



# Report and Recommendation of the President to the Board of Directors

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Project Number: 50146-001  
June 2017

## Proposed Loan Electric Networks of Armenia CJSC Distribution Network Rehabilitation, Efficiency Improvement, and Augmentation (Armenia)

This is an abbreviated version of the document approved by ADB's Board of Directors that excludes information that is subject to exceptions to disclosure set forth in ADB's Public Communications Policy 2011.

Asian Development Bank

## CURRENCY EQUIVALENTS

(as of 18 April 2017)

Currency unit – dram (AMD)

AMD1.00 = \$0.0020571

\$1.00 = AMD486.10

## ABBREVIATIONS

ADB	–	Asian Development Bank
EBITDA	–	earnings before interest, taxes, depreciation, and amortization
ENA	–	Electric Networks of Armenia
ESMS	–	environmental and social management system
ISO	–	International Organization for Standardization
kV	–	kilovolt
PSRC	–	Public Service Regulatory Commission
US	–	United States

## NOTE

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

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Confidential information deleted.

## PROJECT AT A GLANCE

<b>1. Basic Data</b>		<b>Project Number: 50146-001</b>	
<b>Project Name</b>	Distribution Network Rehabilitation, Efficiency Improvement, and Augmentation Armenia, Republic of	<b>Department /Division</b>	PSOD/PSIF1
<b>Country</b>			
<b>Borrower</b>	Electric Networks of Armenia CJSC		
<b>2. Sector</b>	<b>Subsector(s)</b>	<b>ADB Financing (\$ million)</b>	
✓ Energy	Electricity transmission and distribution		80.00
		<b>Total</b>	<b>80.00</b>
<b>3. Strategic Agenda</b>	<b>Subcomponents</b>	<b>Climate Change Information</b>	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Mitigation (\$ million)	80.00
Environmentally sustainable growth (ESG)	Eco-efficiency Global and regional transboundary environmental concerns	CO <sub>2</sub> reduction (tons per annum)	11,400
		Climate Change impact on the Project	Low
<b>4. Drivers of Change</b>	<b>Components</b>	<b>Gender Equity and Mainstreaming</b>	
Partnerships (PAR)	Commercial cofinancing International finance institutions (IFI)	No gender elements (NGE)	✓
Private sector development (PSD)	Private Sector Promotion of private sector investment		
<b>5. Poverty and SDG Targeting</b>		<b>Location Impact</b>	
Geographic Targeting	No	Nation-wide	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG7, SDG8		
<b>6. Nonsovereign Operation Risk Rating</b>			
<b>Obligor Name</b>		<b>Obligor Risk Rating</b>	<b>Facility Risk Rating</b>
Electric Networks of Armenia CJSC		NSO9	NSO9
<b>7. Safeguard Categorization</b>	Environment: B	Involuntary Resettlement: B	Indigenous Peoples: C
<b>8. Financing</b>			
<b>Modality and Sources</b>		<b>Amount (\$ million)</b>	
<b>ADB</b>		<b>80.00</b>	
Nonsovereign LIBOR Based Loan (Regular Loan): Ordinary capital resources		80.00	
<b>B-Loans</b>		<b>0.00</b>	
None		0.00	
<b>Official Cofinancing<sup>a</sup></b>		<b>0.00</b>	
None		0.00	
<b>Others<sup>b</sup></b>		<b>121.24</b>	
<b>Total</b>		<b>201.24</b>	

<sup>a</sup> Concessional financing from external sources.

<sup>b</sup> Derived by deducting ADB financing, B Loans and Official Cofinancing from Project Total Cost.

## I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan of up to \$80,000,000 equivalent in United States (US) dollars and euros to Electric Networks of Armenia CJSC (ENA) for the Distribution Network Rehabilitation, Efficiency Improvement, and Augmentation in Armenia.<sup>1</sup>

## II. THE PROJECT

### A. Project Identification and Description

2. **Project identification.** Since the start of the 21st century, Armenia's energy sector has undergone a series of reforms that have significantly improved its performance. The reforms involved the unbundling of a vertically integrated electricity subsector and the privatization of power and gas distribution networks and of most generating companies.<sup>2</sup> However, the power distribution network was largely neglected and suffers from the effects of poor and irregular construction and maintenance work undertaken in the 1990s [Confidential information deleted]. Distribution assets in the two largest cities of Yerevan and Gyumri are almost fully depreciated.

