Report and Recommendation of the President to the Board of Directors

Project Number: 47101
June 2014

Proposed Multitranche Financing Facility
India: Assam Power Sector Investment Program

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 23 May 2014)

Currency unit	–	Indian rupee/s (Re/Rs)
Re1.00	–	$0.017
$1.00	–	Rs58.82

ABBREVIATIONS

ADB	–	Asian Development Bank
AEGC	–	Assam Electricity Grid Corporation
AERC	–	Assam Electricity Regulatory Commission
APDC	–	Assam Power Distribution Company
APGC	–	Assam Power Generation Corporation
ASEB	–	Assam State Electricity Board
CEA	–	Central Electricity Authority
EMP	–	environmental management plan
ERP	–	enterprise resource planning
GOA	–	Government of Assam
IPP	–	indigenous peoples plan
IPPF	–	indigenous peoples planning framework
MFF	–	multitranche financing facility
PIU	–	project implementation unit
PMU	–	project management unit
SPS	–	Safeguard Policy Statement

WEIGHTS AND MEASURES

GWh	–	gigawatt-hour
km	–	kilometer
kV	–	kilovolt
kWh	–	kilowatt-hour
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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INVESTMENT PROGRAM[a] AT A GLANCE

1. Basic Data				**Project Number:** 47101-001
Project Name	Assam Power Sector Investment Program	**Department /Division**	SARD/SAEN	
Country	India	**Executing Agency**	Assam Power Distribution Company, Assam Power Generation Corporation, State of Assam	
Borrower	India			

2. Sector	**Subsector(s)**		**ADB Financing ($ million)**
✓ **Energy**	Conventional energy generation		250.00
	Electricity transmission and distribution		50.00
		Total	**300.00**

3. Strategic Agenda	**Subcomponents**	**Climate Change Information**	
Inclusive economic growth	Pillar 1: Economic opportunities, including jobs, created and expanded	Mitigation ($ million)	250.00
		CO_2 reduction (tons per annum)	534,000
Environmentally sustainable growth	Global and regional transboundary environmental concerns	Climate Change impact on the Project	High
	Natural resources conservation		
4. Drivers of Change	**Components**	**Gender Equity and Mainstreaming**	
Governance and capacity development	Organizational development	No gender elements (NGE)	✓
	Public financial governance		
5. Poverty Targeting		**Location Impact**	
Project directly targets poverty	No	Rural	Medium
		Urban	High
6. Risk Categorization:	Complex		
7. Safeguard Categorization	No Safeguards Categorization Available		

8. Financing

Modality and Sources	Indicative Tranches ($million)			Amount ($ million)
	I	II	III	
ADB				**300.00**
Sovereign MFF-Tranche (Loan): Ordinary capital resources	50.00	50.00	200.00	300.00
Cofinancing				**0.00**
None				
Counterpart				**130.00**
Government	12.00	12.00	106.00	130.00
Total	**62.00**	**62.00**	**306.00**	**430.00**

9. Effective Development Cooperation

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

10. Country Operations Business Plan

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

11. Investment Program Summary

The Assam Power Sector Investment Program (the Program) is a Multitranche Financing Facility (MFF) to fund the generation capacity enhancement and distribution efficiency improvement subprojects in the state of Assam, India. The objective of the investment program is to achieve adequate power supply in Assam. The Program will be for an amount of $300 million with the Tranche 1 expected for up to $50 million. Tranche 1 investment components will be for: (i) replacement of 60 MW, less effieicnt gas turbine generators in Lakwa with 70 MW, new and efficient plant; (ii) implementation and capacity building supports to Assam Power Generation Company (APGC) and Assam Power Distribution Corporation (APDC). Future tranches include construction of 120 MW hydropower project and distribution efficiency improvement projects in urban Assam.

Impact and Outcome: The impact (of the facility) is increased availability of electricity in Assam.

The outcome (of the facility) is increased capacity and efficiency of energy generation and distribution systems in Assam.

Outputs: (i) Generation system upgraded and expanded,(ii) Distribution system upgraded and expanded,(iii) Institutional capacity of APGC & APDC strengthened,(iv) Project management system in place.

Implementation Arrangements: Assam Power Distribution Company, Assam Power Generation Corporation, State of Assam will be the executing agency/ies.

Project Readiness: Loan negotiations completed on 13 May 2014. Counterpart funding has been approved by the government. Environmental clearances and other government clearances have been obtained. No land clearances are required, for Tranche 1. Procurement has been initiated under advance contracting. All the contract packages for civil work and consultants have been advertised. Bid evaluation is in progress.

