Periodic Financing Request Report

Project Number: 41614
November 2014

Multitranche Financing Facility
India: Assam Power Sector Enhancement Investment Program – Tranche 4

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 20 November 2014)

Currency unit	–	Indian rupee/s (Re/Rs)
Rs 1.00	–	$0.0161
$1.00	–	Rs 61.77

ABBREVIATIONS

ADB	–	Asian Development Bank
AEGCL	–	Assam Electricity Grid Corporation Limited
AERC	–	Assam Electricity Regulatory Commission
APDCL	–	Assam Power Distribution Company Limited
APGCL	–	Assam Power Generation Corporation Limited
ASEB	–	Assam State Electricity Board
CEA	–	Central Electricity Authority
DPR	–	Detailed Project Report
EMP	–	environmental management plan
ERP	–	enterprise resource planning
GOA	–	Government of Assam
IEE	–	initial environmental examination
IPP	–	indigenous peoples plan
IPPF	–	indigenous peoples planning framework
MFF	–	multitranche financing facility
MOP	–	Ministry of Power
PIU	–	project implementation unit
PMU	–	project management unit
RP	–	resettlement plan
SPS	–	Safeguard Policy Statement

WEIGHTS AND MEASURES

GWh	–	gigawatt-hour
km	–	kilometer
kV	–	kilovolt
kWh	–	kilowatt-hour
MVA		megavolt-amperes
MW	–	megawatt

NOTES

(i) The fiscal year (FY) of the Government of India and its agencies begins on 1 April. “FY” before a calendar year denotes the year in which the fiscal year starts, e.g., FY2014 begins on 1 April 2014 and ends on 31 March 2015.

(ii) In this report, "$" refers to US dollars.

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TRANCHE AT A GLANCE

1. Basic Data — **Project Number:** 41614-036

Project Name	Assam Power Sector Enhancement Investment Program - Tranche 4	**Department /Division**	SARD/SAEN
Country	India	**Executing Agency**	Assam Power Distribution Company Ltd.
Borrower	Government of India		

2. Sector	**Subsector(s)**	**ADB Financing ($ million)**
✓ Energy	Electricity transmission and distribution	50.20
	Total	**50.20**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth (IEG)	Pillar 2: Access to economic opportunities, including jobs, made more inclusive	Climate Change impact on the Project	Low

4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Governance and capacity development (GCD)	Client relations, network, and partnership development to partnership driver of change	No gender elements (NGE)	✓

5. Poverty Targeting		**Location Impact**	
Project directly targets poverty	No	Rural	High
		Urban	Medium

6. Risk Categorization: Low

7. Safeguard Categorization **Environment:** B **Involuntary Resettlement:** B **Indigenous Peoples:** C

8. Financing

Modality and Sources	**Amount ($ million)**
ADB	**50.20**
Sovereign MFF-Tranche (Loan): Ordinary capital resources	50.20
Cofinancing	**0.00**
None	0.00
Counterpart	**17.97**
Government	17.97
Total	**68.17**

9. Effective Development Cooperation

Use of country procurement systems	No
Use of country public financial management systems	Yes

TRANCHE AT A GLANCE

Date of Receipt by ADB of PFR: 25 September 2014 Tranche Number: 4

10. Country Operations Business Plan

CPS www.adb.org/documents/india-country-partnership-strategy-2013-2017
COBP www.adb.org/documents/india-country-operations-business-plan-2013-2015

11. Tranche Summary

Tranche 4 of the investment program amounting to $50.2 million aims to fund a distribution efficiency improvement project in the state of Assam, India. It covers part of the state's power sector road map for enhancing the subtransmission and distribution capacities to improve operational efficiency and electricity service to end users. Tranche 4 will finance: (i) augmentation of existing transformers, construction of 33 kV lines, 33 kV and 11 kV railway and river crossings, and 33 kV terminal bays; (ii) construction of new 33/11 kV substations, 11 kV lines, and 11 kV aerial bunch conductors; and (iii) introduction of quick response operation and maintenance system, and installation of 8500 units of information technology modules (smart metering) for high tension consumers.

Impact and Outcome: The impact will be an enhanced quality and expanded service delivery of electricity in Assam. The outcome will be increased operational efficiency and expanded distribution network capacity of Assam Power Distribution Company Ltd. (APDCL).

Outputs: (i) Enhanced capacity of distribution system, and (ii) improved technology of operations and maintenance (O&M) system.

Implementation Arrangements: Assam Power Distribution Company Ltd. will be the executing agency.

Project Readiness: The detailed project report comprising the project scope and design, and demonstrating the project's technical, financial and economic viability has been approved by the Board of Directors of APDCL. Project management unit and project implementation unit were established and fully staffed. The resettlement plans and initial environmental examination were disclosed on 27 August 2014. The bidding documents for two main packages 1 and 2 were issued on 12 August 2014 and 20 August 2014, respectively. Draft bidding documents for packages 3 and 4 will be submitted to ADB for review and approval in October 2014. The majority of the project sites is located on lands owned by APDCL. Land acquisition has been initiated, and more than 50% of the land required has been secured.

12. Significant Developments in the MFF and Previous Tranches

On 18 November 2009, ADB's Board of Directors approved the facility amounting to $200 million. Three loans have been approved under the facility. Assam Electricity Grid Corporation Ltd. (AEGCL) is the executing agency (EA) for Loan 2592 (Tranche 1) and Loan 2677 (Tranche 2); APDCL is the EA for Loan 2800 (Tranche 3).

Tranche 1 and Tranche 2 were approved on 27 November 2009 and 5 October 2010, respectively, and are financing new transmission lines, construction of new substations, extension and augmentation of existing transmission system substations and installation of optical pilot guide wire. All procurement packages have been contracted. Physical progress for subprojects under Tranches 1 and 2 is approximately 83% and 62%, respectively. Tranches 1 and 2 are satisfactory with respect to all indicators and were rated "on track" by the end of Q3 2014, and are expected to retain this rating in Q4 2014, as requests for disbursements are submitted regularly. Tranche 1 closing date is 31 December 2014 and Tranche 2 closing date is 30 June 2015.

Tranche 3, approved on 4 November 2011, is financing distribution system improvements including new substations, renovation and modernization of existing substations, construction of lines, and introduction of high voltage distribution system and aerial bunched cables. All procurement packages under the tranche are already contracted. Physical progress for subprojects under Tranche 3 is approximately 58% and the project is rated "on track" against all indicators. Tranche 3 closing date is 30 June 2015.

The competitive bidding process and the depreciation of the Indian currency against the US Dollar resulted in loan savings of $50.2 million under the MFF from the approved tranches which was canceled by ADB on 4 September 2014. After the realization of these savings, APDCL and Government of Assam requested ADB to consider financing a supplementary tranche under the ongoing MFF.

The Government and both EAs are compliant with the FFA undertakings and with the loan covenants set forth in the loan agreements for Tranches 1, 2 and 3; except the debt service coverage ratio of the EAs, which remains below 1.2, as prescribed under the covenant.

13. Milestones

Estimated Approval	Estimated Effectiveness	Estimated Completion[a]
17 November 2014	1 February 2015	30 June 2019

14. Linked Documents

	Required Document	Disclosure Date
(i) Environment	IEE - Initial Environment Examination	27 August 2014
Weblink:	http://www.adb.org/projects/documents/assam-power-sector-enhancement-investment-program-tranche-4-iee	
(ii) Involuntary resettlement	RP - Resettlement Plan	27 August 2014
Weblink:	http://www.adb.org/projects/documents/assam-power-sector-enhancement-investment-program-tranche-4-rp	
(iii) Indigenous peoples		
Weblink:		

[a] For Tranches, this refers to the financial closing date.

I. BACKGROUND

1. A Framework Financing Agreement (FFA) was signed between the Asian Development Bank (ADB) and the Government of India (the Government) on 15 September 2009 for Assam Power Sector Enhancement Investment Program (the Investment Program). Subsequently on 18 November 2009, the ADB Board of Directors approved the provision of loans to India under a Multitranche Financing Facility (MFF) in an aggregate amount up to $200 million equivalent for the Investment Program.[1] On 27 November 2009, the President approved Tranche 1 (Loan 2592-IND) for $60.3 million. The loan and the project agreements for the Tranche 1 were signed on 15 February 2010 and the loan became effective on 5 May 2010. On 5 October 2010, the President approved Tranche 2 (Loan 2677-IND) for $89.7 million. The loan and project agreements were signed on 17 January 2011, and the loan became effective on 1 April 2011. On 4 November 2011, the President approved Tranche 3 (Loan 2800-IND) for $50 million; the loan and project agreements were signed on 27 February 2012, and the loan became effective on 16 April 2012. Tranche 4 which has not been envisaged in original MFF is being submitted for management consideration in November 2014.

2. The expected impact of the MFF is a sustainable state power sector with increased transmission and distribution capacity to support inclusive economic growth and the outcome is enhanced quality and expanded service delivery of electricity through improved technical, commercial, and financial performance and capability of power utilities. The Investment Program has been financing: (i) construction of new transmission lines, substations, and other transmission system improvement activities; (ii) construction of new distribution lines and substations, and augmentation of existing substations; and (iii) extension and augmentation of transmission substations, reactive compensation and introduction of new technologies to reduce system losses.

3. ADB received the Periodic Financing Request (PFR) for Tranche 4 for an amount of $50.2 million under the MFF on 25 September 2014 (Appendix 1). The investments under Tranche 4 will cover part of the Government of Assam (GOA) power sector road map for enhancing the sub-transmission and distribution capacities to improve operational efficiency and electricity service to end users. The scope of work of Tranche 4 is within the original scope of the MFF and also in compliance with the FFA. For further processing and implementation of additional Tranche 4, extension of the MFF availability period from 30 June 2015 up to 31 October 2019 was approved by ADB on 7 July 2014.

4. Assam's power sector's challenges include: (i) low access to electricity, with only about 37% of the households having access to grid-supplied electricity; (ii) power cuts of about 5 to 6 hours per day; (iii) demand-supply gap of about 23% (in FY2012); (iv) dependency on out of state generation to meet the demand, with only about 25% of demand currently met by in-state generation; (v) high distribution losses; (vi) financial un-sustainability of power companies, particularly Assam Power Distribution Company Limited (APDCL); and (vii) limited capacity of the power sector agencies to use modern technology and management systems. Financial losses of the APDCL are mainly due to two reasons: inability to meet the targeted loss reductions prescribed by the Assam Energy Regulatory Commission (AERC), and purchase of about 15% of power from the spot market at very high costs.

