Completion Report

Project Number: 44198-013
Loan Number: 2869
Grant Number: 0294
June 2021

Kyrgyz Republic: Power Sector Rehabilitation Project

Asian Development Bank

CURRENCY EQUIVALENTS

Currency unit – som (Som)

		At Appraisal 16 May 2012	At Project Completion 31 December 2019
Som1.00	=	$0.0213	$0.0143
$1.00	=	Som47.06	Som69.79
$1.00	=	SDR0.6469	SDR0.7232

ABBREVIATIONS

ADB	–	Asian Development Bank
AEFS	–	audited entity financial statements
AMDA	–	automated metering and data acquisition
APFS	–	audited project financial statements
DMF	–	design and monitoring framework
EIRR	–	economic internal rate of return
EMP	–	environmental management plan
EPP	–	Electric Power Plants (open joint-stock company)
FIRR	–	financial internal rate of return
GWh	–	gigawatt-hour
HEPP	–	hydroelectric power plant
IEE	–	initial environmental examination
KESC	–	Kyrgyz Electricity Settlement Center
kV	–	kilovolt
kWh	–	kilowatt-hour
MDM	–	meter data management
MOEI	–	Ministry of Energy and Industry
O&M	–	operation and maintenance
PIU	–	project implementation unit
PMC	–	project management consultant
RRP	–	report and recommendation of the President
SCIESU	–	State Committee for Industry, Energy and Subsoil Use
SDR	–	special drawing right
WACC	–	weighted average cost of capital

NOTES

(i) The fiscal year (FY) of the Government of the Kyrgyz Republic and its agencies ends on 31 December. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2019 ends on 31 December 2019.

(ii) In this report, “$” refers to United States dollars.

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BASIC DATA

A. Loan Identification

1.	Country	Kyrgyz Republic
2.	Loan number and financing source	2869-KGZ (concessional ordinary capital resources)
	Grant title and financing source	0294-KGZ (Asian Development Fund)
3.	Project title	Power Sector Rehabilitation Project
4.	Borrower	Government of the Kyrgyz Republic
5.	Executing agencies	State Committee on Industry, Energy and Subsoil Use and Electric Power Plants (open joint-stock company)
6.	Amount of loan	SDR9,703,000 ($15,000,000 equivalent)
	Amount of grant	$40,000,000
7.	Financing modality	Project loan and grant

B. Loan Data

1.	Appraisal[a]	
	– Date started	25 June 2010
	– Date completed	7 March 2012
2.	Loan negotiations	
	– Date started	7 May 2012
	– Date completed	8 May 2012
3.	Date of Board approval	11 June 2012
4.	Date of financing agreement	12 September 2012
5.	Date of loan and grant effectiveness	
	– In financing agreement	12 November 2012
	– Actual	14 December 2012
	– Number of extensions	1
6.	Project completion date	
	– Appraisal	30 June 2017
	– Actual	31 December 2019
7.	Loan and grant closing date	
	– In financing agreement	30 June 2017
	– Actual	24 June 2020
	– Number of extensions	2
8.	Financial closing date	
	– Actual	24 June 2020
9.	Terms of loan	
	– Interest rate	1% per annum during grace period and 1.5% per annum thereafter
	– Maturity (number of years)	32
	– Grace period (number of years)	8
10.	Terms of relending[b]	
	– Interest rate	1.5% per annum
	– Maturity (number of years)	25
	– Grace period (number of years)	5
	– Second-step borrower	Electric Power Plants

[a] Only the reconnaissance mission from 25 June 2010 to 7 March 2012 was conducted for this project.
[b] The proceeds of the loan and a portion ($34,600,000) of the grant proceeds were onlent to EPP.

11. Disbursements

a. Dates Loan 2869 and Grant 0294

Initial Disbursement	Final Disbursement	Time Interval
L2869: 17 May 2013 G0294: 17 May 2013	L2869: 26 May 2020 G0294: 26 May 2020	L2869: 84 months G0294: 84 months
Effective Date	**Actual Closing Date**	**Time Interval**
14 December 2012	24 June 2020	90 months

b. Amount (SDR million) – Loan 2869

Category	Original Allocation (1)	Increased during Implementation (2)	Canceled during Implementation [a] (3)	Last Revised Allocation (4=1+2–3)	Amount Disbursed (5)	Undisbursed Balance[b] (6 = 4–5)
1. Turnkey Contract	7.825	0.776	1.424	7.177	7.055	0.122
2. Consulting Services	0.802	0.181	0.000	0.983	0.785	0.198
3. Unallocated	1.076	(0.957)	0.000	0.119	0.000	0.119
Total	**9.703**	**0.000**	**1.424**	**8.279**	**7.840**	**0.439**
$ Equivalent	15.000			11.570	10.966	0.604

[a] Partial loan cancellation was approved on 9 October 2018.
[b] The undisbursed amount was cancelled at loan financial closure.

c. Amount (million) – Grant 0294

Category	Original Allocation (1)	Increased during Implementation (2)	Canceled during Implementation [a] (3)	Last Revised Allocation (4=1+2–3)	Amount Disbursed (5)	Undisbursed Balance[b] (6 = 4–5)
1. Turnkey Contract	27.903	3.001	7.800	23.104	22.999	0.105
2. Consulting Services						
2A. Part 1(b) of the project (EPP)	2.860	0.600	0.000	3.460	2.588	0.872
2B. Part 2 of the project (MOEI)	5.400	0.000	0.000	5.400	4.367	1.033
3. Unallocated	3.837	(3.601)	0.200	0.036	0.000	0.036
Total	**40.000**	**0.000**	**8.000**	**32.000**	**29.954**	**2.046**

EPP = Electric Power Plants (open joint-stock company, MOEI = Ministry of Energy and Industry.
[a] Partial loan cancellation was approved on 9 October 2018
[b] The undisbursed amount was cancelled at loan financial closure

C. Project Data

1. Project cost ($ million)

Cost	Appraisal Estimate	Actual
Foreign exchange cost	55.00	40.92
Local currency cost	7.00	5.58
Total	62.00	46.50

2. Financing plan ($ million)

Cost	Appraisal Estimate	Actual
Implementation cost		
Borrower financed	6.00	5.28
ADB financed	55.00	40.92
Other external financing		
Total implementation cost	61.00	46.20
Interest during construction costs		
Borrower financed	1.00	0.30
ADB financed		
Other external financing		
Total interest during construction cost	1.00	0.30

3. Cost breakdown by project component ($ million)

Component	Appraisal Estimate	Actual
A. Investment Costs		
1. Turnkey contract	40.00	32.86
2. Consultants		
a. Implementation consultant	4.00	3.75
b. Kyrgyz Electricity Settlement Center	3.00	3.00
c. Public awareness program	0.40	0.25
d. Dam safety assessment	2.00	0.98
e. External audit (Electric Power Plants)	0.10	0.08
3. Taxes and duties	6.00	5.28
Subtotal (A)	**55.50**	**46.20**
B. Contingencies		
1. Physical	4.00	0.00
2. Price	1.50	0.00
Subtotal (B)	**5.50**	**0.00**
C. Financing Charges During Implementation		
1. Interest during implementation	1.00	0.30
Total Project Cost (A+B+C)	**62.00**	**46.50**

4. Project schedule

Item	Appraisal Estimate	Actual
Date of contract with consultants		
Project implementation consultant	Q1 2013	Q1 2013
Establishment of electricity settlement center		
Recruitment of consultant	Q3 2013	Q3 2017
Establishment of settlement center	Q3 2013–Q1 2016	Q3 2015
Handover to KESC national staff	Q2 2016	Q4 2019
Dam safety assessment activity		
Date of award	Q1 2013	Q2 2014
Public information program		
Implementation of public information program	Q3 2013–Q3 2014	Q2 2014–Q1 2015
Turnkey contract to rehabilitate Toktogul HEPP		
Date of award	Q1 2014	Q3 2015
Turnkey contractor executed contract	Q4 2016	Q4 2019
Completion of engineering design	NA	
Equipment and supplies	NA	

HEPP = hydroelectric power plant, KESC = Kyrgyz Electricity Settlement Center, Q = quarter, NA = not applicable.

5. Project performance report ratings

Implementation Period	Single Project Rating[a]
14 December 2012 to 31 December 2012	On track
1 January 2013 to 31 March 2013	Actual problem
1 April 2013 to 31 December 2013	Potential problem
1 January 2014 to 31 March 2014	On track

1 April 2014 to 30 September 2014	Potential problem
1 October 2014 to 31 December 2014	On track
1 January 2015 to 31 March 2015	On track
1 April 2015 to 30 September 2015	Potential problem
1 October 2015 to 31 December 2015	On track
1 January 2016 to 31 December 2016	On track
1 January 2017 to 31 December 2017	On track
1 January 2018 to 31 December 2018	On track
1 January 2019 to 31 December 2019	On track

[a] Based on new rating system for evaluating project performance using e-Operations.

D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members
Consultation*	13–18 October 2011	2	6	a, b
Consultation*	11–15 June 2012	4	16	a, b, c, d
Consultation*	10–14 December 2012	3	12	a, b, c
Review*	29 January–8 February 2013	3	21	a, b, c
Inception*	15–22 April 2013	5	30	a, b, c, d, e
Review*	28 October–1 November 2013	3	6	a, b, c
Inception*	25 February–7 March 2014	5	20	a, b, c, d, f
Review*	29–30 May 2014	2	2	a, b
Review*	30 June–11 July 2014	3	15	a, b, f
Midterm project review*	22–26 September 2014	3	12	a, b, d
Review*	21–27 January 2015	4	12	a, b, g, d
Review*	13–16 April 2015	5	15	a, b, f, g, h
Review*	3–9 July 2015	3	9	a, b, f
Review*	19–25 November 2015	3	9	a, b, f
Review*	11–18 April 2016	6	18	a, b, d, g, f, i
Review*	28 September–4 October 2016	7	21	a, b, d, f, g, h, i
Review*	12–23 June 2017	6	12	b, g, a, a, a, d
Review	6–10 August 2018	3	12	b, f, i
Review	14–31 May 2019	5	45	b, b, f, j, k
Review*	29 October 2019	3	6	b, f, j
Project completion review	26 October–19 November 2020	5	65	b, f, j, l, m

*Mission combined with other project in the area.
a = energy specialist, b = project implementation officer, c = young professional, d = project officer, e = director, f = project analyst, g = principal energy specialist, h = senior portfolio management specialist, i = country director, j = environment consultant, k = project administration unit head, l = associate procurement officer, m = project completion review consultant.

I. PROJECT DESCRIPTION

1. The Kyrgyz Republic's power sector is characterized by aging assets, high losses, below-cost tariffs, and poor performance of sector companies. The expected project outcome was improved operational performance of the Kyrgyz Republic's power sector. This outcome was to be achieved through increased reliability and availability of Toktogul hydroelectric power plant (HEPP) to provide more energy to the Kyrgyz power system. The project outputs were (i) a rehabilitated Toktogul HEPP with new secondary electrical equipment, (ii) establishment of Kyrgyz Electricity Settlement Center (KESC), (iii) a dam safety assessment of HEPPs on the Naryn cascade, and (iv) a public information program to raise public awareness of the electricity sector and promote the benefits of reform.[1]

2. The Government of the Kyrgyz Republic identified the energy sector as a major component of its development plan.[2] The project is aligned with the strategy of both the government and ADB to (i) reduce electricity losses and theft, (ii) improve sector financial performance and corporate management, (iii) increase energy security by developing domestic resources, (iv) expand regional power exports, and (v) phase in cost-recovery tariffs over the medium term.[3]

3. Rehabilitation of Toktogul HEPP and the requirement for a dam safety assessment had been recommended under previous ADB project preparatory technical assistance.[4] The technical assistance helped the government and ADB develop an approach to sector reform and rehabilitation. It produced a summary condition assessment, investment scope, cost estimate and schedule, financial and economic analyses, and initial environmental examination of the proposed project, which included rehabilitating the Toktogul and Uch-Kurgan hydropower plants. Because of its importance to the Kyrgyz and regional energy system, rehabilitation of Toktogul HEPP was prioritized. The preparatory technical assistance also revealed a lack of capability within the open joint-stock company Electric Power Plants (EPP) to prepare technical specifications to international standards and handle a tender process in line with ADB rules and guidelines. A full set of bidding documents was prepared under the technical assistance and the support of an international project management consultant was included in the project. Establishing KESC had been recommended in a preceding ADB-financed project to install an automated metering and data acquisition (AMDA) system for the national electricity transmission network.[5]

II. DESIGN AND IMPLEMENTATION

4. The project was approved by ADB's Board of Directors on 11 June 2012.[6] It became effective on 28 February 2013. The project was completed in December 2019, 2.5 years past the original closing date of June 2017. The executing agency for the soft components of the project was the Ministry of Energy and Industry (MOEI) and, subsequently, the State Committee on

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1 The design and monitoring framework is in Appendix 1.
2 Government of the Kyrgyz Republic. 2011. *Medium-Term Development Program of the Kyrgyz Republic, 2010–2014*. Bishkek (approved by Government Resolution No. 540 on 8 September).
3 ADB. 2011. *Country Operations Business Plan: Kyrgyz Republic, 2011–2012*. Manila.
4 ADB. 2012. *Technical Assistance to the Power Sector Rehabilitation Project*. Manila (TA 7704-KGZ).
5 ADB. 2020. *Completion Report: Power Sector Improvement Project*. Manila (Loan 2671-KGZ [concessional ordinary capital resources], Grant 0218-KGZ [Asian Development Fund]).
6 ADB. 2012. *Report and Recommendation of the President to the Board of Directors: Proposed Loan and Grant Kyrgyz Republic: Power Sector Rehabilitation Project*. Manila (Loan/Grant Number: L2869/G0294-KGZ).

Industry, Energy and Subsoil Use (SCIESU), successor of MOEI.[7] EPP was the executing agency for rehabilitation of the Toktogul HEPP.

5. EPP had a project implementation unit (PIU) in place to manage a turnkey contract for the Toktogul works. EPP was assisted by an international consulting firm whose services included bid evaluation, construction supervision, project accounting, safeguard monitoring, and reporting to the government and ADB. Four single turnkey contracts were awarded for design, equipment supply, shipment, construction, and commissioning. MOEI/SCIESU was responsible for (i) establishing KESC, (ii) managing the public information program, and (iii) supervising the dam safety assessment. Consultants were engaged for each of these three components.

A. Project Design and Formulation

6. The Kyrgyz Republic has abundant hydropower resources. More than 90% of the country's energy is generated by 16 hydropower plants, with the rest generated by two thermal combined heat and power plants. With its significant summer exports of surplus hydropower, the Kyrgyz Republic was the largest net power exporter within the Central Asian Power System during the 1990s and 2000s. Load shedding was common, however, during years when river water levels and discharges were low due to hydrologic fluctuations.[8] At appraisal, reliability of the country's power supply was hindered also by (i) high system losses (6% transmission loss and 25% distribution loss in 2009); (ii) obsolete, inefficient technology; (iii) power cuts caused by dilapidated equipment in use since the Soviet era; and (iv) tariffs below cost recovery. These factors, along with dramatically increased national demand, kept power exports and export revenues at levels significantly below their potential.

7. The government identified $4 billion of necessary investments in the power sector for 2012–2017. This is consistent with required investments of $6 billion from 2012 to 2022 identified in a sector study financed by ADB.[9] These investments included rehabilitation and construction of new thermal and hydropower plants as well as new transmission and distribution facilities. On a regional level, energy sector infrastructure requirements are being coordinated through the ADB-sponsored Central Asia Regional Economic Cooperation program.

