



## Completion Report

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Project Number: 42401-015  
Loan Number: 3407  
June 2021

### Azerbaijan: Power Distribution Enhancement Investment Program – Tranche 1

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Asian Development Bank



## CURRENCY EQUIVALENTS

Currency unit – Azerbaijan Manat (AZN)

		<b>At Appraisal</b> (14 April 2016)	<b>At Project Completion</b> (30 June 2019)
AZN1.00	=	\$0.6439	\$0.5894
\$1.00	=	AZN1.5530	AZN1.6965

## ABBREVIATIONS

ADB	–	Asian Development Bank
AEFS	–	audited entity financial statement
APFS	–	audited project financial statement
CAP	–	corrective action plan
DDR	–	due diligence review
DMF	–	design and monitoring framework
EIRR	–	economic internal rate of return
EMP	–	environmental management plan
FIRR	–	financial internal rate of return
FRP	–	financial recovery plan
IEE	–	initial environmental examination
IFRS	–	international financial reporting standards
LARP	–	land acquisition and resettlement plan
MFF	–	multitranche financing facility
MOE	–	Ministry of Energy
OJSC	–	Open Joint-Stock Company
PDEIP	–	Power Distribution Enhancement Investment Program
PMC	–	project management and supervision consultant
PMU	–	project management unit
SOE	–	state-owned enterprise
SSEMP	–	site-specific environmental management plan
TA	–	technical assistance

## WEIGHTS AND MEASURES

km	–	kilometer
kV	–	kilovolt
kWh	–	kilowatt-hour
MVA	–	megavolt-ampere
TWh	–	Terawatt-hour

## NOTES

- (i) The fiscal year (FY) of the Government of the Republic of Azerbaijan ends on 31 December. “FY” before a calendar year denotes the year in which the fiscal year ends, e.g., FY2018 ends on 31 December 2018.
- (ii) In this report, “\$” refers to United States dollars.

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## **CONTENTS**

	<b>PAGE</b>
<b>BASIC DATA</b>	<b>i</b>
<b>I. PROJECT DESCRIPTION</b>	<b>1</b>
<b>II. DESIGN AND IMPLEMENTATION</b>	<b>2</b>
A. Project Design and Formulation	2
B. Project Outputs	3
C. Project Costs and Financing	4
D. Disbursements	5
E. Project Schedule	5
F. Implementation Arrangements	5
G. Consultant Recruitment and Procurement	6
H. Gender Equality	7
I. Safeguards	8
J. Monitoring and Reporting	10
<b>III. EVALUATION OF PERFORMANCE</b>	<b>10</b>
A. Relevance	10
B. Effectiveness	11
C. Efficiency	11
D. Sustainability	12
E. Development Impact	13
F. Performance of the Borrower and the Executing Agency	13
G. Performance of the Asian Development Bank	14
H. Overall Assessment	14
<b>IV. ISSUES, LESSONS, AND RECOMMENDATIONS</b>	<b>15</b>
A. Issues and Lessons	15
B. Recommendations	15
<b>APPENDIXES</b>	
1. Design and Monitoring Framework	16
2. Technical Assistance Completion Report	17
3. List of Minor Changes to the Scope of the Project Components	23
4. Project Cost at Appraisal and Actual	24
5. Project Cost by Financier	25
6. Contract Awards of ADB Loan Proceeds	27
7. Disbursement of ADB Loan Proceeds	28
8. Summary of Amendments to the Supervision and Management Consultant Contract	29
9. The List of Social Safeguard Documents Prepared and Submitted to ADB	30
10. Status of Compliance with Loan Covenants	31
11. Economic Analysis	37
12. Financial Analysis	43



## BASIC DATA

### A. Loan Identification

1.	Country	Azerbaijan
2.	Loan number and financing source	3407-AZE, ordinary capital resources
3.	Project title	Power Distribution Enhancement Investment Program – Tranche 1
4.	Borrower	Azerishiq Open Joint-Stock Company
5.	Guarantor	Republic of Azerbaijan
6.	Executing agency	Azerishiq Open Joint-Stock Company
7.	Amount of loan	\$250,000,000
8.	Financing modality	Multitranche financing facility, project loan

### B. Loan Data

1.	Appraisal	
	– Date started	25 August 2015
	– Date completed	7 September 2015
2.	Loan negotiations	
	– Date started	14–15 March 2016
	– Date completed	11–12 April 2016
3.	Date of Board approval	19 July 2016
4.	Date of loan agreement	22 July 2016
5.	Date of loan effectiveness	
	– In loan agreement	20 October 2016
	– Actual	2 September 2016
	– Number of extensions	0
6.	Project completion date	
	– Appraisal	31 December 2018
	– Actual	31 December 2018
7.	Loan closing date	
	– In loan agreement	30 June 2019
	– Actual	30 June 2019
	– Number of extensions	0
8.	Financial closing date	
	– Actual	31 December 2019
9.	Terms of loan	
	– Interest rate	London interbank offered rate plus 0.60% less 0.10%
	– Maturity (number of years)	20
	– Grace period (number of years)	5

## 10. Disbursements

## a. Dates

<b>Initial Disbursement</b> 16 September 2016	<b>Final Disbursement</b> 16 December 2019	<b>Time Interval</b> 39 months
<b>Effective Date</b> 22 September 2016	<b>Actual Closing Date</b> 30 June 2019	<b>Time Interval</b> 33.8 months

## b. Amount (\$ million)

<b>Category</b>	<b>Original Allocation (1)</b>	<b>Increased during Implementation (2)</b>	<b>Cancelled during Implementation (3)</b>	<b>Last Revised Allocation (4=1+2-3)</b>	<b>Amount Disbursed (5)</b>	<b>Undisbursed Balance (6 = 4-5)</b>
1. Turnkey contract, goods, and consulting services	240,000,000	(509,363)	-	239,490,637	239,461,114	29,523
2. Interest and commitment charges	10,000,000	509,363	-	10,509,363	10,509,363	0
<b>Total</b>	<b>250,000,000</b>	<b>0</b>	<b>-</b>	<b>250,000,000</b>	<b>249,970,477</b>	<b>29,523</b>

## C. Project Data

## 1. Project cost (\$ million)

<b>Cost</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
Foreign exchange cost	169.50	126.98
Local currency cost	155.50	177.31
<b>Total</b>	<b>325.00</b>	<b>304.29</b>

## 2. Financing plan (\$ million)

<b>Cost</b>	<b>Appraisal Estimate</b>	<b>Actual</b>
Implementation cost		
Borrower financed	75.00	54.32
ADB financed	240.60	239.90
Other external financing	0.00	0.00
<b>Total implementation cost</b>	<b>315.60</b>	<b>294.22</b>
Interest during construction costs		
Borrower financed	0.00	0.00
ADB financed	9.40	10.10
Other external financing	0.00	0.00
<b>Total interest during construction cost</b>	<b>9.40</b>	<b>10.10</b>

ADB = Asian Development Bank.



## 3. Cost breakdown by project component (\$ million)

Component	Appraisal Estimate	Actual
<b>A. Base Cost</b>		
1. Turnkey	208.90	226.28
2. Equipment	5.30	10.22
3. Meter installation	2.80	2.80
4. Consulting services		
Project implementation consultants <sup>a</sup>	2.90	2.88
Preparation for future tranches <sup>b</sup>	0.90	0.60
5. Institutional facilities	5.10	6.40
6. Taxes and duties	69.90	44.60
<b>Subtotal (A):</b>	<b>295.80</b>	<b>293.78</b>
<b>B. Contingencies<sup>c</sup></b>		
1. Physical	14.00	0.00
2. Price	5.20	0.00
<b>Subtotal (B):</b>	<b>19.20</b>	<b>0.00</b>
<b>C. Financing Charges During Implementation<sup>d</sup></b>		
1. Interest	9.40	10.08
2. Commitment charges	0.60	0.43
<b>Subtotal (C):</b>	<b>10.00</b>	<b>10.51</b>
<b>Total:</b>	<b>325.00</b>	<b>304.29</b>

<sup>a</sup> Includes capacity development program for Azerishiq and external auditor cost.

<sup>b</sup> Includes Azerishiq's administrative buildings, vehicles and information technology equipment.

<sup>c</sup> Physical contingencies computed at 4.7% of the base cost. Price contingencies computed at 1.5% on foreign exchange costs and 5.1% on local currency costs; includes provision for potential exchange rate fluctuation under the assumption of a purchasing power parity exchange rate.

<sup>d</sup> Includes interest and commitment charges. Interest during construction for ADB's ordinary capital resources (OCR) loan has been computed at the 5-year forward London interbank offered rate plus a spread of 0.5%. Commitment charges for ADB's OCR loan are 0.15% per year to be charged on the undisbursed loan amount.

## 4. Project schedule

Item	Appraisal Estimate	Actual
Date of contract with PMC consultant	June 2016	September 2016
Turnkey contracts on substations		
Date of award	June 2016	May 2017
Completion of work	June 2018	June 2018
Turnkey contracts on lines		
Date of award	June 2016	September 2016
Completion of work	June 2018	June 2018
Turnkey contracts on complete transformer substations		
Date of award	June 2016	February 2017
Completion of work	June 2018	June 2018
Supply of meters		
Contract award	June 2018	May 2017
Delivery of meters	December 2018	March 2018
Start of operations		
Completion of tests and commissioning of all components	December 2018	June 2018

## 5. Project performance report ratings

Implementation Period	Ratings
	Single Project Rating
From 2 September 2016 to 31 December 2016	On Track
From 1 January 2017 to 31 December 2017	On Track
From 1 January 2018 to 31 December 2018	On Track
From 1 January 2019 to 31 December 2019	On Track

#### D. Data on Asian Development Bank Missions

Name of Mission	Date	No. of Persons	No. of Person-Days	Specialization of Members <sup>a</sup>
Loan inception	11–18 October 2016	2	12	a, b
Loan review 1	3–12 May 2017	3	24	a, b, c
Safeguards Review Mission	2–7 July 2017	1	5	d
Loan review 2	6 July 2017	1	1	a
Safeguards Review Mission	21–25 August 2017	2	10	d, f
Safeguards Review Mission	12–14 December 2017	1	3	h
Safeguards Review Mission	31 January–8 February 2018	1	9	g
Loan review 3	29 August–14 September 2018	3	18	a, b, c, e

Note: A separate mission for the project completion report was not needed as the last mission in August–September 2018 collected the essential data and information. Also, since the project team leader is based in the country, the daily communications and discussions with the executing agency and staff paved the way for the team to gather additional information that supplemented the findings of the last review mission.

<sup>a</sup> a = project team leader; b = project analyst; c = senior project officer, AZRM; d = senior social development specialist (safeguards); e = project analyst, AZRM; f = head (safeguards); g = environment specialist; h = national resettlement consultant.

## I. PROJECT DESCRIPTION

1. The electricity sector plays an essential role in Azerbaijan's socioeconomic growth at both national and regional levels. Electricity generation is sufficient to meet domestic needs, with the surplus being exported to neighboring countries, taking advantage of regional synergies. However, continuing challenges include (i) improving operational and financial efficiency, (ii) restoring and maintaining a high level of services across the country, and (iii) establishing a sustainable cost-recovery financing mechanism.

2. The government owns and manages the electricity sector, as well as other key sectors of the economy. However, because of weak sector policies, many state-owned enterprises (SOEs) suffer from inefficiencies and recurrent operational losses, resulting in fiscal risks. In responding to this, the government implemented SOE governance and accountability reforms in 2016 and adopted fiscal rules and medium-term expenditure framework regulations in 2018. Thus, the government was committed to economic and power sector reforms with the aim of improving system efficiency, supply reliability, and transparency; these reforms were reflected in medium-term development strategies. Although significant investments have been made in generation and transmission facilities since 2005, the supply of reliable electricity to customers in rural areas remained constrained because of a weak distribution network. In 2014, the technical and commercial losses of the distribution system were 18.8%<sup>1</sup> and revenue collection was 70%.<sup>2</sup> Although almost 100% of the population had access to electricity, the supply quality and stability of a more than 30-year-old network remained a concern in areas outside of Baku, particularly in secondary cities and rural areas. This affected the living conditions of households and discouraged new economic activities.

3. The unreliable power supply and inefficient utilization of resources undermined industrial competitiveness, constrained economic growth, and created urban–rural income disparity. To address the urban–rural income disparity and diversify from hydrocarbon-export industries through increased economic activity, the government sought to enhance the availability and reliability of the electricity supply across the country. Rehabilitation and expansion of the distribution network was therefore considered a priority and an energy sector master plan was prepared in 2014 with the support of ADB.<sup>3</sup> The master plan covered investment needs for power generation, transmission, and distribution for 2015–2025.

4. In May 2015, ADB signed a memorandum of understanding with Azerishiq Open Joint-Stock Company (OJSC) to provide financial assistance for implementation of the master plan. In July 2016, ADB approved the Power Distribution Enhancement Investment Program (PDEIP), a multitranche financing facility (MFF) for \$750 million to be implemented over 7 years in three tranches. The aim of the PDEIP was to support the government's efforts in providing a reliable and efficient electricity supply, through the rehabilitation and augmentation of the power distribution network. This would help the country meet its growing energy needs for inclusive development, especially in secondary cities and rural areas.

5. Tranche 1 of the MFF, which was approved on 19 July 2016 and signed on 22 July

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<sup>1</sup> This refers to the aggregate level for the distribution network outside of Baku and its suburban area, including technical loss of 11.13% and commercial loss of 7.73%. In Baku and its suburban area, the technical loss was 8.97% and commercial loss was 0.74%. Commercial losses include electricity theft and inaccurate metering.

<sup>2</sup> The revenue not collected was about \$200 million.

<sup>3</sup> ADB. 2014. *Update of the Energy Sector Master Plan of Azerbaijan, 2013–2025: Final Report*. Manila.

2016, became effective on 2 September 2016.<sup>4</sup> The intended outcome of the PDEIP, including tranche 1, is the improved efficiency and reliability of the power distribution networks. The PDEIP is envisaged to benefit 1.45 million customers, of which 60% are residential customers. The tranches have similar project components, with the main difference between them being the locations selected. Tranche 1 was designed to improve electricity supply by rehabilitating 4 units of 110 kilovolt (kV) substations, 16 units of 35 kV substations, 1,157 units of compact transformer station, and 1,415 kilometers (km) of 110, 35, 10, and 6 kV lines. The design and monitoring framework (DMF) is in Appendix 1.

## II. DESIGN AND IMPLEMENTATION

### A. Project Design and Formulation

6. The government has made a strong commitment to provide an adequate and reliable electricity supply to all consumers, as reflected in the country's medium-term development framework Azerbaijan 2020: Look into the Future.<sup>5</sup> The inclusive growth agenda consisted of high social welfare, sustainable economic growth, broad opportunities and decent jobs for all, reduced regional inequalities, and access of remote villages to public utilities. The Presidential order issued on 10 February 2015 set the energy sector restructuring targets and actions, requiring Azerishiq OJSC to take all necessary actions to modernize the distribution network and provide consumers with a reliable and efficient power supply.<sup>6</sup> These policy objectives made rehabilitation a necessity and led to the development of this MFF.

7. The proposed investment program was closely aligned with ADB's Midterm Review of Strategy 2020 and the Azerbaijan country partnership strategy, 2014–2018.<sup>7</sup> ADB was committed to supporting improved energy efficiency and operation to provide an adequate and reliable energy supply throughout the country. This could then stimulate new, non-oil economic activities, promote inclusive growth, and reduce urban–rural disparities. The PDEIP was expected to contribute to achieving ADB's energy policy objectives of promoting energy efficiency, access to energy for all, and capacity building and governance.

8. The project design was formulated through the project preparatory technical assistance (TA).<sup>8</sup> The design was relevant, soundly developed, and addressed the need for reliable electricity supply to consumers in the areas covered by tranche 1, as well as the need to reduce losses and improve metering and collections.

9. As a part of the sector roadmap, the government would establish full cost recovery tariffs by 2022 through pursuing tariff reform. The government requested assistance from ADB to support the preparation and implementation of a power sector financial recovery plan to achieve the committed targets. ADB approved the policy and advisory TA concept paper on 2 June 2016.<sup>9</sup> The objective of this TA was to help the Government of Azerbaijan improve the financial performance and sustainability of the power sector. Its key features were the development of the financial recovery plan (FRP) and a roadmap directed at financial recovery and capacity building on the implementation of tariff reforms. The government's initial efforts to improve the sector's

<sup>4</sup> ADB. 2016. *Report and Recommendation of the President to the Board of Directors: Multitranchise Financing Facility. Azerishiq Open Joint-Stock Company. Power Distribution Enhancement Investment Program*. Manila.

<sup>5</sup> Government of Azerbaijan. 2012. *Azerbaijan 2020: Look into the Future*. Baku.

<sup>6</sup> Government of Azerbaijan. 2015. Presidential Order No. 1045. Baku.

<sup>7</sup> ADB. 2014. *Azerbaijan Country Partnership Strategy. 2014–2018*. Manila.

<sup>8</sup> ADB. 2015. TA 8891-AZE: *Preparing the MFF Power Distribution Enhancement Investment Program*. Manila.

