

**PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE**

Project Name	INDIA Energy Efficient Street Lighting Carbon Offset Project
Region	South Asia
Sector	SASDI
Project ID	P107069
Borrower(s)	NA
Implementing Agency	Asian Electronic Ltd
Environment Category	<input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> FI <input type="checkbox"/> TBD (to be determined)
Date PID Prepared	April 29, 2009
Date of Appraisal Authorization	May 2009
Estimated Date of ERPA Signing	June 2009

I. Country and Sector Background

In India, providing public lighting services including street lighting is the responsibility of the municipal corporations (MCs) and the state electricity boards. The Central Electricity Authority of India has calculated that approximately 5,177 million kilowatt hours per year are used for public lighting. This represents 1.09 percent of actual electricity consumption for the country as a whole. This figure could be reduced by 40 to 60 percent through the use of energy efficient technologies and control systems. Municipalities have high demands for social services and infrastructure development needs which are typically given higher priority than energy efficiency projects, consequently efficiency improvements are not common practice in the municipal sector. The typical street lighting network in Indian municipalities is operated with a minimum investment strategy, and the typical street lighting maintenance scheme consists of the replacement of burned-out lamps with similar technology only due to cost concerns and municipality financial constraints.

Municipalities' financial constraints for energy efficiency improvements can be overcome through adoption of a performance contracting mechanism whereby the investments required for efficient street lighting upgrades can be paid for and maintained by a third party energy service company (ESCO), who is repaid based upon energy savings and bill reductions achieved. Reductions in public expenditures for lighting yield fiscal benefits to participating municipalities by reducing annual operating costs for lighting while also producing global environmental benefits.

II. Objective

The proposed development objectives of the Carbon Offset Project are:

- Contribute to sustainable development by improving energy efficiency of street lighting applications at participating municipalities
- Reduce global emissions of carbon dioxide.

The objectives of this World Bank Carbon Offset Project are consistent with the developmental and poverty reduction objectives of the Government of India.

III. Rationale for Bank involvement

This Carbon Offset project will facilitate greenhouse gas emission reductions and support the development of the international market mechanism for trading Emission Reductions (ERs) developed under the framework of the Kyoto Protocol.

The sale of emission reduction credits to the World Bank-executed Community Development Carbon Fund will allow Asian Electronic Ltd (AEL) to implement an energy efficient lighting program by providing an additional revenue stream, which will provide increased financial comfort to the ESCO as there is high repayment risk for these types of projects in India. This project is consistent with the India Country Assistance Strategy in that it aids in ensuring environmental sustainability in a manner that also produces immediate and tangible local benefits.

IV. Description

The project consists of the sale of at least 123,696 Certified Emission Reductions (CERs) resulting from improvements in the energy efficiency of street lighting at eight municipalities in India (Latur, Akola, Pune, Ajmer MC, Bikaner, Alwar UIT, Alwar MC, and Indore) to the World Bank-managed Community Development Carbon Fund. These projects will be implemented on a build own operate transfer (BOOT) basis through an ESCO shared savings approach. Project financing will be provided by the ESCO. The Municipal Corporations will make regular payments to the ESCO that are proportional to the achieved reductions in energy consumption for street lighting as specified in the energy performance contract (EPC).

The project will produce greenhouse gas reductions through the reduction in fossil fuel-powered grid electricity consumption. Electricity consumption from street lighting applications at participating cities will be reduced through the replacement of T12 fluorescent and mercury/sodium vapor fixtures with energy efficient T5 and high pressure sodium lamps with electronic ballast and the installation of Load Management Systems to do the dimming, the power factor correction and the automatic switch on/off of the switching points, cutting consumption by up to 60 percent with additional financial benefit from reductions in nightly peak demand.

Carbon revenues are needed to ensure success of these projects as the financial inflows from sale of carbon credits will provide much needed additional financial comfort to the ESCO, as there is high repayment risk for these types of projects in India. The revenues from carbon credits will ultimately be shared between the ESCO and the municipality, as specified in each individual CDM agreement signed between the MCs and AEL.

Monitoring and evaluation will be undertaken through the specific plan for Verification of Emissions Reductions that will be developed in the clean development mechanism (CDM)

Project Design Document. AEL will be accountable for overall reporting on implementation progress, preparation of financial monitoring reports, and preparation of audited project accounts.

