

ASIAN DEVELOPMENT BANK

ADB ASSAM POWER SECTOR ENHANCEMENT PROGRAM

Environmental Assessment and Review Framework (EARF)

May 2009

A. Introduction

1. Government of Assam (GoA) through Government of India (GoI) has requested the Asian Development Bank (ADB) for a multi-tranche financing facility (MFF) to partly fund the power sector investment program in the state of Assam. The investment program will cover physical investments in transmission, distribution, energy efficiency, and related non-physical investments. The program will initially finance expansion and upgrade of transmission and distribution systems in the first and second tranches (project loans) executed under the MFF. GoA and Assam State Electricity Board (ASEB) would be the Executing Agencies for the MFF. The Assam Electricity Grid Corporation Ltd. (AEGCL) is the Implementing Agency (IA) for the transmission system investments proposed for the first tranche.¹ The Lower Assam Electricity Distribution Company Limited (LAEDCL)² would be the IA for the distribution system investments supported in subsequent tranche(s).

2. The investments to be supported by ADB will (i) Facilitate increased power transfers to accommodate increased demand and economic growth; peak demand is projected to increase from the current 848 megawatts (MW) to 1443 MW, and total energy demand will increase from current 4398 gigawatt-hours (GWh) to 7585 GWh by 2012; (ii) Improve supply-side energy efficiency by system de-bottlenecking and reducing technical losses; (iii) Reduce the intensity of greenhouse gas (GHG) and other emissions via improved system efficiency; (iv) Support expanded private sector participation in distribution system operations and other energy services; and (v) Facilitate poverty reduction via improved electricity services and economic growth. The proposed program will sustain the reform agenda established with earlier ADB support, and is expected to help to attract other long-term financiers to the sector.

3. This Environmental Assessment and Review Framework (EARF) is applicable to all investments funded by the MFF including projects including subsequent tranches which have not yet been fully defined. The EARF outlines the policy, procedures, and institutional requirements for preparing subsequent tranches. ASEB would be responsible for preparing the required environmental assessments and obtaining ADB concurrence prior to implementation. These approvals must be in place prior to finalization of contracts and commencement of work.

B. Environmental Regulatory and Policy Framework for Subproject Selection

4. GOI and ADB environment policies and procedures apply to all projects/subprojects funded by the MFF. Transmission and distribution projects are not included in the list of projects that require environmental impact assessment (EIA) and environmental clearances from MOEF.

5. Power transmission projects normally are classified by ADB as Category B, and distribution projects are normally classified as Category B or C. Category B-sensitive or Category A may apply to projects located in environmentally sensitive areas.³ For each major

¹ The transmission system investments may be divided into 2 tranches, depending on project readiness and lending headroom for 2009.

² Upper Assam Electricity Distribution Company Limited (UAEDCL) and Central Assam Electricity Distribution Company Limited (CAEDCL) have been merged into LAEDCL as on 1st April 2009 to enhance operational efficiency.

³ Environmentally-sensitive areas include National Parks, Wildlife Sanctuaries, Bio-reserve zones, nature reserves, or wetlands as designated by MoEF and Assam Department of Environment and Forests, and areas

investment component an initial environmental examination (IEE) will be prepared following ADB's *Environment Policy, 2002* and *Environmental Assessment Guidelines, 2003* [and updated policy and guidelines which may come into effect after the MFF is approved by ADB's Board of Directors] and National⁴ environmental assessment regulations and guidelines. Based on these IEE reports, a summary IEE with environmental management plan (EMP) and budget will be prepared for each project (tranche).

C. Environmental criteria for additional subproject selection

6. Specific environmental criteria for project/subproject selection are:

- (i) Projects/subprojects will not be located within national parks, wildlife sanctuaries and nature reserves, or wetlands, unless unavoidable for technical reasons.
- (ii) Monuments of cultural or historical importance will be avoided.
- (iii) An environmental management plan (EMP) with adequate budget will be developed for each project (tranche).
- (iv) Environment Category A and B-sensitive subprojects must comply with ADB's 120-day disclosure policy.
- (v) Potential environmental impacts will be minimized by routing and siting to avoid sensitive areas. Re-alignment or selection of alternative sites may be required.
- (vi) Clearing of any existing forest resources will be avoided if possible, and where unavoidable will be minimized and compensated as per GOI regulatory criteria.
- (vii) New equipment / facilities specifications shall follow international standards and best practices to avoid use of chemicals causing greenhouse gas (GHG) emissions. All equipment procured shall be free from polychlorinated biphenyl (PCBs).