[1] ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Multitranche Financing Facility to India for Assam Power Sector Enhancement Investment Program.* Manila.

5. The GOA has taken various steps to solve the power sector problems. Assam does not have adequate resources to be self-sufficient in power generation. Therefore, grid connectivity with the broader North Eastern region is crucial. GOA has obtained three loans from ADB (Loan 2592-IND, Loan 2677-IND, and Loan 2800-IND, noted above) under the Investment Program to improve connectivity with other North Eastern Region states, expand the transmission and distribution grid, and improve grid efficiency.

6. GOA has prepared a power sector master plan with a sector roadmap that identifies $3.5 billion (about $1.2 billion for generation, $1.1 billion for transmission and $1.1 billion for distribution) of investments for the period 2012-2022.[2] The master plan and road map identify the need for additional near-term investments in the distribution subsector. Improvements of the sub-transmission network system are necessary for reduction of losses, ensuring optimum network operational efficiency. To meet projected demand growth, these improvements must be undertaken in a planned and systematic manner. A key issue is maintaining voltage regulation of the 11kV feeders within desired limits, which requires system improvements in parallel with loss-reduction measures at the low-tension (LT) level. Therefore, the proposed Tranche 4 of the ongoing Investment Program will utilize the available loan savings for priority investments in distribution system expansion and upgrades, and modernization of the metering and maintenance and repair systems.

II. ASSESSMENT OF MFF IMPLEMENTATION

7. The three loans approved under the MFF are progressing in a satisfactory manner. Assam Electricity Grid Corporation Limited (AEGCL) is the executing agency (EA) for Loans 2592-IND and 2677-IND. The APDCL is the EA for Loan 2800-IND. Loans 2592-IND (Tranche 1) and 2677-IND (Tranche 2) are ongoing and financing new transmission lines, new substations, and extension and augmentation of existing substations. Loan 2800-IND (Tranche 3) is also ongoing and financing construction of new substations, renovation and modernization of existing substations, new distribution lines, and introduction of high voltage distribution system (HVDS) and aerial bunched conductors (ABC). The Government and both EAs are compliant with the FFA undertakings and with the loan covenants set forth in the loan agreements for Tranches 1, 2 and 3; except for the debt service coverage ratio of the EAs, which remains below the covenanted level of 1.2.

8. **Project progress.** Overall implementation of the Investment Program is found to be satisfactory. ADB, the EAs, and the Project Management Unit (PMU) have reviewed the status of all procurement packages and analyzed their progress. All procurement packages under all three approved loans have been contracted and disbursement of funds is ongoing on a systematic basis. As of September 2014 undisbursed balance against the total contract amounts under Loan 2592 is 25%, and 37% and 33% for Loans 2677 and 2800, respectively. In order to complete the works under Loan 2592, the Government is planning to request ADB for an extension of loan closing date from 31 December 2014 up to 30 June 2015. Physical progress under Loans 2592-IND, 2677-IND and 2800-IND is around 84%, 63% and 59%, respectively. All three loans are satisfactory in respect of all indicators and are rated “on track” as of the third quarter (Q3) 2014, and are expected to retain this rating in Q4 2014, as requests

[2] On 3 July 2014 ADB approved a new MFF for GOA, Assam Power Sector Investment Program, in the amount of $300 million with about $250 million for increasing in-state generation capacity, and about $50 million for additional improvements in the distribution system. ADB. 2014. *Report and Recommendation of the President to the Board of Directors: Multitranche Financing Facility to India for Assam Power Sector Investment Program.* Manila.

for disbursements are submitted regularly.[3] Safeguards have also been implemented in a satisfactory manner, with no outstanding issues to be resolved.

9. **Change of Executing Agency.** Under the state power sector reform process, the GOA on 12 March 2013 formally dissolved the Assam State Electricity Board (ASEB) which originally acted as an EA for the 3 ongoing loans. The EA functions of ASEB were transferred to APDCL and the AEGCL.[4]

10. **Loan Savings.**[5] The competitive bidding process and the depreciation of the Indian currency against the US Dollar resulted in loan savings of $50.2 million under the MFF from three tranches. These savings were realized while the committed outputs of the MFF being delivered. Subsequent to realization of these savings, APDCL and GOA requested ADB to consider financing a supplementary tranche under the ongoing MFF. In May 2014, the GOA presented a detailed project report (DPR) for Tranche 4 amounting to $68.17 million (including counterpart financing), and ADB initiated due diligence accordingly.

11. **Minor Change to the Multitranche Financing Facility.** As indicated in the RRP for the MFF, the Government, GOA and the EAs have given certain assurances, which have been incorporated into the loan agreement for each tranche under the MFF as covenants. One of such covenants is the requirement for the EAs to maintain a debt service coverage ratio (DSCR) of 1.2 on and after 31 March 2011. Despite the commitments of GOA and the EAs to improve the financial projection of the EAs, the overall financial health of the EAs still remains weak. The financial covenant of 1.2 DSCR has not been achieved in the past, and it is expected that EA will not be able to achieve this during the implementation of the Investment Program. Recognizing this challenge, it is proposed to make a minor change to the Government assurances for the MFF, and (a) delete the DSCR requirement and (b) introduce modified financial covenants that are achievable within the remaining period under the Investment Program. As part of addressing financial sustainability concern, ADB will commence a high level policy dialogue with the GOA to develop a financial restructuring plan to improve the financial situation of EA. These efforts towards improving financial sustainability of the EA will complement the on-going efforts for improving financial management under the new Assam Power Sector Investment Program.

III. PERIODIC FINANCING REQUEST

A. Impact and Outcome

12. The Project's impact will be enhanced quality and expanded service delivery of electricity in Assam by: (i) increasing household electrification rate in project areas from 40% in 2014 to 100% in 2022; and (ii) eliminating unscheduled power outages in project areas by 2022. The outcome of the Project will be increased operational efficiency of APDCL by reducing distribution system losses in Assam from 20% in 2014 to 18% in 2019. The Design and Monitoring Framework for Tranche 4 is given in Appendix 2.

[3] Aide Memoire of August 2014 fact finding mission for Tranche 4.
[4] Memorandum on minor change in MFF implementation was approved by the President on 7 July 2014.
[5] Loan savings cancellation in amount of $50.2 million was approved on 4 September 2013. The actual loan amounts for Loans 2592, 2677 and 2800 are $49.6 million, $66.9 million and $33.3 million, respectively.

B. Outputs

13. The proposed Tranche 4 project has two outputs:[6]

Output 1: Enhanced capacity of distribution system including:

(i) augmentation of nine transformers with capacity addition of 22 MVA;
(ii) construction of twenty new 33/11 kV substations with total capacity of 200 MVA;
(iii) construction of 730 km of 11 kV lines and 477 km of 33 kV lines (378.32 km for connecting new substations and 98.8 km for system strengthening); and
(iv) construction of thirteen 33 kV and 11 kV railway and river crossings, fifteen 33 kV terminal bays and 31 km of 11 kV aerial bunch conductors.

Output 2: Improved technology of O&M including:

(i) introduction of quick response O&M system by procuring 39 units of equipment – mounted maintenance and testing vehicles as well as the 2 mobile emergency restoration units, and;
(ii) installation of 8500 units of information technology (IT) modules for high tension (HT) consumers.

14. The project outputs will contribute to improving grid operational efficiency, reducing system losses, improving the financial health of APDCL, and eventually achieving universal access to electricity services in the project areas. Output 2 is particularly important as the new hardware and software are integral to the long-term evolution of smart grid operations. The quick response O&M systems are a common feature in developed countries and some states in India, but remain under-deployed in Assam. The segregated feeders and advanced metering systems will support end-use energy efficiency improvements at large HT consumers such as tea estates which rely in part on natural gas due to limited electricity supplies. Dedicated supply of electricity to tea gardens will reduce natural gas consumption, which in turn will free-up gas for additional electricity generation. Smart grid deployment will facilitate additional energy efficiency gains and future expansion of renewable energy from variable-output resources such as solar and wind power plants.

C. Investment and Financing Plans

15. The total project cost of the tranche is estimated at $68.17 million (Table 1). Detailed cost estimates by expenditure category and detailed cost estimates by financier are included in the project administration manual (PAM) for this tranche. Total amounts allocated for equipment, civil works and consultancy services are $45.5 million, $3.4 million and $1 million, respectively.

Table 1: Tranche Investment Plan ($ million)

Item		Amount[a]
A.	**Base Cost**[b]	
	1. Enhanced capacity of distribution system	50.65
	2. Improved technology of operations and maintenance system	9.74
	Subtotal (A)	**61.39**
B.	**Contingencies**[c]	**5.84**
C.	**Financing Charges During Implementation**[d]	**0.93**
	Total (A+B+C)	**68.17**

[a] Includes taxes and duties of $4.79 million to be financed from government resources.
[b] In mid-2014 prices.

[6] The number of substations, length of new lines, etc., are taken from the Detailed Project Report prepared by APDCL and are subject to some change during implementation.

[c] Physical contingencies computed at 6.5% of the base cost. Price contingencies computed using ADB's forecasts of international and domestic inflation. Includes provision for potential exchange rate fluctuation under the assumption of a purchasing power.
[d] Interest during implementation has been computed at a base rate of 1.81% plus a spread of 0.50% and a maturity premium of 0.10%. Commitment charges have been computed at 0.15% of undrawn funds.
Sources: Asian Development Bank and Assam Power Distribution Company Limited.

16. The government has requested a loan of $50.2 million from ADB's ordinary capital resources to finance part of the project costs. The loan will have a 25-year term, including a grace period of 5 years, an annual interest rate determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility,[7] a commitment charge of 0.15% per year, and such other terms and conditions set forth in the draft loan and project agreements.

17. The financing plan is in Table 2.[8] The Government and GOA have confirmed the availability of counterpart funds.

Table 2: Financing Plan

Source	**Amount** ($ million)	**Share of Total** (%)
Asian Development Bank (OCR)	50.20	74.00
Government	17.97	26.00
Total	**68.17**	**100.00**

OCR=Ordinary Capital Resources.
Source: Asian Development Bank estimates.