12. Milestones

Modality	Estimated Approval	Estimated Completion[b]
Multitranche financing facility	2014 July 3	2024 June 30
Tranche I	2014 July 7	2018 December 31
Tranche II	2015 August 27	2020 December 31
Tranche III	2016 August 31	2023 December 31

13. Linked Documents

PDS[c]	http://www.adb.org/projects/47101-001/main

[a] Multitranche Financing Facility (MFF).
[b] For MFF, this refers to the end of the availability period; for tranches, this refers to the tranche closing date.
[c] Safeguard documents can be viewed by clicking the Document's hyperlink in the Project Data Sheet (PDS) page.

I. THE PROPOSAL

1. I submit for your approval the following report and recommendation on a proposed multitranche financing facility (MFF) to India for the Assam Power Sector Investment Program.[1]

2. The proposed investment program will finance a portion of the power sector investment plan for generation and distribution of the Government of Assam (GOA).[2] The investment program objectives are to increase capacity and efficiency of power generation and distribution systems in the State of Assam to reduce load shedding and meet growing demand. The investment components include the construction of two power generation projects with total new capacity of 190 megawatts (MW), and installation of critical distribution assets in selected urban areas of Assam. The physical infrastructure development will be complemented with a capacity development component.

II. THE INVESTMENT PROGRAM

A. Rationale

3. **Sector overview.** Assam's power sector faces serious challenges: about 37% of households have access to electricity with about 5–6 hours of power cuts per day. In fiscal year (FY) 2012, peak demand for power was 1,250 MW against available supply of 960 MW, indicating a shortfall of 23%. Only about 30% of the state's 700 tea gardens—one of the mainstays of the Assam economy—are supplied with grid electricity. The remainder use natural gas for tea manufacturing; the gas supply is erratic. On the supply side, Assam is heavily dependent on power imports from other states, with only about 25% of demand currently met by in-state generation. During peak periods, Assam is forced to purchase as much as 15% of its power requirement from independent power producers at very high cost. The poor financial performance of the state's power companies imposes a burden on the economy. Demand for power is projected to increase to 2,200 MW by FY2020. Major investments in power generation are required to increase capacity and meet the growing demand.

4. The state's power distribution company, Assam Power Distribution Company (APDC), has had some success in reducing losses: distribution losses decreased from 40% in FY2001 to 24% in FY2012. However, loss reduction has stagnated due to the provision of new power connections without system upgrades, inadequate investment, and poor management practices. APDC's inability to meet the loss reduction targets approved by the Assam Electricity Regulatory Commission (AERC) has resulted in revenue shortfalls. APDC has petitioned for a distribution loss allowance of 23% for FY2014 and 22% for FY2016. Achieving these targets requires capital investment and improvements in distribution system management.

5. The state's power companies, Assam Power Generation Corporation (APGC) and APDC, do not have sufficient cash flow to meet debt service obligations, invest in their capital assets, and build staff capacity. The broader economic implications of the poorly performing power sector include curtailed competitiveness and productivity, fewer job opportunities, reduced private sector investment, and inefficient use of resources. Supply deficits force consumers to

[1] The design and monitoring framework is in Appendix 1.
[2] The investment program was prepared under Asian Development Bank. 2009. *Cluster Technical Assistance to India for Advanced Project Preparedness for Poverty Reduction*. Manila.

use more expensive, less-efficient, and more polluting energy sources, such as smaller diesel generators.

6. **Policy framework.** The Electricity Act of India (2003) enabled unbundling of the state power utilities, separating generation, transmission, and distribution functions. The act enabled the establishment of state and national regulatory agencies, opened access to transmission networks, and promoted competition in the electricity industry. The National Electricity Policy (2005) enabled setting targets to increase availability, eliminate power shortages, and define lifeline consumption to ensure profitability of power entities. The Rural Electrification Policy (2006) includes provisions for accelerated rural electrification in India through grid and off-grid electrification and innovative financing and operating mechanisms. The 12th Five Year Plan, (FY2012–FY2017) stresses the need to invest in renewable energy and frontier technologies.[3]

7. In 2003, GOA introduced a power policy statement, highlighting the need to (i) ensure commercial orientation, efficiency, and financial viability of the power sector; (ii) carry out technical, managerial, and administrative restructuring of power utilities; (iii) increase the number of power utilities in the state; and (iv) promote private sector participation in the power sector. In implementing this policy framework, GOA unbundled the Assam State Electricity Board (ASEB) into three companies: APGC, Assam Electricity Grid Corporation (AEGC), and APDC.[4] AERC oversees the regulatory aspects of the sector.