D. Environmental assessment and review procedures of additional subprojects

1. Application of selection criteria

7. Proposed projects/subprojects will be screened for compliance with selection criteria listed above prior to additional analysis. Environmental categories will be assigned using the rapid environmental assessment checklist (as described in ADB *Environmental Assessment*

declared as heritage sites. The proposed investments will not be sited in any of these areas unless absolutely required due to technical constraints.

⁴ The Ministry of Environment and Forests updated environmental assessment procedures prescribed in the Environment (Protection) Rules, 1986, via notification published 14 September 2006 in the Gazette of India, extraordinary, Part-II, and Section 3, Sub-section (ii). Transmission systems are not included in the list of projects subject to the notification and environmental impact assessment clearance requirements. Government of India regulations consider transmission and distribution systems to be non-polluting activities, and as such do not require environmental assessments or prior regulatory approval from the Ministry of Environment and Forests. State- and central-level regulatory approval is required for right-of-way and sites located in reserved forests, wildlife preserves, national parks, and other designated sensitive areas.

The following acts, laws, rules and guidelines may be applicable to the investment program: (i) Air (Prevention and Control of Pollution) Act, 1981; (ii) Water (Prevention and Control of Pollution) Act, 1974; (iii) Forest (Conservation) Act, 1980 and its amendments; (iv) Forest (Conservation) Rules, 2003 and its amendments; (v) Wildlife (Protection) Act, 1972; (vi) Wildlife (Protection) Amendment Act, 2002; and (vii) IS Codes and CPCB Guidelines for monitoring and analysis of air, water, soil, etc.

Guidelines 2003). Design changes may be suggested or required by ADB, GOA, and GOI for proposed projects that initially do not meet the selection criteria.

2. Preparation of IEEs and EIAs

8. After categorization, IEE (or full EIA for category A projects) including an EMP with implementation budget will be prepared.⁵ At least one public consultation will be conducted with local community and potentially affected people during IEE preparation, and 2 public consultations will be conducted during EIA preparation. IEE and EIAs will be reviewed and approved by ADB and GOI before commencement of detailed design while IEE results will be communicated to the local community before commencement of construction. Summary IEEs and summary EIAs will be prepared and disclosed in accordance with ADB's *Public Communication Policy 2005*. For Category B-sensitive and A projects, the SIEE or SEIA shall be made available to general public and the ADB Board of Directors at least 120 days before the subproject approval by ADB.⁶

3. Responsibilities /Authorities of various agencies

9. ASEB will be solely responsible for the implementation of the entire environmental assessment and review procedures. This include, among others, ensuring that the selection criteria are adhered to strictly, the preparation of IEE/SIEEs and EIAs/SEIAs be done in a timely and adequate manner, environmental monitoring and institutional requirements be fully met while public consultations be carried out satisfactorily. The EAs will submit the categorization checklist, IEE/SIEEs and monitoring reports to ADB for review.

10. ASEB will also be responsible for obtaining regulatory approval of the relevant regional environmental protection agency as per the regulatory requirements of the GOI.

11. ADB will be responsible for regular review and timely approval of checklists, IEE/SIEEs and EIA/SEIAs. Technical guidance will be provided by ADB to ASEB as needed. ADB will also be responsible for reviewing regular monitoring reports and officially disclosing the SIEEs and SEIAs on its website.

4. Preparation of detailed design

12. Detailed design work for each additional subproject will follow the recommendations of the IEE. ASEB will review detailed designs before contracts are finalized and modifications will be incorporated if considered necessary. Certification to ADB that the detailed designs comply with IEE (including EMP) recommendations will be required before contracts can be made effective.

5. Preparation of construction contracts

13. Early in the implementation period, model construction contract language will be prepared incorporating general environmental safeguards and practices. Specific, individual contracts will include the model contract language, and will be vetted by ASEB to ensure that EMP requirements are covered within the contract.

⁵ In the case of Category C, an environmental review is required.

⁶ For Category B-sensitive or Category A projects included in the first tranche, the SIEE or SEIA shall be made available to the ADB Board of Directors and publicly disclosed 120 days before Board Consideration. For subsequent tranches, the SIEE or SEIA shall be made available and disclosed 120 days before the Periodic Financing Request is forwarded to ADB.

