



Report and Recommendation of the President to the Board of Directors

Project Number: 51090-001
March 2018

Proposed Loan ArmPower CJSC Yerevan Gas-Fired Combined-Cycle Power Project (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 13 February 2018)

Currency unit	–	dram (AMD)		
AMD1.00	=	\$0.0021	or	€0.0017
\$1.00	=	AMD483.28	or	€0.8135
€1.00	=	AMD594.43	or	\$1.2292

ABBREVIATIONS

ADB	–	Asian Development Bank
CCPP	–	combined-cycle power plant
EBITDA	–	earnings before interest, taxes, depreciation, and amortization
ENA	–	Electric Networks of Armenia
EPC	–	engineering, procurement, and construction
IFC	–	International Finance Corporation
LTA	–	lenders' technical advisor
O&M	–	operation and maintenance
PPA	–	power purchase agreement
SIMEST	–	Società Italiana per le Imprese all'Estero (Italian development finance institution)
SPV	–	Siemens Project Ventures
US	–	United States
YTTP	–	Yerevan Thermal Power Plant

WEIGHTS AND MEASURES

µg	–	microgram
m ³	–	square meter
MW	–	megawatt
NO ₂	–	nitrogen dioxide

NOTES

- (i) The fiscal year (FY) of ArmPower CJSC ends on 31 December.
- (ii) In this report, "\$" refers to United States dollars.

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PROJECT AT A GLANCE

1. Basic Data		Project Number: 51090-001	
Project Name	Yerevan Gas-Fired Combined-Cycle Power Project	Department /Division	PSOD/PSIF1
Country	Armenia, Republic of		
Borrower	ArmPower CJSC		
2. Sector		Subsector(s)	
✓ Energy	Conventional energy generation	ADB Financing (\$ million)	
			68.40
		Total	68.40
3. Strategic Agenda		Subcomponents	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Climate Change Information	
		Climate Change impact on the Project	Low
4. Drivers of Change		Components	
Partnerships (PAR)	Bilateral institutions (not client government)	Gender Equity and Mainstreaming	
	Implementation	No gender elements (NGE)	✓
	International finance institutions (IFI)		
	Private Sector		
Private sector development (PSD)	Promotion of private sector investment		
5. Poverty and SDG Targeting		Location Impact	
Geographic Targeting	No	Nation-wide	High
Household Targeting	No		
SDG Targeting	Yes		
SDG Goals	SDG7, SDG9		
6. Nonsovereign Operation Risk Rating			
Obligor Name		Final Project Rating	Facility Risk Rating
ArmPower CJSC			
7. Safeguard Categorization Environment: A Involuntary Resettlement: C Indigenous Peoples: C			
8. Financing			
Modality and Sources		Amount (\$ million)	
ADB		68.40	
Nonsovereign LIBOR Based Loan (Regular Loan): Ordinary capital resources		68.40	
Cofinancing		0.00	
Others		0.00	
Others^a		228.60	
Total		297.00	

^a Derived by deducting ADB financing and Cofinancing from Total Project Cost.

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed loan of up to \$68,400,000 to ArmPower CJSC for the Yerevan Gas-Fired Combined-Cycle Power Project (CCPP) in Armenia.
2. The proposed loan will provide long-tenor financing that is not sufficiently available in the local market to support the construction of a gas-fired CCPP. This will contribute to diversification of energy sources in Armenia and boost efficiency by helping to replace existing aging generation assets with modern facilities.

II. THE PROJECT

A. Project Identification and Description

3. **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 most of the generating companies and power and gas distribution networks.¹ However, the existing generation facilities are aging and need replacement. Generation in Armenia has dropped substantially since its peak in 1988. Armenia relies on nuclear and hydropower for about 65% of its power generation. Several thermal power plants have been delayed and one of the two reactors at the Metsamor Nuclear Power Plant (MNPP) has been shut down therefore, requiring additional power generation.

4. Since 2010, Yerevan Thermal Power Plant (YTPP), owned by the Ministry of Energy Infrastructures and Natural Resources, has been operating a 270 megawatt (MW) gas-fired combined-cycle cogeneration power plant next to the proposed project site. The YTPP was financed with a concessional loan from the Japan Bank for International Cooperation. Given the need to upgrade ageing power generation facilities in Armenia, Renco S.p.A. proposed 250 MW expansion next to the YTPP site to the Government of Armenia. [Confidential information deleted.]