<sup>9</sup> ADB. 2016. [PATA 9151-AZE: Preparing a Power Sector Financial Recovery Plan for Azerbaijan](#). Manila.

financial sustainability included an increase in the retail electricity tariff of 16.7% from AZN0.06/kWh to AZN0.07/kWh on 15 July 2016.

10. In December 2017, the Azerbaijan Energy Regulatory Agency (AERA) was established under the Ministry of Energy (MOE) with responsibility for regulating the utility sectors—electricity, natural gas, and district heating. The TA helped MOE and AERA develop a tariff methodology based on the recommendations of the FRP. The FRP was accepted by the Ministry of Finance in December 2018. The TA also assisted AERA in preparing the first full tariff review, which AERA could use to make proposals to the Tariff Council for adjustments to the electricity tariffs, including the introduction of differentiated tariffs.

11. The FRP was designed so that the agreed assumptions (demand, investments, macroeconomic characteristics, starting cost structure, financial parameters, etc.), together with the realistic efficiency improvement measures, were used to determine the revenue requirements. The tariff changes follow a smooth tariff trajectory over a 7-year period until 2025, reaching accounting breakeven and achieving an economic return based on the 8.9% weighted average cost of capital on the regulated asset value in 2025.

12. The affordability study, carried under the TA, had weighed up the advantages and disadvantages of available mitigation mechanisms, such as Increasing Block Tariffs (IBT) and Volume-Differentiated Tariff (VDT), and concluded that in practical terms, IBT mitigation measure was suited to the Azerbaijan context, as it was similar in certain respects to the two-block structure that had been introduced in 2016. In IBT the higher the consumption is, the higher the price paid by the consumer. The underlying assumption is that the probability of a consumer being poor decreases as consumption increases. This feature is then captured by defining a number of consumption blocks, with an increasing price charged per block when moving from lower to higher blocks. The capacity building, communication, and outreach undertaken in conjunction with the development of the FRP had prepared the ground for successfully implementing the changes that the Azerbaijan electricity sector needed to become a financially sustainable sector in the long term (see Appendix 2 for the TA completion report). Overall, the project with the support of TA was instrumental in moving the reform efforts of the government from the conceptual phase into the implementation phase.

## **B. Project Outputs**

13. The investment program has three components to be implemented through three tranches with each covering all seven regional distribution networks. Tranche 1 and subsequent tranches have similar components but with different districts under each regional network, selected based on the priority and implementation capacity of Azerishiq OJSC.

14. Tranche 1 project had 37 subprojects, which were all completed by the envisaged completion date of 31 December 2018. The project was designed with the following outputs:

- (i) **Rehabilitation of distribution networks.** This involved the rehabilitation and augmentation of aging medium- and low-voltage distribution networks including 6–110 kV substations and distribution lines, namely: (a) 4 units of 110/35/10 kV substations with 2x40 MVA transformer capacity each, (b) 16 units of 35/10-6 kV substations with 2x10 MVA transformer capacity each, (c) 1,157 units of 6 kV and 10 kV compact transformer stations, (d) 54 km of 110 kV transmission lines, (e) 124 km of 35 kV distribution lines, and (f) 1,237 km of 6 kV and 10 kV distribution lines.

- (ii) **Rehabilitation of customer service lines and installation of smart meters.**<sup>10</sup> This included replacement of 3,900 km of 0.4 kV customer service lines and installation of 108,409 electronic meters. The existing 0.4 kV bare overhead conductors were replaced with new aerial bundled cables, and the existing poles were also replaced.
- (iii) **Support for institutional strengthening.** This included (a) capacity building for financial management, accounting and auditing, project management, procurement, monitoring and evaluation, and social and environmental safeguards; (b) a public information campaign for energy efficiency improvement and tariff reform; and (c) improvement of operation and maintenance facilities in Azerishiq's distribution networks.

15. Some minor changes were made to certain components during implementation to address project needs (see Appendix 3). The minor changes included: (i) an increase in the length of the 110 kV transmission lines from 54 km to 58.7 km, (ii) a reduction in the length of 35 kV distribution lines from 124 km to 117.6 km, (iii) an increase in the length of 6 kV distribution lines from 1,237 km to 1,252.3 km, and (iv) a reduction in the length of the 0.4 kV distribution lines from 3,900 km to 3,893.5 km. These minor changes to the original scope were insignificant, did not trigger any change to original costs, and did not cause any environmental or social safeguard impact. In addition, grid code development was conducted under Tranche 1.

16. However, two changes triggered additional social safeguard related costs. These involved the acquisition of (i) a private landholding, as the additional land was needed for the construction of a substation, and (ii) landholdings in a project village for installation of the distribution line towers (see para. 34 for details). These changes affected the involuntary resettlement categorization of the project, which was revised accordingly from C to B, requiring implementation of a social safeguard corrective action plan (CAP).<sup>11</sup> The changes did not have a substantial impact on total project cost and with timely implementation of the CAP, the project was brought back into compliance. Also, ADB's safeguard missions in July and August 2017 noted that the farming activities of the residents of the private and public landholdings located along the 35 kV Udjar-Zardab distribution line might be temporarily disrupted during the construction and stringing of transmission lines. The details of the measures taken to address these changes are in Section I.

### C. Project Costs and Financing

17. At appraisal, the project cost was estimated to be \$325 million, with ADB's share being \$250 million and the Government of Azerbaijan contributing \$75 million (details are in Appendix 4). The ADB loan covered turnkey contracts, meter supply, consulting services, and financing charges. The government's contribution covered taxes and duties, meter installation, procurement of IT and other equipment, operational vehicles, and construction of institutional facilities. Actual cost at completion was \$304.29 million, comprising \$249.97 million from the ADB loan and \$54.32 million from the government. The total cost of contracts financed under the loan was \$239.5 million against the estimated cost of \$240 million. Savings from contracts were used to buy additional meters and pay for financing charges. The government paid \$44.6 million for taxes and duties against the estimated \$69.9 million. Meter installation, originally under ADB financing, was financed by the government using surplus counterpart funds. The financing ratio split between ADB and the government of Azerbaijan was 77:23 at appraisal and 82:18 at completion (Appendix 5). During implementation, to use surplus loan proceeds, reallocations were

<sup>10</sup> Electronic meters were installed instead of smart meters.

<sup>11</sup> The CAP was inadvertently not disclosed on the ADB website.

made between the two cost categories of (i) turnkey contract, goods, and consulting services, and (ii) interest and commitment charges.

#### **D. Disbursements**

18. Advance contracting and retroactive financing were undertaken to expedite project implementation. The first of the 39 contracts (including 2 consultancy contracts) was awarded in May 2016 and the last was procured in June 2017. Construction works were completed ahead of schedule. Despite no delay in the project's physical completion and loan closing date, the financial closing had to be extended until 31 December 2019 because disbursements had to be made for the additional meters purchased before the loan closing date and for the last audit report, which was submitted within 6 months after the loan closing date. The expenditures on additional meters were incurred before loan closing date and were consequently liquidated within 6 months after loan closing date. Contract awards and disbursement of loan proceeds are presented in Appendixes 6 and 7.

19. Loan disbursements were paid in accordance with ADB's Loan Disbursement Handbook (2017, as amended from time to time) under the direct payment and commitment procedure. Total loan disbursements were \$249.97 million, 0.01% less than the \$250 million loan. Financing charges against this loan were \$10.51 million.

#### **E. Project Schedule**

20. Tranche 1 was signed on 22 July 2016 and became effective on 2 September 2016. The scheduled implementation period was from 1 July 2016 through 31 December 2018 for all project components, while the loan closing date was 30 June 2019. All construction works were completed by August 2018, well ahead of schedule.

#### **F. Implementation Arrangements**

21. Azerishiq OJSC was both the executing agency and borrower for the MFF and tranche 1, and Republic of Azerbaijan was the guarantor. As set out in the facility administration manual, Azerishiq OJSC was responsible for all implementation arrangements and established a dedicated program management unit (PMU) for the implementation of the entire MFF.<sup>12</sup> The First Deputy Chairman of Azerishiq had primary responsibility for overall project implementation. The PMU included a project director, procurement specialists, technical specialists, financial management specialists, accountant and environmental and social safeguard specialist. This team had adequate capacity and competence to ensure smooth project implementation. The PMU reported regularly to the First Deputy Chairman on project progress. A financial management assessment undertaken during the project preparatory TA revealed that Azerishiq OJSC had relevant management capacity and systems for financial and accounting administration, reporting, auditing, and internal audit procedures. Azerishiq also hired supervision consultants, funded from the loan proceeds, to assist the PMU in implementation. Azerishiq regularly submitted quarterly project progress reports covering basic data, utilization of funds, scope, implementation progress, compliance with covenants, major issues, and problems identified.

22. During the project, 37 subprojects were implemented through 36 turnkey contracts and 1 supply contract (procurement of electronic meters). The procurement process for all contracts

<sup>12</sup> ADB. 2016. Facility Administration Manual: Proposed Multitranchise Financing Facility. Azerishiq Open Joint-Stock Company. Power Distribution Enhancement Investment Program.

followed ADB guidelines.<sup>13</sup> Biddings were conducted in a timely manner in accordance with the procurement schedule set at appraisal.

23. The project was managed in accordance with the arrangements set during the project preparatory TA and no major changes were made. In general, the project management process was highly satisfactory. The TA helped to achieve the output target on improved institutional capacity and corporate reform by providing capacity building programs to Azerishiq on preparing bidding documents, improving the financial management of utility operations, and gaining knowledge on new technologies.

## **G. Consultant Recruitment and Procurement**

24. **Consultant recruitment.** Azerishiq recruited the project supervision and management consultants (PMC) through the quality- and cost-based selection method in compliance with ADB guidelines.<sup>14</sup> The bidding process started during the first quarter of 2016 (package No.CS-1), as planned. The contract was awarded to a firm initially for 36 months on 5 September 2016 at a contract price of about \$2.13 million plus AZN2.05 million, exclusive of local indirect taxes. The total inputs in the original terms of reference were 76 person-months for international and 168 person-months for national experts. The firm's competence and related experience were regarded as adequate for the assignment. The PMC, which started work in September 2016, (i) provided onsite management of contractors, and measurement, verification, and certification of physical progress, and (ii) supported the PMU with procurement, contract management, safeguard monitoring (environmental and social), and financial management. Four amendments, resulting in the contract price increasing by about \$30,460, were made during implementation to (i) increase on-ground local support, (ii) add the scope of tranche 2 preparation, and (iii) include preparation of the electricity grid code (details are in Appendix 8).

25. During implementation, the PMC did not make full and timely reports on some impacts, as required by the PDEIP's resettlement framework, the initial environmental examination (IEE), and ADB's Safeguard Policy Statement (2009). These impacts related to land acquisition, and environmental issues arising from scope changes, and reporting of absence of site-specific environmental monitoring plans for the project sites. Such negligence raised concerns over the performance of the PMC's safeguard monitoring. To address these issues and strengthen the PMC team, in October 2017, Azerishiq agreed to replacements proposed by the PMC for international environment and social safeguard experts, and accordingly obtained ADB's approval on the contract variation to incorporate the changes in team and their inputs.

26. The selection of an auditor to conduct the external project audit was initiated in the first quarter of 2017. The fixed price contract of about \$117,000 (exclusive of direct local taxes) was awarded on 7 June 2017. The contract also required the auditor to conduct a final audit within 6 months after loan closing. At Azerishiq's request, ADB therefore extended the winding-up period by 6 months from the original closing date.<sup>15</sup>

27. **Procurement.** All contracts related to the procurement of works and goods financed under tranche 1 were conducted in accordance with ADB's Procurement Guidelines.<sup>16</sup> The contracts were fixed price, turnkey contracts awarded using ADB's single stage one-envelope international

<sup>13</sup> ADB Procurement Guidelines (April 2015), as amended from time to time.

<sup>14</sup> ADB Guidelines on the Use of Consultants (March 2013), as amended from time to time.

<sup>15</sup> Azerishiq's request letter dated 20 June 2019 and ADB's response letter dated 28 June 2019.

<sup>16</sup> ADB Procurement Guidelines (April 2015), as amended from time to time.



and national competitive bidding procedure. The threshold for international competitive bidding was set at \$10 million and above.

28. The 37 contracts were awarded for a total value of \$305 million. The first two contracts for procurement of substations were awarded in May 2016 and the last contract was awarded for the supply of electronic meters and accessories on 7 February 2018, in line with the schedule envisaged at inception. The bidding competition level was 2.78 bids per contract on average.

29. The total value of the five contracts that used the international competitive bidding procedure was about \$47 million. The turnkey contracts for the procurement of four 110/35 kV substations were awarded to one international and three local companies, and the contract for the supply of 108,409 electronic meters was awarded to an international company.

30. The total value of contracts awarded through the national competitive bidding procedure was about \$258 million. The procurement plan included 17 packages under this method, with 32 lots for the design, supply, and installation of indoor substations, distribution lines, and compact transformer stations. The bidding was completed by May 2017 for all the packages, resulting in 32 turnkey contracts, which were awarded to 10 local companies.

31. None of the 37 contracts experienced any implementation delays. They were all completed ahead of the tranche 1 physical completion date. However, the performance of the contractors could have been better with regard to the quality of work and the technical specifications and construction standards. The specific issues were (i) design related issues on circuit-breakers for 35 kV switchgear, 35 kV indoor switchgear, short-circuit current of 110 kV substation equipment, concrete poles for 6 kV and 10 kV distribution lines, size of pre-cast foundations for 110 kV and 35 kV steel lattice towers, cross-arms for 6 kV and 10 kV structures, and system earthing; and (ii) construction related issues on the stringing of 110 kV transmission lines, 35 kV and 10 kV distribution lines, installation of 0.4 kV self-supporting insulated wire distribution lines, compaction of ground, installation of pre-cast foundations for steel lattice towers, anchor bolts for 110 kV substation equipment, and grouting. These issues were either partially resolved or recommended for better technical specifications in future tranches of the PDEIP. None of these issues had any impact on the overall quality of project outputs, implementation schedule, and costs.

## **H. Gender Equality**

32. The project was categorized as “some gender elements” at appraisal. The implementation status of specific measures in the DMF is as follows:

- (i) Twenty percent of the 90 Azerishiq staff trained during implementation were women. The training programs in which they participated covered technology and market structures, i.e., sales, financing, procurement, investment training, new technologies, and different smart grid concepts implemented in other countries.
- (ii) Azerishiq gave preference to women candidates in the recruitment process for new customer care jobs created by the introduction of electronic metering. Since 2015, 56 total customer care jobs have been created, with 41 women applicants being employed. The number of men and women who applied for the customer care jobs could not be determined.
- (iii) Public consultation meetings were conducted on the construction schedule and potential temporary interruptions in power supply. Although precise data on the number of men and women participants in these meetings was not available, most of these meetings were attended by women. Being the main energy users at home,

women were also informed about the benefits of using electric home appliances, especially the benefits of energy efficient appliances and lighting devices.

33. Overall, the project improved women's living conditions and livelihoods through providing a sustainable power supply. However, the estimated number of women beneficiaries, including women from the community and, separately, women entrepreneurs, was not available.

## I. Safeguards

34. **Involuntary resettlement.** The project was categorized as category C for involuntary resettlement at appraisal and re-categorized to B after the safeguard review mission in July 2017.<sup>17,18</sup> During the safeguard review missions in July and December 2017, the missions noted past and potential social impacts caused by land acquisition and alignment. Specifically, (i) a private landholding had been acquired in November 2016 as the additional land was needed for the construction of the 110/35/10 kV Dalimammadli substation; (ii) landholdings in Garabork Village had been acquired in 2017 for installing 10 steel lattice towers of the 35 kV Udjar-Zardab distribution line; and (iii) the farming activities of the residents of the private and public landholdings located along the 35 kV Udjar-Zardab distribution line might be temporarily disrupted during the construction and stringing of transmission lines. With regard to the additional land needed for the 110/35/10 kV Dalimammadli substation, it was determined that an affected person in Dalimammadli town, who on 29 November 2016 had sold a portion of his farmland to Azerishiq for the substation's improvement, had not received cash assistance for vulnerability, despite being a household head with physical impairment. In accordance with the agreed mission follow-up activities, Azerishiq prepared a CAP to facilitate the belated payment of a cash allowance to this affected person. A land acquisition and resettlement plan (LARP) was also prepared for affected persons who were to lose landholdings because of the construction of the 35 kV Zardab-Udjar distribution line. Further, Azerishiq conducted a due diligence review (DDR) for each subproject in July–September 2017 to determine if any of the subprojects had triggered or could trigger land acquisition and resettlement. ADB fielded a follow-up mission on 21–25 August 2017 and agreed with Azerishiq on the safeguard documents to be submitted to ADB and the measures to be implemented.<sup>19</sup> These documents are listed in Appendix 9.

35. ADB agreed with the findings of the DDRs that no permanent acquisition of private landholdings occurred or would happen in the finished, ongoing, and planned construction of the subprojects, with the exception of the expansion of the Dalimammadli substation and the construction of the 10 towers of the Udjar-Zardab distribution line, which were brought into compliance through the implementation of the CAP.