8. **Sector road map.** GOA prepared a power sector master plan with Asian Development Bank (ADB) assistance[5] for the 12th (FY2012–FY2017) and 13th (FY2017–FY2022) planning periods. Objectives are to (i) achieve universal access to electricity by 2022, (ii) improve quality and reliability of power supply, and (iii) remove power sector constraints to improve the state's economy. The master plan includes a sector road map, including a generation plan, a transmission plan, and a distribution plan, with a total cost of about $3.5 billion. According to the plan, the state's generation capacity will be increased from 365 MW (as of May 2013) to 1,410 MW by March 2022. The total cost of this capacity addition is estimated to be $1.2 billion. In addition, the northeast region of India is to increase generation capacity by 3,636 MW during the 12th Five Year Plan period. Assam expects to access its share of about 990 MW from the central generating stations to help meet the state's growing demand.

9. The transmission plan of the road map envisages constructing 88 transmission substations, and about 4,800 circuit-kilometers (km) of transmission lines. The estimated cost of the transmission plan is about $1.1 billion. The distribution plan envisages building 265 distribution substations and 63,500 circuit-km of distribution lines to provide about 7.1 million new power connections at a cost of about $1.1 billion. Loss reduction remains a key focus of GOA's sector road map: it aims to reduce total losses to 19% (comprising 15% distribution loss and 4% transmission loss)[6] by FY2017. The road map includes institutional strengthening initiatives for improved construction supervision capacity, enhanced management of ongoing projects, improved financial management systems, and a fully computerized management system.

[3] Government of India, Planning Commission. 2013. *Twelfth Five Year Plan, 2012–2017*. Delhi.
[4] ASEB was formally dissolved in 2013.
[5] ADB. 2012. *Cluster Technical Assistance for India for Advanced Project Preparedness for Poverty Reduction: Updating Load Forecast and Power System Master Plan for Assam*. Manila.
[6] Data is not available to separate the total distribution losses into technical and nontechnical losses.

Table 1: Assam Power Sector Investment Plan (2012–2022)

	Government of Assam Investment Fund Requirements ($ million)			
Fiscal Year	**APGC** (Generation)	**AEGC** (Transmission)	**APDC** (Distribution)	**Total**[a]
2012 (actual)	20.17	21.45	13.47	55.09
2013	62.15	181.92	30.81	274.88
2014	157.53	70.83	158.41	386.77
2015	221.29	33.60	139.46	394.35
2016	410.76	332.92	143.06	886.74
2017/2022	346.79	492.39	637.27	1476.45
Total	**1,218.69**	**1,133.11**	**1,122.48**	**3,474.29**

AEGC = Assam Electricity Grid Corporation, APDC = Assam Power Distribution Company, APGC = Assam Power Generation Corporation.

[a] Generation plus transmission plus distribution.

Source: Government of Assam. 2014. *Assam Power Sector Master Plan.* Assam.

10. **Strategic context**. Since 2003, ADB has supported the Assam power sector with five loans totaling $450 million for sector reforms, and transmission and distribution improvements.[7] The power sector master plan and associated sector road map are consistent with the development goals and strategies of the central government and ADB. The government's 12th Five Year Plan continues its 11th Five Year Plan's infrastructure investment imperative, and includes expanded use of renewable energy resources to increase energy availability in the country. The investment program is consistent with ADB's country partnership strategy, 2013–2017 for India, which envisages expansion, improvement, and better management of energy systems through renewable energy development, transmission and distribution system improvement, and institutional strengthening.[8] The investment program contributes to achieving ADB's Energy Policy objectives of promoting energy efficiency and renewable energy, access to energy for all, and capacity building and governance.[9]

11. **Investment program.** The total investment requirement for Assam's power sector for FY2012–FY2022 is about $3.5 billion. The investment program selected a portion of the total requirement, considering the priority needs. At $430 million, the investment program represents approximately 12% of the overall investment requirement of the Assam power sector. It will finance investments for physical infrastructure development to (i) augment in-state generation capacity through the replacement of a less-efficient gas-fired generating plant at Lakwa and construction of a new hydropower plant at Lower Kopili; and (ii) continue to address distribution loss reduction and efficiency improvement through renovation and modernization of the distribution system. The program will also finance nonphysical components to achieve long-term institutional and financial sustainability of the power utilities.

12. Major lessons from previous ADB interventions in Assam are incorporated in the program design and include the need for (i) connectivity of the Assam grid to the northeast region, (ii) capacity building for power companies, (iii) continuous efforts to reduce losses, (iv) increased in-state power generation capacity, and (v) strengthening of the Assam regulatory agency. ADB's ongoing investment program in Assam invests mainly in improving connectivity

[7] ADB. 2003. *Report and Recommendation of the President to the Board of Directors: Proposed Loans and Technical Assistance Grants for the Assam Power Sector Development Program*. Manila. ($250 million, loans 2036-IND and 2037-IND); and ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Technical Assistance Grant for the Assam Power Sector Enhancement Investment Program*. Manila ($200 million, loans 2592-IND, 2677-IND, and 2800-IND).

[8] ADB. 2013. *Country Partnership Strategy: India, 2013–2017.* Manila.