3. Following financial difficulties in 2015, ENA (which is privately owned and the only electricity distribution company in Armenia) was purchased by Liormand Holdings Limited (Liormand) from an affiliate of Inter RAO UES (Russian company). The new investor is in the process of upgrading the company's management and operations to bring them to international standards. Before the ownership change in 2015, there were public protests because of the worsening quality and reliability of ENA's service at a time when tariffs were being increased. The Government of Armenia supported the change in ownership on the understanding that ENA would be modernized and managed more efficiently. ENA's proposed 5-year investment program is the first step in this planned transformation and has been approved by Armenia's Public Service Regulatory Commission (PSRC). ENA is seeking the support of multilateral development banks. The Asian Development Bank (ADB) and the European Bank for Reconstruction and Development will be jointly financing the project, which commenced in 2016 and is expected to be completed by 2020.

4. **Project design.** Under the new management and ownership, ENA launched the project aimed at (i) improving the quality of the distribution network and services of its multisite operations across the country; (ii) reducing electricity losses and operational expenses; (iii) improving technical maintenance and safety conditions; (iv) modernizing the metering system; (v) rehabilitating, reinforcing, and augmenting the distribution network; (vi) connecting new customers; and (vii) introducing international standards of management<sup>3</sup> and an automated control system. This is expected to directly improve profitability, while keeping tariffs stable. The project has the following key components:

- (i) **Network rehabilitation and reinforcement** [Confidential information deleted]. Outdated equipment and lines will be rehabilitated. The accumulated depreciation of existing equipment ranges from 66% to 92% for most categories, which indicates the age of the equipment. Much of these will need to be replaced and

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<sup>1</sup> CJSC = closed joint stock company is a legal entity, commonly found in the former Soviet Union, whose shares are distributed among a limited number of shareholders with limited liability.

<sup>2</sup> ADB. 2014. *Country Partnership Strategy: Armenia, 2014–2018*. Manila.

<sup>3</sup> International standards as recommended by the International Organization for Standardization (ISO).

upgraded, with about 65% of the new investment to be applied to the reconstruction of the 6/10-kilovolt (kV) distribution network. This component will also include the reconstruction of the 0.4 kV, 35 kV, and 110 kV distribution networks, as well as electric network improvement in apartment buildings.

- (ii) **Special projects** [Confidential information deleted]. Investments to reduce the electricity voltage deviations that exceed permitted limits will enhance the quality of supplied electricity and reduce network losses.
- (iii) **Substation reconstruction and network augmentation** [Confidential information deleted]. With the rapid expansion of the Yerevan city center and the construction of many new buildings, ENA implemented interim measures to cope with the expansion. Investments related to the connection of new customers account for 81% of the investment. In addition, ENA plans to reconstruct and upgrade three important substations.
- (iv) **Automatic meter reading** [Confidential information deleted]. The expansion and improvement of ENA's automatic electricity metering system, mainly in the 0.4 kV and 6/10 kV networks (including more than 250,000 meter installations for end consumers), is being planned. The investment will allow a more efficient flow of electricity and fewer power outages. The installation of automatic recording and control systems will allow ENA to reduce commercial losses and manage systems more efficiently.
- (v) **Vehicles and special machinery** [Confidential information deleted]. ENA plans to purchase maintenance vehicles and machinery required for network operations and maintenance.
- (vi) **Other investments** [Confidential information deleted]. The introduction of an automated control system and International Organization for Standardization (ISO) standards of management will modernize overall planning and control functions as well as customer interface. This component includes the purchase of office and testing equipment, as well as the reconstruction of the administrative building.

5. **Borrower.** As the sole and exclusive licensee for the distribution of electricity in Armenia, ENA is responsible for the maintenance and augmentation of the distribution network and is engaged in the purchase and regulated distribution of electricity. It is also the sole and exclusive purchaser of electricity in Armenia. With 7,136 employees, ENA is the largest employer in Armenia. ENA owns and operates 8,793 110 kV, 35 kV, and 6/10 kV substations and transformation stations; 261 distribution stations; 31,980 kilometers of overhead distribution lines and underground cables; 193 110 kV transformers; and 382 35 kV transformers.<sup>4</sup> ENA has 990,000 electricity meters (including 360,000 in Yerevan and 45,000 in Gyumri) to measure electricity consumed.<sup>5</sup>

6. ENA's customers are the entire population of Armenia: household annual consumption represents about 35% of electricity consumption; large customers (i.e., industry, transport, and water supply and irrigation) account for about 30%; and the remaining 35% are public entities and

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<sup>4</sup> Tetra Tech. 2017. *ENA - Modernisation of Distribution Network: Technical Due Diligence Report*. Yerevan.