36. The CAP on the Dalimammadli substation was implemented in compliance with the safeguard requirements. As a vulnerable household head, the resettlement framework entitled affected persons who lost property in the expansion of the substation to (i) a one-time cash allowance equivalent to the prevailing minimum salary in the locality multiplied by 3 months; and (ii) priority for employment in project-related jobs, training opportunities, and self-employment and wage-employment assistance. The affected person stated that nobody in his household was able or willing to work on the project's construction activities and therefore chose to receive only his

<sup>17</sup> AZE: Power Distribution Investment Program. Resettlement Framework, July 2015.

<sup>18</sup> ADB Memorandum on the Safeguard Review Mission on MFF Power Distribution Enhancement Investment Program – Tranche 1 dated 21 July 2017.

<sup>19</sup> ADB Memorandum on the Safeguard Review Mission on MFF Power Distribution Enhancement Investment Program – Tranche 1, dated 17 January 2018.

special cash allowance of AZN348 (i.e., AZN116 minimum monthly salary multiplied by 3 months) equivalent to \$202.

37. The LARP was successfully implemented in compliance with the ADB Safeguard Policy Statement (2009). The DDR in August 2017 confirmed that the 10 steel lattice towers in Garabork Village would be erected on the landholdings of 9 persons. The affected landholdings of 7 of these persons were actually within the government-owned ROW of the existing 35 kV distribution line. The two other persons had titled properties; one of these belonged to the affected person himself, while the other belonged to the Garabork Village Municipal Government but was occupied by the affected person with permission from the government. On 25 August 2017, the 2 affected persons submitted signed voluntary donation forms, each handing over 5 square meters of their respective landholdings to Azerishig OJSC for the towers. The 7 persons whose farming activities in Garabork Village extended into the ROW of the existing 35 kV distribution line did not contest this fact. The detailed measurement survey in August 2017 found wheat, clover, cotton, and mulberry saplings on the 891 square meters of ROW land that the construction of the eight steel lattice towers and stringing of the lines would adversely affect. In August 2017, Azerishig engaged an independent valuator to determine the prevailing market rate of lands in the locality. Based on the market study by an independent valuator, Azerishig paid AZN700 (about \$407) compensation to the 7 affected persons for their permanently and temporarily affected landholdings. No delays with the compensation payments were noted.

38. The PMU submitted social monitoring reports every six months, as required in the loan covenants; these were reviewed and disclosed on the ADB website. In July 2017, ADB trained the PMU and contractors on environmental and social monitoring activities. The PMC's social and environmental experts and the PMU's expert provided contractors with (i) one on-site training session, (ii) two training programs in Baku, and (iii) regular coaching on safeguard monitoring and grievance redress and management. However, the number of contractors who benefited from the coaching and training was not available.

39. **Indigenous people.** The tranche 1 project was categorized as C for indigenous people at appraisal, and this did not change during implementation.

40. **Environment.** The project was categorized as B for environmental impacts at appraisal, as indicated in the IEE.<sup>20</sup> However, the contractors did not prepare the site-specific environmental management plans (SSEMPs), as required by the EMP. Since implementation of this requirement will need to be carried out better for the next two tranches, the SSEMP will be one of the pre-conditions for all contractors, along with their other tender documents.

41. The environmental mitigation measures, environmental management, and monitoring plans specified in the IEE and updated EMP were largely followed. The impact of the mitigation measures on air quality, construction noise, roads, and infrastructure was satisfactory. Similarly, their impact on the quality of water sources was sufficient, but removal of the construction and domestic waste was poor, as the contractors failed to promptly remove such waste from the sites.<sup>21</sup> These issues, however, had no material environmental impacts on the project components, and they were satisfactorily addressed by Azerishiq, the contractors, and PMC, following recommendations from ADB.

42. The PMU had an environmental and social safeguard specialist who routinely monitored environmental management issues across the project sites with the assistance of the PMC's

<sup>20</sup> AZE: Power Distribution Investment Program – Tranche 1. Initial Environmental Examination, August 2015.

<sup>21</sup> This was noted during the ADB safeguard review missions in December 2017 and January–February 2018.

international and national environmental and social safeguard experts. Azerishiq prepared and submitted six-monthly environment monitoring reports to ADB, as required in the loan covenants.

## **J. Monitoring and Reporting**

43. All loan covenants were adequate and remained applicable throughout project implementation. The loan covenants were all complied with, except the following two, which were partially non-compliant: (i) maintaining separate accounts and records (Section 4.05[a]), which was noted in the management letters submitted to Azerishiq from 2016 to 2019, and (ii) ensuring a current ratio of at least 1 for the FY ending 31 December 2018 and thereafter (Loan Agreement, Schedule 5 para. 13[c]), which was breached for the FY ending 31 December 2019. The partial compliance with these two loan covenants did not affect the overall project performance. Although a separate bank account was initially opened for the government's share of the project's payments, Azerishiq later decided to use the same account for the government's share of some other projects; the reason being the size of other projects did not justify to have a separate account for each and having one account made deduction easy during annual audit. Although Azerishiq had adequate financial management capability, it could not meet the requirements for a separate project account and records. The status of compliance with the covenants at project completion is in Appendix 10.

44. Azerishiq's PMU, with the support of the PMC, conducted routine project performance monitoring and reporting of the physical works and the social and environmental safeguard activities of the contractors (see paragraph 24 for details), and was responsible for the preparation and submission of quarterly progress reports to ADB. The PMU submitted nine quarterly progress reports covering 2017, 2018, and 2019, except for the report for the first quarter of 2017.

45. The loan agreement required that the annual project financial statements (APFS) of PDEIP – Tranche 1 would be audited by a third-party independent auditor. Azerishiq was late in submitting the APFS for 2016 because of its request to prepare the APFS from FY 2016 onwards in accordance with the international public sector accounting standards instead of the international financial reporting standards (IFRS). The PMU's justification was that they did not have any experience in preparing project financial statements under IFRS. The request was approved and an amendment to the loan agreement was signed on 16 October 2017. This change in implementation arrangements did not affect the overall project outcome and outputs.

46. Azerishiq was responsible for the submission of its annual financial statements (AEFS) in accordance with IFRS on a consolidated basis, and had its financial statements audited annually by qualified independent auditors. The submissions of AEFS were on time except for FY2016. The audit reports had unqualified opinions except for AEFS 2016.

## **III. EVALUATION OF PERFORMANCE**

### **A. Relevance**

47. The project is rated as *relevant*. The outcome was in line with the government's electricity sector development priorities of reducing electricity losses and increasing the quality of electricity supply and distribution.<sup>22</sup> The project was well coordinated among the project stakeholders and did not duplicate any work of other international financial institutions and donor organizations. The

<sup>22</sup> Strategic Road Map for Development of Utility Services (electricity, heat energy, gas and water) in Azerbaijan Republic approved on 6 December 2016.

envisaged outcome of “improved efficiency and reliability of the power distribution networks” was aligned with ADB’s country strategy, which focused on improving energy efficiency and operational performance to provide an adequate and reliable energy supply throughout the country, with a view to stimulating new, non-oil economic activities.<sup>23</sup>

48. The MFF was the most appropriate modality to finance this large-scale project through long-term civil works, goods, and services. Additionally, this modality allows a long-term partnership with the government for policy dialogue and capacity development, which is required in Azerbaijan where the reforms in the power sector have generally progressed at a slow pace.

49. The DMF of tranche 1 did not require any revision during implementation. This shows that the project design and formulation process at appraisal was relevant and adequate. All project components followed the project design during implementation.

## **B. Effectiveness**

50. The project is rated as *effective*. The overall project outcome was “improved efficiency and reliability of the power distribution networks.” All three performance indicators set in the DMF for the achievement of the project outcome were attained: (i) the average annual unserved energy resulting from outages was reduced to 4.9% in 2018 against the baseline indicator of 7% in 2014; (ii) the nationwide distribution network losses were reduced to 11.6%, which was significantly below the baseline indicator of 16% in 2014; and (iii) the revenue collection increased to 93% against the baseline indicator of 70% in 2014. The achievement of these indicators had positive benefits on Azerishiq’s power distribution networks. Through the subprojects, the efficiency and reliability of these networks was enhanced and sustainable power supply to consumers was assured.

51. All three physical project outputs were completed and commissioned before the loan completion date. All the performance target indicators for these outputs were achieved. Certain targets on 6–10 kV, 35 kV, and 110 kV transmission and distribution lines differed from those set at appraisal because of slight alignment changes and procurement modifications for some subprojects (see targets 1b and 2a in Appendix 1). Nevertheless, the completion of these subprojects helped to achieve the overall outputs and outcome at no additional cost.

52. The project was re-categorized from C to B for involuntary resettlement because timely and adequate social safeguard monitoring activities were not conducted for certain subprojects (see para. 34). This minor change affected project effectiveness from a safeguard monitoring perspective. However, it had no impact on the overall project outcome and outputs.

## **C. Efficiency**

53. The project’s economic internal rate of return (EIRR) has been re-calculated as 13.1%, compared to 13.4% at appraisal. This EIRR is above the threshold economic opportunity cost of capital of 12.0% used at appraisal and well above the minimum required discount rate of 9% currently employed by ADB in its revised guidelines for economic analysis. The detailed assumptions behind the calculation are in Appendix 11. The difference in the EIRR calculation from appraisal arises from the determination of benefits, as the actual costs of the project are not significantly different from those estimated at appraisal. Estimated benefits may have changed because of lower energy prices. Sensitivity testing on economic benefits being 20% lower than

<sup>23</sup> ADB. 2014. Azerbaijan Country Partnership Strategy. 2014–2018. Manila.

the “base case” estimates has resulted in an EIRR of 11.0%, while other sensitivity tests have resulted in values higher than 10.1%. Thus, the economic viability of the project can be considered robust.

54. Process efficiency is assessed as efficient, as the project was realized on time and on budget, with all project outputs achieved. Consequently, with the EIRR above the threshold of 9%, the overall efficiency is rated as *efficient*.

#### **D. Sustainability**

55. The constructed and rehabilitated facilities of the subprojects have become integral components of Azerbaijan’s power distribution system, increasing the efficiency and sustainability of the distribution networks. Despite being a state-owned utility, Azerishiq has built up a solid power distribution business management and undertakes continuous corporate reforms to further improve its business processes including financial management and technical operations. The sector’s financial situation is expected to improve, given the establishment of an independent regulator, support through ADB’s TA on developing a tariff mechanism, and the government’s acceptance of the financial recovery plan. The project is therefore rated as *likely sustainable*.

56. Azerishiq possesses the necessary level of institutional sustainability because of its qualified human resources and sound management structure. The departments are adequately set up to handle routine planning, operations, maintenance, and finance activities. The company has well-documented financial management processes and systems, uses an integrated enterprise resource planning solution across its finance and accounting functions, prepares financial statements in accordance with IFRS, and is externally audited annually by a recognized international auditor. However, certain technical aspects of its operations could be improved to further enhance the sustainability of the project; in particular, operation and maintenance staff in subproject locations need to be trained on the use of new substation equipment.

57. The project’s financial internal rate of return (FIRR) has been re-calculated to be –0.7%, compared to –10.8% at appraisal. The recalculated FIRR is below the weighted average cost of capital of 1.3%. The detailed assumptions of the calculation are in Appendix 12. Thus, the project has been found to be not financially viable, both currently and at appraisal.

58. The low FIRR can be explained by two factors: (i) Azerishiq’s low average retail tariff, and (ii) the fact that the investments are within a rural setting and that the Government of Azerbaijan has a policy of uniform country-wide electricity tariffs. This is not unusual, as most countries have this policy. However, the result, as in all such circumstances, is a cross-subsidy flowing from urban customers to rural customers, with urban customers typically paying prices that are above the cost of supply and rural customers paying prices below the cost of supply.

59. However, Azerishiq’s low retail tariffs affect not only the outcome of the FIRR calculation, but also its financial performance, which is sub-par. Azerishiq’s retail tariffs are not sustainable. Although ADB financial loan covenants may result in minor tariff increases in the short term, the profits required to maintain Azerishiq’s ability to self-finance do not exist. Ongoing capital infusions from the government have kept Azerishiq afloat. Since its inception in 2015, Azerishiq would not have been a sustainable enterprise without these annual infusions, as the few years of profitability in 2017 and 2018 yielded returns on net fixed assets that did not exceed 3%. The government must continue to provide subsidies to maintain this status quo. This will continue as long as tariffs remain below cost recovery levels. Therefore, consideration must be given to increasing tariffs for the sake of sustainability. The government has experience in increasing retail electricity tariffs—

by 16.7% in 2016—and so the authorities should not find this too difficult to do again. It is estimated that a tariff increase of about 25% is required to earn a return on net fixed assets of 10%, which would indicate a more appropriate level to provide self-sustainability with no subsidies. In any case, with the Government of Azerbaijan consistently subsidizing Azerishiq since its inception in 2015, together with its longer history of support for Azerenerji, the rating of *likely sustainable* is supported on a less-than-ideal financial basis.

## **E. Development Impact**

60. The project constructed or rehabilitated four units of 110 kV substations, 16 units of 35 kV substations, 1,157 units of 10/0.4 kV compact transformer stations, 58.7 km of 110 kV lines, 117.6 km of 35 kV lines, and 1,252.3 km of 6–10 kV stations; replaced 3,893.5 km of customer service lines with self-supporting insulated wire lines; and installed 175,409 electronic meters. These distribution network improvements addressed the deteriorating power distribution infrastructure in the project areas, contributed substantially to power supply stability and sustainability, reduced losses, and helped to meet growing electricity demand. Without the project, power distribution in the project areas would have further worsened and outages increased.

61. The project outcome indicators in the DMF provided the targets for achievement by 2019 against the 2014 baseline (Appendix 1). The actual achievements exceeded the targets for all three indicators: (i) the average annual unserved energy due to outages was 4.9% (target: below 5%); (ii) the distribution grid losses across the country were 11.6% (target: 13%); and (iii) the revenue collection was 93% (target: 80%). These indicators are expected to improve further.

62. The project's success is also evident from its contribution to the ADB Results Framework. The target set in the ADB Results Framework is 1.8 terawatt-hour (TWh) of electricity savings per year after 2022, i.e., after implementation of the MFF.<sup>24</sup> The annual loss reduction from the Azerishiq networks was about 2% per year on average during 2015–2018, or about 0.4 TWh equivalent of energy saved, compared to 2015.

63. The project was successful in achieving the impact of increasing the availability of a reliable electricity supply to all domestic consumers. The improved reliability is shown in the reduction of unserved energy due to outages and the reduction of distribution network losses. The overall impact of the project is therefore rated as *highly satisfactory*.

## **F. Performance of the Borrower and the Executing Agency**

64. Azerishiq, as both the borrower and executing agency, was fully responsible for the implementation and monitoring of the project. The key shortcoming in effective project management was the inadequate level of due diligence in its supervision of the contractors' performance in waste disposal (para. 41) and involuntary resettlement safeguard activities, which resulted in the project's re-categorization (paras. 34–38). However, this shortcoming was addressed in a timely and professional manner. In general, the performance of Azerishiq and the PMU was very good; they were proactive and complied with the loan covenants. The PMU ensured an adequate level of progress and safeguard reporting during implementation and promptly resolved all issues that arose. Moreover, the project's smooth implementation was due

<sup>24</sup> ADB. 2016. Report and Recommendation of the President to the Board of Directors: Proposed Multitranchise Financing Facility. Azerishiq Open Joint-Stock Company. Power Distribution Enhancement Investment Program. Manila.

to the dedication and strong support of Azerishiq's management and staff. The performance of Azerishiq is rated as *highly satisfactory*.

## **G. Performance of the Asian Development Bank**

65. ADB fielded three review missions during tranche 1 implementation—May 2017, July 2017, and September 2018. The missions mainly reviewed implementation progress. Their findings mostly covered project implementation and infrastructure operational matters, namely, the lack of maximum transformer loading of some of the substations, ensuring continuous water supply at all substations, and due diligence monitoring of the contractors' compliance with the technical specifications on design and construction.<sup>25</sup> The relevant follow-up actions were taken by Azerishiq in a timely manner. ADB also fielded three safeguard review missions in July, August, and December 2017 in relation to the involuntary resettlement concerns (paras. 34–38). The follow-up and remedial activities, including the preparation of the DDR report, CAP, and LARP, were duly implemented by Azerishiq with relevant support from ADB.

66. The project records and mission follow-up documents show that ADB's reviews and approvals of procurement documents, project progress reports, and safeguard reports were prompt and adequate. Apart from involuntary resettlement related issues and procurement reviews, no other major intervention was required from ADB during project implementation. In addition, the project team's close coordination with Azerishiq helped to build a relationship that provided the basis for efficient and high-quality implementation. ADB's performance is rated as *satisfactory*.

## **H. Overall Assessment**

67. The project's overall assessment rating is based on the assessment of relevance, effectiveness, efficiency, and sustainability. The project's design was relevant in addressing the need for rehabilitating old power distribution infrastructure, reducing losses, and ensuring a reliable and sustainable power supply. The project was effective because it implemented all the outputs and achieved the outcome. Its economic efficiency was validated through an adequate economic rate of return. The executing agency Azerishiq and the project were assessed as likely sustainable. The design of the subprojects and the construction activities were of an acceptable level. The condition of Azerishiq's power distribution network would have worsened without the project, accompanied by high losses, frequent outages, and an unreliable power supply.