[9] ADB. 2009. *Energy Policy.* Manila.

with the northeastern region and some improvements in the distribution system. The proposed investment program complements ongoing assistance by focusing mainly on generation and capacity building.[10]

13. **Multitranche financing facility.** The weak capacity of power institutions in Assam requires long-term engagement in the sector to help achieve its long-term objective: universal access to power. The MFF is the most suitable funding modality to support the investment program. First, it frontloads a major share of the analytical work, and then blends physical with nonphysical investments for better development impacts than any other available modality. Second, the MFF modality provides up-front support for GOA's substantial investment plan with financial commitments sequenced to match project readiness, allowing the executing agencies and ADB to dedicate more resources to project implementation. Third, the MFF modality supports high project readiness (such as design work and safeguard plans being executed up front) and offers critical mass, continuity, and predictability in relation to funding. Finally, all the basic preconditions for the use of an MFF are in place, including a sound policy framework and road map, well-designed investment and financing plans, an agreement on the treatment of safeguard policies and procedures, and a financial management and governance framework.

B. Impact and Outcome

14. The investment program's impact will be increased availability of electricity in Assam. The outcome will be increased capacity and efficiency of energy generation and distribution systems in Assam.

C. Outputs

15. The investment program will have three outputs: (i) upgraded and expanded generation system, (ii) upgraded and expanded distribution system, and (iii) strengthened institutional capacity of APGC and APDC. Output 1 includes (i) replacement of less-efficient and old open-gas-cycle turbines with more efficient reciprocating internal combustion gas engines with 70 MW capacity; and (ii) construction of a hydropower plant with 120 MW capacity. Output 2 includes construction or upgrading of 30 33/11 kilovolt (kV) substations and about 100 km of 11 kV distribution lines. Output 3 has three major subcomponents: (i) project preparation and implementation support, (ii) enterprise resource planning (ERP) support, and (iii) capacity building and training. Project preparatory support will be provided for the Lower Kopili hydropower plant under tranche 3 of the MFF, and implementation support will be provided for the Lakwa Gas Power Plant Project under tranche 1. ERP support includes hardware and software components to introduce a computerized management system for APGC under tranche 1. Capacity building and training will be provided for financial management, accounting and auditing, project management, procurement, monitoring and evaluation, human resource management, demand-side management, and social and environment safeguards. Tranche 1 will finance Lakwa power plant replacement and institutional capacity strengthening.

[10] ADB. 2009. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility and Technical Assistance Grant for the Assam Power Sector Enhancement Investment Program*. Manila ($200 million, loans 2592-IND, 2677-IND, and 2800-IND).

D. Investment and Financing Plans

16. The investment program is estimated to cost $430 million (Table 2). The government has requested an MFF in an amount up to $300 million from ADB's ordinary capital resources to help finance a part of the investment program. The MFF will comprise three tranches, subject to the government's submission of related periodic financing requests, execution of the related loan and project agreements for each tranche, and fulfillment of terms and conditions and undertakings set forth in the framework financing agreement. The first tranche of the MFF 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,[11] a commitment charge of 0.15% per year, and such other terms and conditions set forth in the draft loan and project agreements.

Table 2: Investment Program ($ million)

Item	Investment Program	Tranche 1 (2014)	Tranche 2 (2015)	Tranche 3 (2016)
A. Base Cost[a]				
1. Lakwa power plant	46.0	46.0	0.0	0.0
2. Capacity strengthening	5.0	5.0	0.0	0.0
3. Upgrading and expansion of distribution system	50.0	0.0	50.0	0.0
4. Lower Kopili hydropower station	239.7	0.0	0.0	239.7
Subtotal (A)	**340.7**	**51.0**	**50.0**	**239.7**
B. Contingencies[b]	58.0	10.2	10.0	37.7
C. Financing Charges during Implementation[c]	31.3	0.8	2.0	28.6
Total (A+B+C)	**430.0**	**62.0**	**62.0**	**306.0**

[a] In mid-2013 prices. Includes taxes and duties of about $14 million to be financed from government resources.
[b] Physical contingencies computed at 8.8% of base costs for tranche 1, 5% for tranche 2, and 3% for tranche 3. Price contingency computed using forecasts of international (1.5%) and domestic inflation (8.3%) by the Asian Development Bank (ADB).
[c] Includes interest and commitment charges. Interest during construction for ADB loan(s) has been computed at the 5-year forward London interbank offered rate plus a spread of 0.2%. Commitment charges for an ADB loan are 0.15% per year to be charged on the undisbursed loan amount.
Source: Asian Development Bank estimates.