8. The government identified rehabilitation of HEPPs as a top priority. An assessment of HEPPs in the Naryn cascade concluded that most of the existing HEPPs required rehabilitation, with Toktogul, the largest, having the highest priority. This was because a failure of Toktogul, an important frequency regulator, would affect stability of the Central Asian Power System and be catastrophic for the Kyrgyz Republic's electricity supply. Toktogul had been in operation for more than 35 years, but no major rehabilitation had been done. Critical equipment was failing, resulting in generation availability dropping to 80%. Availability rates would continue dropping without rehabilitation. A complete rehabilitation of primary and secondary electrical and mechanical equipment at Toktogul was required to prevent continued deterioration. The project was a component of a phased rehabilitation program that will ultimately entail complete rehabilitation of Toktogul with replacement of turbines and generators. Phases 2 and 3 were approved by ADB in 2016 and 2018, respectively, and are under implementation.

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[7] The Kyrgyz government dissolved MOEI in November 2015. Policy-making functions in the energy area were initially transferred to the Ministry of Economy. In July 2016, SCIESU was established and charged with energy policy matters.

[8] Load shedding is the deliberate shutdown of electricity supply in parts of a power grid to prevent failure of the entire system when electricity demand exceeds the ability of the system to support it.

[9] ADB. 2012. *Technical Assistance to Central Asia Regional Economic Cooperation for the Power Sector Regional Master Plan.* Manila (TA 7558-REG).

9. At appraisal, high commercial losses and poor sector financial performance were partly attributable to inadequate wholesale and retail metering. Reliable data on energy flows were not available. This impeded correct identification of energy flows between entities and attribution of losses. The distribution of sector revenues by the MOEI was at that time somewhat arbitrary, being based on operational priorities and carried out in an inconsistent manner that prevented proper financial planning by the power companies.

10. The government decided to create an independent settlement center, KESC, with the aim of collecting and providing accurate, transparent, and timely metering and accounting data, data on flows, and information on monitoring the financial settlements between energy companies. It was envisaged that the settlement center would (i) collect and process accounting data; (ii) verify and control data accuracy; (iii) control financial settlements between energy companies, importers, and exporters; (iv) prepare energy balances; (v) manage the registration of contracts; (vi) calculate and distribute losses; and (vii) prepare and submit appropriate reports to market participants, the regulator, and other interested parties. The KESC component is in line with the strategy of the government and ADB to reduce losses and theft of electricity and to improve the sector's financial performance and governance (footnote 6).

11. Most dams on the Naryn cascade were designed and built between 1960 and 1990. Since then, international design criteria for dam hydrological and seismic safety have become more stringent. The Naryn hydropower plants lie in an active seismic zone, increasing the geological hazard of rockfalls and landslides. Furthermore, existing dam designs may not account for the impact of climate change on hydrology and variation in seasonal flow rates. At appraisal, the structural safety of the dams needed to be assessed and dam monitoring procedures reviewed. A dam safety assessment of Naryn cascade dams was included in the project to identify remedial measures.

12. Tariffs were below cost recovery. The weighted average consumer tariff was $0.022 per kilowatt-hour (kWh) at project appraisal. It was estimated in the report and recommendation of the President (RRP; footnote 6) that a weighted average tariff of $0.05 per kWh was required for full cost recovery. A review of the government's tariff policy was being conducted, with general acceptance from all stakeholders that tariffs must be raised. MOEI drafted an energy strategy that included a target to reach full cost recovery tariffs by 2016. Nevertheless, the government was concerned about implementing tariff reform after negative public reaction in 2010 to tariff increases that were subsequently partly reversed. Therefore, it was envisaged that a public information program would be carried out as part of the project to inform the population about (i) experiences in similar countries, (ii) ongoing sector developments and reforms, and (iii) the benefits of an effective tariff policy.

B. Project Outputs

13. The project comprised four components: (i) rehabilitation of Toktogul HEPP (achieved), (ii) establishment of KESC (achieved), (iii) dam safety assessment (partially achieved), and (iv) public information program (achieved). Output target dates in the design and monitoring framework (DMF) were revised in May 2019 to take into account delays in project implementation. The output targets in the DMF did not change.

14. **Rehabilitation of Toktogul HEPP.** This component included the replacement of existing secondary electrical equipment with new equipment. The scope of work changed somewhat from that envisaged in the RRP because it was not yet known at project appraisal that the rehabilitation

would be continued under phases 2 and 3. After it became clear that the subsequent projects would proceed, the scope of work for Output 1 was optimized in 2014. As a result, work on certain turbine-generator related equipment, such as the excitation system, governor system, and stator windings, were shifted to the subsequent phases. EPP was the executing agency, assisted by an international project management consultant (PMC). The rehabilitation contract was divided into four lots procured using international competitive bidding plus the consultancy services of the PMC.

15. Lot 1 financed inspection of all submerged hydraulic steel structures by remote operated vehicle (ROV) and provided the new ROV to EPP for future underwater inspections. The contract was awarded in May 2015 to BSR Co. and AQUADRON Inc., a Korean joint venture. Underwater inspection works were carried out by BSR in June 2015. BSR's underwater inspection report highlighted certain deficiencies that required further investigation. The options and way forward were summarized by the PMC and presented to EPP. The works were completed in November 2015 when EPP issued the completion certificate to BSR.

16. Lot 2 included (i) supply of four new special SF6 type generator circuit-breakers; (ii) replacement of the main step-up transformers for four turbine-generators; (iii) various switchgear, auxiliaries, and auxiliary transformers; and (iv) new protection equipment and line protection between the powerhouse and the 500 kilovolt (kV) switchyard. The contract was awarded in December 2015 to JOC Technical Engineering Co Ltd (PRC). The works were carried out and completed by JOC between March 2016 and November 2018.

17. Lot 3 included replacement of the existing 500 kV oil-filled cable systems by new, modern cables with polyethylene insulation and the supply and installation of four new sets of SF6 state-of-the-art connector systems from the cables to the main transformers, including four sets of sealing ends at the transition point. The contract was awarded in October 2015 to LS Cables & Systems Ltd. & SM Powertech Co. Ltd (Korea). The works were carried out and completed between January 2016 and November 2018.

18. Lot 4, financed from savings realized after contracts for lots 1–3 were awarded, rehabilitated the 500 kV switchyard at Toktogul HEPP. This included replacing the existing disconnecting switches, current transformers, voltage transformers, surge arresters, and other primary substation equipment, as well as replacing the high- and low-voltage switchgear, DC distribution switchgear, and control and protection systems at the 500 kV substation and transition point. An engineering, procurement, and construction contract between EPP and Genser Genel Muhendisik Taahhut ve Ticaret A. S., a Turkish contractor, was signed in December 2017. Main installation works were done between January 2018 and October 2019, when the final completion certificate was issued. Appendix 2 summarizes all project outputs.

19. **Establishment of KESC.** KESC was formally established in August 2015. It was to start publishing data on electricity flows by 2019 and carry out settlement operations by 2020. This was achieved at the end of 2019. Monthly and quarterly energy balances of the Kyrgyz Republic are now available on the KESC website, as are daily reports on execution of energy consumption limits.[10] Energy flows to distribution substations from the transmission system are now known, which will help distribution companies to identify commercial losses and implement commercial loss reduction programs by district. This component, implemented by Brivus AG (Germany), included procurement of two turnkey contracts and three "shopping" contracts. The two turnkey contracts were for (i) a meter data management (MDM) system with automated metering and data

[10] https://esep.energo.kg

acquisition (AMDA) function; and (ii) server hardware, server room equipment, and a server room to keep the software applications safe and secure. International competitive bidding was used for these turnkey contracts. During implementation, both contracts encountered delays due to contract variations requested by KESC and because the server hardware and MDM/AMDA software were purchased from different sources, which created timing and license problems that had to be resolved on-site. The three shopping contracts were for a vehicle, office computer equipment, and furniture for KESC. All work was finished by project completion in December 2019.

20. **Dam safety assessment.** A dam safety assessment was prepared in 2016. A consultant, Temelsu, was engaged by MOEI to inspect the condition of the dams in the Naryn cascade and identify necessary remedial measures. The work included a series of inspection reports for each dam and a completion report summarizing the research conducted during the project. The reports were submitted to MOEI and reviewed by EPP, operator of the Naryn cascade hydropower plants. EPP, through MOEI, provided comments to the reports but these were not appropriately incorporated, causing EPP to be dissatisfied with the consultant's overall performance. The restructuring of MOEI, first through its merger with the Ministry of Economy and then transformation into SCIESU, which began in 2015 and ended with PIU staff being entirely replaced, left the issue unattended. The miscommunication between EPP and the consultant appears to have been caused by management disruption due to sector reorganization and not necessarily the quality of the consultant's work. The output is considered partially achieved.

21. **Public information program.** The output of the program was increased public awareness of sector issues, demonstrated by one public consumer consultation, three Kyrgyz Republic newspaper articles, and two television reports, all conducted during 2014–2015. The public consumer consultation actually took the form of several roundtable discussions with various consumer groups, such as business associations, and the provision of certain assistance in carrying out public information meetings in all regions of the country. More than 60 articles were run in 6 newspapers and 6 television broadcasts were made on two channels. Video clips, radio broadcasts, and other activities informed the public about the importance of electricity, its cost, and the need for energy efficiency. The output was successfully achieved.

C. Project Costs and Financing

22. At appraisal, the project's total cost was estimated at $62 million equivalent, of which ADB's share was $55 million ($40 million Asian Development Fund grant and $15 million or SDR9.703 million equivalent Asian Development Fund loan). The government's share was $7 million, including the financing, exemptions from taxes and duties, and interest during construction. ADB funding covered (i) the turnkey contract for the Toktogul HEPP and related consulting services, (ii) consultant fees to establish KESC, (iii) consultant fees to undertake the dam safety work, and (iv) consultant fees and expenses associated with the public information program. In October 2018, the government requested that ADB cancel SDR1.43 million ($3.4 million equivalent) of the loan proceeds and $8.0 million of the grant proceeds. Actual cost at completion was $46.50 million, with ADB's share at $40.92 million (74.4% of planned expenditures) and the government's share at $5.58 million (79.7% of planned expenditures). The ADB share included SDR7.84 million (equivalent to $10.97 million) from the loan and $29.95 million from the grant at completion. The financing plan at appraisal had a ratio of 89:11 for ADB and government funding, respectively. At completion, this ratio was 88:12. Appendix 3 compares the details of the project cost at appraisal and at completion. Details of the project financing at appraisal and at completion are in Appendix 4.

D. Disbursements

23. Signing and effectiveness of the Subsidiary Financing Agreement was a condition to withdraw the loan and grant proceeds. The agreement was signed on 14 March 2013 and the legal opinion provided on 28 March 2013. The internal procedures to meet the condition were completed about 3 months after effectiveness of the Financial Agreement.

24. The ADB loan and grant were disbursed in accordance with ADB's *Loan Disbursement Handbook* (2007, as amended from time to time). ADB's direct payment procedures were used to disburse the loan and grant proceeds to suppliers, contractors, and consultants. The first disbursement was made to the PMC in May 2013 for the advance payment. This included $223,183 from the ADB loan and $520,761 from the ADB grant, thus a total of $743,944.

25. The project experienced some implementation delays and had two loan extensions. Toktogul's rehabilitation was delayed by almost 2 years due to a lack of responsive bidders during the first round of bidding in August 2013. There was a 3-year delay in recruiting the KESC implementation consultant, first because of difficulties in developing the consultant's terms of reference and subsequently because of the government restructuring that resulted in formation of the SCIESU. Despite these delays, the project as originally envisaged was achieved under budget and an additional component (Lot 4) was added to the scope.

26. Total loan disbursements were $10.97 million (SDR7.840 equivalent), 26.9% less than the $15 million estimated. Similarly, the total grant disbursements were $29.95 million, 25.1% less than the originally envisaged $40 million. Annual disbursements of grant and loan proceeds are shown in Appendix 5, while Appendix 6 summarizes the actual contract awards.

E. Project Schedule

27. The originally envisaged closing date was 30 June 2017. The actual closing date was 31 December 2019, and the loan and grant were financially closed on 24 June 2020. ADB approved two loan extensions. The first extension in November 2014 was to take into account the delay in procurement, although the 2-year delay in establishing KESC also contributed. The second loan extension was in May 2019 to allow KESC an additional 6 months to become operational in November 2019 as well as to complete Lot 4.

F. Implementation Arrangements

28. MOEI supervised the project's physical investment components and managed the settlement center component, public information program, and dam safety assessment. EPP was executing agency for the rehabilitation of Toktogul HPP. At appraisal, EPP had an existing PIU having some experience with donor-funded projects. The PIU was staffed with three engineers plus a director reporting to the general director of EPP. One of the engineers oversaw the procurement process. MOEI had its own PIU that dealt with donor projects. The PIU at MOEI had four specialists, including its head, and was managing about 10 projects. Each specialist oversaw about 3–4 projects. As a responsibility of the PIU at MOEI was to monitor and supervise the projects, the staff was not involved in procurement. The PIUs coordinated the consultants and contractors. EPP agreed to further expand the capability of its PIU and appointed additional qualified personnel for project accounting and safeguard monitoring. Because EPP's PIU experience with ADB-financed projects was limited, ADB provided training in its guidelines and procedures. During implementation, EPP's PIU, assisted by the PMC, enhanced its project implementation capacity by learning ADB's policies and procedures. The staff of both executive

agencies gained substantial experience, and EPP's capacity for implementing and managing such projects effectively improved. Additional personnel, including financial and safeguard specialists, were engaged to support the PIU at EPP in project accounting, payments processing, and safeguard monitoring.

G. Consultant Recruitment and Procurement

29. Consultant recruitments were implemented in compliance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). At appraisal, four consulting packages were planned: (i) Toktogul HEPP PMC, (ii) KESC and public information program, (iii) dam safety assessment, and (iv) external audit. Consultant recruitment for the public information campaign had been bundled with the establishment of KESC, but it was separated when it became apparent that the KESC implementation would take some time. External audits of EPP were carried out annually until project completion.

30. EPP used quality- and cost-based selection for recruiting the Toktogul PMC. The contract with Fichtner GmbH & Co. KG (Germany), the selected PMC, was signed in March 2013. This contract was revised six times and expired in November 2019. The original consulting services contract covered a 44-month project period. Due to the extension of time required for completing refurbishment of Toktogul HEPP, the actual contract period was 79 months and 21 days. In the cases of the public information program and dam safety assessment, consultant recruitment was carried out by MOEI. The KESC consultant recruitment was carried out by MOEI's successor, SCIESU. The contract with the consultant for assistance in establishing KESC was signed, after about 3 years of delay, in September 2017 and ended upon project completion in December 2019. The public information and dam safety components had minor delays, but both began in June 2014 and were finished by the end of 2016. In the case of the dam safety assessment, a second request for expressions of interest needed to be issued after a poor response to the first notice. The contracts are listed in Appendix 7.

31. At appraisal, refurbishment of Toktogul HPP was to be implemented under a single contract package and the bidding process was initially carried out under this arrangement. In the technical evaluation of the bids received, however, it was determined that all three bids were nonresponsive and were therefore rejected. The complexity and diversity of works integrated into a single contract were the reasons for the failed bidding. It was decided to clarify and adjust the scope of work and divide it into distinct lots. Additionally, the need for the remote operated vehicle (described in para. 15) was identified and added to the project. This was required to identify the scope of work for phases 2 and 3 of the Toktogul rehabilitation. ADB's international competitive bidding procedure and single stage/one-envelope procurement method were used to speed up the process. In July 2014, EPP sent an official request to ADB to change the scope of the rehabilitation work and requested a 2-year project extension. In December 2014, the proposed changes were approved by signing an amendment to the financing agreement. This restructuring of the project significantly affected the schedule, and the expected completion was delayed to early 2019.

H. Safeguards

32. The project was classified environment category B under ADB's Safeguard Policy Statement (2009). An initial environmental examination (IEE), including an environmental management plan (EMP), was prepared and the final version was disclosed in May 2012 in accordance with ADB's public disclosure requirements. Public consultation was carried out and the records have been included in the IEE. The PIU and implementation consultant updated the

IEE based on the detailed design by the turnkey contractor. Information was disclosed to stakeholders and affected people during project implementation. A final update was prepared and issued in February 2015 and approved by both ADB and by the State Agency of Environmental Protection and Forestry. IEEs and safeguard monitoring reports were disclosed on the project website in Russian and English.