18. The government has provided ADB with: (i) the reasons for its decision to borrow under ADB's LIBOR-based lending facility based on these terms and conditions; and (ii) an undertaking that these choices were its own independent decision and not made in reliance on any communication or advice from ADB.

D. Implementation Arrangements

19. The PMU under the Chairperson, APDCL/APGCL/AEGCL will continue its function for overall project coordination. The PMU will be responsible for implementing, monitoring, and reporting the progress of project implementation to ADB, the Government of India, and GOA. The PMU's responsibilities, in particular, will include: (i) overall coordination, macro level project management and monitoring; (ii) annual budget preparation and monitoring utilization of loan proceeds; (iii) progress reporting, including reports on financial management, safeguard compliance and project impact; and (iv) ensuring compliance with MFF undertakings and loan covenants. The PMU will also be responsible for administration, and financial and technical supervision of the subprojects, including procurement of goods and services, engagement of consultants, engineering and construction contractors, and monitoring subproject operation performance. Department of Power, GOA will support the policy related issues and in dealing with the central agencies, and government budgetary matter. A Project Implementation Unit (PIU) has been established under APDCL, which will have the responsibilities of overall day to day implementation of the project, including supervising the output of project implementation support consultants.

[7] The interest includes a maturity premium of 10 basis points. This is based on the loan terms and the government's choice of repayment option and dates.
[8] Contingencies and interest during implementation are computed as noted at Table 1.

20. The implementation arrangements are summarized in Table 3 and described in more detail in the PAM for this tranche (Appendix 3). The procurement plan is included in the PFR and PAM for this tranche.

Table 3: Implementation Arrangements for Tranche 4

Aspects	**Arrangements**		
Implementation period	1 February 2015 – 31 December 2018		
Estimated completion date	31 December 2018		
Management			
(i) Oversight body	Steering Committee, co-chaired by the chairperson of APDCL and the secretary of the Department of Power, GOA; Managing Director of APDCL as member.		
(ii) Executing agency	APDCL		
(iii) Project Management Unit	The PMU includes full-time staff for design, procurement, supervision, monitoring, and reporting. The PIU at APDCL is established with 9 staff.		
Procurement	International competitive bidding	4 contract packages	$59 million
Consulting Services	QCBS	1 package (consulting services)	$1.0 million
Retroactive financing and/or advance contracting	ADB may, subject to its policies and procedures, allow on government request (i) advanced contracting and (ii) retroactive financing of up to 20% of the proposed individual loan for eligible expenditures incurred prior to loan effectiveness but no earlier than 12 months before the date of signing of the related legal agreements.		
Disbursement	The loan proceeds will be disbursed in accordance with ADB's *Loan Disbursement Handbook* (2012, as amended from time to time) and detailed arrangements agreed between the government and ADB.		

ADB = Asian Development Bank, APDCL = Assam Power Distribution Company Ltd., GOA = Government of Assam, PIU = project implementation unit, PMU = project management unit, QCBS = Quality- and Cost Based Selection.
Source: Asian Development Bank.

E. Project Readiness

21. The DPR comprising the project scope and design, and demonstrating the project's technical, financial and economic viability has been approved by the Board of Directors of APDCL. PMU and PIU have been established and fully staffed. The Resettlement Plans (RP) and Initial Environmental Examination (IEE) were disclosed on 27 August 2014. The bidding documents for two main packages 1 and 2 have been issued on 12 August 2014 and 20 August 2014, respectively. Bidding documents for Package 3 were issued on 21 October 2014 and ADB approved the draft bidding documents for Package 4 on 24 October 2014. The majority of the project sites will be located on lands owned by the EA. Land acquisition has been initiated and more than 50% of the land required has been secured already.

F. Advance Contracting and Retroactive Financing

22. The government and APDCL requested ADB for advance contracting to facilitate preparatory activities for procurement of goods, related services, works and recruitment of consultants for the proposed project. This includes preparation of bidding documents, inviting, receiving and evaluation of bids for project contracts. Retroactive financing is also requested for the eligible expenditures, not exceeding the amount of 20% of the loan amount, incurred before loan effectiveness, but not earlier than 12 months before the signing of the legal agreement.

IV. DUE DILIGENCE

23. APDCL led preparation of the project and evaluated the proposed project activities for technical, economic, financial, and safeguard matters. ADB staff and ADB-funded consultants also undertook due diligence for all aspects of the proposed subprojects including safeguards planning and climate risk assessments.

A. Technical

24. The distribution network in Assam is characterized by overloaded transformers and long distribution feeders, resulting in system losses in excess of targeted levels. The distribution network needs strengthening to improve power transfer efficiency from the grid to end users. APDCL prepared a DPR identifying the best options for design of the proposed distribution system enhancements. The proposed outputs have been examined by power sector experts in APDCL for their technical, economic and financial feasibility and were subsequently approved by the GOA. Substations, sub-transmission lines and distribution lines were selected based on network analysis. The ADB project team and ADB funded consultants have reviewed DPR prepared by the EA and the proposed investments under the Tranche 4. All selected subprojects meet the criteria listed in Schedule 4 of the FFA. The ADB project team and project preparatory consultants visited major sites, reviewed all available reports, and undertook a comprehensive due diligence including safeguards analyses. The technical assessments confirmed that the proposed investments are technically sound. The project will utilize proven technologies suitable for local conditions and the capacity of the EA staff following good engineering practices consistent with Indian standards for electricity grid operations.

B. Economic and Financial

25. The project will benefit electricity consumers by reducing distribution system losses (and, in turn, load shedding), which will enable households and commercial establishments to improve their economic, commercial, educational, and social development opportunities. The economic viability of the Tranche 4 investment is confirmed through a cost–benefit analysis conducted using ADB's Guidelines for Economic Analysis of Projects (Appendix 4). The economic internal rate of return is estimated to be 14.7%. Sensitivity analysis and switching values show that the net benefits of Tranche 4 project are stable against the major risk factors.

26. The financial analysis (Appendix 5) of Tranche 4 has been carried out in accordance with ADB's *Financial Management and Analysis of Projects*. All financial costs and benefits have been expressed in mid-2014 constant price levels. Cost streams used for the purposes of estimation of the financial internal rate of return (FIRR) reflect the actual costs incurred in delivering the estimated benefits. The overall FIRR is 7.2%, which compares favorably against the estimated weighted average cost of capital of 4.5%; thus, the project is considered to be financially viable. Sensitivity analyses show that a 10% increase in capital costs, 10% increase in operating and maintenance costs, and a delay in commissioning by 1 year, do not change the financial viability of the Tranche 4 project.

C. Climate Change Impact

27. Detailed climate risk screening report identified that the main climate impact to the project is the increased flood risk as well as increased wind speed of tropical cyclones that may potentially damage the distributions lines. The project sites are located within the floodplains of Brahmaputra River, but vulnerable components such as sub-stations and transmission towers

were specifically located in elevated landscape, and designs ensure increased elevation of the foundations for substations. Overhead distribution lines will be constructed to withstand strong winds. In addition, it was recommended that the project design should take into account possible flood risk during the construction of all substations as well as risk of heavy winds. A supplementary appendix provides the summary of the screening report and the climate proofing options considered. [9]

D. Governance

28. The Financial Management Assessment (FMA) of APDCL draws lessons learned from the implementation of ongoing three loans, as well as a comprehensive FMA which has been carried out under Assam Power Sector Investment Program, an MFF approved in July 2014. It identified that overall financial management capacity is low and financial management risk is high. Among others, the following major weaknesses were identified by the assessment: (i) weak internal controls over fixed assets; cash management and payroll; (ii) weak internal audit; (iii) out-of-date accounting manuals and handbooks; and (iv) manual accounting and financial management system. ADB will assist in addressing some of these critical areas through the design of the capacity development component under the Assam Power Sector Investment Program. Specific undertakings have also been included in the FFA for Assam Power Sector Investment Program to address financial management risks.

29. Enterprise resource planning (ERP) is being introduced by APDCL, which will improve its financial management, accounting and reporting capacity. This will include planning related modules for fixed assets and stores and spares management, as well as manuals for accounting and internal controls. A contract has been signed for implementation and software licenses have been procured. Implementation is scheduled to take place over the next 24 months.

30. APDCL has experience in the implementation of ADB-funded projects, and has staff who are familiar with ADB financial management, procurement, and safeguard policies and procedures. APDCL staff have been seconded to the PMU established for implementation of the on-going MFF, and a PIU has been established within APDCL to implement ADB funded projects. Financial reports are prepared according to Indian Accounting Standards. According to relevant Indian audit law, APDCL is currently subject to annual auditing conducted by chartered accountants appointed by India's Comptroller and Auditor General (CAG).

31. **Anticorruption Policy.** ADB's Anticorruption Policy (1998, as amended to date) was explained to and discussed with the government and APDCL. The specific policy requirements and supplementary measures are described in the facility/project administration manual.

E. Poverty, Social and Gender Dimensions

32. The power sector has significant potential to contribute to economic development and social well-being, and is both directly and indirectly linked to poverty reduction. The Summary of Poverty Reduction and Social Strategy is presented in Appendix 6. A reliable and adequate electricity supply improves living conditions, promotes business expansion, and increases employment opportunities, which all have positive contributions to poverty reduction. Reliable and good quality electricity supplies are necessary for meeting basic human needs of health and education. Poor and vulnerable consumers, as well as public institutions such as public

[9] Climate Change Risk Assessment report is attached as a supplementary Appendix B.

hospitals and schools, are often particularly disadvantaged by an inadequate power supply, load shedding, and poor power quality. The Tranche 4 project will address all of these issues with respect to more reliable and better quality electricity supplies. Tranche 4 is classified as having no gender elements. The loan agreement includes standard assurances for core labor standards for contractors (including equal pay for equal types of work) and awareness program on HIV/AIDS and sexually transmitted diseases.

F. Safeguards

33. An IEE (Appendix 7) and an RP (Appendix 8) were prepared, outlining the environment and social safeguard principles and requirements.[10] Pursuant to Indigenous Peoples Planning Framework for the MFF, an Indigenous Peoples Plan is not required. APDCL will implement the IEE and RP and will submit semiannual reports on the implementation of the environmental management plan (EMP) and the RP, as required.