17. The financing plan is in Table 3.

Table 3: Financing Plan

	Investment Program Funding ($ million)							
Item	Tranche 1 (2014)	Share (%)	Tranche 2 (2015)	Share (%)	Tranche 3 (2016)	Share (%)	Total	Share (%)
ADB (OCR loan)	50.0	80.6	50.0	80.6	200.0	65.4	**300.0**	**69.8**
Government of Assam	12.0	19.4	12.0	19.4	106.0	34.6	**130.0**	**30.2**
Total	**62.0**	**100.0**	**62.0**	**100.0**	**306.0**	**100.0**	**430.0**	**100.0**

ADB = Asian Development Bank, OCR = ordinary capital resources.
Source: Asian Development Bank estimates.

[11] 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.

E. Implementation Arrangements

18. The State of Assam, APGC, and APDC will serve as the executing agencies, and be responsible for the overall investment program. APGC will be the executing agency for generation projects under tranches 1 and 3, and APDC will be the executing agency for tranche 2. The APDC and APGC chairpersons, along with the secretary of the Department of Power, GOA, will co-chair the steering committee—the oversight body of the investment program. A project management unit (PMU) under the APGC, APDC, and AEGC chairs, headed by a project director, is already functioning. APGC has established a project implementation unit (PIU) for the generation projects under the MFF, and APDC has an established PIU for the distribution component. The implementation arrangements are summarized in Table 4 and described in detail in the facility administration manual.[12]

Table 4: Implementation Arrangements

Aspects	**Arrangements**		
Implementation period	1 September 2014–31 December 2023 (for the MFF) 1 September 2014–31 December 2018 (for project 1)		
Estimated completion date	31 December 2023 (for the MFF) 31 December 2018 (for project 1)		
Management			
(i) Oversight body	Steering Committee, chaired by the chairpersons of APDC and APGC along with the secretary of the Department of Power, GOA Managing directors of APGC, APDC, and AEGC as members.		
(ii) Executing agencies	State of Assam, APGC, and APDC		
(iii) Project management unit	The PMU includes full-time staff for design, procurement, supervision, monitoring, and reporting. The PIU at APGC is established with 17 staff and at APDC with 9 staff.		
Procurement (tranche 1)	International competitive bidding	1 contract package	$44 million
Consulting Services (tranche 1)	Quality- and cost-based selection	5 packages (consulting services)	$4 million
	Individual	132 person-months (120 national and 12 international) for three contracts	$1 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, AEGC = Assam Electricity Grid Corporation, APDC = Assam Power Distribution Company, APGC = Assam Power Generation Corporation, GOA = Government of Assam, MFF = multitranche financing facility, PIU = project implementation unit, PMU = project management unit.
Source: Asian Development Bank.

19. Goods, equipment, and civil works to be financed under the investment program will be procured in accordance with ADB's Procurement Guidelines (2013, as amended from time to time). International competitive bidding will be used for civil works and turnkey contracts, with national competitive bidding used for contracts for goods and equipment estimated to cost less than $1.0 million. Advanced contracting and/or retroactive financing are envisaged. The consultants will be selected in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time).

[12] Facility Administration Manual (accessible from the list of linked documents in Appendix 2).

III. DUE DILIGENCE

20. APGC, APDC, AERC, and the Central Electricity Authority examined potential projects under the investment program. These assessments covered technical, economic, financial, and safeguard matters. ADB conducted its own independent due diligence on the potential projects, including climate risk assessments.[13]

A. Technical

21. APGC and ADB conducted detailed studies to identify the best technology for a gas-fired power plant in the tranche 1 project. These studies recommend an internal combustion gas engine plant. The gas supply to Lakwa is erratic because the gas supplied is associate gas from oil production. The internal combustion engine can maintain high plant efficiency and better plant gross heat rate with erratic gas supplies. Similar analyses of projects proposed under tranches 2 and 3 will be undertaken. Preliminary assessment of climate change risks of the hydropower subproject in tranche 3 shows that such risks would be minimal, as climate change may not significantly impact the overall monsoon potential.

B. Economic and Financial

22. The investment program will benefit about 2.76 million electricity consumers by reducing load shedding. It will enable many households and business establishments to improve their economic, commercial, educational, and entertainment opportunities. The generation projects will strengthen APDC's financial position by avoiding the purchase of expensive power from independent power producers. The economic viability of the tranche 1 investment is confirmed through a cost–benefit analysis conducted using ADB guidelines for economic analysis. The tranche 1 project replaces gas turbines that are at the end of their economic lifespan and expensive to operate. The economic benefits of this replacement will accrue primarily as a consequence of reduced gas consumption at the generating plant from improved technical efficiency. In addition, incremental power generation will result from the additional 10 MW capacity. The run-of-the-river type hydropower plant under tranche 3 provides additional benefits of avoided carbon dioxide emissions (534,000 tons per annum)[14] and avoided local air pollution. Economic analysis uses only the benefits of gas savings from the tranche 1 project. With this conservative assumption, the economic internal rate of return of the gas power plant replacement is estimated to be 17.3%. Sensitivity analysis and switching values show that the tranche 1 project's economic benefits are stable against the major risk factors.