33. The main environmental impacts of the original project included (i) occupational health and safety at the project site, (ii) management of the used oil and grease waste, (iii) disposal of scrap metal and other solid waste, and (iv) proper handing and monitoring of circuit breakers. The EMP specified mitigation measures and monitoring plans to cover these impacts. EPP together with the PMC carried out control and monitoring of the required measures' implementation at the work sites and 12 semiannual reports on environmental monitoring were issued. These were published on the websites of ADB and EPP. No cases of polychlorinated biphenyl (PCB) contamination from used oil were identified.

34. A supplementary IEE was required for Lot 4. This was prepared by EPP and the PMC and subsequently approved by ADB in October 2017. A major component of the Lot 4 IEE was the handling of asbestos-containing material, which was not covered by the EMP and therefore needed to be addressed. EPP together with the PMC experienced some difficulty in doing this because precise requirements were not specified in the EMP. An acceptable Lot 4 IEE was nevertheless prepared eventually with proper handling and disposal measures and was disclosed on ADB's website in February 2019.

35. The project was classified category C for both involuntary resettlement and indigenous peoples under ADB's Safeguard Policy Statement. The project was implemented in the existing Toktogul HEPP territory where there were no land acquisition and resettlement impacts. The project did not affect indigenous peoples as defined under ADB's Safeguard Policy Statement.

36. ADB's safeguards policy requires that all persons who may be adversely affected by project activities be advised of procedure for filing complaints through a grievance redress mechanism in the event that a project adversely affects their health, livelihood, or living conditions. To this end, EPP developed order No. 38 "On Grievance Redress Mechanism," dated 15 February 2017, describing the mechanism for timely consideration of complaints from affected people. No complaints or grievances were registered during implementation.

I. Monitoring and Reporting

37. All covenants of the financial agreement have been complied with except for one that was deferred and a second that was only partially complied with (all covenants are detailed in Appendix 8). The exceptions are as follow:

- Revaluation of EPP's assets: ADB approved deferment of asset revaluation because this is covered in the follow-on Toktogul Rehabilitation Phase 2 Project. An amendment to the agreement was signed on 23 June 2014.
- Introduce a phased increase in tariffs to achieve full operational and capital cost recovery by 2016: The government adopted a medium-term tariff policy for 2014–2017 with a 7–10% annual tariff increase but tariffs were increased only once, in 2015. A new medium-term tariff policy for 2020–2022 was approved in March 2020 leaving the existing tariffs unchanged.

38. The executing agencies submitted audited project financial statements to ADB as required, although for some periods they were submitted with delays (maximum 3.6 months). The

final audited project financial statements (APFS) were prepared for the year ending 30 April 2020, whereas the project closed on 24 June 2020. Accordingly, the independent audit covers project payments only up to 30 April 2020. Direct payments amounting to $23,496 were made during the period 1 May 2020 to 24 June 2020. The final APFS disclose liabilities totaling $23,496 in note 6 while note 8 to the final APFS discloses that the payments by ADB were made subsequent to 30 April 2020.

39. The PIU carried out the monitoring and reporting for the Toktogul rehabilitation and was responsible for submitting progress reports to ADB on a monthly and quarterly basis. With support of the PMC, the PIU conducted routine project performance monitoring of physical works and social and environmental safeguard activities by contractors. SCIESU submitted monthly and quarterly reports to ADB for the other project components.

40. In accordance with the project agreement, EPP was also responsible for submitting its annual corporate financial statements in accordance with international auditing standards and to have its financial statements audited annually by qualified independent auditors. Audited entity financial statements (AEFS) were submitted but were delayed in some years. For FY2014, a delay of 10.6 months was due to poor translation of the report, which had to be revised several times. The AEFS submission for FY2018 was delayed by 7.7 months due to rebidding the auditor's contract. The auditor's opinions on EPP's AEFS for FY2012, FY2018, and FY2019 were qualified. The main reason for the qualified opinion for FY2018 was missing information needed to properly reflect the value of certain assets and operations in the financial reports. The latest available audited report, for the year ending 31 December 2019, was accompanied by a qualified opinion based upon (i) the unknown effect of the impairment of property, plant, and equipment on the financial statements; (ii) nonrecognition of long-term employee compensation obligations; (iii) nonrecognition of long-term obligations to restore plant sites; and (iv) uncertainty over opening balances of certain accounts because the previous audit had been undertaken by a different auditor. The AEFS for 2020 was not yet due at the time this report was prepared.

41. EPP's weak financial management capabilities were recognized in the RRP. This situation was to be mitigated by a requirement that external audits be carried out to an international standard. The RRP additionally assessed overall financial risk as high, citing two areas of particular concern: (i) that the sector-level revenue distribution mechanism was arbitrary and nontransparent, and (ii) that the government's unwillingness to raise tariffs undermines EPP's financial sustainability. The first of these concerns was to be addressed at least in part through formation of KESC, which now provides sufficient energy flow information to permit that revenues be distributed among the various power sector entities on a rational and transparent basis. The latter issue of unwillingness to raise tariffs was to be mitigated by (i) the government's raising EPP's sales tariff to ensure long-term sustainability (not done); (ii) MOEI's developing a public information program (done); and (iii) the government, EPP, and USAID's developing and implementing a plan to improve profitability of the Bishkek combined heat and power plant (not done, as EPP's 2019 financial statements indicate major losses on heating operations). The financial management action plan with respect to the major identified areas of risk was thus largely not followed. Another noted area of concern (assigned "medium" risk without mitigation) was a delay in conducting an external audit of EPP's consolidated financial statements in accordance with International Financial Reporting Standards (IFRS). The audit was eventually undertaken for the first time by an international audit firm only in 2019. Before this, the audit was performed by a local firm.

III. EVALUATION OF PERFORMANCE

A. Relevance

42. The project was *relevant* to the government's objectives and policies, as well as ADB's country partnership strategy 2013–2017. The government has identified development of the energy sector as a major component of its development plan. The project is aligned with the government's and ADB's strategy to (i) reduce electricity losses and theft, (ii) improve sector financial performance and corporate management, (iii) increase energy security through the development of domestic resources, (iv) expand regional power exports, and (v) phase in cost-recovery tariffs over the medium term. The project was included in ADB's country operations business plan 2011–2012. Needed investments included, among others, the rehabilitation of existing hydropower plants such as Toktogul HEPP. The project remained relevant at completion, as the government's priorities that led to its development have not changed appreciably since 2010. The grant-and-loan financing modality was appropriate given the relatively small size of the project and the need for technical assistance.

43. The DMF remained unchanged during project implementation except for the timing of targets when the project was delayed. The following observations may nevertheless be made regarding two indicators: (i) the impact indicators of increased exports and increased domestic supply did not foresee the high growth in domestic demand that prevented the export target from being achieved, and (ii) the output indicator of reducing commercial losses to 10% by the end of the project was poorly selected because KESC's identifying losses is only the first step. The second step would be to introduce a targeted loss reduction program. It also should be noted that the DMF wrongly categorized total distribution losses, including technical and commercial (24% at appraisal), as commercial losses.

B. Effectiveness

44. The project was *effective* in achieving its outcomes. The availability of Toktogul HEPP reached 89% in 2019, just short of the 90% target. This occurred in the year that the project was completed and thus also reflected the more limited availability in months when the project had not been completed. Distribution losses were cut in half, from 25% to 12.3%, by 2019 but the 10% loss target was not quite reached. As noted, however, this was a poorly selected indicator.

45. Almost all project outputs were achieved. Toktogul HEPP was rehabilitated according to specifications by 2019, with additional scope added for Lot 4 out of cost savings from lots 1–3. Rehabilitation of Toktogul HEPP directly contributed to substantially achieving the 90% availability outcome target, up from 80% at project appraisal.

46. KESC has been publishing data on electricity flows since 2020 and is currently carrying out settlement operations. This needs to be qualified, however, as KESC presently deals not in financial settlements but only in "physical flow" settlements. The pre-KESC financial settlement system has not changed, as power sector proceeds are distributed by a designated bank in accordance with instructions provided by the regulatory authority. The establishment of KESC and its mandate of publishing data on electricity flows nevertheless have contributed to the outcome of improved operational performance in the Kyrgyz Republic's power sector, as identifying the sources of power system losses will facilitate the implementation of loss reduction programs going forward.

47. Although the dam safety assessment report was provided to MOEI in 2016, there is some question regarding EPP's satisfaction with that report. The assessment was carried out under MOEI's management, but the study's beneficiary and the single assessor of the consultant's technical reports was EPP, owner of the Naryn cascade. Unaddressed comments from EPP left questions regarding the quality of the work. An unclear communications chain complicated matters, as the consultant disregarded EPP's comments unless received via MOEI. Frequent changes in the government's ministerial structures hindered continuity and should have been considered when identifying an executing agency for such a specific technical component. MOEI nevertheless accepted the report, which was useful for identifying the scope of rehabilitation for the subsequent Phase 2 and Phase 3 projects and thus will contribute to improved operational performance.

48. The output of the public information campaign was increased public awareness on sector issues as demonstrated by one public consumer consultation, three Kyrgyz Republic newspaper articles, and two television reports in 2014 and 2015. These outputs were achieved. The effectiveness of this output may be judged by the single tariff increase implemented—with public acceptance—in 2015 shortly after the campaign ended.

C. Efficiency

49. The economic internal rate of return (EIRR) recalculated for the Toktogul rehabilitation is 24.9%. That is higher than the EIRR of 21.3% originally calculated for the RRP. Sensitivity of the economic analysis results was tested by varying the benefits assumptions. These assumptions included (i) a decrease of 20% in the value of avoided energy cost, and (ii) a doubling of the estimated operation and maintenance (O&M) expense. In both cases, the EIRR remained above 20% and above the 12% threshold value at the time of appraisal. The main reason for the higher EIRR at completion was lower capital costs. Appendix 9 details the economic reevaluation.

50. Regarding process efficiency, the project was delayed as the result of inappropriate contract packaging. The subsequent redesign of the contract packaging nevertheless worked to the project's advantage because the final costs were much lower than estimated. In the case of KESC, the difficulties encountered stem from the complexity of the subproject that might have been mitigated through a more thorough design. In these two instances, therefore, process efficiency was low. Given the high EIRR of the Totogul HEPP component and timely completion of the other two components, however, the project is rated *efficient.*

D. Sustainability

51. The recalculated financial internal rate of return (FIRR) for the Toktogul rehabilitation is 10.5%, which is below the FIRR of 12.3% originally calculated for the RRP but above the weighted average cost of capital (WACC) of 0.53%. Sensitivity of the financial analysis results was tested by varying the benefits assumptions. This included (i) a decrease of 20% in EPP's average tariff, and (ii) a doubling of the estimated O&M expense. In both cases, the resulting FIRR was well above the WACC of 0.53%. Appendix 10 details the financial reevaluation.

52. EPP's most recent audited financial statements indicate that it recorded losses of Som3,826 million in 2019 and Som159 million in 2018. Financial statements for previous years show profits, but 2019 was the first year in which an international auditing firm was engaged to undertake the audit. Given the financial results of the past two years, EPP's sustainability is questionable. On the positive side, EPP accounts for the vast majority of electricity generated in the country. State-owned EPP has full support of the government. The government has cancelled

and rescheduled sector debt in the past, when needed, and will continue supporting EPP as the financial guarantor. However, the government's financial condition has deteriorated due to the COVID-19 pandemic. Public debt levels rose to 62.2% of GDP in 2020 compared with 54% in 2019. Real GDP contracted by 8.6% in 2020. Economic growth in 2021 is expected to be only around 3.5%.[11] Finally, the cost of electricity imported from neighboring countries is higher than the revenues from residential tariffs.[12]

53. The project is environmentally and technically sustainable, particularly with respect to the cable lines. The old 500 kV cable lines were oil-filled and required a rigorous daily maintenance procedure that involved checking the oil pressure, chemical analysis of the oil, inspecting for leaks, and checking gas content in the oil. The project replaced the old cable lines with new and modern 500 kV cable lines free of oil and other liquid materials. The project also halted steadily declining efficiency as the equipment had surpassed its useful life and was contributing to significant deterioration in Toktogul HEPP's production.

54. The overall financial impact due to the project in terms of additional O&M expenses is minimal and the government is committed to ensuring that Toktogul HEPP continues to operate. However, given EPP's weak financial position, the lack of government commitment to increase tariffs, and scarcity of government resources to continue subsidizing EPP, the project is assessed *less than likely sustainable.*

E. Development Impact

55. The two impact indicators were (i) 10-year average of net exports by 2021 will be maintained at the 2001–2010 average of 2,000 gigawatt-hour (GWh) per year, and (ii) domestic supply is increased to 8,500 GWh in 2019 from 6,100 GWh in 2010. The second indicator (DMF, Appendix 1) was overachieved (10,540 GWh), but, due to a dramatic increase in domestic demand, the Kyrgyz Republic was unable to achieve its export target. It may be assumed that the additional 2,000 GWh would otherwise have been exported but was used to support domestic development needs. The Kyrgyz Republic is rich in hydropower resources, and electricity production by hydropower plants is an important sector of the economy. Since 2002, the country's hydropower plants have generated 92% of its total electricity production, with Toktogul producing by far the most. The project's development impact is therefore assessed *satisfactory.*

F. Performance of the Borrower and the Executing Agency

56. The borrower was the government, while EPP and MOEI/SCIESU were the executing agencies. Because this project had been preceded by another power sector project, part of which entailed meter data acquisition for KESC (footnote 5), this was essentially an ongoing project for MOEI. Thus, the borrower was well prepared for the current project in terms of ensuring the quality of project preparation and meeting loan effectiveness requirements. No significant shortcomings were noted in implementing the project aside from delay due to the need to repackage and retender some contracts.

57. Financial management capacity of EPP nevertheless remains weak, as is the government's commitment to tariff reform. This causes concern about project sustainability. While 55 of 56 loan and grant covenants were complied with, the covenant related to tariff levels was

[11] ADB. 2021. *Asian Development Outlook 2021.* Manila.
[12] European Bank for Reconstruction and Development. Transition Report 2020-21, the Kyrgyz Republic, https://2020.tr-ebrd.com/countries/#!kyrgyz-republic

satisfied only in part. The PIU and MOEI/SCIESU otherwise fulfilled the project requirements, including for adequate safeguard-related reporting during implementation. The performance of both borrower and executing agencies is rated *satisfactory.*

G. Performance of the Asian Development Bank

58. ADB fielded 15 review missions from the effectiveness date of 14 December 2012.[13] The missions focused on reviewing implementation progress of the current project, the predecessor project, and pipeline power sector projects in consultation with the government, EPP, and MOEI/SCIESU. Missions at the beginning of project implementation generally found that progress was "on-track," but the reports began to highlight issues related to delays in tendering the works for Toktogul HEPP. Nevertheless, actions taken by both ADB and the executing agencies helped ensure that the project was successfully implemented.

59. The project records and ADB's mission follow-up documents show that ADB's review and approval of procurement documents and project progress reports were conducted in a timely manner. Apart from dealing with the delays in implementation by way of developing action plans, no other intervention was required from ADB during the project implementation period. The outcome indicators in the DMF could have been better developed. Nevertheless, ADB's performance with regard to this project is rated *satisfactory.*

H. Overall Assessment

60. Overall, the project is rated *successful*. This assessment is based on the aforementioned criteria of relevance, effectiveness, efficiency, and sustainability. The project's design was relevant in terms of the government's overall development objectives and ADB's country partnership strategy. The project was effective in view of implementing almost all outputs and achieving almost all the expected outcomes. The project was economically efficient with a high estimated economic rate of return. The executing agency, EPP, as well as the project itself were assessed less than likely sustainable. The design of subprojects and construction activities under the project were at an acceptable level and were very timely in view of the fact that Toktogul HEPP's condition would have further deteriorated without the project.