68. Overall, the project is rated *successful*. It has not been rated more highly because safeguard concerns resulted in the project categorization change from C to B for involuntary resettlement and the loan covenants on financial sustainability were not fully met.

### **Overall Ratings**

<b>Criteria</b>	<b>Rating</b>
Relevance	Relevant
Effectiveness	Effective
Efficiency	Efficient
Sustainability	Likely sustainable
<b>Overall Assessment</b>	<b>Successful</b>
Development impact	Highly satisfactory
Borrower and executing agency	Highly satisfactory
Performance of ADB	Satisfactory

Source: Asian Development Bank.

<sup>25</sup> Aide-Mémoires on Loan 3407-AZE: MFF Power Distribution Enhancement Investment Program – Tranche 1, loan review mission dated 12 May 2017 and the consultation mission for Proposed Power Distribution – Tranche 2, dated September 2018.



## IV. ISSUES, LESSONS, AND RECOMMENDATIONS

### A. Issues and Lessons

69. In MFFs, subsequent tranches should be processed and implemented to overlap with tranche 1 to maintain implementation momentum and achieve maximum benefits. The program's tranches 2 and 3 were supposed to be approved in November 2017 and March 2018, respectively. The restricted stance on public external borrowing led to deferral of MFF's tranches 2 and 3 that was not present at the time of appraisal. If possible, the locations and routes of the project components for these tranches should be identified upfront and thoroughly analyzed for potential construction and safeguard impacts. To achieve higher quality and improved technology, it is crucial that the design, technical specifications, and construction standards are based on national and international best practice. In addition, contractors are encouraged to improvise where possible and introduce new technology standards. Subsequent tranches should also build upon lessons learnt and issues identified in the technical specifications for the initial tranche. Finally, the PMUs for subsequent tranches should be more proactive in using the PMC for the capacity development of the operational staff on new technology and standards.

### B. Recommendations

70. **Continuing reforms and financial sustainability of Azerishiq.** In the context of overall SOE reform to which the government has committed (para. 2), ADB should continue to pursue reforms at Azerishiq. This should entail engaging in policy dialogue with the government and Azerishiq to improve the entity's financial performance in a sustainable manner.

71. **Future monitoring.** The project included distribution substations, lines, and metering systems, which became part of Azerishiq's distribution network. These facilities were constructed on schedule and with the required quality through close coordination among Azerishiq's technical departments and regional branches, which will be responsible for their maintenance. Ongoing monitoring of these subprojects is therefore not considered necessary.

72. **Covenants.** All loan covenants except two have been complied with. These are (i) maintaining a separate bank account for the project, and (ii) ensuring no breach of the current ratio. Maintaining a separate bank account will be included as a loan covenant for future tranches under the MFF. As for the breach on the current ratio, the ADB project team requested Azerishiq to continue monitoring compliance with this covenant and undertake appropriate remedial measures if necessary.

73. **Further action or follow-up.** Since the project has been completed with no pending issues, no follow-up action is required.

74. **Timing of the project performance evaluation report.** This report is not considered necessary until after completion of the subsequent tranches, for which reports will be prepared.

## DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Indicators and Targets	Project Achievements
<b>Impact:</b> Increased availability of reliable electricity supply to all domestic consumers (Government of Azerbaijan. 2012. <a href="#">Azerbaijan 2020: Look into the Future</a> . Baku)		
<b>Outcome</b> Improved efficiency and reliability of the power distribution networks	By 2019 a. Average annual unserved energy due to outages reduced to below 5% of energy sales (baseline: 7% in 2014)  b. Nationwide distribution network losses reduced to 13% (baseline: 16% in 2014)  c. Revenue collection in the national distribution companies increased to 80% (baseline: 70% in 2014)	4.9%  11.6%  93%  Outcome has therefore been successfully achieved.
<b>Outputs</b> 1. Distribution network including distribution lines and substations rehabilitated, augmented, and functional	By 2019 1a. Rehabilitation of 110 kV substations (4 units), 35 kV substations (16 units), 6–10 kV transformer stations (1,157 units) (2014 baseline: 0)  1b. Rehabilitation of 110 kV transmission lines (54 km), 35 kV distribution lines (124 km), 6–10 kV distribution lines (1,237 km) (2014 baseline: 0)	Achieved. Construction of 4 units 110/33 kV substations, 16 units 35 kV substations, 1,157 units 10/0.4 kV compact transformer stations  Achieved. Construction of 58.7 km 110 kV lines, 117.6 km 35 kV distribution lines, 1,252.3 km 6–10 kV distribution lines.  Output has therefore been achieved.
2. Customer services lines rehabilitated and smart meters installed and operational	By 2019 2a. Replacement of 0.4 kV customer service lines (3,900 km) including installation of 108,409 smart meters (2014 baseline: 0)  2b. Household electricity bill collection efficiencies increased to 80% (2014 baseline: 70%)	Achieved. 3,893.5 km of 0.4 kV service lines including the installation of 175,409 electronic meters.  95%  Output has therefore been achieved.
3. Institutional capacity improved and corporate reform achieved	By 2019 3a. At least 80 staff (at least 20% of whom are women) from Azerishiq OJSC are trained in key aspects of distribution network management (2014 baseline: 0)  3b. Azerishiq OJSC corporate business plan, financial management system, and performance targets developed by end of 2016 and updated yearly thereafter (2014 baseline: 0)	Achieved. Training of about 90 Azerishiq staff took place in 2017–2019; 19 women participated.  Master Plan (business plan) for “Azerishiq” OJSC which is subject to annual update was issued in 2016 and approved by the decree of Cabinet of Ministries dated 11 April 2016 No.207s.  Output has therefore been achieved.

km = kilometer, kV = kilovolt, OJSC = Open Joint-Stock Company.

Source: Asian Development Bank.

## TECHNICAL ASSISTANCE COMPLETION REPORT

<b>TA Number, Country, and Name:</b> TA 9151-AZE: Preparing a Power Sector Financial Recovery Plan		<b>Amount Approved:</b> \$1,200,000.00	
		<b>Revised Amount:</b> \$1,300,000.00	
<b>Executing Agency:</b> Ministry of Finance	<b>Source of Funding:</b> Technical Assistance Special Fund-Others	<b>Amount Undisbursed:</b> \$25,481.00	<b>Amount Used:</b> \$1,274,519.00
<b>TA Approval Date:</b> 5 August 2016	<b>TA Signing Date:</b> 30 August 2016	<b>TA Completion Date</b>	
		<b>Original Date:</b> 30 June 2019	<b>Latest Revised Date:</b> 31 December 2019
		<b>Financial Closing Date:</b> 30 June 2020	<b>Number of Extensions:</b> 1
<b>TA Type:</b> Policy and advisory TA			

### Description

The objective of this technical assistant (TA) project was to assist the Government of Azerbaijan in developing a Financial Recovery Plan (FRP) and road map directed at improving the financial performance and sustainability of the power sector of Azerbaijan.

The scope involved analyzing the existing situation in the power sector with regard to costs, administrative and operational issues as well as cost recovery from existing tariffs. Cost and revenue projections going forward until 2025 were then to be estimated and analyzed, based on existing structures of costs, tariffs and investment plans. At the same time, the major challenges for the sector's financial sustainability were to be identified and measures developed that would allow the power sector to become fully cost covering by 2022. A financial recovery roadmap was to be developed, comprising a set of prudent financial sustainability benchmarks, measures related to tariff reform, and other areas. The road map should include implementation schedules and action programs. Finally, the project was also meant to assist with communicating the tariff reform to the public and with institutional strengthening for the successful implementation of the financial recovery roadmap.

### Expected Impact, Outcome, and Outputs

Impact: Improved financial performance and sustainability of the power sector of Azerbaijan

Outcome: Development of a power sector financial recovery plan

Outputs: Phase 1: (i) calculating the real cost of electricity supply (power generation, transmission and distribution) and (ii) designing a new tariff structure for power generation, transmission and distribution with differentiating tariffs for different customers and different generation sources (hydro, solar, water, gas) in existence and in development, to replace the current single tariff for all customers and thereby allow cross-subsidization between customer classes. Phase 2: (i) developing a financial recovery road map for the gradual increase in tariff, to achieve a full cost recovery level by 2022 and (ii) undertaking a public informational campaign on tariff reform, case studies of good practices in other countries, and institutional strengthening.

### Implementation Arrangements

The TA which started in August 2016 was implemented by a consulting firm with expertise in tariff regulatory policy and financial assessment for the power sector in coordination with the project officer. A mix of international and national experts comprised the team. An international power sector tariff and regulatory expert was also hired as an individual consultant who delivered a general knowledge product on the financial recovery plan with the objective of encouraging public engagement in 20 working days. The selection and engagement of all consultants were carried out in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time). Office equipment were similarly procured by the consulting firm according to ADB's procurement guidelines. The TA supported the procurement of a desktop computer and printer to support the efficient preparation of workshop and training materials.

The TA was extended once in April 2019. The 6-month extension was necessitated by (i) the additional task of conducting an affordability analysis which was supposed to be undertaken by the World Bank and (ii) the government's request for support with implementation of the tariff methodology and calculation tools.

The consulting firm was engaged initially from 20 January 2017 to 29 March 2019 to render 27 international person-months and 22 national person-months inputs. Due to the additional task of conducting an affordability analysis, the

contract completion date was extended until 30 November 2019 and the actual inputs rendered increased to 32.61 international person-months and 25.57 national person-months. The TA also envisioned the engagement of a national individual consultant to perform TA coordination activities for 16 person-months. However, during implementation, the recruitment of an international power sector tariff and regulatory expert was deemed more important and relevant.

The TA utilized 98% of the approved amount to produce its deliverables.

#### **Conduct of Activities**

All outputs outlined in the design and monitoring framework were achieved. For outputs 1 to 4, the final reports on (i) determination of real cost of electricity supply, (ii) tariff structure, (iii) financial recovery plan including the road map, and (iv) affordability of electricity tariff were approved by the government on 24 December 2018.

For output 5, a 4-day study tour in Germany was conducted for several members of the government stakeholders, with the purpose of supporting the financial recovery measures identified in the financial recovery plan, specifically measures on tariff regulation and efficiency improvements. A visit to a developed electricity market with a diverse structure of companies and pricing approaches was thought to address the current capacity building needs in the sector. A media training designed to support the capacity building of journalists and press-secretaries of the energy sector was also conducted. A knowledge sharing session at the ADB headquarters was conducted in May 2018 and training for the media was conducted in November 2019 to support the capacity building of journalists and press secretaries of the energy sector. Leaflets were also developed in May 2018 to introduce the Azerbaijan Energy Regulatory Agency (AERA) as the new regulatory agency to the wider public.

#### **Technical Assistance Assessment Ratings**

<b>Criterion</b>	<b>Assessment</b>	<b>Rating</b>
Relevance	The intended TA outcome was aligned with stated development priorities and ADB strategies. The TA design clearly corresponded to the TA type as it related to policy advisory changes and capacity development. The TA rationale was well articulated.	Relevant
Effectiveness	The TA results were essentially achieved, and activities were completed satisfactorily. All five outputs were accepted by the government, though with some delays, and contributed to improve business processes of the newly established AERA.	Effective
Efficiency	The TA experienced an implementation delay of 1 year. Targets set were achieved within the budget, funds were used for the purposes intended and there were no financial reporting and procurement issues.	Efficient
<b>Overall Assessment</b>	The project was relevant and effective. Delay in project implementation did not affect efficiency. Overall rating is 2.35. The TA provided essential support to regulatory reforms.	Successful
<b>Sustainability</b>	Establishment of AERA during the project implementation period clearly demonstrates evidence of sustainability mechanisms. There is a high degree of support from the government and stakeholders. The likelihood of project benefits continuing beyond the project's lifecycle is substantial.	Most likely sustainable

#### **Lessons Learned and Recommendations**

Design and/or planning	The technical soundness of the TA design and its adequacy were well-aligned with country partnership strategy (CPS) priorities and fitted government's program to help them to achieve financial cost recovery in the power sector.
Implementation and/or delivery	The TA implementation could benefit from better coordination between multiple stakeholders.
Management of staff and consultants	Substantial physical presence of TA consultants in the country was very helpful and achieved more buy-in of the government. The newly created regulator and its staff's proactive engagement during the implementation stage was key reason for the success of the TA deliverables.

Knowledge building	Media Training designed to support the capacity building of journalists and press-secretaries of the energy sector stakeholders also included dissemination materials such as posters and brochures contributing to awareness raising and communication strategy among the users. The tariff calculation mechanism produced under the TA has contributed to innovations and improved business processes.
Replication and/or scaling up	Replication of this TA can be considered if Tranche 2 of the multitranche financing facility is processed. This would enable to follow up and upstream the tariff policy advice.

#### Follow-up Actions

It is advisable to highlight the TA achievements in the 2019–2023 CPS final review.

ADB could also consider dedicated TA support to the ongoing energy sector reforms in Azerbaijan.

#### Prepared by:

Adnan Tareen

#### Designation and Division:

Principal Energy Specialist, CWEN

## DESIGN AND MONITORING FRAMEWORK

<b>Impact</b> Improved financial performance and sustainability of the power sector of Azerbaijan (Government of Azerbaijan. 2012. <a href="#">Azerbaijan 2020: Look into the Future</a> . Baku).
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Results Chain	Performance Indicators with Targets and Baselines	Achievements
<b>Outcome</b>  Power sector financial recovery plan developed	The government accepts and approves the power sector financial recovery plan by September 2017	The technical assistance (TA) project supported the development of a power sector financial recovery plan which was accepted and approved by the government in December 2018.
<b>Outputs</b>  1. Real cost of electricity supply (power generation, transmission and distribution) calculated  2. New tariff structure for power generation, transmission, and distribution with differentiating tariff for different customers developed  3. Financial recovery road map for gradual increase in tariff, to achieve a full cost recovery by 2022  4. Affordability analysis of electricity tariff  5. Public information campaign, case studies of good practices in other countries, and institutional strengthening undertaken	1. Final report on determination of real cost of electricity supply approved by the government by March 2017  2. Final report on tariff structure approved by the government by March 2017  3. Final FRP, including the road map, approved by the government by September 2017  4. Final report on affordability of electricity tariff approved by the government by November 2017  5. Public information campaign, case studies, study tour, and training programs conducted by December 2017	1. The key input was the Financial Recovery plan (FRP), which was accepted by the government in December 2018. Subsequent approval of final report was not required as its main component was the FRP.  2. The key input was the FRP, which was accepted by the government in December 2018. Subsequent approval of final report was not required as its main component was the FRP.  3. The final FRP produced under the TA was accepted by the government in December 2018.  4. The final FRP produced under the TA was approved by the government in December 2018.  5. A Study tour in Germany was conducted in October 2019.  A knowledge sharing session at the ADB headquarters was conducted in May 2018.  Media Training designed to support the capacity building of journalists and press secretaries of the energy sector was conducted in November 2019

**Actual Key Activities with Milestones****1. Real cost of electricity supply (power generation, transmission, and distribution) calculated**

- 1.1 Conducted a comprehensive review and assessment of the Energy Sector Master Plan of Azerbaijan (2013–2025) and other relevant reports, and the financial performance of Azerenerji Open Joint-Stock Company (OJSC) and Azerishiq OJSC (first quarter [Q1] 2018)
- 1.2 Analyzed the gap between the current practice in Azerbaijan and international best practice in system planning and investment analysis, and identified the improvement measures (Q2 2018)
- 1.3 Developed a model and mechanism in determining the real cost of electricity supply in Azerbaijan's power sector, including in particular benchmarks for metering and acceptable levels of technical and commercial losses (Q3 2018)
- 1.4 Conducted stakeholder consultations and workshop (Q2 2017)

**2. New tariff structure for power generation, transmission, and distribution with differentiating tariff for different customers developed**

- 2.1 Analyzed the gap between the current practice in Azerbaijan and international best practice in tariff structure design, and develop a tariff structure that facilitates differentiated tariffs for different customers as well as different generation sources (hydro, solar, water, gas) in existence and in development in Azerbaijan's power sector (Q2 2018)
- 2.2 Conducted training and a study tour to learn international best practice in tariff design in the power sector (Q4 2019)
- 2.3 Conducted stakeholder consultations and workshop (continued until TA completion)

**3. Financial recovery road map for gradual increase in tariff, to achieve a full cost recovery by 2022**

- 3.1 Identified key activities and an appropriate strategy in designing a financial recovery road map based on multi-criteria analysis (Q2 2018)
- 3.2 Developed a financial recovery road map that included recommendations for capital restructuring, write-offs or a one-time settlement of intercompany debts, and actions for gradual increase in tariff to achieve a full cost recovery level by 2022; and identified cross subsidies and/or state budget support that may need to be provided until the full-cost recovery tariff (Q1 2019)
- 3.3 Conducted stakeholder consultations and a workshop to seek feedback (Q2 2019)
- 3.4 Finalized the road map and facilitate government review and approval (Q2 2019)

**4. Affordability analysis for supporting financial recovery road map and communication strategy**

- 4.1 Data gathering of household expenditure and income (Q2 2018)
- 4.2 Assessment of the current household affordability situation (Q3 2018)
- 4.3 Assessment of expected changes (Q3 2018)
- 4.4 Conclusion of affordability analysis (Q4 2018)

**5. Public information campaign, case studies of good practices in other countries, and institutional strengthening undertaken**

- 5.1 Developed media products (e.g. infographics, social advertisements) (Q3 2019)
- 5.2 Developed appropriate public information dissemination programs, including surveys, consultations, public hearings, and media interviews to enhance the public's understanding of the energy sector and tariff reform; and encourage public engagement (Q3 2018)
- 5.3 Facilitated the executing agency, the Ministry of Finance, and other stakeholders in project administration for effective project implementation; and provided on-the job training for key staff of stakeholders (Q3 2018)
- 5.4 Designed and organized a training and study tour for 5–10 staff of the key stakeholders in at least one other country to learn of the approach taken to implement tariff reforms and the impact these had on cost and service delivery structures (Q2 2019)
- 5.5 Prepared case studies of good practices in tariff reforms in other countries, and conducted workshop to disseminate the recommendations (Q2 2018)

**Actual Inputs**

Asian Development Bank: \$1,300,000 (Technical Assistance Special Fund-Others)

Source: Asian Development Bank.