23. Assessment of the financial viability of the tranche 1 project used ADB guidelines. Incremental cash flow accruing to APGC from the tranche 1 investment is considered as the financial benefit of the project. The project has an estimated financial internal rate of return of 5.5% (post-tax real) against a weighted average cost of capital of 2.7%.[15] Sensitivity analysis shows that the financial internal rate of return is robust against cost increases and project implementation delays. However, it is sensitive to power output decrease. Gas supply, one of the main determinants of tranche 1 outputs, should be assured to reduce the risk of decreased output.

[13] Climate Change: Project Adaptation Action Report (accessible from the list of linked documents in Appendix 2).
[14] ADB estimated the carbon emission reduction.
[15] Financial Analysis (accessible from the list of linked documents in Appendix 2).

C. Governance

24. The governance risks for APGC and APDC, including their financial management and procurement capacities, were assessed. The accounting, financial management, and internal audit functions in both entities, especially APGC, are noted to be weak. Overall, financial management risk is assessed as high. The financial management risk mitigation includes (i) the capacity building component of the investment program, which specifically targets the weaknesses of the utilities' financial management; (ii) implementation of time-bound action plans provided by APGC and APDC to address major financial management shortcomings highlighted by the statutory auditors; (iii) specific covenants on financial management aspects in the loan agreements; and (iv) use of the direct payment method to expedite disbursement and ease the administrative burden imposed on APDC and APGC. APGC has a contract and awards department. Currently, the PMU handles procurement; it has four qualified staff who have received procurement capacity training from ADB.

25. Consistent with its commitment to good governance, accountability, and transparency, ADB reserves the right to examine and review directly any alleged corrupt, fraudulent, collusive, or coercive practices relating to the MFF and the projects. To support these efforts, relevant provisions of ADB's Anticorruption Policy (1998, as amended to date) were explained to and discussed with the government, GOA, APGC, and APDC. Specific policy requirements and supplementary measures are described in the facility administration manual (footnote 12).

D. Poverty and Social

26. The social assessment notes that 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. A reliable and adequate electricity supply improves living conditions, promotes business expansion, and increases employment opportunities, which will have a positive impact on poverty reduction. A good quality, reliable electricity supply is important in meeting the basic human needs of health and education. Poor and vulnerable consumers, as well as public institutions such as public hospitals and schools, are often particularly disadvantaged by an inadequate power supply, load shedding, and poor power quality. They will therefore benefit directly from projects under the MFF. Tranche 1 is classified as having no gender elements; tranche 2 may have opportunities for gender mainstreaming. The loan agreement includes a standard assurance related to core labor standards for contractors (including equal pay for equal types of work), and an awareness program on HIV/AIDS and sexually transmitted diseases.

E. Safeguards

27. An environment assessment and review framework, a resettlement framework, and an indigenous peoples planning framework (IPPF) were prepared, outlining the environment and social safeguard principles and requirements.[16] APGC and APDC will undertake environmental and social safeguard due diligence on individual projects under the MFF, and submit semiannual reports on the implementation of the environmental management plans (EMPs) and, if required, the resettlement plans and indigenous peoples plans (IPPs).

[16] Environmental Assessment and Review Framework, Resettlement Framework, and Indigenous Peoples Planning Framework (accessible from the list of linked documents in Appendix 2).

28. **Environment (category B).** The tranche 1 project is categorized B for environment. The ADB project preparatory team prepared an initial environmental examination (IEE) report, incorporating procedures for disposal of the obsolete plant, an EMP for disposal, cost estimates for the EMP, and a grievance redress mechanism. APGC and the ADB project preparatory team undertook public consultations as per ADB's Safeguard Policy Statement (SPS, 2009).[17] The gas power plant replacement project is not located in the vicinity of any environmentally sensitive areas. No significant air, water, noise, or soil pollution will result from replacement of the old plant. The potential adverse environmental impacts due to the project are envisaged to be minimal. Any adverse impacts can be readily mitigated using standard engineering and environmental practices incorporated in the EMP. The IEE for the tranche 1 project was disclosed on the ADB and APGC websites. Tranche 2 (upgrading of power distribution system) is likely to be environment category B and tranche 3 (hydropower plant) is likely to be category A.