5. Confidential information deleted.

6. **Borrower.** ArmPower will own and operate the project. It is a special purpose company owned 60% by Renco Power (a 75:25 joint venture between Renco and Società Italiana per le Imprese all'Estero (SIMEST)); and 40% by Siemens Project Ventures (SPV).

7. **Sponsors.** Renco is an Italian company incorporated in 1979. Its core activities are to provide consulting services, and engineering and construction services for the energy, oil and gas, and civil infrastructures sectors. In addition to its operations in Italy, Renco operates in countries such as Armenia, Congo, Kazakhstan, the Russian Federation, and Tanzania. [Confidential information deleted.]

8. SIMEST was established in 1991 to promote investments of Italian businesses abroad and to provide Italian companies with technical and financial support. Cassa Depositi e Prestiti Group, 82.77% owned by Italy's Ministry of Economy and Finance, holds 76% of SIMEST's

¹ ADB. 2014. *Country Partnership Strategy: Armenia, 2014-2018*. Manila.

shares through the Servizi Assicurativi del Commercio Estero S.p.A. The remaining shares are owned by minority shareholders including Italian banks and industrial associations.² [Confidential information deleted.]

9. SPV is the investment arm of Siemens Financial Services, which is based in Germany, and is a wholly-owned subsidiary of Siemens AG. Incorporated in 1847, Siemens is a global leading technology company in various business segments including power and gas, renewable energy, energy management, and healthcare. The company is well-diversified in industry and geography. Siemens has 130 years of experience in the construction of turnkey power plants, and more than 1,500 of the power plants it constructed are in commercial operation globally. [Confidential information deleted.]

10. Confidential information deleted.

B. Development Impacts, Outcome, and Outputs

11. **Impacts.** The project will lead to the diversification of Armenia's primary energy sources.³ The project will support the energy policy of the Government of Armenia, which aims to ensure energy independence and enhance energy security.

12. **Outcome.** The outcome of the project will be increased availability of reliable and affordably priced power to the domestic grid and the CCPP's power generation of 1,981 gigawatt-hours annually, which will help satisfy local electricity demand. The project is expected to provide at least 80 jobs during operations.

13. **Outputs.** The outputs will be (i) 250 MW capacity gas-fired CCPP installed and operated by the private sector, (ii) local employment generated from the construction and operation of the CCPP, and (iii) local and national economy stimulated.

C. Alignment with ADB Strategy and Operations

14. **Consistency with ADB strategy and country strategy.** The project is consistent with the Midterm Review on Strategy 2020, which includes a focus on private sector development and operations, and infrastructure development.⁴ ADB's support for the project is in line with its country partnership strategy for Armenia, 2014-2018 which supports private sector development and energy security by diversifying energy sources.⁵

15. **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—promoting energy efficiency and renewable energy. Although not a renewable energy source, the project will become the most efficient thermal power plant in the country and contribute to upgrade of electricity sources in Armenia where nuclear and hydropower plants generate about 65% of the electricity.⁶ This project is also complements ADB's earlier financing to ENA to improve the efficiency of Armenia's electricity sector.

² SIMEST. 2017. Shareholders. <http://en.simest.it/Who-We-Are/Shareholders/Shareholders.kl>.

³ Government of the Republic of Armenia. *Program of the Government of the Republic of Armenia 2017-2022*. June 2017. Yerevan. <http://www.gov.am/files/docs/2219.pdf>.

⁴ ADB. 2014. *Midterm Review of Strategy 2020. Meeting the challenges of a Transforming Asia and Pacific*. Manila.

⁵ ADB. 2014. *Country Partnership Strategy: Armenia, 2014-2018*. Manila.

⁶ ADB. 2009. *Energy Policy*. Manila.

D. Project Cost and Financing Plan

- 16. Confidential information deleted.
- 17. Confidential information deleted.

E. Implementation Arrangements

- 18. Confidential information deleted.

F. Projected Financial and Economic Performance

- 19. Confidential information deleted.

III. THE PROPOSED ADB ASSISTANCE**A. The Assistance**

20. ADB's proposed assistance comprises a limited-recourse, secured loan of up to \$68,400,000 to ArmPower from ADB's ordinary capital resources, with a tenor of up to 15 years, including a 2.5-year grace period.