**TECHNICAL ASSISTANCE COST BY ACTIVITY**  
(\$'000)

Item	Amount		
	Original	Revised	Actual
1. Consultants	1,110.0	1,222.0	1,247.3
2. Training, seminars and/or conferences	40.0	40.0	24.3
3. Miscellaneous TA administration	20.0	22.0	0.0
4. Studies, surveys and reports	0.0	1.5	1.4
5. Equipment	0.0	4.0	1.5
6. Contingency	30.0	10.5	0.0
<b>Total</b>	<b>1,200.0</b>	<b>1,300.0</b>	<b>1,274.5</b>

TA = technical assistance.

Source: Asian Development Bank estimates.



## LIST OF MINOR CHANGES TO THE SCOPE OF THE PROJECT COMPONENTS

1. **35-kilovolts (kV) overhead line to supply the new Saatli substation (contract AI/ADB-6.2):** Originally, it was planned to supply the Saatli substation from the Saatli–Darti substation. To effectively plan design for sustainable power supplies to consumers, the executing agency (EA) decided that the new Saatli substation shall be connected to the reconstructed 110/35/10 kV Sarijali substation thereby establishing a loop system for Saatli. The length of this line is 8.6 kilometers (km) thus 2.4 km shorter than the originally planned line.
2. **35 kV overhead line to supply new 35 kV Siyazan substation (contract AI/ADB-7):** Originally, it was planned to supply the new Siyazan substation from the existing 110/35/6 kV Siyazan substation with a total line length of 3.5 km. To effectively plan design for sustainable power supplies to consumers, the EA decided to construct instead the connecting line from the first and second Gizilburun overhead lines, with the length of each line is 1.2 km, thus 2.3 km shorter than the originally planned line.
3. **110 kV Neftchala–Salyan overhead line (contract AI/ADB-8.1):** The 110 kV overhead line, from the 110 kV Neftchala substation to the 110 kV Salyan substation, was extended by about 4.9 km to Azerenerji's Salyan 220 kV substation to avoid the line passing through residential areas.
4. **35 kV overhead line to supply the new Pirsaat substation (contract AI/ADB-8.2):** Originally, it was planned to supply the Pirsaat substation from the Quazimammed–Darti substation. To effectively plan design for sustainable power supplies to consumers, the EA decided to construct instead the line from the 35/6 kV Atbulag substation to the 110/35/10 kV Alyat substation. The length of this line is 12.6 km, thus 2 km shorter than the originally planned line.
5. **Changes in the alignment of the 10 kV distribution line in Siyazan City:** Per the EA's discussions with the Siyazan City government, the route of this underground cabling was adjusted for aesthetics purpose.
6. **Changes in the alignment of the 110 kV transmission lines and 35 kV distribution lines between Gakh and Zagatala substations:** To effectively plan design for sustainable power supplies to consumers, the route was adjusted.

**PROJECT COST AT APPRAISAL AND ACTUAL**  
(\$ million)

Item	Appraisal Estimate			Actual		
	Foreign Exchange	Local Currency	Total Cost	Foreign Exchange	Local Currency	Total Cost
<b>A. Base Cost</b>						
1. Turnkey	138.5	70.4	208.9	105.0	121.2	226.3
2. Equipment	5.3	0.0	5.3	9.7	0.5	10.2
3. Meter installation	0.0	2.8	2.8	0.0	2.8	2.8
4. Consulting services						
a. Project implementation consultants	2.3	0.6	2.9	1.7	1.1	2.9
b. Preparation for future tranches	0.7	0.2	0.9	0.0	0.6	0.6
5. Institutional facilities	0.0	5.1	5.1	0.0	6.4	6.4
6. Taxes and duties	0.0	69.9	69.9	0.0	44.6	44.6
<b>Subtotal (A)</b>	<b>146.8</b>	<b>149.0</b>	<b>295.8</b>	<b>116.5</b>	<b>177.3</b>	<b>293.8</b>
<b>B. Contingencies</b>						
1. Physical	9.3	4.7	14.0	0.0	0.0	0.0
2. Price	3.4	1.8	5.2	0.0	0.0	0.0
<b>Subtotal (B)</b>	<b>12.7</b>	<b>6.5</b>	<b>19.2</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>
<b>C. Financing Charges During Implementation</b>						
1. Interest	9.4	0.0	9.4	10.1	0.0	10.1
2. Commitment charges	0.6	0.0	0.6	0.4	0.0	0.4
<b>Subtotal (C)</b>	<b>10.0</b>	<b>0.0</b>	<b>10.0</b>	<b>10.5</b>	<b>0.0</b>	<b>10.5</b>
<b>Total (A+B+C)</b>	<b>169.5</b>	<b>155.5</b>	<b>325.0</b>	<b>127.0</b>	<b>177.3</b>	<b>304.3</b>

Note: Numbers may not sum precisely because of rounding..

Sources: Asian Development Bank estimates and Azerishiq's audited project financial statements.

## PROJECT COST BY FINANCIER

**Table A5.1: Project Cost at Appraisal by Financier**  
(\$ million)

Item	ADB		Government of Azerbaijan		Total Cost
	Amount A	Share of Cost Category A/C	Amount B	Share of Cost Category B/C	Amount C
<b>A. Base Cost</b>					
1. Turnkey	208.9	100.0%	0.0	0.0%	208.9
2. Equipment	5.3	100.0%	0.0	0.0%	5.3
3. Meter installation	2.8	100.0%	0.0	0.0%	2.8
4. Consulting services					
a. Project implementation consultants	2.9	100.0%	0.0	0.0%	2.9
b. Preparation for future tranches	0.9	100.0%	0.0	0.0%	0.9
5. Institutional facilities	0.0	0.0%	5.1	100.0%	5.1
6. Taxes and duties	0.0	0.0%	69.9	100.0%	69.9
<b>Subtotal (A)</b>	<b>220.8</b>	<b>74.6%</b>	<b>75.0</b>	<b>25.4%</b>	<b>295.8</b>
<b>B. Contingencies</b>					
1. Physical	14.0	100.0%	0.0	0.0%	14.0
2. Price	5.2	100.0%	0.0	0.0%	5.2
<b>Subtotal (B)</b>	<b>19.2</b>	<b>100.0%</b>	<b>0.0</b>	<b>0.0%</b>	<b>19.2</b>
<b>C. Financial Charges During Implementation</b>					
1. Interest	9.4	100.0%	0.0	0.0%	9.4
2. Commitment charges	0.6	100.0%	0.0	0.0%	0.6
<b>Subtotal (C)</b>	<b>10.0</b>	<b>100.0%</b>	<b>0.0</b>	<b>0.0%</b>	<b>10.0</b>
<b>Total Project Cost (A+B+C)</b>	<b>250.0</b>		<b>75.0</b>		<b>325.0</b>
<b>% Total Project Cost</b>		<b>76.9%</b>		<b>23.1%</b>	<b>100.0%</b>

ADB = Asian Development Bank.

Note: Numbers may not sum precisely because of rounding.

Sources: Asian Development Bank estimates.

**Table A5.2: Project Cost at Completion by Financier**  
(\$ million)

Item	ADB		Government of Azerbaijan		Total Cost
	Amount A	Share of Cost Category A/C	Amount B	Share of Cost Category B/C	Amount C
<b>A. Base Cost</b>					
1. Turnkey	226.3	100.0%	0.0	0.0%	226.3
2. Equipment	9.7	95.1%	0.5	4.9%	10.2
3. Meter installation	0.0	0.0%	2.8	100.0%	2.8
4. Consulting services					
a. Project implementation consultants	2.8	100.0%	0.0	0.0%	2.8
b. Preparation for future tranches	0.6	100.0%	0.0	0.0%	0.6
5. Institutional facilities	0.0	0.0%	6.4	100.0%	6.4
6. Taxes and duties	0.0	0.0%	44.6	100.0%	44.6
<b>Subtotal (A)</b>	<b>239.5</b>	<b>81.5%</b>	<b>54.3</b>	<b>18.5%</b>	<b>293.8</b>
<b>B. Contingencies</b>					
1. Physical	0.0	0.0%	0.0	0.0%	0.0
2. Price	0.0	0.0%	0.0	0.0%	0.0
<b>Subtotal (B)</b>	<b>0.0</b>	<b>0.0%</b>	<b>0.0</b>	<b>0.0%</b>	<b>0.0</b>
<b>C. Financial Charges During Implementation</b>					
1. Interest	10.1	100.0%	0.0	0.0%	10.1
2. Commitment charges	0.4	100.0%	0.0	0.0%	0.4
<b>Subtotal (C)</b>	<b>10.5</b>	<b>100.0%</b>	<b>0.0</b>	<b>0.0%</b>	<b>10.5</b>
<b>Total Project Cost (A+B+C+D)</b>	<b>249.9</b>		<b>54.3</b>		<b>304.3</b>
<b>% Total Project Cost</b>		<b>82.1%</b>		<b>17.8%</b>	<b>100.0%</b>

ADB = Asian Development Bank.

Note: Numbers may not sum precisely and/or percentages may not total 100% because of rounding.

Sources: Asian Development Bank estimates and Azerishiq's audited project financial statements.

## CONTRACT AWARDS OF ADB LOAN PROCEEDS

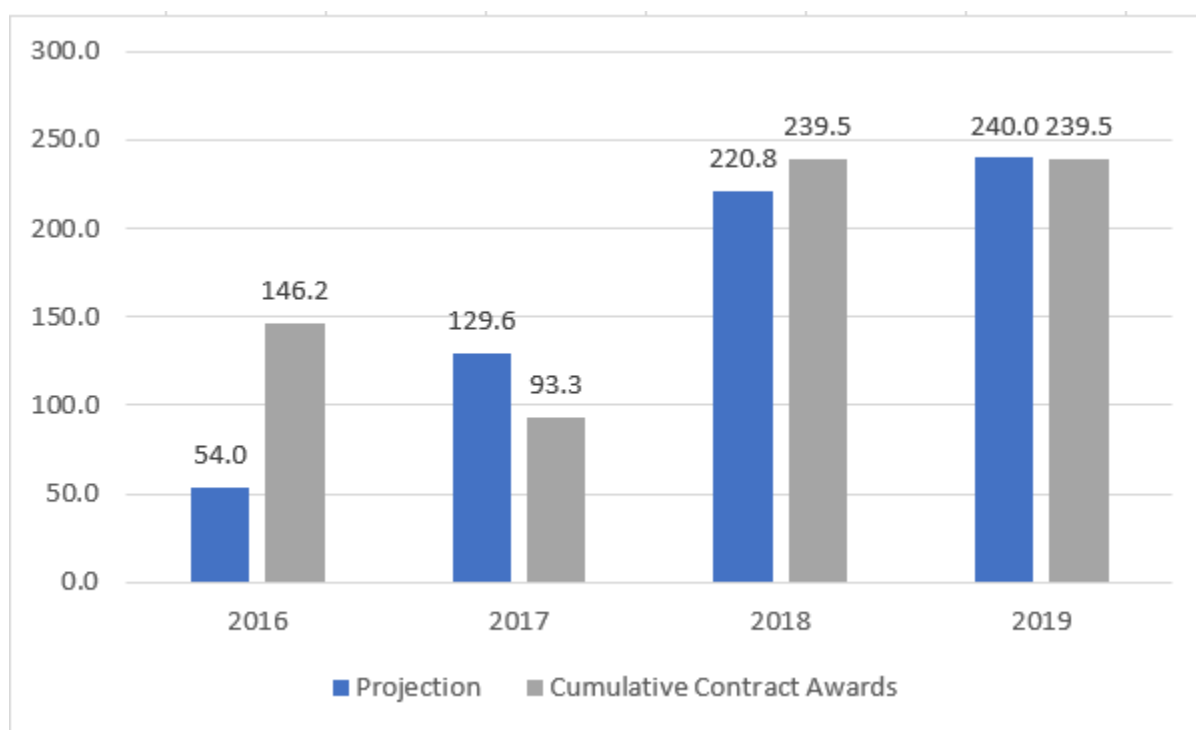
**Table A6: Annual and Cumulative Contract Awards of ADB Loan Proceeds**

Year	Annual Contract Awards		Cumulative Contract Awards	
	Amount (\$ million)	% of Total	Amount (\$ million)	% of Total
2016	146.2	61.0	146.2	61.0
2017	93.3	39.0	239.5	100.0
<b>Total</b>	<b>239.5</b>	<b>100.0</b>	<b>239.5</b>	<b>100.0</b>

ADB = Asian Development Bank.

Source: Asian Development Bank.

**Figure A6: Projection and Cumulative Contract Awards of ADB Loan Proceeds**  
(\$ million)



ADB = Asian Development Bank.

Source: Asian Development Bank.

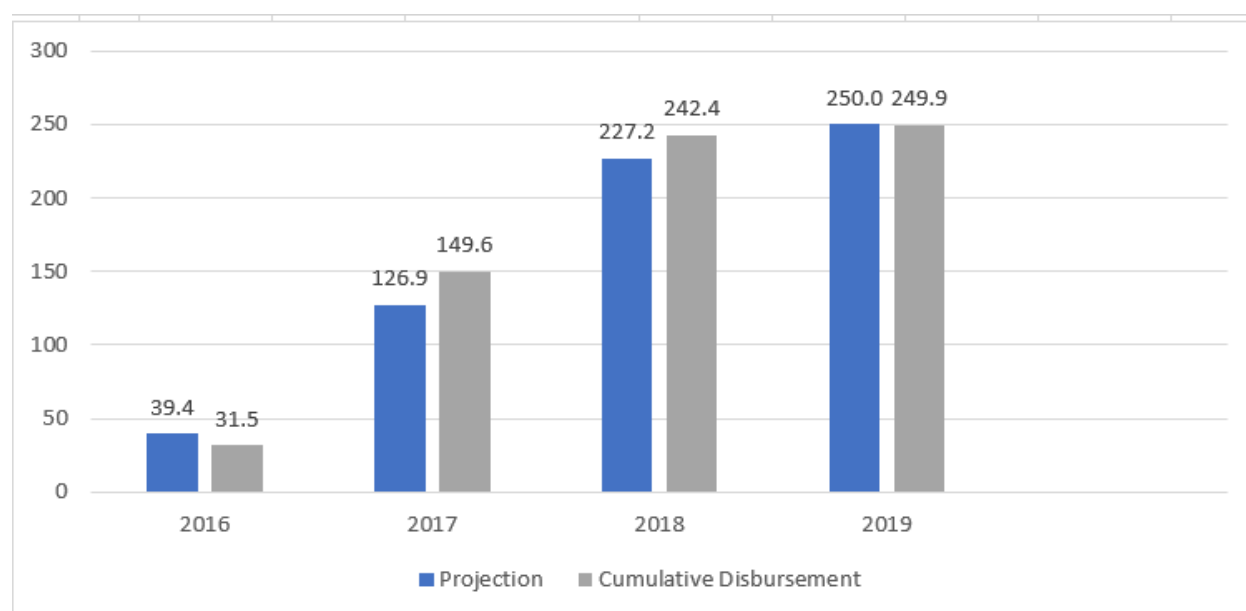
## DISBURSEMENT OF ADB LOAN PROCEEDS

**Table A7: Annual and Cumulative Disbursement of ADB Loan Proceeds**  
(\$ million)

Year	Annual Disbursement		Cumulative Disbursement	
	Amount (\$ million)	% of Total	Amount (\$ million)	% of Total
2016	31.5	12.6	31.5	12.6
2017	118.0	47.2	149.6	59.8
2018	92.9	37.2	242.4	97.0
2019	7.5	3.0	249.9	100.0
<b>Total</b>	<b>249.9</b>	<b>100.0</b>	<b>249.9</b>	<b>100.0</b>

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

**Figure A7: Projection and Cumulative Disbursement of ADB Loan Proceeds**  
(\$ million)



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

## SUMMARY OF AMENDMENTS TO THE SUPERVISION AND MANAGEMENT CONSULTANT CONTRACT

1. **Amendment No.1 (27 April 2017):** The project management unit of Azerishiq and the Consultant revised the initially agreed staff inputs of international and national consultants with the aim of increasing the inputs of national staff because of the intense project supervision needs at the sites. The revised staff inputs became (i) 65 person-months for international, with the contract amount revised to \$1,657,405.02 (exclusive of local indirect taxes of \$298,332.9); and (ii) 201 person-months for national staff, with the contract amount revised to AZN2,773,090.64 (exclusive of local indirect taxes of AZN499.156.31).
2. **Amendment No. 2 (31 October 2017):** Considering the importance of commencing the preparation of Tranche 2 feasibility study documentation at the earliest possible time because of the successful and rapid Tranche 1 implementation progress, Azerishiq requested ADB to consider the variation order to the existing consultant contract to recruit the same consultants' consortium for the preparation of Tranche 2. As a result of the agreed amendment, the contract amounts in United States Dollar (\$) and Azerbaijan manat (AZN) remained similar to Amendment No.1, with the staff inputs by international and national staff revised to 62.6 person-months for international and 204.1 person-months for national. New scope of work on Tranche 2 preparation was added. Also, the replacement of the environment specialist (international) and the social safeguard experts (international and national) was included in this amendment.
3. **Amendment No.3 (11 October 2018):** The initial scope for Tranche 2 enunciated in Amendment No. 2 was revised to include the Baku region, and the Consultant was requested to modify all feasibility study reports with due consideration of the study scope change. The contract amounts were also revised and were set as \$1,642,549.39 (exclusive of local indirect taxes \$295,658.89) and AZN2,798,345.21 (exclusive of local indirect taxes AZN503,702.14).
4. **Amendment No. 4 (31 October 2018):** The Government of Azerbaijan requested Azerishiq to prepare the Electricity Grid Code of Azerbaijan. Azerishiq therefore assigned the Consultant to prepare the Grid Code through relevant variation order to its existing contract. The respective Terms of Reference on Grid Code preparation was added. Azerishiq and the Consultant agreed on the budget of Grid Code preparation as \$177,184.34 for foreign currency and AZN181,982.58 for local currency (\$284,232.92 in total). It was decided to reallocate the savings from the existing contract after Amendment No. 3 in the amount of \$202,500 for the Grid Code preparation. The remaining amount of \$81,732.92 was covered from loan savings.