Overall Ratings

Criteria	Rating
Relevance	Relevant
Effectiveness	Effective
Efficiency	Efficient
Sustainability	Less than likely sustainable
Overall Assessment	**Successful**
Development impact	Satisfactory
Borrower and executing agency	Satisfactory
Performance of ADB	Satisfactory

ADB = Asian Development Bank.
Source: Asian Development Bank.

[13] ADB Aide-Memoires and Back-to-Office Reports concerning Loan/Grant Number: L2869/G0294-KGZ, January 2013 to May 2019.

IV. ISSUES, LESSONS, AND RECOMMENDATIONS

A. Issues and Lessons

61. **Financial management and power sector performance.** The RRP identified the arbitrary method by which power sector revenues were allocated to the various power sector entities. This led to creating KESC to address at least part of the problem. In addition, a medium-term tariff policy adopted by the government for the period 2014–2017, ostensibly to address the government's reluctance to increase tariffs, resulted in a single, insufficient tariff increase in 2015. The current medium-term tariff policy 2020–2022 foresees no tariff increases. Thus, some provisions in the financial management action plan in the RRP have not been carried out and the project's overall risk rating at financial close remains high.

62. **Safeguard compliance.** As mentioned in para. 34, EPP and the PMC together prepared an IEE to cover Lot 4 but were not prepared to address the handling of asbestos. To avoid spending time unnecessarily to resolve this issue, it would have been useful to have had the training on asbestos handling and on ADB's Safeguard Policy Statement. In ongoing and future projects, training and advice on ADB's safeguard policy should be strengthened. Strong safeguards compliance monitoring by the executing agency, consultants, and ADB will help in timely resolution of issues that emerge during project implementation. During project implementation, the removal and proper storage of asbestos-containing material and long-term storage of concrete waste are examples of where additional training would have better prepared the implementers in safeguard compliance.

63. **Implementation delays.** Project implementation experienced initial procurement delays of about 2 years because bidder interest was lacking. The establishment of KESC was delayed 3 years, partly because of disagreements on the terms of reference and partly because of incompatibility between the KESC server hardware and MDM/AMDA software. Two lessons should be learned: (i) contracts need to be carefully packaged (the initial Toktogul HEPP contract should have been broken into separate lots, while the two separate KESC packages for server hardware and MDM/AMDA software packages should have been combined to improve compatibility); and (ii) terms of reference should be agreed by all pertinent stakeholders well before implementation to avoid costly delays, especially when there are complex issues to be resolved.

64. **DMF impacts and outcomes.** Often, not enough consideration is given to developing DMF impacts and outcomes that can be easily assessed in post-project evaluations, as noted in para. 43. In one instance, one impact (exports) could not be achieved even when the other impact (domestic supply) was overachieved. In this case, total supply (i.e., exports plus domestic supply) would have been a better indicator. The expected outcome (lower losses) is only partially dependent on the project, which provides the ability only to measure losses but not to reduce them. In this case, "identification of commercial losses by district" would have been a better indicator. In addition, the reduced loss outcome indicator was not well defined (as described in para. 43).

65. **Project structuring.** There is some question regarding EPP's satisfaction with the dam safety assessment report, as described in paras. 20 and 47. Considerable thought should be given to identifying the most appropriate executing agencies for project components, and especially for those that require specific technical expertise to manage the work. This will also provide a higher level of ownership, thereby helping to ensure successful completion.

B. Recommendations

66. Implementation delays (para 63) may have been avoided through a market assessment that would match areas of expertise of firms (and the number of such firms in the market) with the specific work to be undertaken. This would lead to better design of tendering packages, better response from potential bidders and fewer delays.

67. In ongoing and future projects, training on ADB's safeguards policy and procedures could be strengthened. Strong safeguards compliance monitoring by the executing agency, consultants, and ADB can help quickly resolve of issues that emerge during project implementation. During this project's implementation, dealing with the removal and proper storage of asbestos-containing material (paras. 34 and 62) can be cited as an example where more training would have been appropriate.

68. **Future monitoring.** Rehabilitation of Toktogul HEPP entailed the installation of new equipment that became part of EPP's operating infrastructure. Timely and quality construction of these facilities was achieved, and will likely be operated with the diligence which has been employed in operating and maintaining the old equipment well beyond its useful life. KESC is operational, but its scope should be greatly increased. For one, smart meters are currently installed only on the 110–500 kV substations. While these meters can certainly help to identify commercial losses, better information may be obtained by expanding the metering to also include all lines at the high-voltage distribution level. ADB should follow up and encourage such expansion. Secondly, the RRP refers to KESC's involvement in financial settlements, but this has not happened. Some clarity is required on whether KESC will eventually undertake this function or whether it will continue to be performed by another entity. Finally, ADB should monitor the financial performance of EPP during loan repayment and follow up on the government's commitment to increase tariffs or provide sufficient subsidies for EPP to become a financially sustainable entity.

69. **Covenants.** Future covenants should address the weak financial position not only of EPP but also of the other power sector entities in the Kyrgyz Republic. Such covenants might include a requirement for raising tariffs (or other methods of increasing sector revenues), the continued requirement for a tariff plan (a covenant partially complied with under the current project), or a requirement that the entities attain a minimum level of financial performance as might be measured by the debt service coverage ratio (for example). For future assistance, it may also be advisable to recruit consultants who can work with EPP to build financial planning capacity by developing financial management action plans and financial models, as well as provide recommendations for improving EPP's financial sustainability over the medium to long term.

70. **Timing of the project performance evaluation report.** The project is one of a series (phases 1–3) of rehabilitation projects at Toktogul HEPP. A project performance evaluation report may be appropriate after all phases have been completed.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Indicators and Targets	Project Achievements
Impact Increased reliability of national and regional power systems	10-year average of net exports by 2021 will be maintained at 2001–2010 average of 2,000 GWh/year Domestic supply increased to 8,500 GWh in 2019 from 6,100 GWh in 2010	Not achieved. The average of annual net exports over the period 2011-2020 was 589 GWh per year. However, this was compensated by an increase in Domestic supply of over 2,000 GWh per year, thus reflecting enhanced Domestic supply at the expense of exports. Over-achieved. Total supply by distribution companies was 10,540 GWh in 2019.
Outcome Improved operational performance of the Kyrgyz Republic power sector	% of time Toktogul HEPP is available to operate reaches 90% in 2019 against 80% in 2010 Commercial losses reduce from 24% in 2009 to 10% in 2019	Substantially achieved. Availability was 89% in 2019. This occurred in the year that the project was completed and thus, also reflected the more limited availability in the months the project had not been completed. Not achieved. Losses were 12.3% in 2019. However, this indicator was not well-selected because the formation of KESC does not, by itself, lead to an outcome of reduced losses. The establishment of KESC must be followed or accompanied by a loss reduction program. Also, commercial losses were not 24% in 2009; total distribution losses (technical +commercial) were 24%.
Outputs 1. Rehabilitation of Toktogul HEPP	Toktogul HEPP rehabilitated according to specifications by 2019.	Over-achieved with the addition of Lot 4, which arose from cost savings generated by lower-than-envisaged costs for Lots 1-3.
2. Establishment of electricity settlement center	KESC publishes data on electricity flows by 2019 and carries out settlement operations by 2020.	Achieved. These data are publicly available on the internet.
3. Dam safety assessment	Dam safety assessment report is approved by MOEI by 2016.	Partially achieved. Report was provided and accepted by MOEI, but EPP was not satisfied with it.
4. Public information program	Increased public awareness on sector issues as demonstrated by one public consumer consultation, three Kyrgyz Republic newspaper articles, and two television reports in 2014 and 2015.	Achieved. Targets were exceeded. The public consultation took form of several roundtable discussions. More than 60 articles were run in 6 newspapers and 6 television broadcasts were made on 2 channels.

Source: Asian Development Bank.
All information pertaining to production, availability and losses has been provided by EPP and SCIESU.

SUMMARY OF PROJECT OUTPUTS

	At Appraisal	Actual Outputs	Quantity and Details
1	Rehabilitation of Toktogul HEPP	(1) Inspection of all hydraulic steel structures.	Including inspection of all submerged hydraulic steel structures by means of a Remote Operated Vehicle (ROV) with supply of a new ROV to EPP for future underwater inspections.
		(2) Rehabilitation of the secondary electrical equipment.	Installed: (i) four new special SF6 type generator circuit-breakers; (ii) four new main step-up transformers; (iii) various switchgear, auxiliaries and auxiliary transformers; and (iv) new protection equipment and line protection between the powerhouse and the 500 kV switchyard.
		(3) Rehabilitation of 500 kV cable systems.	Installed: (i) four modern 500 kV cable systems with polyethylene insulation; (ii) four new sets of SF6 state-of-the-art connector systems from the cables to the main transformers; (iii) including four sets of cable sealing ends at the transition point.
		(4) Rehabilitation of the 500 kV switchyard and the 500 kV cable transition point.	Installed: new disconnecting switches, current and voltage transformers, surge arresters and other primary and secondary substation equipment including high and low voltage switchgears, DC distribution switchgears, control and protection systems.
2	Establishment of KESC	Design/supply and installation of MDM with AMDA with auxiliary equipment and necessary construction works.	Including: (i) installation of MDM with AMDA; (ii) installation of server hardware and server room equipment; (iii) construction works to create a server room to keep the software applications in a safe and secure location; (iv) a vehicle, office computer equipment and office furniture for the KESC.
3	Dam safety assessment	The study was implemented by a consultant team under the management of the MOEI.	Inspection of the condition of 5 dams in the Naryn cascade of hydropower plants with indication of the necessary remedial measures.
4	Public information program	The program increased public awareness on sector issues.	Several round table discussions with various consumer groups and the provision of certain assistance in carrying out public information meetings in all regions of the country. More than 60 publications were posted in 6 newspapers and 6 television broadcasts were made on 2 television channels. This was in addition to video clips, radio broadcasts and other activities to inform the public about the importance of electricity, its cost and the need to use it efficiently.

HEPP = Hydroelectric Power Plants, MDM = Meter Data Management System, AMDA = Automated Metering and Data Acquisition system, EPP = JSC Electric Power Plants, MOEI = Ministry of Energy and Industry, KESC = Kyrgyz Electricity Settlement Center, DC = Direct Current

PROJECT COST AT APPRAISAL AND ACTUAL
($'000)

	Item	Appraisal Estimate			Actual		
		Foreign Excahnge	Local Currency	Total Cost	Foreign Excahnge	Local Currency	Total Cost
A.	**Base Cost**						
	1 Turnkey Contract	40.00		40.00	32.86		32.86
	2 Settlement Center	3.00		3.00	3.00		3.00
	3 Consulting Services [a]	6.50		6.50	5.06		5.06
	4 Taxes and Duties	-	6.00	6.00		5.28	5.28
	Subtotal (A)	**49.50**	**6.00**	**55.50**	**40.92**	**5.28**	**46.20**
B.	**Contingencies**	**5.50**		**5.50**	**-**		**-**
C.	**Financing Charges During Implementation**		**1.00**	**1.00**		**0.30**	**0.30**
	1 Interest During Implementation		1.00	1.00		0.30	0.30
Total Project Cost (A+B+C)		**55.00**	**7.00**	**62.00**	**40.92**	**5.58**	**46.50**

[a] Includes estimated audit fees of $100,000 for the audit of the annual project financial statements for 2012–2019 to be financed from ADB resources: 30% loan and 70% grant. Actual audit fee amounted to total of $80,000

Source: The report and recommendation of the President; ADB loan and grant financial information system; Open Joint Stock Company Electric Power Plants

PROJECT COST BY FINANCIER
Table A3.1: Project Cost at Appraisal by Financier

Item			Loan 2869		Grant 0294		Government/EPP*		Total Cost	
			Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	Taxes and Duties
			(A)	(A/D)	(B)	(B/D)	(C)	(C/D)	(D)	(E)
A.	**Investment Costs**									
	1	Turnkey Contract	12.10	27%	27.90	62%	5.30	12%	45.30	5.30
	2	Consultants	1.24	12%	8.26	81%	0.70	7%	10.20	0.70
		a. Project Implementation	1.21	30%	2.79	70%	-	0%	4.00	-
		b. Settlement Center		0%	3.00	88%	0.40	12%	3.40	0.40
		c. Dam Safety Assessment		0%	2.00	89%	0.25	11%	2.25	0.25
		d. Public Information Program		0%	0.40	89%	0.05	11%	0.45	0.05
		e. External Audit (EPP)	0.03	30%	0.07	70%	-	0%	0.10	-
		Subtotal (A)	**13.34**	**24%**	**36.16**	**65%**	**6.00**	**11%**	**55.50**	**6.00**
B.	**Contingencies**									-
	1	Physical	1.21	30%	2.79	70%		0%	4.00	-
	2	Price	0.45	30%	1.05	70%		0%	1.50	-
		Subtotal (B)	**1.66**	**30%**	**3.84**	**70%**	**-**	**0%**	**5.50**	**-**
C.	**Financing Charges During Implementation**									-
	1	Interest During Implementation		0%		0%	1.00	100%	1.00	
Total Project Cost (A+B+C)			**15.00**	**24%**	**40.00**	**65%**	**7.00**	**11%**	**62.00**	**6.00**
					ADB (%)			**Government/EPP**		
% of Total Project					**89%**			**11%**		**100%**

Note: Numbers may not sum precisely because of rounding

EPP= Open Joint Stock Company Electric Power Plants

Source: Asian Development Bank

Table A3.2: Project Cost at Completion by Financier
($ million)

Item			Loan 2869		Grant 0294		Government/EPP*		Total Cost	
			Amount	% of Cost Category	Amount	% of Cost Category	Amount	% of Cost Category	Amount	Taxes and Duties
			(A)	(A/D)	(B)	(B/D)	(C)	(C/D)	(D)	(E)
A.	**Investment Costs**									
	1	Turnkey Contract	9.86	26%	23.00	61%	4.77	13%	37.63	4.77
	2	Consultants	1.11	13%	6.95	81%	0.51	6%	8.57	0.51
		a. Project Implementation	1.09	29%	2.67	71%	0.02	1%	3.77	0.02
		b. Settlement Center		0%	3.00	90%	0.32	10%	3.32	0.32
		c. Dam Safety Assessment		0%	0.98	85%	0.17	15%	1.15	0.17
		d. Public Information Program		0%	0.25	100%	-	0%	0.25	-
		e. External Audit (EPP)	0.02	30%	0.05	70%	-	0%	0.08	-
		Subtotal (A)	**10.97**	**24%**	**29.95**	**65%**	**5.28**	**11%**	**46.20**	**5.28**
B.	**Contingencies**									-
	1	Physical	-	-	-	-	-	-	-	-
	2	Price	-	-	-	-	-	-	-	-
		Subtotal (B)	-	-	-	-	-	-	-	**-**
C.	**Financing Charges During Implementation**									-
	1	Interest During Implementation [d]		0%		0%	0.30	100%	0.30	-
Total Project Cost (A+B+C)			**10.97**	**24%**	**29.95**	**64%**	**5.58**	**12%**	**46.50**	**5.28**
					ADB (%)		**Government/EPP**			
% of Total Project					**88%**			**12%**		**100%**

Note: Numbers may not sum precisely because of rounding

EPP= Open Joint Stock Company Electric Power Plants

* The amount of taxes and duties

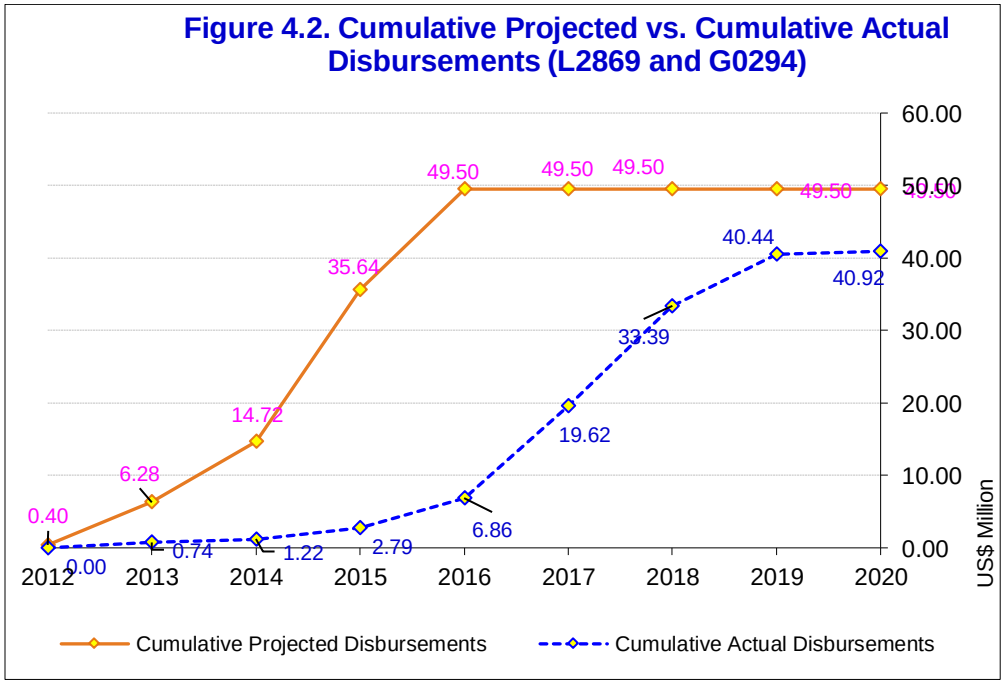
Source: Asian Development Bank

{Note{s}:
1. Numbers may not sum precisely because of rounding.