B. Value Added by ADB Assistance

21. ADB's role as a direct lender will enable the project to catalyze much-needed long-term debt financing, which has limited availability in the domestic market. The project's sustainability depends on its ability to amortize its up-front capital costs over the period of operation and tenor of the loan. The long tenor of the ADB loan is necessary for the project to achieve sound debt service levels over the life of the project. The national and international commercial financing market does not provide such loans to the borrower. ADB's involvement significantly enhances environmental and social standards for the project. Successful project financing will establish precedents for future financings of similar projects, including independent power producer projects in Armenia, by boosting investor and lender confidence.

C. Risks

- 22. Confidential information deleted.
- 23. Confidential information deleted.
- 24. Confidential information deleted.
- 25. Confidential information deleted.
- 26. Confidential information deleted.
- 27. Confidential information deleted.
- 28. Confidential information deleted.
- 29. Confidential information deleted.

30. Confidential information deleted.

IV. POLICY COMPLIANCE

A. Safeguards and Social Dimensions

31. In compliance with ADB's Safeguard Policy Statement (2009), the project's safeguards categories are as follows: *category A* for environment, and *category C* for involuntary resettlement and indigenous peoples. To meet ADB environmental and social requirements for an environment *category A* project, an Environmental and Social Impact Assessment was prepared.⁷ The potential environmental and social impacts of the project have been identified and effective measures to avoid, minimize, mitigate, and compensate for the adverse impacts are incorporated into an Environmental and Social Management Plan. The institutional capacity and commitment of ArmPower to manage the project's social and environmental impacts are deemed adequate, particularly given that Renco is already certified under international standards.⁸

32. **Environment (category A).** The site is a former farmland in an industrial area of Yerevan. It has been subject to previous earthworks through its use as a laydown and storage area for the neighboring power station. The soil has been tested for contamination and is suitable for industrial land use, but the groundwater has elevated hydrocarbons and heavy metals. Air monitoring for sulfur dioxide, nitrogen dioxide (NO₂), and particulate matter 10 micrometers or less in diameter found that the airshed is non-degraded.⁹ Except for locations near main roads, the site and surrounding areas generally have low noise levels.¹⁰

33. Temporary construction impacts will potentially include noise, dust, traffic, erosion, solid and liquid waste generation, hazardous substances management, and health and safety issues. No construction camp is required. The contractor will implement dust control, erosion and sediment control, and waste management as part of a construction environmental, health, and safety management plan. No truck movements will be permitted at night. Groundwater is to be managed by the installation of a clay barrier and sub-surface drainage. The sponsor is engaging experts to conduct a hydrological assessment and develop mitigation measures, which will be reviewed and approved by ADB prior to construction.

34. The plant will have a low nitrogen oxide burner and a 66-meter stack height in compliance with international standards.¹¹ The projected NO₂ emissions of 97.9 micrograms (µg)/cubic meter (m³) per hour and 5.1 µg/m³ per year are well below the national and international NO₂ emission standards of 200 µg/m³ per hour and 40 µg/m³ per year. Greenhouse gas emissions of 785,000

⁷ Fichtner. 2018. *Yerevan 2 CC Power Plant ArmPower CJSC Environmental and Social Impact Assessment – Final*. Fichtner, Stuttgart.

⁸ OHSAS 18001 and ISO 14001.

⁹ The International Finance Corporation (IFC) considers airsheds that significantly exceed national or World Health Organization air quality standards as degraded. IFC. 2007. [Environmental, Health, and Safety \(EHS\) Guidelines—General EHS Guidelines: Air Emissions and Ambient Air Quality](#). Washington, DC.

¹⁰ Levels that do not exceed IFC guidelines of 55 A-weighted decibels for daytime and 45 A-weighted decibels for nighttime (residential) and 70 A-weighted decibels (commercial/industrial). IFC 2007. [Environmental, Health, and Safety \(EHS\) Guidelines—General EHS Guidelines: Noise Management](#). Washington, DC.

¹¹ IFC. 2008. [Environmental, Health, and Safety Guidelines for Thermal Power Plants](#). Washington, DC; and United States Environmental Protection Agency. 1985. [Guideline for Determination of Good Engineering Practice Stack Height \(Technical Support Document for the Stack Height Regulations\)](#). Revised. Research Triangle Park, North Carolina.

tons of carbon dioxide equivalent per year are within Armenia's intended nationally determined contribution under the Paris climate agreement. Noise will not increase by more than 0.15 A-weighted decibels at sensitive receptors. Water requirements of up to 450 m³/hour will be sourced from the municipal network. Industrial wastewater will be treated via an oil–water separator and a biological treatment system to international discharge standards.¹² Discharges of 70 m³/hour will be delivered into an existing discharge pipeline and a series of canals, before entering the Hrazdan River 7 kilometers downstream. This provides sufficient cooling so that there are no adverse effects on the river. About 14m³/hour of sanitary sewage will be discharged to the municipal network.