6. Monitoring during the construction period

14. Monitoring during construction will be the responsibility of ASEB. Monitoring will be sufficient to confirm that construction activities meet contractual requirements, determine the state and health of affected environmental resources, and determine the effectiveness of mitigation measures. Reporting will be to ADB and the relevant environmental agencies (Assam Department of Environment and Forests, Assam Pollution Control Board, Ministry of Environment and Forests, etc.) on a regular basis.

7. Monitoring of subproject operations

15. The EMPs should be formulated to minimize recurrent responsibilities and costs. However, for some projects continuous monitoring may be required.

E. Environmental Management Plan

16. An environmental management plan has been prepared that will apply to all components and/or subprojects.⁷ The matrix is developed on the basis of environmental analysis of first tranche facilities and review of environmental impacts of typical power transmission and distribution projects. The mitigation measures for subsequent tranches will be developed in the spirit of the principles agreed upon in this EMP framework. Any unanticipated consequence of the project will be documented.

17. Environmental monitoring will consist of routine systematic checking that the above environmental management measures have been implemented effectively during each stage of the project. Table 1 presents the summary monitoring plan for projects to be funded by the MFF. Table 2 presents the indicative estimated costs for EMP implementation of the first tranche projects.

⁷ The EMP is presented as a stand-alone document.

Table 1: Minimum Provisions for Environmental Monitoring⁸

Project Stage	Mitigation Measure	Parameters to be Monitored	Location	Measurements	Frequency	Responsibility	Cost
Pre-construction	Route survey to define alternative alignments	Possible encroachment on reserved forests	All transmission and substation sites	Field mapping with Global Positioning System (GPS) equipment	1-time survey to finalize design	AEGCL / PMU through route survey contractor	n/a
Construction	Dust, equipment emissions, erosion, and noise control Waste management	Incorporation of appropriate clauses in construction contracts	All construction contracts for all substation and transmission sites	Field inspection to ensure that appropriate measures are implemented and facilities are installed	1 time per month	AEGCL and PMU to include in bidding documents. ADB to verify through review of bidding documents. ⁹	Included in construction contract (estimated at < 0.5% of total contract value)
	Dust, equipment emissions, and erosion control Waste management	Suspended particulate matter (SPM) Noise Water: pH, dissolved oxygen (DO), biochemical oxygen demand (BOD), total suspended solids (TSS), hydrocarbons and PCBs ¹⁰ Solid waste generation and disposal	All substation sites and selected transmission lines	“Grab” samples for air and water Spot check for noise using portable monitoring device Spot check for solid waste generation and disposal	Every 6 months, beginning with initial activity, for total of 18 months Monitoring will be extended if necessary Spot checks for solid waste activities	Contractors to implement, PMU staff to provide oversight via regular field inspections; ADB to audit during project review missions AEGCL has responsibility for solid waste management	See details in table 2.
Operations and Maintenance	Dust, equipment emissions, and erosion control Waste management	Same parameters as during construction period	All substations and transmission lines	Spot checks based on visual inspections and any complaints	As necessary based on inspections and complaints	AEGCL through PMU ADB to audit during project review missions	

ADB = Asian Development Bank, AEGCL = Assam Electricity Grid Corporation Ltd., BOD = biochemical oxygen demand, DO = dissolved oxygen, PCB = polychlorinated biphenyls, PMU = project management unit, SPM = suspended particulate matter, TSS = total suspended solids
Source: Asian Development Bank assessment.

⁸ Monitoring of issues related to compensation of landowners for land acquisition will be included in the resettlement plan.

⁹ ADB will review documents and provide “no objection” at each stage of bidding, contract evaluation, and contract award.

¹⁰ These parameters should be monitored if warranted based on visual observations or complaints.

Table 2: Summary of Estimated Costs for EMP Implementation

Activity	Units	Unit cost (\$)	Total Cost (\$) ^a
Transmission Route Survey	262 km	521	136,502
Civil works	8 sites	n/a	61,657
Utilities and sewage	8 sites	n/a	43,651
Drainage controls	8 sites	n/a	163,690
Site access controls	8 sites	n/a	147,322
Fire safety and suppression	8 sites	n/a	47,917
Subtotal - Design & Construction¹¹			600,739
Environmental Services			
Test of Environmental parameters	lump sum		65,000
Environmental Training	lump sum	-	15,000
Consultant Services (remuneration)	16 p-m	5,000	80,000
Consultant Services (per diem)	Per month	3,450	55,200
Consultant Services (transportation)	Per month	1,875	30,000
ESMC Staff (8 person-months)	Per month	2,500	20,000
Report/Communication	Lump sum	-	5,000
Subtotal – environmental services			270,200
Contingency (10 %)			27,020
Total			897,959

^a Estimated costs are indicative only for expected implementation effort as per assumptions and have been depicted for Tranche 1 only.