DISBURSEMENT OF ADB LOAN AND GRANT PROCEEDS
Table 4.1: Annual and Cumulative Disbursement of ADB Proceeds
($ million)

Year	Loan Annual Disbursement		Grant Annual Disbursement		Total Cumulative Disbursement	
	Amount (000 USD)	% of Total	Amount (000 USD)	% of Total	Amount (000 USD)	% of Total
2012	0.00	0%	0.00	0%	0.00	0%
2013	0.22	2%	0.52	2%	0.74	2%
2014	0.00	0%	0.48	2%	1.22	3%
2015	0.35	3%	1.23	4%	2.79	7%
2016	1.11	10%	2.96	10%	6.86	17%
2017	3.78	34%	8.98	30%	19.62	48%
2018	3.90	36%	9.87	33%	33.39	82%
2019	1.52	14%	5.53	18%	40.44	99%
2020	0.09	1%	0.39	1%	40.92	100%
Total	**10.97**		**29.95**		**40.92**	**100%**

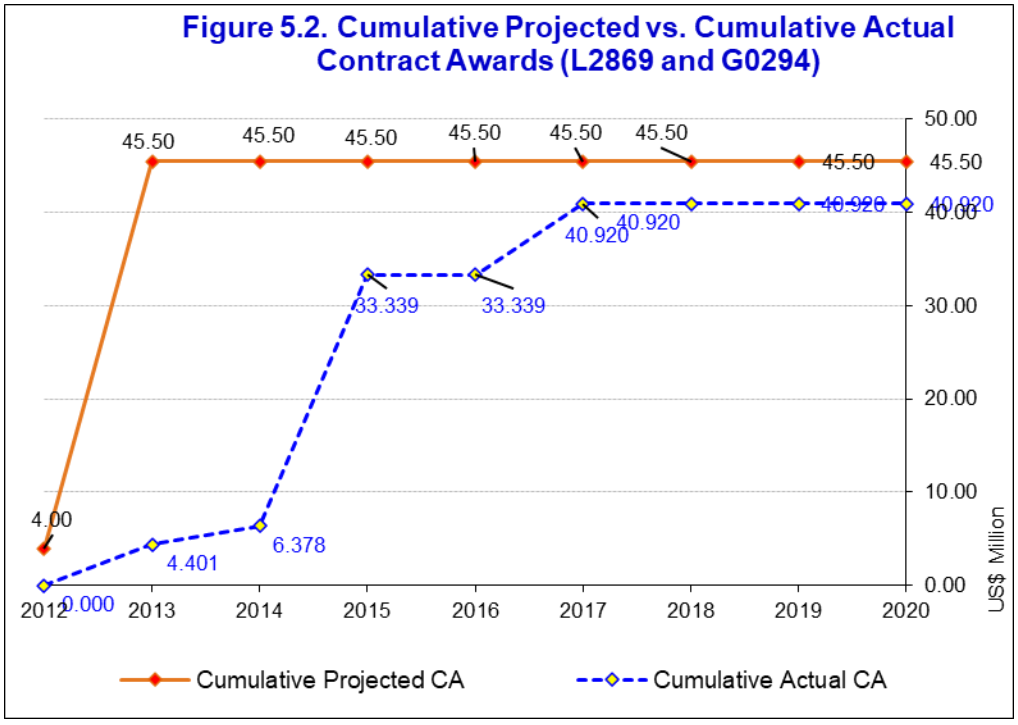
Note: Numbers may not sum precisely because of rounding
ADB = Asian Development Bank
Source: Asian Development bank



CONTRACT AWARDS OF ADB LOAN AND GRANT PROCEEDS
Table A5.1: Annual and Cumulative ADB Contract Award
($ million)

Year	Annual Contract Award Loan Contract		Annual Contract Award Grant Contract		Total Cumulative Contract Award	
	Amount (000 USD)	% of Total	Amount (000 USD)	% of Total	Amount (000 USD)	% of Total
2012	0.00	0%	0.00	0%	0.00	0%
2013	1.32	12%	3.08	10%	4.40	11%
2014	0.02	0%	1.95	7%	6.38	16%
2015	8.09	74%	18.88	63%	33.34	81%
2016	0.00	0%	0.00	0%	33.34	81%
2017	1.54	14%	6.04	20%	40.92	100%
2018	0.00	0%	0.00	0%	40.92	100%
2019	0.00	0%	0.00	0%	40.92	100%
2020	0.00	0%	0.00	0%	40.92	100%
Total	**10.97**		**29.95**		**40.92**	**100%**

Note: Numbers may not sum precisely because of rounding
ADB = Asian Development Bank
Source: Asian Development Bank



LIST OF CONTRACTS UNDER LOAN AND GRANT

Grant 0294-KGZ (Amount in US as of 16 January 2021)

Contract Number	Description	Supplier Name	Address	Contract Amount	Contract Date	Procurement Mode
G09381	CONSULTING SERVICES FOR PROJECT IMPLEMENTATION	FICHTNER GMBH & CO. KG	SARWEYSTRABE 3 70191 STUTTGART	$2,533,487.52	18-Mar-13	INT'L COMP BIDDING
G11211	CONSULTING SERVICES (PROCUREMENT SPECIALIST)	JARKYN ISAMATOVA	BISHKEK KYRGYZ REPUBLIC	$8,628.85	13-Feb-14	OTHERS
G11276	NATIONAL CONSULTANT (TRANSLATOR)	ANDREY ZENS	BISHKEK KYRGYZ REPUBLIC	$6,723.39	12-Feb-14	OTHERS
G11429	PROJECT FINANCIAL AUDIT	HLB MARKA AUDIT LLC	BISHKEK KYRGYZ REPUBLIC	$54,308.10	02-Apr-14	CON'S QUALFICAT'N SELECTION
G11479	NATIONAL CONSULTANT (FINANCIAL MANAGER)	JAMILA KARYPBAEVA	BISHKEK KYRGYZ REPUBLIC	$79,955.88	03-Apr-14	OTHERS
G11636	CONSULTANT (DAM SAFETY ASSESSMENT)	TEMELSU INTERNATIONAL ENGINEERING SERVICES, I	YILDIZEVLER 721 SOK NO. 6 06550 GANKAYA, ANKARA	$981,056.27	02-Jun-14	QUALITY AND COST BASED SELECTION
G11667	CONSULTANT (PUBLIC INFORMATION PROGRAM)	PROMOTANK LLC	BISHKEK KYRGYZ REPUBLIC	$254,174.84	12-Jun-14	CON'S QUALFICAT'N SELECTION
G13218	NATIONAL CONSULTANT (TRANSLATOR)	LILIYA ANTIMONOVA	175 TOKTOGULA STR. APT. 33 BISHKEK KYRGYZ REPUBLIC	$9,078.42	27-Apr-15	OTHERS
G13271	SMALL WORKS (UNDERWATER INSPECTION)	JV OF BSR CO., LTD AND AQUADRON INC.	#305 (STX-V TOWER), 128 GASANDIGITER1-RO GUEMSHEON, SEOUL. KOREA, REPUBLIC OF	$110,040.00	18-May-15	INT'L COMP BIDDING
G14044	REFURBISHMENT OF TOKTOGUL HPP (REPLACEMENT OF ELECTRICAL COMPONENTS, ELECTRICAL AUXILIARIES & INSTRUMENTATION) - HV CABLES	LS CABLES & SYSTEMS LTD/SM POWERTECH CO. LTD	12-16F, LS-TOWER, 127, LS-RO, DONGAN-GU ANYANG-SI, GYEONGGI-DU, 431-848 KOREA, REPUBLIC OF	$7,029,420.97	12-Oct-15	INT'L COMP BIDDING
G14413	EPC CONTRACT FOR LOT 2: REPLACEMENT OF SECONDARY ELECTRICAL AND MECHANICAL COMPONENTS	JOC TECHNICAL ENGINEERING CO., LTD.	29/F XINHUA MANSION, NO. 55 ZHONGSHAN RD NANJING 210005 CHINA, PEOPLE'S REPUBLIC OF	$11,650,685.67	22-Dec-15	INT'L COMP BIDDING
G16767	INDIVIDUAL CONSULTANT (TRANSLATOR, NATIONAL)	ESENJAN ABUBAKIROV	BISHKEK KYRGYZ REPUBLIC	$26,877.65	04-Jan-17	OTHERS
G17997	KYRGYZ ELECTRICITY SETTLEMENT CENTER (CONSULTANT)	BRIVUS AG SWITZERLAND	GEWERBESTRASSE 9 6330 CHAM	$3,000,296.68	28-Sep-17	OTHERS
G18446	REFURBISHMENT OF TOKTOGUL HPP: LOT IV-REHABILITATION OF 500 KV SUBSTATION & 500 KV CABLE TRANSITION POINT	GENSER GENEL MUHENDISIK TAAHUT VE TICARET AS	SAMANDIRA SANCAKTEPE, ISTANBUL TURKEY	$4,209,102.35	27-Dec-17	INT'L COMP BIDDING

Loan 2869-KGZ (Amount in US as of 16 January 2021)

Contract Number	Description	Supplier Name	Address	Contract Amount	Contract Date	Disbursements (Total)
0001	PROJECT MANAGEMENT CONSULTANT	FICHTNER GMBH & CO.	SARWEYSTRABE3 7191 STUTTGART GERMANY	$1,085,780.37	18-Mar-13	QLTY & COST-BSED SEL
0002	PROJECT FINANCIAL AUDIT (MOEI AND EPP)	HLB MARKA AUDIT LLC	PROFESSORA ZIMY STREET BISHKEK KYRGYZ REPUBLIC	$23,274.90	02-Apr-14	CON'S QUALFICAT'N SELECTION
0003	SMALL WORKS (UNDERWATER INSPECTION)	JV OF BSR CO., LTD AND AQUADRON, INC.	#305 (STX-V TOWER), 128 GASANDIGITER1-RO GUEMCHEON, SEOUL KOREA, REPUBLIC OF	$47,160.00	18-May-15	INT'L COMP BIDDING
0004	REFURBISHMENT OF TOKTOGUL HPP (REPLACEMENT OF ELECTRICAL COMPONENTS, ELECTRICAL AUXILIARIES & INSTRU	LS CABLES & SYSTEMS LTD/SM POWERTECH CO. LTD	12-16F, LS-TOWER, 127, LS-RO, DONGAN-GU ANYANG-SI, GYENGGI-DU, 431-848 KOREA, REPUBLIC OF	$3,012,608.98	12-Oct-15	INT'L COMP BIDDING
0005	EPC CONTRACT FOR LOT 2: REPLACEMENT OF SECONDARY ELECTRICAL AND MECHANICAL COMPONENTS	JOC TECHNICAL ENGINEERING CO., LTD.	29/F XINHUA MANSION, NO. 55 ZHONGSHAN RD NANJING 210005 CHINA, PEOPLE'S REPUBLIC OF	$4,993,150.99	21-Dec-15	INT'L COMP BIDDING
0006	REFURBISHMENT OF TOKTOGUL HPP: LOT IV-REHABILITATION OF 500 KV SUBSTATION & 500 KV CABLE TRANSITION	GENSER GENEL MUHENDISIK TAAHUT VE TICARET AS	SAMANDIRA SANCAKTEPE, ISTANBUL TURKEY	$1,803,901.02	27-Dec-17	INT'L COMP BIDDING

STATUS OF COMPLIANCE WITH LOAN COVENANTS

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
Reallocation of Loan Proceeds. Notwithstanding the allocation of the Loan proceeds and the withdrawal percentages set forth in the Table: (a) if the amount of the Loan allocated to any Category appears to be insufficient to finance all agreed expenditures in that Category, ADB may, in consultation with the Beneficiary, (i) reallocate to such Category, to the extent required to meet the estimated shortfall, amounts of the Loan which have been allocated to another Category but, in the opinion of ADB, are not needed to meet other expenditures, and (ii) if such reallocation cannot fully meet the estimated shortfall, reduce the withdrawal percentage applicable to such expenditures in order that further withdrawals under such Category may continue until all expenditures thereunder shall have been made; and (b) if the amount of the Loan then allocated to any Category appears to exceed all agreed expenditures in that Category, ADB may, in consultation with the Beneficiary, reallocate such excess amount to any other Category.	Schedule 3A, para 3	**Complied with.** EAs coordinated with ADB on any need for reallocation. Reallocation was made on the engagement of 3 individual experts to augment EAs' capacities on project implementation. Another reallocation was made in Aug 2016 to finance PIC contract price increase. EA for Part 3 under Financing Agreement was updated as a result of government reorganization where MOEI was abolished in Nov 2015 and energy sector was reorganized in July 2016.
Except as ADB may otherwise agree, the proceeds of the Loan for financing Goods, Works, Consulting services and other items of expenditures shall be disbursed in accordance with the Loan Disbursement Handbook.	Schedule 3A, para 4	**Complied with.**
Financing Agreement (Condition for Withdrawals from Loan Account). Notwithstanding any other provision of this Financing Agreement and except as ADB may otherwise agree, no withdrawals shall be made from the Loan Account until the Subsidiary loan Agreement, in form and substance satisfactory to ADB, has been duly authorized and executed and delivered on behalf of, the Beneficiary and EPP, and is legally binding upon the parties thereto in accordance with its terms, and a copy of such Subsidiary loan Agreement and its English translation have been provided to ADB.	Schedule 3A, para 5	**Complied with.** Subsidiary loan agreement was signed in Mar 2013. Initial withdrawal was made in Apr 2013.
Reallocation of Grant Proceeds Notwithstanding the allocation of the Grant proceeds and the withdrawal percentages set forth in the Table: (a) if the amount of the Grant allocated to any Category or Subcategory appears to be	Schedule 3B, para 3	**Complied with** EAs coordinated with ADB on any need for reallocation. Reallocation was made on the engagement of 3 individual experts to