<sup>5</sup> ENA. 2016. *Development of Activities for the Improvement of Operating Efficiency*. Yerevan.

small to medium-sized businesses.<sup>6</sup> ENA purchases power from various private and state-owned power producers. Since 2013 Metsamor Nuclear Power Plant (MNPP), with more than one-third of supplied energy, has been the most important supplier of electricity for ENA.

Confidential information deleted.

7. Confidential information deleted.

8. ENA is a closed joint stock company that was founded in May 2002 when four state-owned, regional electricity distribution companies<sup>7</sup> were merged and privatized. After receiving the required approvals from Armenia in October 2015, Liormand (a private company incorporated in Cyprus) acquired ENA.

Confidential information deleted.

9. Confidential information deleted.

## **B. Development Impact, Outcome, and Outputs**

10. **Impact.** The project contributes to government goals of energy independence and energy efficiency.<sup>8</sup>

11. **Outcome.** The outcome will be improved private sector electricity distribution in Armenia, primarily characterized by lower distribution losses of 8.0% by 2021, compared with 9.7% in 2016.

12. **Outputs.** The output will be a rehabilitated network of 400 kilometers of upgraded distribution lines, 900 upgraded transformers, 550 installed substations, and 250,000 automatic metering devices installed for end consumers by the end of 2020.

## **C. Alignment with ADB Strategy and Operations**

13. **Consistency with ADB strategy and country strategy.** The project is consistent with the Midterm Review of Strategy 2020, which includes a focus on private sector development and operations, as well as infrastructure development.<sup>9</sup> ADB's support for the project is in line with its country partnership strategy for Armenia, 2014–2018, which supports energy security by diversifying energy sources and rehabilitating and upgrading electricity transmission and distribution networks (footnote 2).

14. **Consistency with sector strategy and relevant ADB operations.** The project is in line with ADB's Energy Policy, particularly with one of its three pillars—maximizing access to energy for all. The project will support the installation of modern transmission and distribution systems to transmit electricity efficiently from generation facilities to consumers, including the upgrading of existing systems to reduce technical losses.<sup>10</sup>

<sup>6</sup> United States Agency for International Development. 2016. *Armenia Gap Analysis with List of Market Challenges and Legal Barriers*. Washington, DC.

<sup>7</sup> Yerevan Electric Networks, North Electric Networks, South Electric Networks, and Central Electric Networks.

<sup>8</sup> Armenia Government Programme 2016. <http://www.gov.am/en/gov-program/>. Accessed on 12 May 2017.

<sup>9</sup> ADB. 2014. *Midterm Review of Strategy 2020: Meeting the Challenges of a Transforming Asia and Pacific*. Manila.

<sup>10</sup> ADB. 2009. *Energy Policy*. Manila.

#### D. Investment Program and Financing Plan

15. Confidential information deleted.

16. Confidential information deleted.

#### E. Implementation Arrangements

17. ENA is a regulated distribution company and has been awarded the sole right to distribute electricity in Armenia. Table 3 summarizes the main implementation arrangements that determine ENA's revenues and the implementation of the investment program.

**Table 3: Summary of Implementation Arrangements**

Aspects	Arrangements
Regulatory framework	The Ministry of Energy Infrastructure and Natural Resources governs the power subsector. The Public Services Regulatory Commission (PSRC) is an independent regulatory body that regulates tariffs, licenses, service standards, and trade provisions for companies in the power subsector. The Energy Law, 2001 of Armenia is the main legislation for the power subsector. The Electric Networks of Armenia (ENA) received a license to distribute electricity in Armenia for an unlimited period. ENA's tariff is approved by PSRC as regulated in the Energy Law. The tariff regulation and ENA license set out the basis for calculating the necessary revenue required by ENA and this includes the permissible profit earned by ENA. Procurements carried out by ENA are subject to the requirements of the Procurement Law, 2005.
Management	ENA has a six-member management team that is led by Karen Harutyunyan, the general director who is supported by a director in charge of each of the following functions: (i) finance and economy; (ii) technical; (iii) sales; (iv) security and control; and (v) general operations. ENA is managed by a team of professionals with strong industry background.
Implementation period	Asian Development Bank and European Bank for Reconstruction and Development funding for the implementation of the investment program will be drawn over 4 years in four tranches.
Operations arrangements	
Revenue structure	The industry regulator, PSRC, determines the revenue that ENA earns. ENA's regulated revenue is an aggregate of several components, which includes the cost of purchased power (including generation, transmission, and system operation costs); ENA's operating and maintenance costs; depreciation of ENA's regulated asset base; allowance for uncollectable receivables; and a reasonable economic return on ENA's regulated asset base.
Operation and maintenance	Management of operations and technical aspects related to ENA's distribution network are undertaken by the employees of ENA. ENA has separate departments that manage budgeting and planning, technical management, and safety and inspections. ENA prepares demand forecasts and establishes its strategic development plans and operating and capital expenditure budgets based on these forecasts.
Performance monitoring	Key performance indicators, including output and outcome indicators, will be reported by ENA.