34. **Environment.** The Tranche 4 project is classified as environment category B. APDCL prepared an IEE including an EMP with cost estimates, described the structure of the grievance redress mechanism and undertook public consultations following ADB's *Safeguard Policy Statement (SPS) 2009*. Environmentally-sensitive areas such as national park, protected areas, wildlife sanctuaries, forests, wetlands, etc. have been avoided in selecting the sites for substations and power lines. No significant air, water, noise, or soil pollution will result from the project but potential adverse environmental impacts are expected during the construction of the subtransmission and distribution systems which are temporary and of short duration. These temporary adverse environmental impacts are potential increase in dust and noise level during construction, disturbance to daily activities of local people, and temporary crop damages. These adverse impacts can be readily mitigated using standard engineering and environmental practices and are incorporated in the EMP. The IEE for the Tranche 4 project was disclosed on the ADB and APDCL websites on 27 August 2014.

35. **Social Assessment.** The Tranche 4 project is categorized as B[11] for Involuntary Resettlement (IR) and C for Indigenous Peoples according to ADB's SPS. The RP describes the extent of IR impact and describes provisions of compensation and assistance to the Affected Persons (APs). The RP was endorsed by the EA on 26 August 2014 and disclosed on the ADB website on 27 August 2014. The RP is based on the engineering design and is prepared in due consultation with stakeholders. Resettlement impacts have been minimized at the design stage by selection of substation sites at government land requiring no resettlement, use of barren tea estate lands, and scheduling construction of lines during crop off-season. Total land required for proposed new substations is 4.68 hectares (ha) out of which 1.10 ha is government land, 2.30 ha of land is tea estate land, and 1.28 ha of land is private land. There are a total of 6 affected households who are considered to be economically displaced because they will lose small

[10] An environmental assessment and review framework (EARF) prepared for the facility in May 2009 has been updated to incorporate the Safeguard Policy Statement 2009 and Public Communications Policy 2011. The updated EARF has been endorsed by APDCL and was posted to ADB website on 8 September 2014. The Resettlement Framework (RF) for the facility has been updated due to new Indian legislation pertaining to land acquisition and resettlement (Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act (RFCT in LARR), 2013), as well as the ADB Safeguard Policy Statement 2009. The updated framework was endorsed by the EA and disclosed on the ADB website on 9 September 2014.

[11] A proposed project is classified as category B if it includes involuntary resettlement impacts that are not deemed significant which means less than 200 persons will experience major impacts, which are defined as (i) being physically displaced from housing, or (ii) losing 10% or more of their productive assets (income generating). The level of detail and comprehensiveness of the resettlement plan are commensurate with the significance of the potential impacts and risks. A resettlement plan is required for category B projects.

portions of land without any physical displacement. Temporary impacts on loss of crops on the right-of-way of distribution lines are foreseen with minimum impacts. The RP for the Tranche 4 project was disclosed on the ADB and APDCL websites on 26 August 2014. The PMU will confirm that the key milestones specified in Table 11 of the RP are achieved prior to commencement of civil works.

G. Risks and Mitigating Measures

36. Potential project-related risks include: (i) power generation capacity does not expand sufficiently to meet demand growth; (ii) prices of raw materials and equipment exceed contingency and inflation forecasts; (iii) possible delays in mobilizing counterpart funds; (iv) delays in procurement and contract awards; (v) poor financial management capacity and weak financial viability of the EA. These risks have been minimized to the extent possible in project formulation and implementation or are regarded as low, because: (i) ADB has approved a new MFF to support generation expansion, (ii) contingencies are considered adequate to cover foreseeable inflation and commodity market volatility; (iii) GOA and APDCL have provided assurances on the timely provision of counterpart funding; (iv) procurement processes are in advanced stage; (v) the new MFF approved in July 2014 included number of measures including training and capacity building, preparation of accounting manuals, introduction of computerized management system and undertaking and assurances to improve financial management; and (vi) ADB will start a high level policy dialogue with the GOA to ensure that concrete steps will be taken to restore financial health of APDCL. In addition, APDCL is implementing internal management improvements and GOA is committed to ongoing sector reforms, full financial independence of the electric utility companies, and operational independence of the Assam Electricity Regulation Commission. Overall, the integrated benefits and impacts are expected to outweigh the costs, given the likelihood of the risks. Major risks and mitigating measures are described in detail in the risk assessment and risk management plan (Appendix 9).

H. Risk Categorization

37. Based on the loan amount, the EA's positive record of experience with ADB and its reasonable capacity in administration of externally-financed projects, and the safeguard categorization, the project is categorized as "*low risk"*.

V. ASSURANCES

38. The government, GOA, and APDCL have assured ADB that implementation of the project shall conform to all applicable ADB polices including those concerning anticorruption measures, consulting services, safeguards, gender, procurement, and disbursement as described in detail in the PAM, which will be incorporated in the loan agreement and project agreement, as applicable, and mutually agreed between the government, GOA, and ADB. The government, GOA and APDCL have agreed with ADB on certain covenants for the project, which are set forth in the loan agreement and project agreement.

VI. RECOMMENDATION

39. On the basis of the approval by ADB's Board of Directors for the provision of loans under the MFF in an aggregate principal amount not exceeding $200,000,000 equivalent to India for the Investment Program, it is recommended that the President approve: (i) minor change in the MFF as described in paragraph 11 above; and (ii) the proposed tranche as described in

paragraph 16 of this report, and the draft loan and project agreements for the proposed tranche substantially in the forms attached to this report.

PERIODIC FINANCING REQUEST FROM THE GOVERNMENT OF INDIA

Provided as a separate attachment

DESIGN AND MONITORING FRAMEWORK – TRANCHE 4

Design Summary	Performance Targets and/or Indicators	Data Sources and/or Reporting Mechanisms	Assumptions and Risks
Impact Enhanced quality and expanded service delivery of electricity in Assam	Household electrification to reach 100% in project areas by 2022, from 40% in 2014. Unscheduled power outages are eliminated in project areas by 2022	For all indicators: Annual reports of APDCL CEA and MOP annual reports	**Assumptions** Load growth in Assam is as projected. Power generation capacity expands to meet demand growth
Outcome APDCL increases operational efficiency	Distribution system losses in Assam reduced from 20% in 2013 to 18% in 2019	For all indicators: APDCL annual report AERC annual reports	**Assumptions** Other power sector distribution projects in the state are completed as planned
Outputs 1. Enhanced capacity of distribution system 2. Improved technology of operations and maintenance system.	By 2019: (a) 9 transformers with total capacity of 22 MVA installed at existing substations; (b) 20 substations (33/11kV) constructed; (c) 1207 km of 33 kV and 11 kV lines constructed; (d) 13 railway and river crossings (33 kV and 11 kV) constructed; (e)15 terminal bays (33 kV) constructed; (f) 31 km 11 kV aerial bunch conductors installed (a) 41 quick response O&M vehicles procured; (b) 8500 automated meters and associated software installed.	For all indicators: APDCL annual reports Monitoring reports from PMU and PIU ADB review mission reports	**Risks** Increase in prices of raw materials exceeds contingency allocation
Activities with Milestones **Tranche 4** **1. Enhanced capacity of distribution system** 1.1 Issue bidding documents from August 2014 to October 2014 and contract awards by April 2015. 1.2. Construct 33/11 kV substations, 33 and 11 kV lines, 33 kV terminal bays and 11 kV railway and river crossings by May 2018. 1.3. Augment distribution system with 33/11 kV substations and construct 33 kV and			**Inputs** **ADB (loan):** OCR $50.2 million **Government:** $17.97 million

11 kV lines by May 2018. 1.4. Commission between June 2018 and July 2018. **2. Improved technology of O&M system** 2.1 Issue bidding documents from September 2014 to October 2014 and contract awards by May 2015. 2.2. Complete supply of O&M vehicles and installation of meters by June 2018. 2.3. Operation starts between July 2018 and August 2018.	

ABC = aerial bunched conductors, ADB = Asian Development Bank, AERC = Assam Electricity Regulatory Commission, APDCL = Assam Power Distribution Company Limited, CEA = Central Electricity Authority, GOA = Government of Assam, km = kilometers, kV = kilovolts, MOP = Ministry of Power, MVA = megavolt-amperes, O&M = operations and maintenance.

PROJECT ADMINISTRATION MANUAL – TRANCHE 4

Provided as a separate attachment

ECONOMIC ANALYSIS

A. Background and Approach

1. The Assam Power Sector Enhancement Investment Program (the Investment Program) is a Multitranche Financing Facility (MFF) to fund the power transmission and distribution efficiency improvement projects in the state of Assam, India. The main objectives of the Investment Program are to achieve increased adequacy and efficiency of Assam's power system.

2. Tranche 4 of the MFF concerns the reinforcement, augmentation and upgrading of electricity distribution facilities in central and upper zones of Assam. Subprojects have been selected by the Assam Power Distribution Company Limited (APDCL) to cater for demand growth, reduce low voltage losses, provide dedicated feeders to tea estates, improve the operations and maintenance responsiveness of the business, and improve the technology and metering interface with the company's high voltage customers.

3. A power system master planning exercise was completed for Assam in late 2013.[12] The resulting master plan presents a least-cost, 10-year investment program for transmission and distribution (to the low voltage level) in the state to meet forecast demand growth and to ensure security and reliability of supply. Because the proposed Tranche 4 investment is part of the master plan, an overall economic assessment has been made of the master plan investment program. Specifically, economic analysis was undertaken to determine the economic viability of the overall plan by:

(i) validating electricity demand and supply projections;
(ii) ensuring that the overall investment program is least cost;
(iii) undertaking cost-benefit analysis of the investment; and
(iv) identifying distribution of project costs and benefits amongst key stakeholders.

B. Calculation of Economic Internal Rate of Return, Risk Assessment and Sensitivity Analysis

4. **Demand Forecast.** A 10-year electricity demand forecast was prepared for Assam as part of a master planning exercise for the state. This disaggregated forecast used a variety of techniques to estimate electricity demand for the next ten years – compound average growth rate, trend analysis, econometric analysis, and a partial end use approach. In all cases, electricity demand was forecast to grow at a faster rate than identified in India's official demand forecast for Assam (the Electricity Power Survey), with expected annual growth in the range 7-15%. It also confirmed that capacity and energy supply deficits are likely to continue for at least the next 10 years, even with the addition of planned new generation from state government, central government and private sectors.