**THE LIST OF SOCIAL SAFEGUARD DOCUMENTS PREPARED AND SUBMITTED TO ADB**

<b>Subprojects</b>	<b>Document Prepared</b>	<b>Date of Azerishiq Submission</b>	<b>Date of ADB Approval</b>
35/10 kV Saatli S/S and 110/35/10 kV Sarijali S/S	DDR report	9 Sept 2017	14 Sept 2017
35 kV Masalli-Aldavi DL	DDR report	18 Sept 2017	20 Sept 2017
Expansion of the 110/35/10 kV Dalimammadli S/S	CAP	21 Sept 2017	21 Sept 2017
35 kV Udjar-Zardab DL	LARP	21 Sept 2017	26 Sept 2017 <sup>a</sup>
110 kV S/Ss and DLs in Goranboy, Gakh, and Neftchala Districts, in addition to Ganja City	DDR report	28 Sept 2017	18 Oct 2017
35 kV S/Ss and DLs in Shamkir, Imishli, Hajigabul, Lankaran, Gakh, Shamakhi, Siyazan, Masalli, Oghuz, Saatli, Zardab, and Absheron Districts, in addition to the Cities of Baku, Ganja, and Mingachevir	DDR report	19 Oct 2017	30 Oct 2017
10/6 kV DL and 0.4 kV self-supported insulated wire lines in Garadag, Hajigabul, Goranboy, Imishli, Saatli, Zardab, Shamkir, Gakh, Shamakhi, Oghuz, Neftchala, Masalli, Lankaran, and Siyazan Districts, in addition to the Cities of Khirdalan, Mingachevir, and Ganja	DDR report	6 Nov 2017	6 Nov 2017

ADB = Asian Development Bank, CAP = corrective action plan, DDR = due diligence review, DL = distribution line, kV = kilovolt, LARP = land acquisition and resettlement plan, S/S = substation, TL= transmission line.

<sup>a</sup> The LARP was disclosed on the ADB website on 16 October 2017.

Source: Asian Development Bank.



## STATUS OF COMPLIANCE WITH LOAN COVENANTS

Particular Covenants	Status
<b>Loan Agreement, Article IV, Particular Covenants</b>	
Section 4.01. (a) The Borrower shall cause the Project to be carried out with due diligence and efficiency and in conformity with sound applicable technical, financial, business, and development practices.	Complied.
(b) In the carrying out of the Project and operation of the Project facilities, the Borrower shall perform, or cause to be performed, all obligations set forth in Schedule 5 to this Loan Agreement.	Complied.
Section 4.02. The Borrower shall make available, promptly as needed and on terms and conditions acceptable to ADB, the funds, facilities, services, land and other resources, as required, in addition to the proceeds of the Loan, for the carrying out of the Project and for the operation and maintenance of the Project facilities.	Complied.
Section 4.03. (a) Whenever applicable, in the carrying out of the Project, the Borrower shall cause competent and qualified consultants and contractors, acceptable to ADB to be employed to an extent and upon terms and conditions satisfactory to the Borrower and ADB.	Complied.
(b) The Borrower shall cause the Project to be carried out in accordance with plans, design standards, specifications, work schedules and construction methods acceptable to the Borrower and ADB, as applicable. The Borrower 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.	Complied.
Section 4.04. The Borrower shall ensure that the activities of its departments and agencies with respect to the carrying out of the Project and operation of the Project facilities are conducted and coordinated in accordance with sound administrative policies and procedures.	Complied.
Section 4.05. (a) The Borrower shall (i) maintain separate accounts and records for the Project; (ii) prepare annual financial statements for the Project in accordance with IPSAS-Accrual; (iii) have such financial statements audited annually by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB, in accordance with the International Standards on Auditing; (iv) as part of each such audit, have the auditors prepare a report, which includes the auditors' opinion(s) on the financial statements and the use of the Loan proceeds, 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 other information concerning these documents and the audit thereof as ADB shall from time to time reasonably request.	Partially complied. Maintaining separate bank accounts for the project will be considered in future tranches. Audit opinion for AEFS for FY2016 was qualified. Delay in the submission of APFS for FY2016, FY2017 and FY2018, and AEFS for FY2016 were noted.
(b) ADB shall disclose the annual audited financial statements for the Project and the opinion of the auditors on the financial statements within 14 days of the date of ADB's confirmation of their acceptability by posting them on ADB's website.	Complied.
(c) In addition to annual audited financial statements referred to in subsection (a) hereinabove, the Borrower shall (i) provide its annual financial statements prepared in accordance with IFRS on a consolidated basis; (ii) have its financial statements audited annually by independent auditors whose qualifications, experience and terms of reference are acceptable to ADB, in accordance with	Complied.

Particular Covenants	Status
<p>auditing standards acceptable to ADB; (iii) as part of each such audit, have the auditors prepare the auditors' opinion(s) on the financial statements and compliance with the financial covenants of the Loan Agreement (being paragraphs 12 and 13 of Schedule 5 to this Loan Agreement); and (iv) furnish to ADB, no later than 1 month after approval by the relevant authority, copies of such audited financial statements and auditors' opinion(s), all in the English language, and such other information concerning these documents and the audit thereof as ADB shall from time to time reasonably request.</p> <p>(d) The Borrower shall enable ADB, upon ADB's request, to discuss the financial statements for the Project and the Borrower's financial affairs where they relate to the Project with the auditors appointed pursuant to subsection (a) (iii) hereinabove, and shall authorize and require any representative of such auditors to participate in any such discussions requested by ADB. This is provided that such discussions shall be conducted only in the presence of an authorized officer of the Borrower, unless the Borrower shall otherwise agree.</p>	Complied.
Section 4.06. The Borrower shall enable ADB's representatives to inspect the Project, the Goods and Works, and any relevant records and documents.	Complied.
Section 4.07. The Borrower shall ensure that any facilities relevant to the Project are operated, maintained and repaired in accordance with sound applicable technical, financial, business, development, operational and maintenance practices.	Complied.
<b>Loan Agreement, Schedule 5, Execution of Project; Financial Matters</b>	
<p><b>Implementation Arrangements</b></p> <p>1. The Borrower shall ensure that the Project is implemented in accordance with the detailed arrangements set forth in the FAM. Any subsequent change to the FAM shall become effective only after approval of such change by the Borrower and ADB. In the event of any discrepancy between the FAM and this Loan Agreement, the provisions of this Loan Agreement shall prevail.</p>	Complied.
<p>2. The Borrower shall ensure that:</p> <p>(a) within 2 months after the Effective Date, the PMU is fully staffed with qualified and experienced specialists on technical, financial, procurement, and safeguards matters; and</p> <p>(b) within 3 months after the Effective Date, a consulting firm is engaged, with dual reporting responsibility to both the Borrower and ADB, to assist the PMU in Project implementation monitoring, procurement, evaluation and reporting, preparation of subsequent tranches of the Investment Program and capacity training to the PMU members.</p>	<p>Complied.</p> <p>Complied.</p>
3. The Borrower shall ensure that the contracts for Works, Goods and related services financed by the Project are properly supervised to achieve timely and successful implementation, including by exercising its contractual rights as necessary or desirable in the best interests of Project implementation.	Complied.
4. The Borrower shall construct, rehabilitate, install, equip, operate, maintain and operate the Project facilities in compliance with applicable national standards of the Guarantor, and that the construction supervision, quality control, contract management, and completion inspection and acceptance procedures shall be in accordance with contractual provisions and all applicable national and local laws and regulations of the Guarantor.	Complied.
5. The Borrower shall ensure that the relevant staff will attend the training related to the operation of the distribution networks and metering system provided by the contractors of the contracts financed under the Project.	Complied.

Particular Covenants	Status
<b><u>General Operations</u></b> 6. The Borrower shall, promptly as required, take all actions within its powers 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.	Complied.
7. The Borrower shall 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.	Complied.
8. The Borrower shall 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.	Complied.
9. Except as ADB may otherwise agree, the Borrower 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 Agreement. In addition to the foregoing, the Guarantor and the Borrower shall 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 the Borrower over operation and maintenance of any such asset, facility or structure financed under the Project. The Guarantor and the Borrower shall ensure that any such changes shall be carried out in a legal and transparent manner.	Complied.
10. Each of the Guarantor and the Borrower shall promptly notify ADB of (i) 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 facilities; and (ii) any proposal to transfer an interest in the Borrower to a third party and information on the ultimate beneficial ownership of the interest proposed to be transferred. The Guarantor and the Borrower shall afford ADB an adequate opportunity to comment on such proposal prior to taking any affirmative action thereon.	Complied.
<b><u>Counterpart Support</u></b> 11. The Guarantor and the Borrower shall make available all counterpart funding promptly as required for purposes of timely and successful implementation of the Project, including the full costs of construction of administration centers and procurement of vehicles and equipment (including information technology equipment) as described in paragraph 3(c)(ii) of Schedule 1 to this Agreement. In addition to the foregoing, the Guarantor shall ensure that the Borrower has sufficient funds to satisfy its liabilities arising from any Works, Goods and/or Consulting Services contract.	Complied.
<b><u>Financial Covenants</u></b> 12. For every Financial Year ending on 31 December 2016 and thereafter, the Borrower shall ensure that:  (a) the debt of the Borrower for the current Financial Year is not more than 3 times to its equity for the same period based on its audited consolidated annual financial prepared in accordance with IFRS. For the purposes of this paragraph: (i) the term "debt" means any indebtedness of the Borrower maturing by its term more than 1 year from the date on which it was originally incurred; and (ii) the term "equity" means the sum of total unimpaired paid up capital, retained earnings, and reserves of the Borrower not allocated to cover specific liabilities.	Complied.

Particular Covenants	Status
<p>(b) the free cash flows of the Borrower for the current Financial Year shall be at least 1.2 times the debt service requirements for the same period on all debt based on its audited consolidated annual financial statements prepared in accordance with IFRS. For the purposes of this paragraph:</p> <p>(i) the term “debt” means any indebtedness of the Borrower maturing by its term more than 12 months from the date on which it was originally incurred;</p> <p>(ii) the term “debt service requirements” means the aggregate amount of all repayments (including sinking fund payments, lease payments under finance leases, if any) whether or not actually paid, and interest and other charges on debt, provided that interest charges which are incurred in financing capital expenditure during development are excluded if they are capitalized; and</p> <p>(iii) the term “free cash flows” means the difference between (A) the sum of revenues from all sources related to operations, after making adequate provision for uncollectible debt and net non-operating income; and (B) the sum of all expenses related to operations including administration, maintenance, current taxes and payments in lieu of taxes (but excluding provision for depreciation, other non-cash expenses, and deferred taxes), movements in working capital other than cash.</p>	
<p>13. The Borrower shall ensure that its current ratio, based on its audited consolidated annual financial statements prepared in accordance with IFRS, is (a) at least 0.50 for the Financial Year ending on 31 December 2016; (b) at least 0.75 for the Financial Year ending on 31 December 2017; and (c) at least 1 starting from for the Financial Year ending on 31 December 2018 and thereafter. For purposes of this paragraph:</p> <p>(i) the term “current ratio” means the ratio of current assets to current liabilities;</p> <p>(ii) the term “current assets” means all assets which could in the ordinary course of business be converted into cash within 12 months, including accounts receivable, marketable securities, inventories, prepaid expenses properly chargeable to operating expenses within the next Financial Year, and cash; and</p> <p>(iii) the term “current liabilities” means all liabilities which will become due and payable or could under circumstances then existing be called for payment within 12 months, including accounts payable, customer advances, debt service requirements, taxes and payments in lieu of taxes, and dividends.</p>	Partially complied. EA's financial projections contend compliance with the financial covenant 13 (c).
<p>14. For each Financial Year, the Borrower shall prepare its projected financial performance based on the prevailing electricity tariff, and estimate the additional resources required for it to fully achieve the covenants set out in paragraphs 12 to 13 above and submit a request to the Guarantor for subsidy. The Guarantor shall make such subsidy available in each year's annual budget, until such time as the tariffs are revised so as to enable the Borrower to fully comply with the financial covenants without any subsidy.</p>	Complied.
<p><b>Sector</b></p> <p>15. The Guarantor shall (a) regularly review the financial position of the electricity sector; (b) ensure the financial sustainability of the electricity sector; and (c) keep the ADB informed of its actions in ensuring the financial sustainability of the electricity sector. The Guarantor shall ensure that the Borrower will achieve full cost recovery by 31 December 2022, by pursuing financial and tariff reform and gradually adjusting tariff level and structure, taking into account cost reduction, efficiency improvement and targeted financial support to protect vulnerable groups of customers.</p>	<p>Complied.</p> <p>The AERA was established in December 2017 under the MOE. ADB's TA-9151 assisted MOE and AERA with developing a Tariff Methodology based on the recommendations of the FRP. The FRP was accepted by the MOF in December 2018. The TA project also assisted AERA in preparing full Tariff Review, resulting in a detailed Tariff Proposal Document. Several Amendments were made to the Law on Energy, the Law on Electricity, the Law on Gas Supply</p>

Particular Covenants	Status
	and the Law on Power and Heating Stations.
16. The Guarantor shall ensure that (a) ADB is informed about updates to the State Program on the Development of the Fuel and Energy Sector in Azerbaijan (2005–2015); (b) it remains committed to the implementation of the State Program on the Development of the Fuel and Energy Sector in Azerbaijan (2005–2015), or updates or amendments thereto as satisfactory to ADB; and (c) its Cabinet of Ministers coordinates the work between Ministry of Economy, Ministry of Ecology and Natural Resources, MOE, MOF and other government ministries and agencies for the expeditious resolution of any issues, and timely implementation of the Project.	Complied.
<b><u>Environment</u></b> 17. The Borrower shall 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 Guarantor relating to environment, health, and safety; (b) the Environmental Safeguards; (c) the EARF; and (d) all measures and requirements set forth in the respective IEE and EMP, and any corrective or preventative actions set forth in a Safeguards Monitoring Report.	Complied.
<b><u>Indigenous Peoples; Land Acquisition and Involuntary Resettlement</u></b> 18. The Borrower shall ensure that the Project does not have any indigenous peoples or involuntary resettlement impacts, each within the meaning of ADB's Safeguard Policy Statement (2009). In the event that the Project does have any such impact, the Borrower shall take all steps required to ensure that the Project complies with the applicable laws and regulations of the Borrower, the LARF and ADB's SPS.	Complied.
<b><u>Human and Financial Resources to Implement Safeguards Requirements</u></b> 19. The Borrower shall make available necessary budgetary and human resources to fully implement the EMP.	Complied.
<b><u>Safeguards – Related Provisions in Bidding Documents and Works Contracts</u></b> 20. The Borrower shall ensure that all bidding documents and contracts for Works contain provisions that require contractors to: <p>(a) comply with the measures and requirements relevant to the contractor set forth in the IEE and the EMP (to the extent they concern impacts on affected people during construction), and any corrective or preventative actions set out in a Safeguards Monitoring Report;</p> <p>(b) make available a budget for all such environmental and social measures;</p> <p>(c) provide the Borrower 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;</p> <p>(d) adequately record the condition of roads, agricultural land and other infrastructure prior to starting to transport materials and construction; and</p> <p>(e) fully reinstate pathways, other local infrastructure, and agricultural land to at least their pre-project condition upon the completion of construction.</p>	Complied.
<b><u>Safeguards Monitoring and Reporting</u></b> 21. The Borrower shall do the following: <p>(a) submit semiannual Safeguards Monitoring Reports to ADB and disclose relevant information from such reports to affected persons promptly upon submission;</p>	Complied.