Assumptions:

1. Design and construction costs: route survey @ 100% of DPR estimate; civil works @ 33% of DPR estimate; utilities and sewage @ 33% of DPR estimate; drainage controls @ 100% of DPR estimate; site access controls @ 50% of DPR estimate; fire safety & suppression @ 100% of DPR estimates. Total = 0.9% of total project cost.
2. Air and noise sampling/testing at substations @ Rs 5000 per sample and Rs 3000 per sample. Air and water sampling at construction camps @ Rs 5000/per sample and Rs 5000/per sample respectively. Total of 60 samples each (of air, noise, and water) x 4 events. Testing frequency proposed at commencement of construction, and every 6 months afterward for the following 18 months, for a total of 4 testing events.
3. Environmental monitoring and compliance training for ESMC personnel estimated at 2 person-months domestic consultants @\$5000/month + \$5000 associated costs (travel, per diem, document preparation, seminar rooms, etc.)
4. Consultant services for total of 4 person-months per monitoring event x 4 events spread over initial 18 month implementation period; domestic consulting @ \$5000/p-m
5. ESMC Staff to conduct field inspections; 2 people x 4 months during the 18 month project period; 8 p-m @ \$2500/p-m
6. Exchange rate: \$1 = INR 48
7. Total environmental services = 15% of design and construction cost = 0.14% of total project cost

Source: ADB staff and consultants estimates.

¹¹ Contingency costs are included within.

F. Institutional Arrangements

18. The existing Project Management Unit (PMU) will assume primary responsibility for the environmental assessment as well as implementation of EMPs for their respective components. An environmental and social management cell (ESMC), responsible for environment, resettlement, and any other social development obligations, will be established at the PMU.¹² Counterpart personnel with responsibility for environmental management issues will be assigned within AEGCL and LAEDCL..

19. The duties of the ESMC will include at minimum: (i) oversight of construction contractors for monitoring and implementing mitigation measures; (ii) preparing and implementing environment policy guidelines and environmental good practices; (iii) liaising with the ADEF and seeking their help to solve the environment-related issues of project implementation; (iv) providing awareness training on environmental and social issues related to power transmission and distribution projects to AEGCL, LAEDCL and ASEB staff; and (v) preparation of environmental management reports every 6 months (as required by ADB).

20. Consulting services will be mobilized as necessary to assist in initial operations, to ensure that the ESMC will be self-sufficient for EMP implementation, submission of progress reports, and preparation of environmental assessment for subsequent tranches. Additional third-party services may be employed by the AEGCL and LAEDCL as necessary.

G. Disclosure, Consultation and Grievances

21. The summary IEE and EMP for each tranche (project) will be translated into local language (Assamese) and made available to the public. A grievance redress mechanism has been established by ASEB: a special office has been set up at the ASEB headquarters, which is open on a regular schedule to receive visitors with complaints. The GOI Right to Information Act (2005) provides an additional legal channel for affected to people to obtain information about the proposed Project.

22. ASEB will be responsible for internal monitoring of EMP implementation, and will forward semiannual progress reports to the Government and ADB. The reports will cover EMP implementation with attention to compliance and any needed corrective actions. On-going consultation measures will be incorporated in the EMP. Project documents will be made publicly available in accordance with the ADB *Public Communications Policy 2005*.

H. Monitoring and Evaluation

23. The EMP will have both internal and external monitoring. The ESMU at the local level will be responsible for internal monitoring of the EMP implementation, and will forward quarterly progress reports to ASEB with details of activities and progress made in EMP implementation. ASEB will submit semi-annual monitoring reports to ADB. An independent monitoring agency will be hired by ASEB with ADB concurrence for undertaking external monitoring of the all projects funded by the MFF. The monitoring agency will be selected

¹² ADB advises that all EAs develop in-house capability for environmental, health, and safety (EHS) program consistent with international best practices. The EHS program should include accounting for environmental benefits resulting from investment projects.

within three months of loan approval. The monitoring agency shall report on semi-annual basis directly to ADB and determine whether sound environmental management practices have been achieved, and suggest suitable recommendations and remedial measures for mid term correction and improvement.