Source: Asian Development Bank estimates.



## F. Projected Financial and Economic Performance

18. Confidential information deleted.

## III. THE PROPOSED ADB ASSISTANCE

### A. The Assistance

19. ADB's proposed assistance comprises a loan of up to \$80,000,000 equivalent in US dollars and euros to ENA from ADB's ordinary capital resources.

Confidential information deleted.

### B. Value Added by ADB Assistance

20. ENA's investment program merits ADB's assistance for the following reasons:

- (i) ADB is filling a critical market gap by providing long-term funding which is not available in the local market.
- (ii) The proposed assistance will demonstrate ADB's confidence in ENA's financial stability which forms the foundation of Armenia's energy sector.
- (iii) ENA's environmental and social responsibility will be enhanced through ADB's involvement.

### C. Risks

21. Confidential information deleted.

22. Confidential information deleted.

23. **Operation and maintenance.** ENA manages the operation of the distribution network across Armenia and has 7,136 employees running its operations. ENA has experienced and qualified staff. The investment program aims to improve operation and maintenance performance by implementing international management standards and automated information systems, and rehabilitating outdated infrastructure.

24. Confidential information deleted.

25. Confidential information deleted.

## IV. POLICY COMPLIANCE

### A. Safeguards and Social Dimensions

26. In compliance with ADB's Safeguard Policy Statement (2009), the project is classified *category B* for the environment and involuntary resettlement and *category C* for indigenous peoples. The potential environmental and social impacts of the investment plan are generally site-specific, reversible, and mostly associated with decommissioning and installation activities. These typically include issues on occupational and community health and safety, noise and vibration, soil erosion due to soil excavations, and management of hazardous and nonhazardous wastes. Management measures to avoid, minimize, mitigate, and compensate for the adverse impacts will

be incorporated in the operational procedures of ENA and in the safeguard reports and plans of new facilities.

Confidential information deleted.

27. Involuntary resettlement impacts are not expected to be significant as reconstruction and refurbishment will be carried out within the existing footprints of the facilities, without need for additional land acquisition. New facilities such as substations and transformers, if required, will be located on government lands after obtaining the required permission from the local authorities. The due diligence confirmed that ENA does not typically implement any projects that involve involuntary resettlement or land acquisition and selects alternate suitable locations on government lands. ENA will establish screening and categorization procedures for environment and involuntary resettlement impacts as part of its environmental and social management system (ESMS), prepare and implement safeguard documents and plans, as required, and in accordance with the Safeguard Policy Statement. Category A subprojects for environment and involuntary resettlement impacts are unlikely under the investment program given the nature of ENA's operations and the scale of the facilities proposed. The investment program is unlikely to trigger impacts on Indigenous Peoples (IPs) as there are no known IPs, as per Safeguard Policy Statement definition, in Armenia. A grievance redress mechanism will be adopted to address internal and external stakeholder grievances. Information disclosure and consultation with affected people will be conducted following ADB requirements. ENA has committed to strengthen its institutional capacity to manage the project's social and environmental impacts.

28. The Lenders' consultant conducted a corporate audit on ENA's current ESMS and its past and current performance against the objectives, principles, and requirements of ADB's Safeguard Policy Statement. The audit showed that while ENA is currently working on the implementation of five ISO standards (including ISO 14001), the existing procedures are mainly established to address national requirements. The Lenders' consultant developed a corrective action plan, which ENA has agreed to integrate into its corporate ESMS. The ESMS will (i) formalize an internal system that outlines ENA's environmental and social policies; (ii) establish a screening, categorization, safeguard planning, and review procedure for environment and involuntary resettlement impacts of all facilities under the investment program; (iii) rationalize the organizational structure and staffing to manage environmental and social safeguard concerns; (iv) conduct continual training and capacity-building activities; and (v) expand monitoring and reporting regimes. These will be included in the legal agreement between ADB and ENA.