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
insufficient to finance all agreed expenditures in that Category, ADB may, in consultation with the Beneficiary, (i) reallocate to such Category or Subcategory, to the extent required to meet the estimated shortfall, amounts of the Grant which have been allocated to another Category or Subcategory but, in the opinion of ADB, are not needed to meet other expenditures, and (ii) if such reallocation cannot fully meet the estimated shortfall, reduce the withdrawal percentage applicable to such expenditures in order that further withdrawals under such Category or Subcategory may continue until all expenditures thereunder shall have been made; and (b) if the amount of the Grant then allocated to any Category appears to exceed all agreed expenditures in that Category or Subcategory, ADB may, in consultation with the Beneficiary, reallocate such excess amount to any other Category or Subcategory.		augment EAs' capacities on project implementation. Another reallocation was made in Aug 2016 to finance PIC contract price increase. EA for Part 3 under Financing Agreement was updated as a result of government reorganization where MOEI was abolished in Nov 2015 and energy sector was reorganized in July 2016. With the savings incurred from EPC procurement packages, Lot 4 on switchyard rehabilitation was added in Feb 2017. Its bidding documents were issued in Jun 2017 and contract was awarded in Dec 2017.
Except as ADB may otherwise agree, the proceeds of the Grant for financing Goods, Works, Consulting services and other items of expenditures shall be disbursed in accordance with the Loan Disbursement Handbook.	Schedule 3B, para 4	**Complied with.**
Financing Agreement (Condition for Withdrawals from Grant Account) Notwithstanding any other provision of this Financing Agreement and except as ADB may otherwise agree, no withdrawals shall be made from the Grant Account for activities under Part 1 of the Project until the Subsidiary loan Agreement, in form and substance satisfactory to ADB, has been duly authorized and executed and delivered on behalf of, the Beneficiary and EPP, and is legally binding upon the parties thereto in accordance with its terms, and a copy of such Subsidiary loan Agreement and its English translation have been provided to ADB.	Schedule 3B, para 5	**Complied with.** Subsidiary loan agreement was signed in Mar 2013. Initial withdrawal was made in Apr 2013.
Except as ADB may otherwise agree, Goods and Works shall only be procured on the basis of international competitive bidding.	Schedule 4, para 3	**Complied with.** Selection of turn-key contractor for Toktogul rehabilitation was revised and divided into three packages. Bidding documents for Lot 1 (Underwater

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
		Inspection) were issued in late-Jan 2015, and contract was awarded in May 2015. Bidding documents for Lot 3 were issued in Jun 2015, and contract was awarded in Oct 2015. Bidding documents for Lot 2 were issued in July 2015, and contract was awarded in Dec 2015. Procurement of the said lots was done through ICB. Procurement for Lot 4 on switchyard rehabilitation was added in Feb 2017, with bidding documents were issued in Jun 2017 and contract was awarded in Dec 2017. Procurement was also done through ICB.
The method of procurement is subject to, among other things, the detailed arrangements and threshold values set forth in the Procurement Plan. The Beneficiary may only modify the method of procurement or threshold values with the prior agreement of ADB, and modifications must be set out in updates to the Procurement Plan.	Schedule 4, para 4	**Complied with.**
Except as ADB may otherwise agree or as set out in paragraph 6 below, the Beneficiary shall apply quality- and cost-based selection for selecting and engaging Consulting Services.	Schedule 4, para 5	**Complied with** As MOEI and ADB agreed, Public Information Program consultant selection was revised to CQS.
The Beneficiary shall apply consultants' qualifications selection for selecting and engaging Consulting Services for purposes of external auditing of the Project accounts and EPP's corporate accounts.	Schedule 4, para 6	**Complied with** Contract for Financial Audit consultant under CQS was awarded on 2 April 2014 and extended the project closing date.
Financing Agreement (Industrial or Intellectual Property Rights) (a) The Beneficiary shall ensure that all Goods and Works procures (including without limitation all computer hardware, software and systems, whether separately procured or incorporated within other goods and services procured) do not violate or infringe and industrial property or intellectual property right or claim of any third party. (b) The Beneficiary shall ensure that all contracts for the procurement of Goods and Works contain appropriate	Schedule 4, para 7	**Complied with**

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
representations, warranties and, if appropriate, indemnities from the contractor or supplier with respect to the matters referred to in subparagraph (a) of this paragraph.		
Financing Agreement (Industrial or Intellectual Property Rights) The Beneficiary shall ensure that all ADB-financed contracts with consultants contain appropriate representations, warranties and, if appropriate, indemnities from the consultants to ensure that the Consulting Services provided do not violate or infringe any industrial property or intellectual property right or claim of any third party.	Schedule 4, para 8	**Complied with**
All contracts procured under international competitive bidding procedures and contracts for Consulting Services shall be subject to prior review by ADB, unless otherwise agreed between the Beneficiary and ADB and set forth in the Procurement Plan.	Schedule 4, para 9	**Complied with** As MOEI and ADB agreed, Public Information Program consultant selection was revised to CQS.
The Beneficiary shall seek ADB's approval before it: (a) grants any extension of the stipulated time for completion of a contract for Goods or Works; or (b) agrees to any modification or waiver of the conditions of a contract for Goods or Works, including any change order that falls under (c) or (d) below; or (c) issues any change order under a contract for Goods or Works which would in aggregate increase the original contract price (for the avoidance of doubt, such aggregate shall take into account any previous or simultaneous change order or orders under such contract); or (d) issues any change order under a contract for Goods or Works that would affect more than 15% of the original contract price (either through increases or decreases), even if the net effect of such change order would not in aggregate increase the original contract price. For the avoidance of doubt, such aggregate shall take into account any previous or simultaneous change order or orders under such contract.	Schedule 4, para 10	**Complied with** Selection of turn-key contractor for Toktogul rehabilitation was revised and divided into three packages. Bidding documents for Lot 1 (Underwater Inspection) were issued in late-Jan 2015, and contract was awarded in May 2015. Bidding documents for Lot 3 were issued in Jun 2015, and contract was awarded in Oct 2015. Bidding documents for Lot 2 were issued in July 2015, and contract was awarded in Dec 2015. Delivery and installation of equipment under Lots 1,2 and 3 were completed. Procurement for Lot 4 on switchyard rehabilitation was added in Feb 2017, with bidding documents issued in Jun 2017 and contract awarded in Dec 2017. Delivery and installation of equipment under Lot 4 completed.
ADB undertakes to respond to each request for approval under paragraph 10 above within 10 ADB business days (in Manila) of ADB's receipt of such request. Such response will indicate that the request is (i) approved, (ii) declined, or (iii) pending receipt of	Schedule 4, para 11	**Complied with**

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
additional information or documentation or (iv) pending consideration by ADB's Procurement Committee, in each case as determined by ADB. If ADB fails to respond within 10 ADB business days (in Manila) of ADB's receipt of such request (except if it relates to consideration by the Procurement Committee), the request shall be deemed to have been approved by ADB. In the case of (iii), the Beneficiary shall promptly provide the requested information or documentation to ADB and ADB undertakes to respond to the relevant request within 10 ADB business days (in Manila) upon receipt of such requested information or documentation satisfactory to ADB. In the case of (iv), ADB shall notify the Beneficiary of the decision by the Procurement Committee within 10 ADB business days (in Manila) of such decision by the Procurement Committee.		
The Beneficiary shall, or shall ensure that each Project Executing Agency will: (a) provide a copy of all time extensions, modifications or waivers to the contracts (including change orders) requiring ADB's approval in accordance with paragraph 10 above to ADB for its record promptly after signing; and (b) maintain an accurate record of all change orders under all contracts for Goods or Works which do not require ADB's prior approval under paragraph 10 above and submit such record for ADB's review every six months.	Schedule 4, para 12	**Complied with** EAs closely coordinated with ADB on any need for contracts' extension. Implementation arrangement was updated as a result of government reorganization where MOEI was abolished in Nov 2015 and energy sector was reorganized in July 2016. As such, supervision of MOEI consultants was transferred to SCIESU and their contracts were amended as necessary.
The Beneficiary shall ensure, or cause EPP to ensure, that no Works contract which involves environmental impacts will be awarded until: the State Agency of Environmental Protection and Forestry has granted the final approval of the IEE; and EPP has incorporated the relevant provisions from the EMP into the Works contract.	Schedule 4, para 13	**Complied with.** All contracts included provision from IEE and EMP. IEE and EMP were included in bidding documents
The Beneficiary, through MOE and EPP, shall ensure that the Project is implemented in accordance with the detailed arrangements set forth in the Project Administration Manual (PAM). Any subsequent change to the PAM shall become effective only	Schedule 5, para 1	**Complied with**. Especially on implementation arrangement, was updated as a result of government reorganization where MOEI was abolished in Nov 2015

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
after approval of such change by the Beneficiary and ADB. In the event of any discrepancy between the PAM and this Financing Agreement and/or the Project Agreement, the provisions of this Financing Agreement and/or the Project Agreement shall prevail.		and energy sector was reorganized in July 2016.
The Beneficiary shall cause: (a) EPP to adequately staff and equip the Project implementation unit for Part 1 of the Project and to ensure that the Project implementation unit shall function until such component is completed; and (b) MOEI to designate a qualified and experienced staff as the focal point for implementing Part 2 of the Project upon effectiveness of the Grant, and to notify ADB promptly upon any replacement of such focal point until such Project components are completed.	Schedule 5, para 2	**Complied with.** PIC for EPP and individual consultants for MOEI/MOE were engaged to assist on project implementation. Implementation arrangement was updated as a result of government reorganization where MOEI was abolished in Nov 2015 and energy sector was reorganized in July 2016.
The Beneficiary, through MOEI, shall promptly (a) consider the outputs and recommendations being prepared on the Kyrgyz Electricity Settlement Center under the Power Sector Improvement Project, including but not limited to the governance and ownership structures of the Kyrgyz Electricity Settlement Center; (b) consult with ADB on any comments thereon and (c) formally approve such outputs and recommendations (with amendments as necessary). The Beneficiary, through MOE, shall ensure that the establishment of the Kyrgyz Electricity Settlement Center shall be in accordance with such approved outputs and recommendations satisfactory to ADB.	Schedule 5, para 3	**Complied with.** KESC study under Loan 2671 completed in July 2013. EA for KESC component was updated as a result of government reorganization where MOEI was abolished in Nov 2015 and energy sector was reorganized in July 2016. The KESC was formally established, and KESC consultant contract was awarded in Oct 2017 to assist in development of the Settlement Center.
The Beneficiary shall ensure that EPP will provide (a) full access to relevant information and documents, and (b) make appropriate arrangements to facilitate any visits to sites, each as reasonably requested with notice for purposes of carrying out the dam safety assessment and report under Part 2(b) of the Project. The Beneficiary shall also ensure that EPP will provide adequate office accommodation to such consultants during the term of their engagement.	Schedule 5, para 4	**Complied with.** Close coordination and data sharing between EAs was observed. Implementation arrangement was updated as a result of government reorganization where MOEI was abolished in Nov 2015 and energy sector was reorganized in July 2016.

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
The Beneficiary shall make available and release all counterpart funding promptly as required for purposes of timely and successful Project implementation.	Schedule 5, para 5	**Complied with**
The Beneficiary shall ensure that the Project is included in the state budget as necessary to ensure timely disbursement of Project expenditures.	Schedule 5, para 6	**Complied with**
The Beneficiary shall ensure that (a) no taxes, duties or other mandatory payments are levied on the Project expenditure within its territory; or (b) sufficient budgetary allocations are provided to MOE and EPP to cover the cost of such taxes, duties or other mandatory payments; or (c) MOE and EPP will have other financial resources sufficient to cover the cost of such taxes, duties or other mandatory payments.	Schedule 5, para 7	**Complied with** All contracts awarded to consultants and contractors financed by ADB were exclusive of duties and taxes. Payments for such were respectively covered by the EAs.
The Beneficiary shall ensure, or shall cause MOE and EPP to ensure, that qualified and experienced staff are made available for the effective operation and maintenance of the Project facilities.	Schedule 5, para 8	**Complied with** Individual consultants were engaged to augment EAs' capacities on project implementation Implementation arrangement was updated as a result of government reorganization where MOEI was abolished in Nov 2015 and energy sector was reorganized in July 2016.
The Beneficiary shall ensure, or shall cause EPP to ensure, that ADB's consent is obtained at least 6 months prior to the implementation of any of the following: (i) any change in ownership of any asset, facility or structure financed under the Project; (ii) any sale, transfer, or assignment of interest or control in any asset, facility or structure financed under the Project; or (iii) any lease or other contract or modification of the functions and authority of EPP over operation and maintenance of any such asset, facility or structure financed under the Project. The Beneficiary shall ensure, or shall cause EPP to ensure, that any such changes will be carried out in a legal and transparent manner.	Schedule 5, para 10	**Complied with**
The Beneficiary shall cause EPP to carry out revaluation of its assets and provide ADB with the revaluation data and outcome by December 2013.	Schedule 5, para 11	Per EPP's request, ADB approved on 14 Jan 2014 deferment of asset revaluation as this was agreed to include in the Toktogul

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
		Rehabilitation Project Phase 2 (ADB Project 46348). The Government signed the amendment to the Financing Agreement on 23 June 2014.
The Beneficiary shall cause EPP to ensure that: (a) it complies with the Procurement Guidelines and Consulting Guidelines and the terms of this Financing Agreement and the Project Agreement for procurement of Goods and Works and engagement of consultants for the Project; and (b) annual external audits by an independent auditor acceptable to ADB will be carried out in respect of financial year 2013 and onwards during Project implementation and that such external auditor shall provide an opinion on the compliance by EPP with the laws of the Beneficiary and good industry practice for procurement of goods, works and services other than for the Project.	Schedule 5, para 12	**Complied with** Procurement Guidelines and Consultant Guidelines were complied with.
The Beneficiary, through MOE, shall make its best efforts to improve the transmission and distribution systems, including by way of proper and timely implementation of the ongoing projects in relation to rehabilitation and improvement of the wholesale and retail metering systems.	Schedule 5, para 13	**Complied with.**
The Beneficiary, through MOE, shall ensure that ADB is informed of key power sector policy and restructuring reforms including reforms pertaining to the tariff policy.	Schedule 5, para 14	**Complied with** Implementation arrangement was updated as a result of government reorganization where MOEI was abolished in Nov 2015 and energy sector was reorganized in July 2016.
Consistent with the Beneficiary's strategy for achieving financial sustainability of the power sector, the Beneficiary, through MOE, shall ensure that such new power sector strategy shall: (a) be informed to the public through a public information program carried out during 2013; (b) introduce a phased increase in tariffs to achieve full operational and capital cost recovery as provided for in the Beneficiary's Electricity Law (1997) by 2016; (c) contain adequate measures to protect vulnerable and poor customers; (d) ensure the phased elimination of cross subsidies between generation, transmission, distribution and district heating sub sector companies; and (e) ensure the distribution of sector revenues to sub sector companies is in accordance with sub sector tariffs.	Schedule 5, para 15	**Partially complied.** Public information campaign promoted public awareness on energy sector development the need for tariff reform. The government adopted and Medium-Term Tariff Policy (MTTP) for 2014-2017, with 7-10% of tariff increase each year but failed to follow it. Tariffs were increased only once in 2015. A new MTTP for 2020-2022 was approved in March 2020 leaving the existing tariffs unchanged.