Particular Covenants	Status
<p>(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 or the EMP, promptly inform ADB of the occurrence of such risks or impacts, with detailed description of the event and proposed corrective action plan; and</p> <p>(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.</p>	
<p><b><u>Prohibited List of Investments</u></b></p> <p>22. The Borrower shall ensure that no proceeds of the Loan are used to finance any activity included in the list of prohibited investment activities provided in Appendix 5 of the SPS.</p>	Complied
<p><b><u>Labor Standards, Health and Safety</u></b></p> <p>23. The Borrower shall ensure that the core labor standards and applicable laws and regulations of the Guarantor are complied with during Project implementation. The Borrower shall include specific provisions in the bidding documents and contracts financed by ADB under the Project requiring that the contractors, among other things: (a) comply with the applicable labor law and regulations of the Guarantor and incorporate applicable workplace occupational safety norms; (b) do not use child labor; (c) do not discriminate workers in respect of employment and occupation; (d) do not use forced labor; (e) allow freedom of association and effectively recognize the right to collective bargaining; and (f) disseminate, or engage appropriate service providers to disseminate, information on the risks of sexually transmitted diseases, including HIV/AIDS, to the employees of contractors engaged under the Project and to members of the local communities surrounding the Project area, particularly women.</p>	Complied.
<p>24. The Borrower shall strictly monitor compliance with the requirements set forth in paragraph 23 above and provide ADB with regular reports.</p>	Complied.
<p><b><u>Gender and Development</u></b></p> <p>25. The Borrower shall ensure that the principles of gender equity aimed at increasing Project benefits and impacts on women in the Project area consistent with ADB's Policy on Gender and Development (1998) are followed during implementation of the Project, including (a) equal pay to men and women for work of equal value; (b) enabling working conditions for women workers; and (c) taking necessary actions to encourage women living in the Project area to participate in the design and implementation of Project activities.</p>	Complied.
<p><b><u>Governance and Anticorruption</u></b></p> <p>26. The Borrower and the Guarantor shall (a) comply with ADB's Anticorruption Policy (1998, as amended to date) and acknowledge that ADB reserves the right to investigate directly, or through its agents, any alleged corrupt, fraudulent, collusive or coercive practice relating to the Project; and (b) cooperate with any such investigation and extend all necessary assistance for satisfactory completion of such investigation.</p>	Complied.
<p>27. The Borrower shall ensure that the anticorruption provisions acceptable to ADB are included in all bidding documents and contracts, including provisions specifying the right of ADB to audit and examine the records and accounts of the executing and implementing agencies and all contractors, suppliers, consultants, and other service providers as they relate to the Project</p>	Complied.

ADB = Asian Development Bank, AEFS = audited entity financial statement, AERA = Azerbaijan Energy Regulatory Agency, APFS = audited project financial statement, EA = executing agency, EARF = environmental assessment and review framework, EMP = environmental management plan, FAM = facility administration manual, FRP = financial recovery plan, FY = fiscal year, IEE = initial environmental examination, IFRS = international financial reporting standard, IPSAS = international public sector accounting standard, LARF = land acquisition and resettlement framework, MOE = Ministry of Energy, MOF = Ministry of Finance, PMU = project management unit, SPS = Safeguard Policy Statement, TA = technical assistance.

Source: Asian Development Bank.

## ECONOMIC ANALYSIS

### A. Introduction

1. This economic re-evaluation of the project has been carried out in accordance with the Asian Development Bank (ADB) Guidelines for *the Economic Analysis of Projects* (2017).<sup>1</sup> It replicates, with updated data, the original economic analysis carried out as per Appendix 8 of the project's report and recommendation of the President to the Board of Directors.<sup>2</sup> This analysis assessed the benefits and costs of the project by comparing with-project and without-project scenarios.

2. The analysis examined the economic viability of the replacement of distribution substations, customer service lines, and meters, mostly in the rural areas of the distribution network of the executing agency, Azerishiq Open Joint-Stock Company (OJSC), a 100% state-owned power distribution company.<sup>3</sup>

3. The Tranche 1 investment has entailed the replacement of four existing 110/33 kilovolt (kV) substations, 16 existing 35/10/6 kV substations, and 1,157 existing 10/0.4 kV compact transformer stations, plus associated distribution circuits. Low-voltage distribution systems were also be reconfigured to eliminate long overloaded circuits. Domestic meters were installed to provide a separate meter to each customer at locations where metering was either communal or nonexistent. Replacement of customer-owned and outdated meters was also included within the scope of the project. The operation and maintenance (O&M) was expected to commence gradually from 2016, with physical completion of the project in 2018. In implementation, all construction works were completed by August 2018, and all components were well ahead of the scheduled project completion date.

### B. Methodology and Major Assumptions

#### 1. Sector Overview

4. In 2015, the Government of Azerbaijan issued a presidential decree to transfer all distribution business and assets of Azerenerji OJSC (Azerenerji) to Azerishiq OJSC (formerly Bakielektrikishebeke OJSC, a distribution company serving the Baku region).

5. The quality of power supplied and the duration of supply in the distribution areas served by Azerishiq OJSC (Azerishiq) were constrained by the poor performance of the aging network. Azerishiq financial status was marginal, and the additional burden of maintaining and upgrading the inherited distribution network would require significant new capital injection. The government is committed to sector reforms and ADB is supporting the effort through providing technical assistance grants in preparing and implementing a financial recovery plan including tariff reform and encouraging private sector investment in the power sector.

<sup>1</sup> ADB. 2017. [Guidelines for the Economic Analysis of Projects](#). Manila.

<sup>2</sup> ADB. 2016. [Report and Recommendation of the President to the Board of Directors: Proposed Multitranchise Financing Facility to Azerishiq Open Joint-Stock Company for the Power Distribution Enhancement Investment Program \(Guaranteed by the Republic of Azerbaijan\)](#). Manila.

<sup>3</sup> Until February 2015, Azerenerji OJSC was the vertically integrated power utility for the country, except for power distribution in the Baku region, which was handled by Bakielektrikishebeke OJSC (now Azerishiq OJSC).

## 2. Sales Forecast and Benefits Summary

6. Azerishiq's peak demand forecasts for 110 kV and 33 kV substations in the project areas have been converted to energy forecasts and adjusted for estimated medium- and low-voltage losses to provide electricity sales forecasts in the project areas (Table A11.1). It is assumed that much of this growth will not occur without the project. However, no demand growth beyond year 15 has been modelled for the analysis on the basis that further investment would be required to augment capacity at that stage. Also, the assets in the network at appraisal were old, resulting in frequent outages and a high level of power system losses. Thus, project benefits arise from three sources: (i) growth, (ii) reduction in outages, and (iii) reduction in losses.

**Table A11.1: Sales Forecast Summary for Project Areas**

Item		2016	2017	2018	2019	2020	2025	2030
Non-coincident peak demand <sup>a</sup>	MW	150.3	155.7	161.1	170.6	176.6	211.0	253.7
Generation	GWh	750.5	781.1	815.0	833.4	867.4	1,068.3	1,335.4
Technical losses	% of input	11.0	11.2	11.6	11.4	11.4	11.4	11.4
Commercial losses	% of input	6.2	5.8	4.5	0.7	0.7	0.7	0.7
Total sales	GWh	621.0	644.3	671.2	723.6	749.0	894.9	1,075.9
Sales growth	%		3.8	4.1	7.8	3.5	3.7	3.8

GWh = gigawatt-hour, MW = megawatt.

<sup>a</sup> Demand growth has been considered only to year 15.

Source: Azerishiq demand forecast and project preparatory technical assistance consultant's estimates for commercial losses and demand.

## C. Method and Approach

### 3. Least Cost Project

7. In general, there were few, if any, viable alternatives to the distribution system augmentation. The approach adopted for distribution planning was to identify and adopt appropriate planning criteria and standardized designs so as to minimize cost while achieving or exceeding domestic and international standards. This included standardization of substation capacities, maximum loadings, conductor types and maximum circuit lengths, and metering (all of which have been briefly reviewed as part of project technical due diligence). Some of the Tranche 1 subprojects, particularly putting physically congested parts of distribution networks underground, are driven principally by safety concerns, for which there are no practical alternatives.

### 4. Economic Costs

8. The project financial investment costs and net incremental O&M costs have been converted into economic costs at 2020 constant prices. As in the original economic analysis, a domestic price numeraire has been adopted. Traded goods and services have been shadow priced at the estimated shadow exchange rate factor (SERF) of 1.1 as per the appraisal estimate, reflecting a commonly held view of an overvalued domestic currency that has not changed since project appraisal. Nontraded inputs have been valued at domestic prices. It has been assumed there are no significant distortions in the wage rates for skilled labor. In the case of unskilled labor, underemployment exists in the economy, and a shadow wage rate (SWR) of 0.75 was adopted. Taxes, financing charges, and price contingencies were excluded from the economic analysis.



9. **Capital expenditures.** These expenditures include the actual costs of (i) replacing existing 110 kV, 35 kV, and 10 kV substations; (ii) associated medium- and low-voltage distribution circuits; (iii) reconfiguration of low-voltage distribution systems; (iv) installation of single-phase domestic meters; and (v) consulting services.

10. **Incremental operation and maintenance costs.** Based on international benchmarks and experience and in reflection of the relatively high capital cost, incremental O&M costs have been assumed to be 1.5% of capital costs in the with-project case. For the without-project case, a historical figure of AZN0.015 per kilowatt-hour (kWh) of sales has been adopted as per the appraisal estimate based on the estimated O&M cost from Bakielektrikishebeke's financial statements before significant investments were made to improve its distribution efficiency. As the coverage area of Bakielektrikishebeke was an urban network, this was assessed in the original economic analysis as a conservative estimate of O&M cost for the mostly rural networks of the project, as a higher estimation of O&M cost in the without-project case would increase the incremental benefit of the analysis.

## 5. Economic Benefits

11. **Avoided costs of lower losses.** With reduced losses, Azerenerji will generate less energy in order to meet the same load, resulting in spare capacity on the Azerishiq system to meet new demand. These are partly incremental benefits valued at willingness-to-pay and partly non-incremental benefits valued at the resource cost savings arising from the avoided use of surplus capacity in the form of diesel gensets. These gensets have been installed in the project area as the result of many years of unreliable power supply. In the absence of consumer-level information on the market penetration of the gensets, associated benefits have been considered as partly incremental and partly non-incremental on a 50-50 basis. The weighted average benefit amounts to \$0.156 per kWh.

12. **Reduction of outages.** A second benefit of the project arises from the increased electricity consumption through reduction of outages. In the existing network (i.e., in the without-project case), customers experienced a lack of electricity supply due to the outages. The project has reduced these outages and provides grid-supplied electricity to customers in the with-project case. Therefore, this reduction of outages is the economic benefit, which comprises both incremental and non-incremental consumption as described above. The weighted average benefit is \$0.156 per kWh.

13. **Consumption growth.** The last benefit of the project is the increased growth in consumption that will occur as a result of the greater throughput capacity provided by the new facilities.<sup>4</sup> As with the other benefits, a portion of this growth will be incremental and a portion will be non-incremental. Also, it must be considered that a portion of the growth would have occurred in absence of the project, i.e., the capacity of the existing facilities would have been sufficient to take on at least some of the load growth indicated on Table A11.1, as well as the fact that a portion of the sales growth will fill the "saved" capacity arising from the reduced losses already considered as per para 11. To take these factors into account, it has been assumed that the existing facilities could accommodate an additional 10% of sales plus the additional sales room brought on by the reduced losses, both of which have been subtracted from anticipated sales growth. The net benefits have then been valued at \$0.156 per kWh as described above.

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<sup>4</sup> The original economic analysis did not consider this benefit.

14. Key non-quantified benefits are related to a general improvement in supply quality. These include: (i) improved voltage levels, (ii) reduced flicker, and (iii) enhanced public safety.

#### **D. Economic Internal Rate of Return**

15. The economic evaluation was conducted over the period 2016 to 2043 (28 years), with capital investment occurring mainly during the first 3 years and benefits slowly materializing from 2016 as the distribution plant entered service. The economic internal rate of return (EIRR) was calculated to be 13.1%. This rate is above the original estimation of the economic opportunity cost of capital of 12.0%. The calculation is summarized on Table A11.2.

16. In the original analysis, the EIRR was calculated to be 13.4%. The difference from the present analysis may be due to lower energy prices today that are the basis of the project's benefits. The slightly lower EIRR result arises even though growth benefits included in the present analysis were not considered in the original analysis. Another negative factor influencing the EIRR is that the project covers higher-cost rural areas, which can be uneconomic to supply.

#### **E. Sensitivity Analysis**

17. The sensitivity of the results of the economic analysis was tested by varying some of the input assumptions (Table A11.3). These assumptions include: (i) a 20% decrease in the value of avoided energy benefits, (ii) a 10% increase in incremental O&M costs, and (iii) a 10% decrease in avoided O&M costs. The EIRR falls below the threshold value of 12.0% (to 11.0%) only in the case of the reduced benefits, which indicates a somewhat robust EIRR.

**Table A11.2: Economic Internal Rate of Return (\$ millions)**

YEAR	PROJECT COST (\$ millions)				PROJECT BENEFITS							NET CASH FLOW (\$millions)
	Investment Cost	Incremental O&M Cost/ Benefit		Total Cost	Loss reduction (GWh)	Loss benefit (\$millions)	UE reduction (GWh)	UE benefit (\$millions)	Growth (GWh)	Growth benefit (\$millions)	Total Benefits	
	1.1 SERF	0.75 SWR	0.75 SWR			\$0.1556 per kWh		\$0.1556 per kWh		\$0.1556 per kWh		
2016	36.75	-	-	36.75	5.71	0.89	3.29	0.51	-	-	1.40	(35.35)
2017	135.76	1.76	(2.65)	134.88	27.82	4.33	16.01	2.49	-	-	6.82	(128.06)
2018	105.34	2.84	(4.44)	103.74	46.66	7.26	26.85	4.18	-	-	11.44	(92.30)
2019	8.38	2.93	(4.79)	6.51	50.30	7.83	28.94	4.50	-	-	12.33	5.82
2020	-	2.93	(4.96)	(2.03)	50.30	7.83	29.96	4.66	11.07	1.72	14.21	16.24
2021	-	2.93	(5.14)	(2.21)	50.30	7.83	31.05	4.83	38.22	5.95	18.60	20.82
2022	-	2.93	(5.33)	(2.40)	50.30	7.83	32.17	5.01	66.34	10.32	23.15	25.55
2023	-	2.93	(5.52)	(2.59)	50.30	7.83	33.34	5.19	95.49	14.86	27.87	30.46
2024	-	2.93	(5.72)	(2.79)	50.30	7.83	34.54	5.37	125.69	19.56	32.76	35.55
2025	-	2.93	(5.93)	(3.00)	50.30	7.83	35.80	5.57	156.97	24.42	37.82	40.82
2026	-	2.93	(6.15)	(3.22)	50.30	7.83	37.14	5.78	190.56	29.65	43.25	46.47
2027	-	2.93	(6.38)	(3.45)	50.30	7.83	38.53	6.00	225.40	35.07	48.89	52.34
2028	-	2.93	(6.62)	(3.69)	50.30	7.83	39.98	6.22	261.56	40.70	54.74	58.43
2029	-	2.93	(6.87)	(3.94)	50.30	7.83	41.48	6.45	299.07	46.53	60.81	64.75
2030	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2031	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2032	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2033	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2034	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2035	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2036	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2037	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2038	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2039	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2040	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2041	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2042	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
2043	-	2.93	(7.12)	(4.20)	50.30	7.83	43.04	6.70	337.97	52.59	67.11	71.30
NPV @	12.00%			357.37							399.80	42.43
											B/C ratio	1.12
											EIRR	13.1%

( ) = negative, B/C = benefit–cost ratio, EIRR = economic internal rate of return, GWh = gigawatt-hour, kWh = kilowatt-hour, NPV = net present value, O&M = operation and maintenance, SERF = shadow exchange rate factor, SWR = shadow wage rate, UE =unserved energy.  
Source: Asian Development Bank estimates.

**Table A11.3: Sensitivity Tests on Economic Analysis Results**

<b>Scenario</b>	<b>EIRR (%)</b>	<b>NPV (\$ million)</b>
Base Case	13.1	42.4
Decrease in avoided energy costs by 20%	11.0	(37.5)
Increase incremental O&M by 20%	12.9	35.5
Decrease avoided O&M by 20%	12.8	28.9

( ) = negative, EIRR = economic internal rate of return, NPV = net present value, O&M = operation and maintenance.

Source: Asian Development Bank estimates.

## FINANCIAL ANALYSIS

### A. Introduction

1. This financial re-evaluation of the project has been carried out in accordance with the Asian Development Bank (ADB) Financial Management and Analysis of Projects (2005).<sup>1</sup> It replicates, with updated data, the original financial analysis carried out as per Appendix 8 of the project's report and recommendation of the President (RRP) to the Board of Directors.<sup>2</sup> This analysis assessed the benefits and costs of the project by comparing with-project and without-project scenarios and made financial projections for the executing agency (EA).