29. **Involuntary resettlement (category C).** The tranche 1 project is categorized C for resettlement impacts in accordance with the SPS. The proposed replacement of the existing 60 MW plant will be undertaken within the existing premises of the Lakwa thermal power station complex, utilizing the vacant 2.9 hectares available within the complex. No additional land is required, and hence, no involuntary resettlement impacts are envisioned. Therefore, no resettlement plan is required for tranche 1; a social due diligence report was prepared. Tranche 2 is likely to be category B for involuntary resettlement and tranche 3 likely category A due to the hydropower plant with an estimated 26 families to be physically displaced. A resettlement framework was prepared in accordance with national and state laws and policies and the SPS, and disclosed on the ADB website.

30. **Indigenous peoples (category C).** The impacts of the tranche 1 project on indigenous peoples are classified as category C. An IPPF was prepared in accordance with national and state laws and policies and the SPS, and disclosed on the ADB website. Social assessments conducted during project preparation did not find any indigenous peoples who would be impacted by tranche 1 project activities. If any project impact on indigenous peoples is found during project implementation, project authorities will formulate an IPP in accordance with the IPPF. The project authorities will submit the IPP to ADB for review and approval. If future tranche for hydropower impact indigenous peoples or tribes, a standalone IPP or a combined resettlement plan and IPP will be prepared in accordance with the IPPF.

F. Risks and Mitigating Measures

31. Major risks and mitigating measures are summarized in Table 5 and described in detail in the risk assessment and risk management plan.[18] The integrated benefits and impacts of the investment program are expected to outweigh the costs of the risk mitigating measures.

Table 5: Summary of Risks and Mitigating Measures

Risks	Mitigating Measures
Weak financial management systems, internal audit procedures, and asset accounting and management; and noncompliance with key financial management and	The executing agencies prepared time-bound action plans to rectify financing management issues. Asset management issues will be resolved with

[17] The IEE meets all requirements of the SPS (2009). The environment audit (scoping) for the existing and the proposed plants conducted by government agencies is in accordance with ADB's SPS. ADB. 2008. Safeguard Policy Statement. *Operations Manual*. OM F1/BP. Manila.

[18] Risk Assessment and Risk Management Plan (accessible from the list of linked documents in Appendix 2).

Risks	Mitigating Measures
auditing requirements	implementation of the asset module of the enterprise resource planning system. Specific covenants and undertakings are incorporated in the project documents.
The geological risks for the Lower Kopili hydropower project for tranche 3 may affect performance of the tranche 3 subproject.	Extra geological investigations and field testing will be undertaken to design necessary mitigation measures.
Acidic river water may cause damage to turbines reducing the lifespan of the Lower Kopili hydropower project under tranche 3.	The design features of the turbines and associated infrastructure, including dam structure, will be modified to ensure longevity of the hydropower plant.
Delay in construction of the evacuation transmission line from the Lower Kopili hydropower power plant up to the pooling center may cause capacity underutilization of the plant.	The evacuation transmission line is included as an integral part of the hydropower project. APGC will coordinate with AEGC in constructing the evacuation line.
Lack of long-term gas supply, resulting in unused capacity of the new generation plant at Lakwa, may cause the tranche 1 project to be not financially viable.	The proposed plant will be used as a peaking plant. APGC has entered into a medium-term gas purchasing agreement and is working to enter into a long-term gas supply framework with Oil India and Gas Authority of India.
Lack of community support due to social safeguard issues in the project-affected area may cause delays in project approval and project implementation for tranche 3.	Baseline social studies and extensive consultations will be conducted in the project-affected areas. A social impact assessment and community development plan will be prepared and implemented to minimize this risk.

AEGC = Assam Electricity Grid Corporation, APGC = Assam Power Generation Corporation.
Source: Asian Development Bank.

IV. ASSURANCES AND CONDITIONS

32. The Government of India, GOA, APGC, and APDC have assured ADB that implementation of the projects under the MFF shall conform to all applicable ADB policies, including those concerning anticorruption measures, safeguards, gender, procurement, consulting services, and disbursement as described in detail in the facility administration manual and loan documents.

33. The Government of India, GOA, APGC, and APDC have given ADB certain undertakings for the MFF, which are set forth in the framework financing agreement. Specific covenants agreed by the government, GOA, APGC, and APDC, as applicable, with respect to individual tranches under the MFF are set forth in the loan and project agreements for the respective tranches.

V. RECOMMENDATION

34. I am satisfied that the proposed multitranche financing facility would comply with the Articles of Agreement of the Asian Development Bank (ADB) and recommend that the Board approve the provision of loans under the multitranche financing facility in an aggregate principal amount not exceeding $300,000,000 to India for the Assam Power Sector Investment Program, from ADB's ordinary capital resources, with interest to be determined in accordance with ADB's London interbank offered rate (LIBOR)-based lending facility, and such other terms and conditions as are substantially in accordance with those set forth in the framework financing agreement presented to the Board.