29. ENA will comply with Armenia's Labor Code, 2004 and, pursuant to ADB's Social Protection Strategy (2001), will take measures to comply with internationally recognized core labor standards.<sup>11</sup> The borrower will report regularly to ADB on (i) its compliance with such laws, and (ii) the measures taken. Information disclosure and consultation with affected people will be conducted following ADB requirements (footnote 20).

## **B. Anticorruption Policy**

30. ENA was advised of ADB's policy of implementing best international practice relating to combating corruption, money laundering, and the financing of terrorism. ADB will ensure that the investment documentation includes appropriate provisions prohibiting corruption, money laundering, and the financing of terrorism, and remedies for ADB in the event of noncompliance.

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<sup>11</sup> ADB. 2003. *Social Protection*. Manila (adopted in 2001).

**C. Investment Limitations**

31. Confidential information deleted.

**D. Assurances**

32. Consistent with the Agreement Establishing the Asian Development Bank (the Charter),<sup>12</sup> ADB will proceed with the proposed assistance upon establishing that the Government of Armenia has no objection to the proposed assistance to ENA. ADB will enter into suitable finance documentation, in form and substance satisfactory to ADB, following approval of the proposed assistance by the Board of Directors.

**V. RECOMMENDATION**

33. I am satisfied that the proposed loan would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the loan of up to \$80,000,000 equivalent in United States dollars and euros from ADB's ordinary capital resources to Electric Networks of Armenia CJSC for the Distribution Network Rehabilitation, Efficiency Improvement, and Augmentation in Armenia, with such terms and conditions as are substantially in accordance with those set forth in this report, and as may be reported to the Board.

Takehiko Nakao  
President

01 June 2017

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<sup>12</sup> ADB. 1966. *Agreement Establishing the Asian Development Bank*. Manila.

### DESIGN AND MONITORING FRAMEWORK

<b>Impacts the Project is Aligned with:</b>			
Ensure energy independence and promote energy efficiency. Government of Armenia, 2016 <sup>a</sup>			
<b>Results Chain</b>	<b>Performance Indicators with Targets and Baselines</b>	<b>Data Sources and Reporting Mechanisms</b>	<b>Risks</b>
<b>Outcome</b> Private sector electricity distribution in Armenia improved	By 2021 a. Number of household connections increased to 957,451 (2016 baseline: 936,451)  b. Number of non-household connections increased to 80,641 (2016 baseline: 73,635)  c. Annual energy distribution increased to 5,500 GWh (2016 baseline: 5,328 GWh)  d. Distribution losses decreased to 8.0% (2016 baseline: 9.7%)  e. Annual CO <sub>2</sub> emissions avoided amounts to 11,400 tons per annum <sup>b</sup> (2016 baseline: 0)	a–e. Annual monitoring report	Tariff revisions necessary for cost recovery do not materialize.  Improvements in operations and maintenance are not implemented.
<b>Output</b> Network rehabilitated	Cumulative, 2016–2020 a. 400 km of distribution lines upgraded to 10/0.4 kV overhead lines (2016 baseline: 0 km) <sup>c</sup>  b. 900 10/0.4 kV transformers upgraded (2016 baseline: 0) <sup>c</sup>  c. 550 substations upgraded (2016 baseline: 0) <sup>c</sup>  d. 250,000 automatic metering devices for end consumers installed (2016 baseline: 0) <sup>c</sup>	a–d. Annual monitoring report	Investment program costs are higher than expected.
<b>Key Activities with Milestones</b>			
<b>Output: Network rehabilitated</b>			
1. Execution of legal documentation completed by July 2017			
2. Environmental and social safeguard policies implemented by December 2017			

**Inputs**

Confidential information deleted.

**Assumptions for Partner Financing**

Not applicable

ADB = Asian Development Bank; CO<sub>2</sub> = carbon dioxide; GWh = gigawatt-hour, km = kilometer; kV = kilovolt.

<sup>a</sup> Armenia Government Programme 2016. <http://www.gov.am/en/gov-program/>. Accessed on 12 May 2017.

<sup>b</sup> Based on a grid emission factor of 0.428 tCO<sub>2</sub>/MWh, and annual reduction in distribution losses of about 26,500 MWh.

<sup>c</sup> Beginning of 2016, before the investment program commenced.

Source: Asian Development Bank.

**Confidential information deleted.**