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
The Beneficiary shall ensure, or cause EPP to ensure, that the preparation, design, construction, implementation, operation and decommissioning of the Project and all Project facilities comply with (a) all applicable laws and regulations of the Beneficiary relating to environment, health and safety; (b) the environmental safeguards requirement as set out in the Safeguard Policy Statement (SPS); and (c) all measures and requirements set forth in the IEE, the EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.	Schedule 5, para 16	**Complied with.**
The Beneficiary shall ensure that EPP will submit an emergency response plan as part of the IEE to ADB for approval within 6 months after award of the Works contract. The emergency response plan shall identify responsible parties and actions to be taken in the event of an emergency relating to the collection of waste oil and its transport from Toktogul hydroelectric power plant to the power plant where such waste oil is to be disposed. The Beneficiary shall ensure that EPP has distributed the approved emergency response plan to responsible parties at least 3 months before any collection and transport of waste oil is carried out under the Project.	Schedule 5, para 17	**Complied with.** With the modification on the procurement package, IEE was updated and incorporated in the procurement contracts. Emergency response plan were respectively included in the implementation plan and design.
The Beneficiary shall make available, or cause EPP to make available, necessary budgetary and human resources to fully implement the EMP.	Schedule 5, para 18	**Complied with.** In all procurement and implementation activities, EPP support was provided with its PIU staff actively involved for EMP implementation.
The Beneficiary, through EPP, ensure that all bidding documents and contracts for Works contain provisions that require contractors to: (a) comply with the measures relevant to the contractor set forth in the IEE and the EMP and any corrective or preventative actions set forth in a Safeguards Monitoring Report; (b) make available a budget for all such environmental and social measures; (c) provide the Beneficiary with a written notice of any unanticipated environmental, resettlement or indigenous peoples risks or impacts that arise during construction, implementation or operation of the Project that were not considered in the IEE and the EMP; (d) adequately record the condition of roads, agricultural land and other infrastructure concerned prior to starting to transport materials and	Schedule 5, para 19	**Complied with**. EMRs were submitted and disclosed covering the periods of (i) Jan to Jun 2014; (ii) Jul to Dec 2014; (iii) Jan to Jun 2015; (iv) July to Dec 2015; (v) Jan to Jun 2016; (vi) Jul to Dec 2016; (vii) Jan to Jun 2017; Jul to Dec 2017; and (viii)Jan to Jun 2018; Jul to Dec 2018; (x) Jan to Jun 2019. Final EMR with information for Jun to Dec 2019 was submitted and disclosed.

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
construction; and (e) reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.		Bidding documents and contracts for all four lots contained compliance conditions on IEE and EMP.
The Beneficiary shall cause EPP to do the following: (a) submit semi-annual safeguards monitoring reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission; (b) if any unanticipated environmental and/or social risks and impacts arise during construction, implementation or operation of the Project that were not considered in the IEE, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; and (c) report any actual or potential breach of compliance with the measures and requirements set forth in the EMP promptly after becoming aware of the breach.	Schedule 5, para 20	**Complied with.** EMRs were submitted and disclosed covering the periods of (i) Jan to Jun 2014; (ii) Jul to Dec 2014; (iii) Jan to Jun 2015; (iv) July to Dec 2015; (v) Jan to Jun 2016; (vi) Jul to Dec 2016; (vii) Jan to Jun 2017; Jul to Dec 2017.; and (viii)Jan to Jun 2018 and Jul to Dec 2018; (x) Jan to Jun 2019. Final EMR with information for Jun to Dec 2019 was submitted and disclosed. Progress reports related to all the four lots included social and environmental safeguards compliance in accordance with ADB SPS.
The Beneficiary shall cause EPP to ensure that Project implementation will not involve any land acquisition and/or resettlement impacts within the meaning of the SPS. In the event that any land acquisition and/or resettlement impacts are identified during Project implementation, the Beneficiary shall cause EPP to ensure that such impacts are addressed in accordance with the SPS, including the preparation of a land acquisition and resettlement plan in consultation with the affected people in accordance with the SPS.	Schedule 5, para 21	**Complied with.** The project had no resettlement issues.
The Beneficiary shall, and shall cause EPP to, carry out performance monitoring and reviews during implementation, to evaluate the scope, implementation arrangements, benefit monitoring, progress, and achievement of the objectives of the Project in accordance with ADB's project performance management system guidelines.	Schedule 5, para 22	**Complied with.**
The Beneficiary shall cause EPP to ensure that contractors engaged under the Project (i) comply with all applicable labor laws; (ii) use their best efforts to employ women and local people, including disadvantaged people, living in the vicinity of the Project; (iii) provide equal pay to men and women for work of equal type; (iv) provide and adequately equip first-aid, health and sanitation, and	Schedule 5, para 23	**Complied with.**

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
personal hygiene facilities for male and female workers at the Project site; (v) carry out HIV/AIDS awareness programs for laborer and disseminate information at worksites on risks of sexually transmitted diseases and HIV/AIDS for construction workers, as part of the health and safety program at campsites during the construction period; (vi) maximize female training and employment; and (vii) abstain from child labor. Relevant contracts financed under the Project must include specific clauses on these undertakings.		
The Beneficiary shall cause EPP to ensure that updated information on the Project, reflecting the performance of the Project, business opportunities, bidding process and guidelines, outcome of biddings and summary progress reports of the Project, will be disclosed on EPP's website in a timely manner.	Schedule 5, para 24	**Complied with.**
The Beneficiary shall, and shall ensure that EPP will, comply with ADB's Anticorruption Policy (1998, as amended to date). The Beneficiary acknowledges, and shall ensure that EPP will acknowledge, that ADB reserves the right to investigate, directly or through its agents, any alleged corrupt, fraudulent, collusive or coercive practices relating to the Project and the Beneficiary agrees, and shall ensure that EPP shall agree, to cooperate fully with any such investigation and to extend all necessary assistance.	Schedule 5, para 25	**Complied with.**
The Beneficiary shall cause MOE and EPP to ensure that all contracts financed by ADB under the Project include provisions specifying ADB's right to audit and examine the records and accounts of EPP and all contractors, suppliers, consultants and other service providers as they relate to the Project.	Schedule 5, para 26	**Complied with.**
Particular Covenants in the Project Agreement		
Project Agreement (Art. II, Sec. 2.01) (a) EPP shall carry out the Project with due diligence and efficiency, and in conformity with sound administrative, financial, engineering, environmental and social practices. (b) In the carrying out of the Project and operation of the Project facilities, EPP shall perform all obligations set forth in the Financing Agreement to the extent that they are applicable to EPP.	Art. II	**Complied with.** Implementation and compliance with covenants as well as ADB policies and guidelines were closely monitored.
Project Agreement (Art. II, Sec. 2.13) Except as ADB may otherwise agree, EPP shall apply the proceeds of the Loan and the Grant to the financing of expenditures on the Project in accordance with the	Art. II	**Complied with.** APFS received unqualified opinions and auditors confirmed that funds were

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
provisions of the Financing Agreement and this Project Agreement, and shall ensure that all items of expenditures financed out of such proceeds are used exclusively in the carrying out of the Project.		used for purpose of the project, although there were delays in submission of APFS and AEFS. AEFSs for FY 20218 and FY 2019 were qualified, yet the reasons for qualifications were not linked to the eligibility of the project's fund spending.
Project Agreement (Art. II, Sec. 2.12) Except as ADB may otherwise agree, EPP shall not sell, lease or otherwise dispose of any of its assets which shall be required for the efficient carrying on of its operations or the disposal of which may prejudice its ability to perform satisfactorily any of its obligations under this Project Agreement.	Art. II	**Complied with.**
Project Agreement (Art.II, Sec.2.14) Except as ADB may otherwise agree, EPP shall duly perform all its obligations under the Subsidiary loan Agreement, and shall not take, or concur in, any action which would have the effect of assigning, amending, abrogating or waiving any rights or obligations of the parties under the Subsidiary loan Agreement.	Art. II	**Complied with**.
Project Agreement (Art. II, Sec. 2.09) (a) EPP shall (i) maintain separate accounts and records for the Project and for its overall operations; (ii) prepare annual financial statements for the Project and EPP in accordance with accounting principles acceptable to ADB; (iii) have such financial statements audited annually by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB, in accordance with international auditing standards consistently applied; (iv) as part of each such audit of the Project accounts, have the auditors prepare a report (which includes the auditors' opinion on the use of the Loan and Grant proceeds and compliance with the financial covenants of this Financing Agreement) and a management letter (which sets out the deficiencies in the internal control of the Project that were identified in the course of the audit, if any); and (v) furnish to ADB, no later than 6 months after the end of each related fiscal year, copies of such audited financial statements, audit report and management letter, all in the English language, and such further information	Art. II	**Partially complied with.** Some APFS/AEFS submissions were delayed The following Audited Project Financial Statements (APFS) for MOEI and EPP were submitted: (i) on 30 June 2014 for the reporting period 14 Dec 2012 to 31 Dec 2013; (ii) on 30 Jun 2015 for FY 2014; (iii) on 29 and 30 Jun 2016 for EPP and MOEI/MOE, respectively for FY 2015. EPP APFS for FY 2016 was submitted on 30 Jun 2017 while SCEISU submitted APFS on 18 October 2017 with the 3.6 months delay, for FY 2017 on 20 July 2018 (due to delay of the auditor's contract extension).

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
concerning these documents and the audit thereof as ADB shall from time to time reasonably request. (b) ADB shall disclose the annual audited financial statements for the Project and the opinion of the auditors on the financial statements within 30 days of the date of their receipt by posting them on ADB's website. (c) EPP shall enable ADB, upon ADB's request, to discuss EPP's financial statements and its financial affairs from time to time with the auditors appointed by EPP pursuant to subsection (a) hereinabove, and shall authorize and require any representative of such auditors to participate in any such discussions requested by ADB. This is provided that any such discussion shall be conducted only in the presence of an authorized officer of EPP unless EPP shall otherwise agree.		EPP and SCIESU APFS for FY 2018 were submitted on 28 Jun 2019. For FY 2019, EPP submitted APFS on 19 June 2020 and SCEISU submitted on 23 June 2020. The following Audited Financial Statement (AFS) for EPP were submitted: (i) on 25 Aug 2014 covering the reporting period 14 Dec 2012 to 31 Dec 2013; (ii) in Sep 2015 with English translation of notes in Mar 2016 for FY 2014; and (iii) on 27 July 2016 for FY 2015. AFS for FY 2016 was submitted in Aug 2017 and for FY 2017 on 30 June 2018. AFS for FY 2018 was submitted on 20 February 2020 (there was a delay in the audit firm selection process). For 2019 AEFS was submitted on 12 August 2020.
Project Agreement (Art. II, Sec. 2.11) (a) EPP shall, promptly as required, take all action within its powers to maintain its corporate existence, to carry on its operations, and to acquire, maintain and renew all rights, properties, powers, privileges and franchises which are necessary in the carrying out of the Project or in the conduct of its operations. EPP shall at all times conduct its operations in accordance with sound applicable technical, financial, business, development and operational practices, and under the supervision of competent and experienced management and personnel. EPP shall at all times operate and maintain its plants, equipment and other property, and from time to time, promptly as needed, make all necessary repairs and renewals thereof, all in accordance with sound applicable technical, financial, business, development, operational and maintenance practices.	Art. II	**Complied with.**
Project Agreement (Art. II, Sec. 2.06) EPP shall maintain, or cause to be maintained, records and accounts adequate to identify the items of expenditure financed out of the proceeds of the Loan or the Grant, to disclose the use thereof in the Project,	Art. II	**Complied with**

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
to record the progress of the Project (including the cost thereof) and to reflect, in accordance with consistently maintained sound accounting principles, its operations and financial condition.		
Project Agreement (Art. II, Sec. 2.05) (a) EPP shall take out and maintain with responsible insurers, or make other arrangements satisfactory to ADB for, insurance of Project facilities to such extent and against such risks and in such amounts as shall be consistent with sound practice. (b) Without limiting the generality of the foregoing, EPP undertakes to insure, or cause to be insured, the Goods to be imported for the Project against hazards incident to the acquisition, transportation and delivery thereof to the place of use or installation, and for such insurance any indemnity shall be payable in a currency freely usable to replace or repair such Goods.	Art. II	**Complied with.**
Project Agreement (Art. II, Sec. 2.03) (a) In the carrying out of the Project, EPP shall employ competent and qualified consultants and contractors, acceptable to ADB, to an extent and upon terms and conditions satisfactory to ADB. (b) Except as ADB may otherwise agree, EPP shall procure all items of expenditures to be financed out of the proceeds of the Loan and the Grant in accordance with the provisions of Schedule 4 to the Financing Agreement. ADB may refuse to finance a contract where any such item has not been procured under procedures substantially in accordance with those agreed between the Beneficiary and ADB or where the terms and conditions of the contract are not satisfactory to ADB.	Art. II	**Complied with**. Project implementation consultant was engaged in March 2013. Consultants for Public Information Program, Financial Audit and Dam Safety Assessment were engaged. Selection of turn-key contractor for Toktogul rehabilitation was revised and divided into three packages, the procurement contracts for such were awarded in May (Lot 1), October (Lot 3) and December 2015 (Lot 2). Request for Proposal (RFP) for Settlement Center consultant was issued in April 2017, with contract awarded in Oct 2017. Procurement for Lot 4 on switchyard rehabilitation was added in Feb 2017 and contract awarded in Dec 2017.
Project Agreement (Art. II, Sec. 2.07) (a) ADB and EPP shall cooperate fully to ensure that the purposes of the Loan and the Grant will be accomplished. (b) EPP shall promptly inform ADB of any condition which interferes with, or threatens to interfere with, the progress of the Project, the performance of its obligations under this Project Agreement or the Subsidiary loan Agreement, or the	Art. II	**Complied with.**

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
accomplishment of the purposes of the Loan and the Grant. (c) ADB and EPP shall from time to time, at the request of either party, exchange views through their representatives with regard to any matters relating to the Project and the Loan and the Grant.		
Project Agreement (Art. II, Sec. 2.04) EPP shall carry out the Project in accordance with plans, design standards, specifications, work schedules and construction methods acceptable to ADB. EPP shall furnish, or cause to be furnished, to ADB, promptly after their preparation, such plans, design standards, specifications and work schedules, and any material modifications subsequently made therein, in such detail as ADB shall reasonably request.	Art. II	**Complied with** Selection of turn-key contractor for Toktogul rehabilitation was revised and divided into three packages. Bidding documents for Lot 1 (Underwater Inspection) were issued in late-Jan 2015, and contract was awarded in May 2015. Bidding documents for Lot 3 were issued in Jun 2015, and contract was awarded in Oct 2015. Bidding documents for Lot 2 were issued in July 2105, and contract was awarded in Dec 2015. Under Lot 1, underwater inspection was performed in June 2015, Remotely Operated Vehicle (ROV) was delivered in July 2015, and Final report was submitted in November 2015. Under Lot 2, all four main transformers and other electrical equipment were delivered and installed by Dec 2018. Under Lot 3 all four 500 kV cables and accessories were delivered to the site and installed. Procurement for Lot 4 on switchyard rehabilitation was added in Feb 2017, with bidding documents issued in Jun 2017 and contract awarded in Dec 2017. delivery and installation of equipment under Lot 4 completed in Dec 2019.
Project Agreement (Art. II, Sec. 2.15) EPP shall promptly notify ADB of any proposal to amend, suspend or repeal any provision of its constitutional documents, which, if implemented, could adversely affect the carrying out of the Project or the operation of the Project	Art. II	**Complied with.**

Covenant	Reference in Financing/ Project Agreements	Status of Compliance
facilities. EPP shall afford ADB an adequate opportunity to comment on such proposal prior to taking any affirmative action thereon.		
Project Agreement (Art. II, Sec. 2.02) EPP shall make available, promptly as needed, the funds, facilities, services and other resources as required, in addition to the proceeds of the Loan and the Grant, for the carrying out of the Project.	Art. II	**Complied with.** EPP counterpart support was provided on time. EPP-PMU was reorganized where all staff involved in ADB projects for Toktogul rehabilitation (i.e., Phases 1, 2, and 3) was consolidated in one unit.
Project Agreement (Art. II, Sec. 2.08) (a) EPP shall furnish to ADB all such reports and information as ADB shall reasonably request concerning (i) the Loan and the Grant and the expenditure of the proceeds thereof; (ii) the items of expenditure financed out of such proceeds; (iii) the Project; (iv) the administration, operations and financial condition of EPP; and (v) any other matters relating to the purposes of the Loan and the Grant. Without limiting the generality of the foregoing, EPP shall furnish to ADB periodic reports on the execution of the Project and on the operation and management of the Project facilities. Such reports shall be submitted in such form and in such detail and within such a period as ADB shall reasonably request, and shall indicate, among other things, progress made and problems encountered during the period under review, steps taken or proposed to be taken to remedy these problems, and proposed program of activities and expected progress during the following period. Promptly after physical completion of the Project, but in any event not later than 3 months thereafter or such later date as ADB may agree for this purpose, EPP shall prepare and furnish to ADB a report, in such form and in such detail as ADB shall reasonably request, on the execution and initial operation of the Project, including its cost, the performance by EPP of its obligations under this Project Agreement and the accomplishment of the purposes of the Loan and the Grant.	Art. II	**Complied with.**

ECONOMIC REEVALUATION

A. Introduction

1. This economic re-evaluation of the project has been carried out in accordance with *the ADB Guidelines for the Economic Analysis of Projects (2017)*. It replicates the economic analysis carried out for the rehabilitation of the Toktogul hydroelectric power plant (HEPP) at project appraisal.