Takehiko Nakao
President

10 June 2014

DESIGN AND MONITORING FRAMEWORK FOR THE INVESTMENT PROGRAM

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Increased availability of electricity in Assam	By 2027: load shedding in the state reduced to zero (Baseline 2013: up to 5–6 hours/day)	CEA and MOP publications	**Assumption** Proposed central generating station (northeast and eastern region) and independent power producer projects are commissioned as planned. **Risk** Increase in fuel prices due to international market conditions and inability of APDC to purchase sufficient power to meet the demand.
Outcome Increased capacity and efficiency of energy generation and distribution systems in Assam	By 2024: Energy generation increased by 962 GWh/year Distribution losses reduced to 15% (Baseline 2012: 25%)	For all indicators: APGC and APDC annual reports, and CEA and MOP statistics	**Assumption** Other power sector distribution projects in the state funded by other agencies are completed as planned. **Risk** A long-term gas supply is not available for the new gas power plant.
Outputs 1. Generation system upgraded and expanded	By 2018: Lakwa 4x15 MW gas power generation units replaced with new gas engines with (7x10) MW of total capacity By 2024: Lower Kopili Hydro Project 120 MW (peaking run-of-river) constructed	For all indicators: APGC and GOA, annual reports	**Assumption** All statutory and nonstatutory approvals for Lower Kopili hydropower plant are received on time. **Risk** Geological uncertainties in Lower Kopili hydro project may lead to cost and time overrun.
2. Distribution system upgraded and expanded	By 2022: About 30 33/11 kV substations upgraded or built About 100 km of 11 kV lines installed	For all indicators: APDC and GOA annual reports	
3. Institutional capacity of APGC and APDC strengthened	By 2018: ERP system fully operating By 2017: About 30 staff trained on procurement, project implementation, demand management, safeguards, and monitoring and evaluation By 2017: about 70 staff trained on financial and	For all indicators: project review reports of executing agencies	

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
	human resource management		
4. Project management system in place	Investment program implemented on time within allocated budget		
Activities with Milestones **1. Generation system upgraded and expanded** 1.1. Replacement of Lakwa gas power plant 1.1.1. Complete procurement by Q1 2015 1.1.2. Complete construction of Lakwa gas power plant by Q4 2018 1.2. Construction of 120 MW Lower Kopili hydroelectric power plant 1.2.1. Complete procurement by Q2 2016 1.2.2. Complete construction by Q4 2023 2. **Distribution system upgraded and expanded** 2.1 Complete procurement by Q2 2015 2.2 Complete construction by Q4 2020 3. **Institutional capacity of APGC and APDC strengthened** 3.1 Complete detailed needs assessment by Q1 2015 3.2 Develop ERP systems by Q4 2015 3.3 Develop training modules by Q2 2015 3.4 Conduct training through 2015–2017 3.5 Initiate construction supervision for Lakwa gas power plant by Q1 2015 3.6 Prepare Lower Kopili hydroelectric power project documents by Q3 2015 4. **Project management system in place** 4.1 Advertise bid for project 1 by Q1 2014 4.2 Recruit consultants for capacity strengthening by Q4 2014 4.3 Submit PFR 2 by Q4 2014 4.4 Advertise bids for tranche 2 by Q4 2014 4.5 Submit PFR 3 by Q4 2015 4.6 Advertise bids for tranche 3 by Q2 2016			**Inputs** **ADB (loan):** OCR $300 million (in three tranches) **Government:** $130 million (in three tranches)

ADB= Asian Development Bank, APDC = Assam Power Distribution Company, APGC = Assam Power Generation Corporation, CEA = Central Electricity Authority, ERP = enterprise resource planning, GOA = Government of Assam; GWh = gigawatt-hour, km = kilometer, kV = kilovolt, MOP = Ministry of Power, MW = megawatt, OCR = ordinary capital resources; PFR = periodic financing request.
Source: Asian Development Bank.

LIST OF LINKED DOCUMENTS

http://www.adb.org/Documents/RRPs/?id=47101-001-3

1. Loan Agreement
2. Project Agreement
3. Framework Financing Agreement
4. Periodic Financing Request for Tranche 1
5. Sector Assessment (Summary): Power
6. Facility Administration Manual
7. Contribution to the ADB Results Framework
8. Development Coordination
9. Financial Analysis
10. Economic Analysis
11. Country Economic Indicators
12. Summary Poverty Reduction and Social Strategy
13. Initial Environmental Examination: Tranche 1
14. Environmental Assessment and Review Framework
15. Resettlement Framework
16. Indigenous Peoples Planning Framework
17. Risk Assessment and Risk Management Plan

Supplementary Documents

18. Procurement Capacity Assessment
19. Financial Management Assessment
20. Climate Change: Project Adaptation Action Report
21. Tariff and Governance Assessment
22. Project Implementation Support and Capacity Development
23. Comparison of Financing Modality for IND: Assam Power Sector Investment Program