35. **Involuntary resettlement and indigenous peoples (category C).** The project site is in an industrial area owned by YTPP. ArmPower entered into the final land purchase agreement in 2017 to acquire the site. The land does not have any legacy or current risks associated with land acquisition and resettlement. The due diligence phase has also assessed that the project does not result in impacts on indigenous peoples. Hence, no involuntary resettlement or indigenous people issues are envisaged for the project.

36. ArmPower will comply with national labor laws and, pursuant to ADB's Social Protection Strategy (2001), will take measures to comply with the internationally recognized core labor standards.¹³ The client will report regularly to ADB on (i) its and its contractors' compliance with such laws and (ii) the measures taken. Information disclosure and consultation with affected people will be conducted in accordance with ADB requirements.¹⁴

B. Anticorruption Policy

37. ArmPower 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.

C. Investment Limitations

38. The proposed loan is within the medium-term, country, industry, group, and single exposure limits for nonsovereign investments.

D. Assurances

39. Consistent with the Agreement Establishing the Asian Development Bank (the Charter),¹⁵ ADB will proceed with the proposed assistance upon establishing that the Government of Armenia has no objection to the proposed assistance to ArmPower. 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.

¹² IFC. 2008. Environmental, Health, and Safety Guidelines for Thermal Power Plants. Washington, DC.

¹³ ADB. 2003. *Social Protection*. Manila (adopted in 2001).

¹⁴ Summary Poverty Reduction and Social Strategy; Safeguards and Social Dimensions Summary (accessible from the list of linked documents in Appendix 2).

¹⁵ ADB. 1966. *Agreement Establishing the Asian Development Bank*. Manila.

V. RECOMMENDATION

40. 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 \$68,400,000 from ADB's ordinary capital resources to ArmPower CJSC for the Yerevan Gas-Fired Combined-Cycle Power Project 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

19 March 2018

DESIGN AND MONITORING FRAMEWORK

Impacts the Project is Aligned with			
Primary energy sources diversified (Armenia Development Strategy for 2014–2025) ^a Energy independence ensured and energy security enhanced (Energy Policy of the Armenian Government) ^b			
Results Chain	Performance Indicators with Targets and Baselines	Data Sources and Reporting	Risks
Outcome Reliable and affordably priced power to the domestic grid increased	By 2021 a. Electricity delivered to offtaker reached 1,981 gigawatt-hours per year (2018 baseline: 0) b. Number of jobs provided during operation totaled at least 80 (2017 baseline: 0)	a–b. ArmPower annual monitoring reports	Changes in regulatory environment or power purchasing agreement Disruption in gas price and supply
Outputs 1. Gas-fired CCPP constructed and commissioned 2. Local employment generated 3. Growth of local and national economy supported	By 2020 1. Total installed electricity generation capacity of project reached 250 megawatts (2017 baseline: 0) 2. Number of jobs provided during construction phase totaled at least 250 (2017 baseline: 0) 3a. Confidential information deleted. 3b. Confidential information deleted.	1–3. ArmPower annual monitoring reports	Construction delay due to force majeure events Cost overruns
Key Activities with Milestones Output 1 - 3: Gas-fired CCPP constructed and commissioned. 1. Confidential information deleted. 2. Confidential information deleted. 3. Confidential information deleted.			
Confidential information deleted.			
Assumptions for Partner Financing Not Applicable			

CCPP = combined-cycle power plant [Confidential information deleted.]

^a Government of Armenia. 2014. [Armenia Development Strategy for 2014–2025](#). Yerevan.

^b Government of Armenia. 2017. [Program of the Government of the Republic of Armenia, 2017–2022](#). Yerevan.

Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

<http://www.adb.org/Documents/RRPs/?id=51090-001-4>

1. Sector Overview
2. Client Information
3. Details of Implementation Arrangements
4. Contribution to the ADB Results Framework
5. Financial Analysis
6. Economic Analysis
7. Country Economic Indicators
8. Summary Poverty Reduction and Social Strategy
9. Safeguards and Social Dimensions Summary
10. Environmental and Social Impact Assessment