B. Project Components

2. The economic analysis covers the rehabilitation of the Toktogul HEPP only, including design, supply, installation, testing, and commissioning of the dam rehabilitation works and equipment, which includes 500 kilovolts (kV) of high voltage cables, governor system, excitement system, generator circuit breakers, medium and low voltage switch gears, and spare stator winding. It does not include the other project components undertaken by the SCIESU.

3. Because the cost of implementing these works was less than envisaged, another component was added to the project during implementation out of the cost savings. This extra scope included the rehabilitation of the Toktogul 500 kV switchyard. As the project components are interrelated, costs and benefits have been considered on a total project level.

C. Approach and Assumptions

4. The economic analysis results in the determination of economic internal rate of return (EIRR). These measures are based on the actual stream of capital costs and updated estimated benefits or revenues resulting from the rehabilitation works and operation of the project components over their economic life (25 years), measured in mid-2020 prices and in real terms. Regional economic benefits are not included in the EIRR calculations since they accrue to countries other than the Kyrgyz Republic.

5. The project investment returns are gauged by comparing the benefit and cost streams of with-project and without-project scenarios. At project appraisal, the Toktogul HEPP was in a dilapidated state, exposed to critical risks of major incidents that would result in increasing failures and possibly catastrophic breakdown of the entire power station. The without-project scenario therefore assumes increased outages caused by reduced availability and operational failures.

D. Least-Cost Approach

6. The project is the least-cost solution for reliable power supply to the country and to the Central Asia Power Transmission Grid. Toktogul HEPP is unique and important in its size and functions as a frequency regulation station for the regional transmission grid, without any equivalent alternatives in the country. Continuing the current practice with old equipment and no rehabilitation does not provide a sustainable long-term solution. A possible alternative new HEPP would have cost $0.07 to $0.09 per kilowatt-hour (kWh), as estimated in the 2012 Master Plan[14]. This was significantly higher than the levelized cost calculated for the Toktogul HEPP rehabilitation (estimated to be $0.0237 per kWh).

[14] ADB. 2012. *Technical Assistance to Power Sector Rehabilitation Project*. Manila (TA 7704-KGZ)

E. Project Costs

7. In the original analysis, it was assumed the project construction period would be 5 years (2012 to 2016) with commissioning at the end of 2016. Actual disbursements took place over 8 years (2013 to 2020). As costs for the purpose of economic analysis are expressed in real terms and do not consider inflation, the actual annual costs have been adjusted so they are all expressed at 2020 price levels. Taxes and import duties are not included. A conversion factor of 0.9 was used in the original analysis to convert local inputs into economic prices and the conversion factor for unskilled labor was assumed to be 0.75, applied to the cost of operation and maintenance personnel. In this current analysis, a world price numeraire has been adopted and local inputs are minimal; therefore, capital costs are not adjusted. Also, the project required mainly skilled workers, the share of unskilled labor in civil works and in installation and commissioning was assumed to be 0%. This same assumption has been used for the updated economic analysis. There are no decommissioning costs or salvage values, nor are there any noteworthy benefits from recycling equipment. Environmental or social costs have been included as a part of the project costs. There are no costs for land acquisition nor for resettlement. Annual operation and maintenance (O&M) costs have been estimated to increase compared with the without-project scenario, under which the power plant operation has been expected to be reduced. This increase, which was estimated at project appraisal, has been adopted for the purpose of the current analysis and entails an increase in O&M of about 0.2% of the investment cost at the beginning of the project's life, increasing to 1.3% at the end of the period. A major overhaul for $1 million every 10 years has also been considered, which have been incorporated into the O&M costs. The selected timeframe for the economic analysis is 25 years, since the new equipment has an economic lifetime of 20 to 50 years. The discount rate for calculation of the net present value (NPV) is 12% in the base case scenario.

F. Project Benefits

8. The benefit of the project can be conservatively estimated in terms of the avoided loss of energy, measured in kWh, as a result of deterioration in the power plant output caused by equipment breakdowns and lower equipment operating efficiencies. It is stated in the RRP that this deterioration would occur at a rate of 10% per annum. This is a very high rate of decline. It is more likely that the deterioration would occur at a much lower rate. A rate of 1% per annum has therefore been assumed in the revised economic analysis. Additionally, the project will also result in a lower probability of catastrophic equipment failure. Avoided catastrophes cannot be easily quantified in terms of the precise nature of the equipment failure, its timing and the resulting loss in output. To invent one would be very speculative.

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9. The value of project benefits of the avoided energy losses is estimated using the value of energy imports for replacement of lost Toktogul generation and/ or exports as the opportunity cost of foregone exports. The current import price is $0.024 from Kazakhstan, while the current export price is $0.020 to Uzbekistan. For the economic analysis, an average value of $0.022 per kWh has been adopted. This is the most conservative value compared to other alternatives such as stand-by generators ($0.10 to $0.50 per kWh) or willingness to pay, which was estimated to be $0.20 per kWh under the Power Sector Regional Master Plan[15].

10. Project benefits not considered in the analysis include:

[15] See Footnote 1.

(i) the frequency regulation role of Toktogul HEPP, which is critical for stability of both the domestic and regional power systems;
(ii) the water resource management function of Toktogul HEPP, which is the primary source of water supply for irrigation downstream; and
(iii) avoided major breakdown incidents at the Toktogul HEPP as well as at other hydro dams downstream of the Naryn Cascade, since the breakdown of Toktogul HEPP may flood other hydro dams downstream.

G. Analysis

11. The results of the economic analysis are shown in Table 1 and can be summarized as follows:

(i) The economic internal rate of return is 24.9%, which exceeds the threshold of 12% significantly. This compares to an EIRR of 21.3% calculated at appraisal.
(ii) At a discount rate of 12%, the project has a net benefit of $97 million. This is derived from the NPV of costs (equal to $53 million) and the NPV of benefits (equal to $150 million). The benefit to cost ratio is therefore 2.8.

H. Sensitivity Analysis

12. The sensitivity of the results of the economic analysis was tested by varying certain assumptions. These assumptions include: (i) a decrease in the value of avoided energy, and (ii) an increase in O&M expenses of 100%. In both cases, the EIRR remains much above 12%. Thus, the results of the economic analysis are thus robust against the usual variations in assumptions, as shown on Table 2.

Table 1: Economic Internal Rate of Return Cash Flows ($ millions)

	Energy benefit:	100% of annual production		
	Energy value:	$0.0220 per kWh		
Year	Capital cost	O&M	Energy benefits	Net cash flow
2012				
2013	(0.801)	-	-	(0.801)
2014	(0.025)	-	-	(0.025)
2015	(1.252)	-	-	(1.252)
2016	(3.943)	-	-	(3.943)
2017	(13.198)	-	-	(13.198)
2018	(12.417)	-	-	(12.417)
2019	(5.226)	-	-	(5.226)
2020	(0.137)	(0.107)	9.668	9.424
2021		(0.107)	10.823	10.716
2022	-	(0.107)	11.966	11.859
2023	-	(0.107)	13.098	12.991
2024	-	(0.107)	14.218	14.112
2025	-	(0.213)	15.327	15.114
2026	-	(1.280)	16.426	15.146
2027	-	(0.213)	17.513	17.299
2028	-	(0.213)	18.589	18.376
2029	-	(0.213)	19.655	19.441
2030	-	(0.320)	20.709	20.389
2031	-	(0.320)	21.754	21.434
2032	-	(0.320)	22.788	22.468
2033	-	(0.320)	23.811	23.491
2034	-	(0.427)	24.825	24.398
2035	-	(0.427)	25.828	25.401
2036	-	(1.493)	26.821	25.328
2037	-	(0.533)	27.804	27.271
2038	-	(0.640)	28.778	28.138
2039	-	(0.640)	29.741	29.101
2040	-	(0.747)	30.695	29.949
2041	-	(0.747)	31.640	30.893
2042	-	(0.747)	32.575	31.828
2043	-	(0.747)	33.500	32.754
2044	-	(0.747)	34.417	33.670
			EIRR	**24.9%**
			ENPV @ 12.0%	**96.8**

Table 2: Sensitivity Tests on Economic Analysis Results

Scenario	EIRR (%)	NPV ($million)
Base Case	24.9	96.8
Decrease in avoided energy cost by 20%	21.6	66.9
Increase in O&M costs by 100%	24.6	94.1

FINANCIAL REEVALUATION

A. Introduction

1. This financial re-evaluation of the project has been carried out in accordance with *the* ADB's *Financial Management and Analysis of Projects (2005)*. It replicates the financial analysis carried out for the rehabilitation of the Toktogul hydroelectric power plant (HEPP) at project appraisal.

B. Project Components

2. The financial analysis covers the rehabilitation of the Toktogul HEPP only, including design, supply, installation, testing, and commissioning of the dam rehabilitation works and equipment, which includes 500 kilovolts (kV) of high voltage cables, governor system, excitement system, generator circuit breakers, medium and low voltage switch gears, and spare stator winding. It does not include the other project components undertaken by the SCIESU.

3. Because the cost of implementing these works was less than envisaged, another component was added to the project during implementation out of the cost savings. This extra scope included the rehabilitation of the Toktogul 500 kV switchyard. As the project components are interrelated, costs and benefits have been considered on a total project level.

C. Approach and Assumptions

4. The financial analysis results in the determination of financial internal rate of return (FIRR). These measures are based on the actual stream of capital costs and updated estimated benefits or revenues resulting from the rehabilitation works and operation of the project components over their economic life (25 years), measured in mid-2020 prices and in real terms. Regional economic benefits are not included in the EIRR calculations since they accrue to countries other than the Kyrgyz Republic.

5. The project investment returns are gauged by comparing the benefit and cost streams of with-project and without-project scenarios. At project appraisal, the Toktogul HEPP was in a dilapidated state, exposed to critical risks of major incidents that would result in increasing failures and possibly catastrophic breakdown of the entire power station. The without-project scenario therefore assumes increased outages caused by reduced availability and operational failures, and a higher frequency of major incidents and associated repair costs.

D. Project Costs

6. The financial cost–benefit analysis compares the costs and benefits of the project from the viewpoint of EPP. The project costs use market prices. Taxes and duties are assumed to be exempted by the government.

E. Project Revenues

7. The stated assumption in the original financial analysis was that under the without-project case, the existing equipment will start to deteriorate in 2013 (losing 5% of the energy generation) and then continue to deteriorate gradually at 10% per year. This seems high. As in the revised economic analysis, a rate of 1% per annum has been assumed. For outages caused by incidents

at the 500 kV cables and turbine generator, the assumptions are the same as in the economic analysis. The avoided loss of the electricity sales revenue is the project revenue.

8. In the original analysis, the avoided loss of sales revenue in the base case was valued at $0.0092 per kWh, which was the 5-year average sales revenue (export and domestic sales) of EPP for 2007–2011. This revised analysis uses the 2019 EPP average tariff of 0.535 Som, which has been derived as the 2019 revenue from electricity sales from EPP's 2019 audited Annual Report divided by total EPP electricity sales. At the average exchange rate of 0.01267 USD per Som in 2019, this is about $0.0068 per kWh.

F. Weighted average cost of capital

9. Under the financial analysis, the financial return (FIRR) is gauged against the weighted average cost of capital (WACC). To compute the WACC, it is assumed that the financing sources include ADB funds relent at 1.5% in nominal terms, and EPP equity contribution. Based on the Kyrgyz Republic's long-term bond rate, the cost of EPP equity is estimated to be 12% in nominal terms. The corporate tax rate is 10%. Domestic inflation is assumed to be 8% as per the most current ADB forecast for the Kyrgyz Republic, and the most current inflation rate of the USD is 1.2%. The WACC is estimated to be 0.53% in real terms, as seen in Table 3.

Table 3: Weighted Average Cost of Capital Calculation

		ADB Loan	Government	Total
		(onlending terms)		
A	Amount of project (US$ '000)	55.00	7.00	62.00
B	Weighting	88.71%	11.29%	100%
C	Nominal cost (for calculation)	1.50%	12.00%	-
D	Tax rate	10%	10%	-
E	Tax-adjusted nominal cost	1.35%	10.80%	-
F	Inflation rate	1.2%	7.0%	-
G	Real cost	0.15%	3.55%	-
H	**WACC in real cost**	**0.13%**	**0.40%**	**0.53%**

G. Analysis

10. As seen in Table 4, the FIRR is calculated to be 22.3% for the project. This rate compares favorably with the estimated WACC of 0.53%, substantiating the financial viability of the project.

Table 4: Financial Internal Rate of Return Calculation

Year	Capital cost	O&M	Incremental Revenue	Net cash flow
2012	-	-	-	-
2013	(0.801)	-	-	(0.801)
2014	(0.025)	-	-	(0.025)
2015	(1.252)	-	-	(1.252)
2016	(3.943)	-	-	(3.943)
2017	(13.198)	-	-	(13.198)
2018	(12.417)	-	-	(12.417)
2019	(5.226)	-	-	(5.226)
2020	(0.137)	(0.142)	2.988	2.709
2021	-	(0.142)	3.345	3.203
2022	-	(0.142)	3.699	3.556
2023	-	(0.142)	4.048	3.906
2024	-	(0.142)	4.395	4.252
2025	-	(0.284)	4.738	4.453
2026	-	(1.707)	5.077	3.370
2027	-	(0.284)	5.413	5.129
2028	-	(0.284)	5.746	5.461
2029	-	(0.284)	6.075	5.791
2030	-	(0.427)	6.401	5.974
2031	-	(0.427)	6.724	6.297
2032	-	(0.427)	7.043	6.617
2033	-	(0.427)	7.360	6.933
2034	-	(0.569)	7.673	7.104
2035	-	(0.569)	7.983	7.414
2036	-	(1.991)	8.290	6.299
2037	-	(0.711)	8.594	7.883
2038	-	(0.853)	8.895	8.042
2039	-	(0.853)	9.193	8.339
2040	-	(0.996)	9.488	8.492
2041	-	(0.996)	9.780	8.784
2042	-	(0.996)	10.069	9.073
2043	-	(0.996)	10.355	9.359
2044	-	(0.996)	10.638	9.642
			FIRR	**10.5%**
			FNPV @ 0.53%	**109.2**

H. Sensitivity Analysis

11. The sensitivity analysis has examined the parameters with the greatest impact on the financial indicators. These are the generation tariff and a doubling of O&M expenses. The results, shown on Table 5, confirms the robustness of the financial viability of the project, as the FIRR remains above the WACC of 0.53%.

Table 2: Sensitivity Tests on Financial Analysis Results

Scenario	FIRR (%)	NPV ($million)
Base Case	10.5	109.2
Decrease in avoided energy cost by 20%	8.4	77.0
Increase in O&M costs by 100%	9.6	94.7