5. It was noted that the level of investment required in the distribution network to maintain supply reliability and security and to meet forecast demand growth is significantly higher than currently available funding. The total investment proposed in APDCL's 2013 multi-year tariff petition to the Assam Electricity Regulatory Commission (AERC) was around 30% of the capital

[12] ADB. 2012. *Technical Assistance to India for Advanced Project Preparedness for Poverty Reduction - Updating Load Forecast and Power System Master Plan for Assam.* Manila

investment requirement identified in the master plan for the same period. This expectation of a sustained under-investment underscores the need for APDCL and other state electricity entities to carefully target investment programs to maximize economic benefits and to ensure financial sustainability. In this context, the need for the Tranche 4 investment is confirmed.

6. **Least Cost Analysis.** In general, there are few if any viable alternatives to distribution system augmentation. The approach adopted in the power system master plan to 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 arrangements (including automatic meter reading for high voltage and valuable customers). APDCL has adopted the same approach in the preparing Tranche 4 investment.

7. **Investment Costs.** Investment costs were taken from the power system master plan and an allowance for replacement of end-of-life assets was added (it was assumed that the asset age profile is flat and that, therefore, asset replacement expenditure is constant). All capital costs of the power system master plan investment program have been expressed at a constant fourth quarter 2013 price level. The domestic price numeraire was used. Traded inputs were valued at their border price equivalent values and then adjusted to the domestic price numeraire by multiplying by the standard exchange rate factor (SERF) of 1.03, which was calculated using a simple trade-weighted approach.[13] Non-traded inputs were valued at domestic prices. It was assumed that 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 and financing charges were excluded. The power system master plan treated released transformer capacity (that is, transformers removed from service to be replaced with larger transformers) as a negative capital cost, but this has been ignored for the purposes of this analysis on the basis that it is a sunk cost. System operating and maintenance costs adopted for analysis purposes reflect international experience and AERC's typical benchmarks. Generation costs were estimated from the power system master plan, based on the master plan's indicative split between generation types (coal, hydropower, gas and small-scale renewables) and the allocation to central and state sector generation sources. Specific conversion factors were estimated for each fuel type to convert from levelized financial costs of generation to levelized economic costs.[14]

8. **Investment Benefits.** The main economic benefits of the proposed master plan investments are incremental consumption and displaced alternative energy sources. In the absence of the investment, electricity consumption in Assam would not be able to increase at the rate forecast. In particular, planned industrial investments would not be made or would be made on a reduced scaled elsewhere in India. Other consumers would not be able to increase their consumption or would have to use other energy sources. It was conservatively assumed that the unreinforced existing system (that is, the "without investment case) has sufficient capacity to cope for incremental demand to increase by 50% of the forecast demand. That is, only 50% of the incremental demand growth was attributed as a benefit of the system investment program.

[13] The SERF adopted in the power system master plan was 1.2. This is considered significantly too high for India and was adjusted accordingly.

[14] Specific conversion factors (0.9 for hydropower and 1.05 for gas- and coal-fired plant) were estimated based on an approximate split between capacity and fuel costs for each generation type.

9. Incremental outputs were valued using consumers' estimated willingness to pay for incremental consumption, adjusted for medium voltage and low voltage losses as appropriate. Demand functions relating energy price to energy demand were estimated for each of the main consumer sectors in Assam (domestic, commercial, high voltage and low voltage industrial, tea gardens and bulk supply). The form of the demand functions follows the methodology outlined in Measuring Willingness to Pay for Electricity.[15] They were derived from average unit realization rates and specific consumption levels achieved by APDCL in recent years, plus estimated self-generation or alternative energy costs for each consumer type. The derived demand functions were then applied and solved, on a year-by-year basis, to value the incremental consumption enabled for each consumer type.

10. Without the proposed investments, some demand would be met from other energy sources once existing network capacity is exhausted. Non-incremental outputs from the investments were valued at the resource cost savings that would accrue if the investments proceed. It was assumed that only 10% of unmet demand would be met from alternative sources - kerosene lamps for lighting for domestic consumers and diesel generators for all other consumers. Marginal costs of diesel generators were based on an estimated border price equivalent value (BPEV) of diesel derived from the World Bank's commodity price forecasts, specific consumption of 0.3 liters per kilowatt-hour (kWh), and non-fuel operating and maintenance costs of INR 0.2 per kWh The variable cost of output from kerosene lamps was estimated at INR 37.7 per kWh (on a lux-equivalent basis).

11. The proposed investment does not produce any clear, measureable net environmental benefits.

12. Table 1 summarizes estimated economic benefit quantities and unit values for the first five years of the power system master plan investment program. As a basis for comparison, the energy component of end-use electricity tariffs in Assam range from INR 3.53 per kWh to INR 6.15 per kWh.

Table 1: Economic Benefits – Quantities and Values Ascribed

Economic Benefits	Units	2015	2016	2017	2018	2019
Quantities						
Non-incremental output	GWh	41.9	88.5	140.4	198.7	289.2
Incremental output	GWh	376.9	796.2	1,263.8	1,788.1	2,602.4
Unit Values						
Average resource cost saving	INR/kWh	22.6	22.1	21.6	21.1	20.5
Average incremental consumption	INR/kWh	7.0	7.1	7.1	7.2	7.1
Values						
Resource cost saving	INR m	947.9	1,950.8	3,027.9	4,186.9	5,927.0
Incremental consumption	INR m	2,655.4	5,638.4	8,996.4	12,790.9	18,541.2

Source: Asian Development Bank staff estimates.

13. **Estimated Economic Internal Rate of Return.** The basis for economic evaluation of the proposed investments is a comparison of benefits and costs between the "with investment" scenario and the "without investment" scenario. A period of 20 years was used for economic evaluation, with capital investment occurring during the first 9 years (starting from FY2015) Benefits were assumed realized from the second year. Because some of the capital expenditure

[15] P. Choynowski. 2002. *Measuring Willingness to Pay for Electricity. ERD Technical Note No. 3.* Manila: ADB.

occurs late in the forecast period, asset residual values were included in the analysis and were based on average assumed lives of 40 years for transmission assets and 30 years for distribution assets. The detailed cost-benefit calculations show that the overall sector investment program is economically viable and is expected to deliver significant economic benefits, even under the conservation valuation approach adopted. The economic internal rate of return (EIRR) is estimated to be 14.7%, well above the assumed hurdle rate of 12% (see Table A4.2).

14. **Sensitivity and Risk Analysis.** The risks that the proposed investment does not achieve satisfactory economic returns was identified from both cost and benefit sides. For each of the risks identified, the sensitivity of the aggregate EIRR was tested and switching values were calculated.[16] EIRR sensitivity results are shown in Table A4.3, with the EIRR exceeding or equal to 12% in all cases with the exception of the combined downside scenario. Based on these results, the overall power system master plan investment appears to be economically viable. As stated in paragraph 5, it is unlikely that sufficient financing will be mobilized to achieve the power system master plan investment program, and state electricity companies will need to prioritize investments that provide the highest return or that are required for safety and regulatory reasons. Moreover, because there is an expectation of ongoing supply deficits, marginal willingness to pay is likely to be higher than assumed in the analysis above. In this context, it is reasonable to assume that the subset of master plan projects that are actually implemented, including those selected for Tranche 4, will deliver higher economic rates of return than 14.7%.

15. **Distribution Analysis.** The distribution of costs and benefits amongst stakeholders was assessed by comparing financial costs and benefits to economic costs and benefits. Financial benefits were estimated by calculating the incremental average revenue requirement arising from the power system master plan investment program, calculated according to tariff regulations prescribed by the AERC. The distribution analysis is summarized in Table A4.4. Overall, the economic net present value exceeds the financial net present value by INR 38,484 million. The state economy is the greatest beneficiary (approximately INR 22,177 million), mostly due to the significant taxes and transfers that the Investment Program would generate (although much of this revenue would accrue to the central government rather than the state government). Electricity consumers are also large beneficiaries as a consequence of resource cost savings and consumer surpluses on incremental consumption (approximately INR 14,796 million). Power sector companies are net losers in this analysis (approximately INR 22,858 million), as the overall sector weighted average cost of capital and therefore its expected financial internal rate of internal on the investment is below the 12% discount rate used in the analysis.

C. Conclusion

16. The economic analysis confirms that the power system master plan investment is least cost and economically viable, and by extension the Tranche 4 investment is also least cost and economically viable. The analysis yields an overall EIRR of 14.7%. Sensitivity and risk analysis demonstrates that the expected economic performance is robust. From an economic perspective the overall investment program and the Tranche 4 investment should proceed.

[16] A switching value measures the percentage change in the variable required to reduce the EIRR to the assumed hurdle rate.

Table 2: EIRR Results (INR million) [1/]

Year	Benefits		Costs			Net Benefits
	Incremental Output	Non-Incremental Output	Capital	Supply	O & M	
2015	-	-	15,635.8	0	0	(15,635.8)
2016	5,638.4	1,950.8	15,950.5	311.2	4,759.5	(13,432.0)
2017	8,996.4	3,027.9	18,237.5	626.3	7,481.7	(14,321.3)
2018	12,790.9	4,186.9	14,625.8	976.7	10,483.5	(9,108.2)
2019	18,541.2	5,927.0	14,648.5	1,262.7	15,112.4	(6,555.4)
2020	25,241.5	7,876.2	27,860.0	1,549.0	20,405.2	(16,696.5)
2021	33,048.4	10,048.9	14,714.2	2,033.6	26,469.9	(120.4)
2022	42,134.1	12,517.3	15,269.2	2,321.1	33,435.4	3,625.7
2023	52,706.9	15,300.4	1,026.6	2,616.8	41,440.2	22,923.8
2024	52,706.9	15,300.4	0	2,616.8	41,440.2	23,950.4
2034	52,706.9	15,300.4	(72,320.0)	2,616.8	41,440.2	96,270.3
					EIRR =	14.7%

1/ For brevity, selected years shown only.
EIRR = economic internal rate of return; O&M = operations and maintenance.
Source: Asian Development Bank staff estimates.