2. The analysis examined the financial viability of the replacement of distribution substations, customer service lines, and meters, mostly in the rural areas of the distribution network of the executing agency, Azerishiq Open Joint-Stock Company (OJSC), a 100% state-owned power distribution company.<sup>3</sup>

3. The Tranche 1 investment has entailed the replacement of four existing 110/33 kilovolt (kV) substations, 16 existing 35/10/6 kV substations, and 1,157 existing 10/0.4 kV compact transformer stations, plus associated distribution circuits. Low-voltage distribution systems were also reconfigured to eliminate long overloaded circuits. Domestic meters were installed to provide a separate meter to each customer at locations where metering was either communal or nonexistent. Replacement of customer-owned and outdated meters was also included within the scope of the project. The operation and maintenance (O&M) was expected to commence gradually from 2016, with physical completion of the project in 2018. In implementation, all construction works were completed by August 2018, and all components were well ahead of the scheduled project completion date.

### B. Methodology and Major Assumptions

#### 1. Sector Overview

4. In 2015, the Government of Azerbaijan issued a presidential decree to transfer all distribution business and assets of Azerenerji OJSC (Azerenerji) to Azerishiq OJSC (formerly Bakielektrikishebeke OJSC, a distribution company serving the Baku region).

5. The quality of power supplied and the duration of supply in the distribution areas served by Azerishiq OJSC (Azerishiq) were constrained by the poor performance of the aging network. Azerishiq financial status was marginal, and the additional burden of maintaining and upgrading the inherited distribution network would require significant new capital injection. The government is committed to sector reforms and ADB is supporting the effort through providing technical assistance grants in preparing and implementing a financial recovery plan including tariff reform and encouraging private sector investment in the power sector.

<sup>1</sup> ADB. 2005. *Financial Management and Analysis of Projects*. Manila.

<sup>2</sup> ADB. 2016. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranchise Financing Facility to Azerishiq Open Joint-Stock Company for the Power Distribution Enhancement Investment Program (Guaranteed by the Republic of Azerbaijan)*. Manila.

<sup>3</sup> Until February 2015, Azerenerji OJSC was the vertically integrated power utility for the country, except for power distribution in the Baku region, which was handled by Bakielektrikishebeke OJSC (now Azerishiq OJSC).

## 2. Sales Forecast and Benefits Summary

6. Azerishiq's peak demand forecasts for 110 kV and 33 kV substations in the project areas have been converted to energy forecasts and adjusted for estimated medium- and low-voltage losses to provide electricity sales forecasts in the project areas (Table A12.1). It is assumed that much of this growth will not occur without the project. However, no demand growth beyond year 15 has been modelled for the analysis on the basis that further investment would be required to augment capacity at that stage. Also, the assets in the network at appraisal were old, resulting in frequent outages and a high level of power system losses. Thus, project benefits arise from three sources: (i) growth, (ii) reduction in outages, and (iii) reduction in losses.

**Table A12.1: Sales Forecast Summary for Project Areas**

Item		2016	2017	2018	2019	2020	2025	2030
Non-coincident peak demand <sup>a</sup>	MW	150.3	155.7	161.1	170.6	176.6	211.0	253.7
Generation	GWh	750.5	781.1	815.0	833.4	867.4	1,068.3	1,335.4
Technical losses	% of input	11.0	11.2	11.6	11.4	11.4	11.4	11.4
Commercial losses	% of input	6.2	5.8	4.5	0.7	0.7	0.7	0.7
Total sales	GWh	621.0	644.3	671.2	723.6	749.0	894.9	1,075.9
Sales growth	%		3.8	4.1	7.8	3.5	3.7	3.8

GWh = gigawatt-hour, MW = megawatt.

<sup>a</sup> Demand growth has been considered only to year 15.

Source: Azerishiq demand forecast and project preparatory technical assistance consultant's estimates for commercial losses and demand.

## C. Method and Approach

### 3. Cost and Revenue Streams for With Project and Without-Project Scenarios

7. This analysis entails determining the financial internal rate of return (FIRR) and comparison with the weighted average cost of capital (WACC). It is based on streams of costs and benefits resulting from installing and operating the new distribution assets. The streams of costs and benefits are developed as annual cash flows comprising capital investments over 3 years plus annual financial benefits over the project life of 25 years. The streams are then discounted to a net present value. The costs and benefits are expressed in 2020 constant prices. The analysis has excluded price contingencies and costs from financial charges such as interest during construction and commitment charges.

### 4. Costs

8. **Capital expenditures.** These expenditures included the actual costs of (i) replacing existing 110 kV, 35 kV, and 10 kV substations; (ii) associated medium- and low-voltage distribution circuits; (iii) reconfiguration of low-voltage distribution systems; (iv) installation of single-phase domestic meters; and (v) consulting services.

9. **Incremental operating and maintenance costs.** Based on international benchmarks and experience and in reflection of the relatively high capital cost, incremental O&M costs have been assumed in the RRP financial analysis to be 1.5% of capital costs in the with-project case. For the without-project case, a historical figure of AZN0.015 per kilowatt-hour (kWh) of sales has been adopted, as per the appraisal estimate based on the estimated O&M cost from Bakielektrikishebeke's financial statements before significant investments were made to improve its distribution efficiency. As the coverage area of Bakielektrikishebeke was an urban network, this was assessed in the original financial analysis as a conservative estimate of O&M cost for

the mostly rural networks of the project, as a higher estimation of O&M cost in the without-project case would increase the incremental benefit of the analysis.

## 5. Financial Benefits

10. With reduced losses, Azerishiq will purchase less energy in order to meet the same load, i.e., a savings in the resource cost will be incurred. Loss savings of 6.5% have been expected in the project areas. Azerishiq's average purchase price in 2019 was \$0.02825 per kWh.

11. A second benefit of the project arises from the increased electricity consumption through reduction of outages. In the existing network (i.e., in the without-project case), customers experienced a lack of electricity supply due to the outages. The project has reduced these outages and provides grid-supplied electricity to customers in the with-project case. Therefore, this reduction of outages in kWh is the benefit. This energy is valued at Azerishiq's average 2019 tariff (\$0.04132) less the cost of purchased power adjusted for losses. Although the government has committed under the project loan to implement tariff reforms, this has not happened and there is no clear indication of when the next tariff increase(s) might occur, even though such increases are needed (para. 15).

12. The last benefit of the project is the increased growth in consumption that will occur as a result of the greater throughput capacity provided by the new facilities.<sup>4</sup> These sales are valued at the same level as the increased sales from reduced outages.

## D. Weighted Average Cost of Capital

13. The WACC calculation is shown on Table A12.2. ADB's Tranche 1 loan, representing 76.9% of total project cost, was directly lent to Azerishiq with a guarantee from the government of no additional charges. The corporate tax rate as it applies to Azerishiq is 20%. The balance of 23.1% of project costs was funded by the government and Azerishiq. The cost of equity for the government has been estimated to be 6.5% based on the most recent government lending rates.<sup>5</sup> Since the Azerishiq capital investment budget has been heavily supported by the government's equity injections, the same cost of equity of 6.5% has been assumed for Azerishiq.

14. Assuming a domestic inflation rate of 3.0% and an international inflation rate of 1.2%, the real, post-tax WACC for the Tranche 1 investment according to the standard WACC derivation is estimated to be 1.34%, as seen on Table A12.2.

<sup>4</sup> The original economic analysis did not consider this benefit.

<sup>5</sup> Country Economy. [Central Bank Key Rates: Azerbaijan](https://countryeconomy.com/key-rates/azerbaijan) (accessed 20 November 2020)  
<https://countryeconomy.com/key-rates/azerbaijan>

**Table 12.2: Weighted Average Cost of Capital Calculation**  
(%)

Item		ADB Loan	Azerishiq Funds	Total
A. Weighting		76.90	23.10	100
B. Nominal cost		2.90	6.50	
C. Tax rate		20.00	20.0	
D. Tax-adjusted nominal cost	$[B \times (1 - C)]$	2.32	5.20	
E. Inflation rate		1.20	3.00	
F. Real cost	$[(1 + D) / (1 + E) - 1]$	1.11	2.14	
G. Weighted component of WACC	$[F \times A]$	0.85	0.49	
<b>WACC</b>				<b>1.34</b>

WACC = weighted average cost of capital.

Source: Asian Development Bank estimates.

## E. Results

15. The calculation of the project's financial internal rate of return (FIRR) is shown on Table A12.3. Under the assumptions adopted, the project is not financially viable, with FIRR of  $-0.66\%$  under the current electricity tariff, which is below the WACC of  $1.34\%$ . However, this is somewhat better than  $-10.8\%$  calculated in the original analysis compared to the WACC of  $2.8\%$  at the time. The original financial analysis also included a calculation of the FIRR under a "full cost recovery" scenario, but without defining what full cost recovery entails, as this would depend on meeting adequate financial performance criteria that need to be defined. Certainly, meeting ADB loan covenant requirements cannot be defined as full cost recovery, as Azershiq falls well short of adequately meeting other normally acceptable financial measures (para. 15).

16. The low FIRR may also be explained by the fact that the investments are within a rural setting and that the government of Azerbaijan has a policy of uniform country-wide electricity tariffs. This is not unusual, as most countries have this policy. However, the result, as in all such circumstances, is a cross-subsidy flowing from urban customers to rural customers, with urban customers typically paying prices that are above the cost of supply and rural customers paying prices below the cost of supply.

## F. Azerishiq Financial Projections

17. Table A12.4 provides a summary of Azerishiq financial performance since 2016 and projections to 2025. Key assumptions going forward include the following: (i) the current retail tariff and power purchase tariffs are maintained at existing levels; (ii) required capital expenditures in 2021 are set at the 6-year average 2015–2020 and assumed to grow with sales and inflation; (iii) capital investment funding from government sources in the form of paid-in capital will continue to 2023 at AZN100 million per year (as per present plans), after which it will continue at about 30% of investment requirements; and (iv) all remaining capital requirements will be borrowed at a concessionary rate of 2.5%. Current government plans end at 2023; however, capital investments must continue and the above assumptions are consistent with the current short-term plan.



Table A12.3: Financial Internal Rate of Return

YEAR	PROJECT COST (\$ millions)				PROJECT BENEFITS							NET CASH FLOW (\$millions)
	Investment Cost	Incremental O&M Cost		Total Cost	Loss reduction (GWh)	Loss benefit (\$millions) per kWh	UE reduction (GWh)	UE benefit (\$millions) per kWh	Growth (GWh)	Growth benefit (\$millions) per kWh	Total Benefits	
		1.50% of investment	0.0088 USD/ kWh benefit									
2016	33.41	0.50	(0.73)	33.19	5.7	0.16	3.3	0.03	-	-	0.19	-32.99
2017	123.42	2.35	(3.53)	122.24	27.8	0.79	16.0	0.16	-	-	0.95	-121.29
2018	95.76	3.79	(5.93)	93.63	46.7	1.32	26.8	0.27	-	-	1.59	-92.03
2019	7.62	3.90	(6.39)	5.13	50.3	1.42	28.9	0.30	-	-	1.72	-3.41
2020	-	3.90	(6.61)	(2.71)	50.3	1.42	30.0	0.31	11.1	0.11	1.84	4.55
2021	-	3.90	(6.85)	(2.95)	50.3	1.42	31.0	0.32	38.2	0.39	2.13	5.08
2022	-	3.90	(7.10)	(3.20)	50.3	1.42	32.2	0.33	66.3	0.68	2.43	5.63
2023	-	3.90	(7.36)	(3.46)	50.3	1.42	33.3	0.34	95.5	0.98	2.74	6.20
2024	-	3.90	(7.62)	(3.72)	50.3	1.42	34.5	0.35	125.7	1.29	3.06	6.78
2025	-	3.90	(7.90)	(4.00)	50.3	1.42	35.8	0.37	157.0	1.61	3.40	7.39
2026	-	3.90	(8.20)	(4.29)	50.3	1.42	37.1	0.38	190.6	1.95	3.75	8.05
2027	-	3.90	(8.51)	(4.60)	50.3	1.42	38.5	0.39	225.4	2.31	4.12	8.73
2028	-	3.90	(8.82)	(4.92)	50.3	1.42	40.0	0.41	261.6	2.68	4.51	9.43
2029	-	3.90	(9.16)	(5.25)	50.3	1.42	41.5	0.42	299.1	3.06	4.91	10.16
2030	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2031	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2032	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2033	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2034	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2035	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2036	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2037	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2038	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2039	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2040	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2041	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2042	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
2043	-	3.90	(9.50)	(5.60)	50.3	1.42	43.0	0.44	338.0	3.46	5.32	10.92
NPV @	1.34%			164.11							95.09	-69.02
											B/C ratio	0.58
											FIRR	-0.66%

( ) = negative, B/C = benefit–cost ratio, FIRR = financial internal rate of return, GWh = gigawatt-hour, kWh = kilowatt-hour, NPV = net present value, O&M = operation and maintenance, UE = unserved energy.

Source: Asian Development Bank estimates.

**Table A12.4: Azerishiq Financial Performance and Projections**

Item	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Total revenue	890.1	1,176.8	1,205.0	1,232.4	1,234.4	1,236.0	1,256.4	1,270.6	1,284.9	1,299.0
Total operating expenses	974.3	1,132.8	1,168.2	1,265.7	1,296.2	1,313.7	1,349.9	1,386.7	1,424.7	1,464.9
Operating profit	(84.2)	44.1	36.8	(33.2)	(61.8)	(77.7)	(93.5)	(116.1)	(139.8)	(165.9)
Interest and financing costs	20.5	0.2	6.6	19.8	17.1	15.0	10.4	16.7	22.3	31.3
Depreciation	85.1	77.2	93.3	104.5	110.4	113.2	123.6	134.6	146.0	158.0
Net profit before tax	(104.7)	43.9	30.3	(53.0)	(78.9)	(92.7)	(103.9)	(132.8)	(162.2)	(197.2)
Capital expenditure	269.2	443.5	331.6	208.4	104.1	286.4	299.9	313.9	328.5	343.7
Financing cash flow	246.1	407.1	283.5	112.9	104.1	275.0	278.2	302.8	350.4	389.0
Net cashflow	(0.3)	37.3	(27.1)	6.8	24.0	2.2	(6.5)	(14.2)	0.7	0.7
Current assets	196.1	239.1	170.7	148.0	187.9	205.6	214.6	216.2	232.9	249.9
Fixed assets	1,349.1	1,753.4	2,057.4	2,156.0	2,149.7	2,322.9	2,499.1	2,678.4	2,860.9	3,046.7
Current liabilities	203.0	174.1	150.6	607.2	109.7	120.2	131.1	151.1	222.1	325.8
Short-term borrowing requirement					0.0	0.0	0.0	9.0	69.0	161.8
Long-term borrowings	71.7	314.3	558.9	574.1	574.1	749.1	927.3	1,121.0	1,306.8	1,493.5
Share capital	1,581.9	1,767.3	1,902.5	2,005.9	2,110.0	2,210.0	2,310.0	2,410.0	2,514.6	2,624.1
Retained earnings	(264.2)	(246.2)	(330.3)	(385.1)	(466.0)	(560.7)	(664.6)	(797.4)	(959.6)	(1,156.8)
Debt service coverage ratio	1.19	10.17	1.49	4.73	1.40	0.51	0.47	(0.08)	(0.35)	(0.56)
Debt ratio	5.2%	17.1%	26.2%	26.2%	25.9%	31.2%	36.0%	41.0%	45.7%	50.4%
Current ratio	0.97	1.37	1.13	0.24	1.71	1.71	1.64	1.43	1.05	0.77
Average payables (days)	67.6	42.4	11.8	13.0	12.8	12.8	12.8	12.8	12.8	12.8
Average receivables (days)	38.1	26.5	23.9	21.2	24.7	28.3	31.6	34.9	38.1	41.4

( ) = negative.

Source: Asian Development Bank estimates.

18. From Table A12.4, it can be concluded that, under existing tariffs: (i) Azerishiq's operating profit and net profit will continue to deteriorate; (ii) Azerishiq might be able to maintain a degree of liquidity until about 2023, when cash shortfalls will either trigger short-term borrowing requirements or require government support beyond the investment assumptions described above; and (iii) Azerishiq will probably not meet ADB loan covenant requirements in 2021, during which debt service coverage falls below the requirement of 1.20. Therefore, it appears that a tariff increase is necessary immediately – about 1%, assuming that the existing year-to-date numbers for 2020 are accurate and that the power purchase tariff remains unchanged.

19. However, it should be noted that Azerishiq's retail tariffs are not sustainable. Small tariff increases may be sufficient to meet ADB loan covenants, but the profits required to maintain self-financing ability do not exist. Ongoing capital infusions from the government would be instrumental in keeping Azerishiq afloat. In every year since its inception in 2015, Azerishiq has not been a sustainable enterprise without these infusions, as the few years of profitability in 2017 and 2018 yielded returns on net fixed assets that did not exceed 3%. This government support will need to continue as long as tariffs remain below cost recovery levels. It is estimated that a tariff increase in the order of 25% would be required to earn a return on net fixed assets of 10%, which may be interpreted as an approximate estimate of financial viability without government support (subject to a more rigorous analysis).