Table 3: Sensitivity Analysis

	Sensitivity Parameter	Variation	EIRR	Switching Value
	Base case		14.7%	
1	Project capital costs	+ 15%	12.6%	19.5%
2	Benefits	- 20%	13.1%	-25.5%
3	Operation and maintenance	+ 20%	14.4%	140.3%
4	Commissioning Delayed	1 year	14.3%	
5	Combined (1, 2, 3, 4)		5.0%	

Source: Asian Development Bank staff estimates.

Table 4: Distribution of Benefits to Affected Groups (INR million)

Item	NPV at 12%			Distribution to Affected Groups		
	Economic	Financial	Difference	Govt. / Economy	Labor	Consumers
Benefits						
Incremental consumption	206,165	0	206,165			206,165
Resource cost saving	61,604	0	61,604			61,604
Revenue	0	252,973	-252,973			-252,973
Costs						
Investment	154,150	198,298	-22,074	20,564	1,511	
O&M	11,220	11,220	0	0		
Supply	163,848	165,462	-1,614	1,614		
Net benefits	**15,627**	**-22,858**	**38,484**	**22,177**	**1,511**	**14,796**

NPV = net present value; O&M = operations and maintenance.
Source: Asian Development Bank staff estimates.

FINANCIAL ANALYSIS

D. Tranche 4 Financial Analysis

1. The financial analysis of Tranche 4 of the multitranche financing facility (MFF) has been carried out in accordance with the Asian Development Bank's (ADB) Financial Management and Analysis of Projects.[17] All financial costs and benefits have been expressed in constant May 2014 prices. Cost streams used for financial internal rate of return (FIRR) determination (capital investment, electricity purchases, income tax and operations and maintenance) reflect the costs of delivering the estimated benefits. Benefits flowing to the Assam Power Distribution Company Limited (APDCL) consist of regulated revenue accruing from newly constructed distribution facilities. To assess financial viability, the weighted average cost of capital (WACC) of the proposed investment was calculated and compared with the investment's FIRR. Sensitivity of the FIRR to changes in the underlying assumptions was also tested.

2. The tariff revenue that APDCL earns for the new distribution facilities is calculated in accordance with regulations set by the Assam Electricity Regulatory Authority (AERC). An annual revenue requirement is determined by AERC, based on AERC's view of reasonable and efficient power purchase costs, operations and maintenance costs, overhead costs, depreciation, interest on loans and on working capital, and return on equity. In determining tariffs, any grant financing is ring-fenced by AERC and is excluded from depreciation and rate of return calculations. APDCL's revenue from the new facilities has been estimated in accordance with these regulations.

3. APDCL has estimated it will be able to supply an additional 281 gigawatt-hours (GWh) of demand once the tranche 4 facilities are commissioned. APDCL also estimates that distribution losses will be reduced by approximately four percentage points in areas covered by the project. The increase in sales will generate regulated income only (that is, AERC will only allow APDCL to earn sufficient revenue on the incremental sales to meet costs and to earn a return on assets). However, the loss reduction will lower APDCL's overall power purchase costs resulting in additional incremental net revenue. Other minor financial benefits may accrue to APDCL from the investment arising from improved quality and reliability of supply but these have not included in the analysis.

4. It has been assumed that only 10% of ADB's loan will be on-lent to APDCL as a local currency loan with an indicative interest rate of 10.5%. The balance of ADB's loan (90%) will be provided to APDCL as a grant. In determining revenue, the Assam Electricity Regulatory Authority (AERC) allows APDCL a return on equity capital of 14.0%. This represents APDCL's opportunity cost of capital - it can invest in other distribution projects and earn the same rate of return – therefore this value has been adopted as a proxy for the cost of equity capital. The corporate tax rate as it applies to APDCL is 33.99%.[18] Assuming a domestic inflation rate of 8.0%, the real, post-tax WACC for the investment is 1.7% as shown in Table 1. Note that the grant component has been excluded from the WACC calculation (and, for consistency, has been excluded from the capital costs in the cash flow calculation)

[17] ADB. 2005. *Financial Management and Analysis of Projects.* Manila.
[18] Tax is treated as a pass-through in the tariff setting regime in Assam.

Table 1: Weighted Average Cost of Capital

Item	Amount ($ million)	Weight (%)	Pre-Tax Nominal Cost (%)	Post-Tax Real Cost (%)	Weighted Cost (%)
ADB loan [1/]	5.0	21.8	10.5	0.0	0.0
GOA equity	18.0	78.2	14.0	5.8	4.5
Total	**23.0**	**100.0**			**4.5**

1/ Only the on-lent component of ADB's loan is included in the project WACC calculation. The component of ADB's loan that is provided as a grant to APDCL has been excluded for the purposes FIRR comparison.
ADB = Asian Development Bank; GOA = Government of Assam.
Source: Asian Development Bank staff estimates.

5. Incremental cash flows attributable to the Tranche 4 investment were estimated based on the methodology and assumptions described above. The estimated real post-tax FIRR of the investment is 7.2% as shown in Table 2, which compares favorably with the WACC of 4.5%.

Table 2: Calculation of Financial Internal Rate of Return (INR million)

Year	Revenue	Costs				Net C.F.
		Capital [1/]	Power Purchases	Operating	Tax	
2015	0	261.1	0	0	0	(261.1)
2016	0	419.6	0	0	0	(419.6)
2017	0	449.0	0	0	0	(449.0)
2018	0	320.3	0	0	0	(320.3)
2019	1,574.8	0	1,198.1	73.8	90.2	212.6
2020	1,534.7	0	1,174.2	73.1	85.0	202.4
2021	1,496.2	0	1,150.8	72.5	80.1	192.9
2022	1,459.3	0	1,127.8	71.8	75.6	184.1
2023	1,423.8	0	1,105.3	71.1	71.4	175.9
2024	1,386.8	0	1,083.3	70.4	68.3	164.9
2025	1,354.1	0	1,061.6	69.8	64.7	158.0
2026	1,322.6	0	1,040.5	69.1	61.5	151.6
2027	1,292.3	0	1,019.7	68.5	58.4	145.7
2028	1,263.0	0	999.4	67.8	55.6	140.2
2029	1,234.8	0	979.4	67.2	53.0	135.1
2030	1,207.5	0	959.9	66.6	50.6	130.4
2031	1,181.1	0	940.8	66.0	48.4	126.0
2032	1,155.6	0	922.0	65.3	46.3	122.0
2033	1,131.0	0	903.6	64.7	44.4	118.3
2034	1,108.0	(227.3)	885.6	64.1	42.9	342.7
						FIRR = 7.2%

1/ Only the on-lent component of ADB's loan is included in the project WACC calculation. The component of ADB's loan that is provided as a grant to APDCL has been excluded for the purposes FIRR comparison.
C.F. = cash flow, FIRR = financial internal rate of return.
Source: Asian Development Bank estimates.

6. Analyses were carried out to examine the sensitivity of the FIRR to adverse changes in key variables: a 10% increase in capital costs, a 10% reduction in benefits, a 10% increase in power purchase costs, a 10% increase in operation and maintenance costs (assuming that the AERC does not allow these costs to be passed through as a tariff adjustment), a one-year implementation delay and combined downside scenario. Results are shown in Table 3. Because

APDCL's gross margin is small (the difference between average revenue and average purchase cost per unit sold is only around 27%) financial outcomes are sensitive to changes in revenue and power purchase costs and a 10% change in either would render the project financially non-viable. It should be noted however that revenue decreases and purchase price increases are likely to be allowed for in subsequent years by AERC through the "true-up" process, unless the AERC deemed the decrease in revenue or increase in purchase costs was within APDCL's control.[19] FIRRs exceed the WACC in other cases except for the multiple downside scenario.

Table 3: FIRR Sensitivity Analyses

	Sensitivity Parameter	Variation (%)	FIRR (%)	Switching Value (%)
	Base case		7.2	
1	Capital cost Increase	+ 10	6.0	22.2
2	Revenue decrease	- 10	-1.0	-3.3
3	Power purchase cost increase 1/	+ 10	1.1	4.4
4	O&M cost increase	+ 10	6.9	76.6
5	Delay		6.1	
6	Combined 1-4		-12.7	

FIRR = financial internal rate of return; O&M = operations and maintenance cost.
1/ A 10% increase in power purchase costs is equivalent to distribution losses reducing to 18%, rather than 16% as is assumed in the base case.
Source: Asian Development Bank estimates.

E. Historical Financial Performance of APDCL

7. Highlights of the historical financial performance of the Assam Power Distribution Company Limited (APDCL) FY2010 to FY2013 are presented in Table 4. The financial performance of the company is characterized by an average cost per unit of electricity sold that is greater than the average revenue per unit sold. This means the company has insufficient cash to meet interest and principal payment obligations on borrowings from the Government of Assam (GOA); accrued principal repayment obligations were INR 2.1 billion by the end of FY2013, representing unpaid principal back to FY2006. This cash squeeze is a consequence of two main factors: (i) poor performance of the company assets against distribution losses performance benchmarks set by AERC; and (ii) disallowance by AERC of interest cost pass-through on GOA borrowings (due to lack of provision of evidence matching these unsecured borrowings to revenue-generating assets) and on the general provident fund (GPF) liability (no evidence has been provided to AERC of a unique fund or bank account for this liability). There have also been significant delays in the company's submission of audited financial statements to AERC to allow AERC to true-up actual costs against allowed costs.

F. Financial Projections for APDCL

8. Indicative ten-year financial projections have been developed for APDCL and are summarized in Table 4. Projections have generally been based on the company's recent performance, AERC's recent tariff and revenue determinations, and multi-year tariff (MYT) petitions submitted by the company for the period FY2014-FY2016. With the exception of network losses and depreciation, revenue allowed by AERC is assumed to match actual costs from FY2017. In FY2014, AERC reset tariffs for the final third of the year; until then, previous

[19] A "true-up" is the process by which AERC compares audited costs to previously approved costs. Over-or under-recovery of actual costs by APGCL and APDCL, where adequately justified to AERC, can be recovered in subsequent years' tariffs.

tariffs applied. It has been assumed that AERC will allow the resulting revenue deficits to be recovered in FY2016.

9. It has been assumed that capital expenditure beyond FY2018 equals the rolling average of the previous three years expenditure. This is adequate to replace assets reaching the end of their service lives and to augment the network to some extent, but would not be sufficient to meet forecast demand growth and network expansion requirements.[20] Financing is assumed to be a mix of debt, equity and grants, as indicated in APDCL's MYT petition for FY2014-FY2016 and AERC's FY2014 tariff order. Domestic inflation has been assumed to be 8.1% in FY 2014, 7.8% in FY2015, 7.5% in FY2016 and 7.0% thereafter.

10. It is expected that the company will continue to suffer significant accounting losses over the next three years (the period covered by AERC's most recent tariff order, released in November 2013). The main reasons for these losses are the same as those outlined in paragraph 7 above – missed loss targets and disallowance by AERC of interest cost pass-through on GOA borrowings on the general provident fund (GPF) liability. The AERC's approved net revenue requirement for APDCL over the period represents only around 77% of the revenue claimed by APDCL in its tariff petition.

11. On the basis of the assumption that AERC will pass through most of APDCL's costs from FY2017 onwards (due to earlier and more complete petitioning on APDCL's part and a reduction in inefficient expenditure), the financial projections indicate that the performance of APDCL will improve modestly over the forecast period. APDCL is expected to continue to lag behind AERC's approved network loss trajectory, which means that APDCL will continue to under-recover its electricity purchase costs – in FY2017 this represents a projected cost under-recovery of approximately INR1.7 billion (including generation and transmission charges). It is possible that APDCL will not be able to reduce distribution losses to 18.5% (of energy sent out) as assumed, particularly in light of the inadequate level of capital investment discussed above. Further, the assumption that the AERC will allow pass-through interests costs on GOA from FY2017 may prove to be incorrect; disallowance of these costs would see APDCL again reporting significant accounting losses and experiencing cash shortfalls.[21] The low percentage of equity in APDCL's capital base also limits the cash buffer that the return on equity allowed by AERC should provide; operational inefficiencies will therefore quickly erode the modeled cash surpluses. In the absence of marked operational performance improvements, significant capital expenditure and an equity injection, APDCL's financial position will remain perilous.

12. The sensitivity analysis undertaken in relation to the Tranche 4 investment and as summarized in Table 3 above demonstrates the importance to APDCL of investing in and maintaining its capital assets to reduce network losses. The difference between the losses allowed by AERC and the actual losses incurred by APDCL means that gross margins are minimal. If operating costs increase without adequate justification, AERC may disallow expenditure, causing cash surpluses and accounting profit margins to decline. APDCL's asset base is expected to double over the forecast period, and the company will need to scale its operations and maintenance capacity and budget accordingly. This will be a challenge to the company and represents a significant risk to the company's financial performance.

[20] Analysis undertaken separately indicates a requirement for capital expenditure of at least twice that modeled here to meet demand growth and to maintain the network.

[21] Because there appears very little prospect of repayment, debt service arrears (principal and interest) on GOA debt have been ignored for the purposes of calculating debt service cover ratio. Inclusion of arrears would further deteriorate DCSR.

Table 4: Summarized Historical and Projected Financial Performance of APDCL [1/ 2/ 3/.]

Item		2011	2012	2013	2014	2015	2016	2017	2023
		Audited			Forecast				
Commercial									
Electricity sales	(GWh)	3,535	3,970	4,277	4,734	5,328	6,054	6,269	10,054
Average revenue per unit sold	(INR/kWh)	4.8	5.2	5.4	5.1	5.7	6.0	6.7	10.7
Average cost per unit sold	(INR/kWh)	6.2	6.0	5.9	5.9	6.1	6.3	6.5	9.5
Financial									
Revenue from sales	(INR m)	16,971	20,465	23,018	24,264	30,280	36,333	41,787	107,787
Operating expenses	(INR m)	19,288	23,107	23,399	24,638	28,892	33,627	35,991	86,068
Operating profit	(INR m)	(2,317)	(2,642)	(381)	(374)	1,388	2,706	5,795	21,720
Other expenses	(INR m)	1,349	(828)	(15)	909	1,068	1,277	1,463	3,657
Interest due	(INR m)	745	879	1,250	1,662	2,130	2,297	2,287	3,298
Depreciation & amortization	(INR m)	643	577	566	614	569	666	822	2,321
Other income	(INR m)	1,087	1,622	1,866	1,718	1,923	2,134	2,352	3,785
Net profit before tax	(INR m)	(4,859)	(4,076)	(4,181)	(5,437)	(4,252)	(3,496)	(782)	3,980
Capital expenditure	(INR m)	653	(466)	487	1,449	1,830	2,660	7,363	3,672
Operating cash flow	(INR m)	2,367	(1,414)	(5,294)	(539)	(886)	3,156	2,245	15,717
Investing cash flow	(INR m)	(5,057)	(3,405)	(4,466)	(7,150)	(6,542)	(3,655)	(2,680)	(2,375)
Financing cash flow	(INR m)	5,775	6,696	7,152	6,354	4,356	1,087	115	(491)
Net cash flow	(INR m)	3,085	1,877	(2,607)	(1,336)	(3,072)	588	(319)	12,851
Current assets	(INR m)	28,241	33,628	34,778	32,739	31,214	33,360	34,451	84,242
Fixed assets	(INR m)	23,614	26,732	30,976	37,513	43,390	46,284	48,047	49,572
Short term borrowings	(INR m)	328	308	374	-	-	-	-	-
Other current liabilities	(INR m)	22,099	28,872	29,980	32,273	34,392	39,544	40,778	78,720
Long term borrowings	(INR m)	3,708	3,193	7,939	13,085	16,012	15,280	14,707	19,425
Other non-current liabilities	(INR m)	7,250	8,314	9,632	10,005	10,649	11,370	12,180	20,219
Capital and reserves	(INR m)	18,472	19,674	17,830	14,889	13,551	13,449	14,833	15,451
Return on average net fixed assets		-46%	-37%	-34%	-44%	-23%	-11%	11%	22%
Debt-service coverage ratio		—	—	-4.24	-0.31	-0.32	0.99	0.68	3.37
Self-financing (3-yr average)		—	—	—	-56%	-54%	141%	45%	410%
Debt (LT) / Debt (LT)+Equity		60%	56%	76%	84%	85%	81%	78%	79%
Current ratio		1.26	1.15	1.15	1.01	0.91	0.84	0.84	1.07

GWh = gigawatt-hour, KWh = kilowatt-hour, LT = long term, yr = year, Prov = provisional year end results

1/ Selected years shown in projections.

2/ Revenue for FY2016 includes assumed true-up revenue arising from previous years' under-recovery of electricity purchase costs.

3/ DSCR does not take into account debt service arrears (interest and principal) on long-term borrowings from GoA.

Source: Company' annual reports and regulatory petitions, AERC determinations, and Asian Development Bank staff estimates.

SUMMARY POVERTY REDUCTION AND SOCIAL STRATEGY

Country:	IND	Project Title:	Assam Power Sector Enhancement Investment Program (Tranche-4)
Lending/Financing Modality:	Multitranche Financing Facility (MFF)	Department/ Division:	South Asia Department (SARD)/ Energy Division (SAEN)

I. POVERTY AND SOCIAL ANALYSIS AND STRATEGY

Targeting classification: General Intervention (GI)

A. Links to the National Poverty Reduction and Inclusive Growth Strategy and Country Partnership Strategy

The tranche-4 components are part of the overall road map and investment program supported by the MFF. The MFF was linked to country partnership strategy during its processing. Currently, the government has prepared a transmission and distribution investment plan for the 12th five-year period (FYP) for 2012 – 2017. The Government's power sector roadmap aims to achieve 100% village electrification by the end of the 12th FYP and attain 100% system access by 2020. The Electricity Act (2003) of India provides a comprehensive legal framework for implementing reforms in India and its states. ADB's strategy is closely aligned with India's strategy, in that both have a strong focus on infrastructure development, including energy and power sector development and reforms. Adequate electric power supply is essential for achieving sustainable economic growth. At state level, GOA introduced a power sector reform policy through Power Policy Statement (2003) highlighting the needs to (i) increase the financial viability of the sector; (ii) restructure the power utility companies; and (iii) promote private sector participation. To implement this policy framework, GOA formulated an investment program - Assam Power Sector Development Program (APSDP) - a sector reform program with transmission and distribution roadmap. ADB's CPS for 2013 - 2017 continues with the same approach by strengthening transmission and distribution networks to reduce technical and commercial losses and improve the financial health of state utilities; and second, by focusing on capacity issues.

B. Results from the Poverty and Social Analysis during PPTA or Due Diligence

1. Key poverty and social issues.

The impact of the Investment Program including tranche-4 components will be reliable access to energy in Assam. This will increase economic opportunities, including temporary jobs during project implementation and construction. The outcome will be increased adequacy reliability and efficiency of power system in Assam. The outputs include improved distribution network efficiency in Assam. Improved power supply and reliability contributes to improved social services, as hospitals, schools and other social utilities are often hardest hit by load shedding and poor power quality. Socially, regular and efficient power supply increases access to electronic media such as TV and radio, enabling more informed, meaningful choices and an enhanced understanding of civic affairs and duties. For economic growth, power sector development could support greater farm mechanization leading to greater agricultural yields, and could benefit the commercial and industrial sectors by promoting access to markets, skills training, entrepreneurship, and an increase in employment opportunities. With regular electrification, there would also be expansion and improvement in household and cottage industries. All these factors have a positive impact on alleviating and reducing poverty.

2. Beneficiaries.

Project beneficiaries are those that will directly benefit from a more reliable distribution network. The beneficiaries in tranche-4 components are existing consumers including the tea estates and tea estate workers. Therefore, no specific beneficiaries have been identified; however, it would have general positive impact of the people in Assam and local people in terms of providing some temporary job opportunities during project construction.

3. Impact channels.

The project has the capacity to indirectly improve the quality of life and well-being of beneficiaries in the project area by providing them with opportunities to increase their incomes through employment and alternative livelihoods. Also, stable electricity supplies promote business expansion and increased employment opportunities (specifically, the tea industry in this case), which can have a positive impact on reducing poverty. The tranche-4 components will bring direct and indirect positive social impacts. This will specifically benefit people living in remote areas through improved frequency and voltage levels for various uses which will ultimately result in socio-economic growth including possible employment opportunities for skilled and unskilled labor during construction. The improved distribution system will have positive impact by enhancing the target tea production with more reliable electric supply and will help in improving the living standard of tea estate workers.

4. Other social and poverty issues.

Assam ranks 16th in human development index according the Human Development Report 2011 (HDR-2011). The economy of Assam is overwhelmingly agricultural. The total cropped area according to 2010-2011 is 4.16 million

hectares (52.99% of total area) and the total net area sown is 2.81 million hectares (35.80% of total area). Around 19.7 percent of the State's population continues to live below the poverty line (as per the latest data available in HDR-2011), a figure considerably below the national average of 27.5 percent (2004-2005). A social analysis was conducted through sample socio-economic household surveys to prepare general socio-economic profile of the project areas. Economy pattern is largely farming, small scale business, and tea estates. Average family size is 5.06. Literacy rate is 89% which is higher compared to Assam's overall literacy rate of 72%. The main sources of drinking water in these villages are hand pump and water supply through PHE department. The main livelihood options for most of the workforce in the project area are agricultural activities and tea estate labor work. The average annual household income is INR 202,388 and the annual average expenditure per household is INR. 125,389. Approximately 89% of the households in the sub project area are electrified, but the average electricity supply is only 8.2 hours per day.

5. Design features.

The project has been classified as general intervention (GI) and is expected to have a positive impact on peoples accessing energy from the grid across the state/country, as well as peoples living in the direct area of influence of the project either in the way of jobs or increased economic growth and investment in the area. No critical/adverse impacts of an irreversible manner have been identified. No direct impact on poverty is envisaged to occur as result of the implementation of this Project. Nonetheless, the Project will have indirect positive impacts on both Assam and India as a whole.

C. Poverty Impact Analysis for Policy-Based Lending- Not Applicable (NA)

II. PARTICIPATION AND EMPOWERING THE POOR

1. Summarize the participatory approaches and the proposed project activities that strengthen inclusiveness and empowerment of the poor and vulnerable in project implementation.

Consultations were carried out with various stakeholders such as village community, local people, women's groups in the villages, representative of government officials, and EA during the due diligence activities. Stakeholders were informed about the new proposed project and the stream of information will continue during the implementation of the project.

2. If civil society has a specific role in the project, summarize the actions taken to ensure their participation.

The tranche-4 project is categorized as "B" for involuntary resettlement and "C" for indigenous peoples. Land acquisition is quite minimal with no physical displacement. Given the nature of the project, there is no pertinent role for civil society during implementation. Distribution enhancement projects are usually welcomed by the people and community in general.

3. Explain how the project ensures adequate participation of civil society organizations in project implementation.

Consultation will be continued with all stake holders including civil society during project implementation, otherwise, there is no such specific role of civil society foreseen for project implementation.

4. What forms of civil society organization participation is envisaged during project implementation?

[L] Information gathering and sharing [M] Consultation [N] Collaboration [N] Partnership

5. Will a project level participation plan be prepared to strengthen participation of civil society as interest holders for affected persons particularly the poor and vulnerable?

☐ Yes. ☒ No. This is a simple project with insignificant impact on land acquisition, IR, and IP.

III. GENDER AND DEVELOPMENT

Gender mainstreaming category: No Gender Elements

A. Key issues.

No particular issues are with respect to targeted gender benefits. Nonetheless, attempts will be made by the EA/IA and the construction contractor(s) to create job opportunities during construction with equal wage for men and women and additional compensation as vulnerable allowances in case of women headed households that may be affected in the future.

B. Key actions. The project will not have any targeted impact on women except some potential employment scope. However, as a part of social due diligence, focused group discussions were carried out among the women groups in the surrounding villages of the project to create awareness about the upcoming development activities.

☐ Gender action plan ☐ Other actions or measures ☒ No action or measure

IV. ADDRESSING SOCIAL SAFEGUARD ISSUES

A. Involuntary Resettlement **Safeguard Category:** ☐ A ☒ B ☐ C ☐ FI

1. Key impacts.

Land acquisition is minimal. Total land required for the proposed 20 new 33/11kV substations is 4.68 hectares (Ha) out of which 1.10 Ha is government land, 2.30 Ha of land is tea estate land and 1.28 Ha of land is private land. The total numbers of affected households (AH) are 6 who are considered to be economically displaced families and will be losing small portion of land without any physical displacement. Temporary impacts on loss of crops on the right of way of distribution lines are foreseen with minimum impacts.

2. Strategy to address the impacts.

A Resettlement Plan has been prepared for the tranche-4 distribution components. Also, the Resettlement Framework prepared during the MFF processing and approval has been updated and revised based on Government of India's new Land Acquisition Act, 2013. The Resettlement Framework is consistent with the India Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013, and the ADB *SPS 2009.*

3. Plan or other Actions.

☒ Resettlement plan
☒ Resettlement framework
☐ Environmental and social management system arrangement
☐ No action
☐ Combined resettlement and indigenous peoples plan
☐ Combined resettlement framework and indigenous peoples planning framework
☐ Social impact matrix

B. Indigenous Peoples **Safeguard Category:** ☐ A ☐ B ☒ C ☐ FI

1. Key impacts.

There will be no impact on Indigenous peoples. One Scheduled Tribe (ST) household will be affected due to acquisition of small portion of land. The affected ST household is mainstreamed and is willing to sell the land for cash. Construction activities will not have any impact on Indigenous Peoples or Scheduled Tribes of that area.

Is broad community support triggered? ☐ Yes ☒ No

2. Strategy to address the impacts.

No action is required for tranche-4 subproject since there will be no impact on IP. However, Indigenous Peoples Planning Framework has been prepared for the entire facility program which will include ttanche-4 also to address any likely issues, if any, during the implementation.

3. Plan or other actions.

☐ Indigenous peoples plan
☒ Indigenous peoples planning framework
☐ Environmental and social management system arrangement
☐ Social impact matrix
☐ No action
☐ Combined resettlement plan and indigenous peoples plan
☐ Combined resettlement framework and indigenous peoples planning framework
☐ Indigenous peoples plan elements integrated in project with a summary

V. ADDRESSING OTHER SOCIAL RISKS

A. Risks in the Labor Market

1. Relevance of the project for the country's or region's or sector's labor market.

[L] unemployment [L] underemployment [L] retrenchment [M] core labor standards

2. Labor market impact.

In general, there will be job opportunities for skilled and unskilled laborers during the construction period. The EA/IA will include specific provisions in its contractual agreements with construction contractors to ensure gender equality and compliance with labor standards.

B. Affordability

No particular issue is expected.

C. Communicable Diseases and Other Social Risks

1. Indicate the respective risks, if any

[L] Communicable diseases [L] Human trafficking [NA] Others (please specify) _____

2. Describe the related risks of the project on people in project area.

Provisions will be taken to prevent / minimize impacts. Where and if necessary, the project will be expected to take specific action to inform, educate and prevent workers from contracting and the spread of HIV/AIDs. A no tolerance policy on human trafficking, child labor, among other issues, is expected.

VI. MONITORING AND EVALUATION

1. Targets and indicators:

Target indicators would be general in nature such as (i) number of employment or jobs generated during project construction for unskilled, semi-skilled and skilled labor, (ii) number of people compensated for land and crops etc.

2. Required human resources:

PMU staff, PIU staff and Project Management Consultant staff. However, these are already available as this is a tranche-4 loan and the institutions/staff will be responsible for its implementation.

3. Information in PAM:

Explain what information the project review, monitoring, and completion reports included in the PAM.
Safeguards, gender, Health, Labor etc.

4. Monitoring tools:

The impact is negligible. Hence, no impact is seen during the implementation except for submitting the standard semiannual monitoring report on safeguards by the EA/IA to ADB.

INITIAL ENVIRONMENT EXAMINATION

Provided as a separate attachment and accessible via the following link:

http://www.adb.org/sites/default/files/projdocs/2014/41614-036-iee-01.pdf

RESETTLEMENT PLAN

Provided as a separate attachment and accessible via the following link:

http://www.adb.org/sites/default/files/projdocs/2014/41614-036-rp-01.pdf

RISK ASSESSMENT AND RISK MANAGEMENT PLAN

Risk Description	Risk Assessment	Mitigation Measures or Risk Management Plan
Public Financial Management		
Poor financial management capacity of EA is a risk to the project	Medium	The new MFF included number of measures including training and capacity building, preparation of accounting manuals, introduction of computerized management system and undertaking and assurances to improve financial management.
Consumer tariff rates do not increase adequately to meet the revenue requirements	Medium	Tranche 4 targets high-value commercial consumers who account for the bulk of APDCL's revenue. These consumers regularly pay the power bills and cost recovery is generally achieved for these consumers.
Poor financial health of APDCL	Medium	ADB will start high level policy dialogue with the GOA to restore the financial shape of the company. Concrete measures such as compete financial restructuring and revision of on-lending agreement between the Borrower and the EA will be offered.
Governance		
Delays in the acquisition of land	Low	Land acquisition has been minimized by design. About 60% of required land has already been secured. Assurances on land acquisition are also included in the loan documentation.
Possible delays in mobilizing counterpart funds	Low	GOA and APDCL have provided assurances on the timely provision of counterpart funding
Procurement		
Delays in procurement and contract awards	Low	Procurement processes are in advanced stage
Others		
Increase in raw material prices resulting in increase of project costs	Low	The capital expenditure estimates are benchmarked to recent projects in India. Project cost estimates use a lower exchange rate than the existed rate.
Power generation capacity does not expand to meet demand growth	Medium	A multitranche financing facility for Assam was approved in July 2014 which provides funding for 210 MW of new generation capacity. Assam will also receive 990 MW of power from the new centrally owned power stations in north –east region.
Overall	**Low**	

MFF=Multitranche Financing Facility, EA=Executing Agency, APDCL=Assam Power Distribution Company Limited, GOA=Government of Assam
Source: Asian Development Bank

CONTRIBUTION TO THE ADB RESULTS FRAMEWORK – TRANCHE 4

No.	Results Framework Indicators	Targets	Methods / Comments
1	Distribution lines installed and upgraded (km)	1,207	Measured on physical construction

ADB = Asian Development Bank; km = kilometer.
Source: Asian Development Bank estimates.