V. Financing

Source:	(\$m.)
Equity	1.75
Local Financial Institution	4.08
Total	5.83

VI. Implementation

AEL will assume overall management of the Street Lighting Energy Efficiency Program, based on a build own operate transfer (BOOT) basis with the MCs. The MCs will be responsible for operations and maintenance of the street lights once the EPC terminates; however, under the separate CDM agreement, AEL will be responsible for all CDM related tasks to ensure that CERs are monitored and accounted for.

The project will be implemented using a performance contracting concept. AEL will provide the technology, funding and Monitoring & Verification services (M&V) after the construction for the duration of the performance contract. The MCs will make regular payments to AEL, secured in an escrow account, for energy savings proportional to the achieved savings as specified in the EPC.

The EPC for all cities also includes a back-to-back agreement for the transfer of CER title and sharing of realized carbon finance benefits. This agreement signed between AEL and each of the participating MCs transfers the rights to the CERs to AEL and defines the terms of carbon revenue sharing. AEL is responsible for monitoring the CERs for the entire CDM crediting period.

VII. Sustainability

The ESCO approach where a private company provides the required capital investment and O&M in exchange for proceeds from the energy savings and a share of the carbon revenues unburdens the MCs from the concern of maintaining the street lighting system and will reduce energy bills and street lighting O&M costs, thus reducing their overall annual operational costs. This in turn may allow the Municipalities to invest the budgetary savings in service provision or other development needs.

The annual financial incentive to both the ESCO and the MCs from actual achieved energy savings complemented by the additional financial benefits of actual achieved carbon reductions will help ensure that the energy efficiency equipment is properly maintained over the life of the EPC contract. Long term sustainability will be achieved as MCs renew EE service contracts based upon their positive experience from reducing energy demand from street lighting.

VIII. Lessons Learned from past experiences in the country/sector

This project draws from previous World Bank operational experiences and analytic and advisory work in energy efficiency and in support of increased uptake of the ESCO mechanism in India. It further benefited from certain WB technical papers such as “Achieving Greenhouse Gas Emission Reductions in Developing Countries through Energy Efficient Lighting Projects in the Clean Development Mechanism (Figueres & Bosi, 2006).

The project applies an approved small-scale CDM Methodology utilized by several CDM projects registered with the UNFCCC.

IX. Safeguard Policies (including public consultation)

The project triggers the World Bank’s Environmental Assessment Policy (OP/BP 4.01) and was designated a Category B as the potential negative environmental impacts of the project are site specific and manageable with the proposed mitigation measures. The table below lists the applicable World Bank Safeguard Policies.

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment (OP/BP 4.01)	[X]	[]	
Natural Habitats (OP/BP 4.04)	[]	[X]	
Pest Management (OP 4.09)	[]	[X]	
Physical Cultural Resources (OP/BP 4.11)	[]	[X]	
Involuntary Resettlement (OP/BP 4.12)	[]	[X]	
Indigenous Peoples (OP/BP 4.10)	[]	[X]	
Forests (OP/BP 4.36)	[]	[X]	
Safety of Dams (OP/BP 4.37)	[]	[X]	
Projects in Disputed Areas (OP/BP 7.60)*	[]	[X]	
Projects on International Waterways (OP/BP 7.50)	[]	[X]	
Piloting the Use of Borrower Systems to Address Environmental and Social Issues in Bank-Supported Projects (OP/BP 4.00)	[]	[X]	

Overall, the project will have a positive impact on the environment as is evident from the reduction of generation of greenhouse gases, which is supported by the carbon funding. This avoidance would also simultaneously reduce generation of local pollutants such as SPM, SOx and NOx to the extent that the power is produced from coal. The project sponsor has been proactive in managing the minimal potential adverse short-term and long-term impacts by preparing and agreeing a concise environmental management manual for the operation with each city where the project is to be implemented. Since the project activities mainly include replacing existing lamps with higher efficiency lamps, few direct impacts of the activity are being envisaged. The environmental management manual covers the occupational safety of workers, safety and access during the operation for other road users, and also provides guidance for handling chance finds in the very few cases where additional poles may have to be erected. The manual prescribes temporary storage of lamps that have been removed and replaced by CFL as

* *By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties’ claims on the disputed areas*

well as CFL lamps that have been damaged or have completed their useful life. This has been done to avoid indiscriminate disposal since that could lead to contamination of land/water by residual metal coating. This arrangement would be continued until the regulation currently being discussed between the Ministry of Environment and Forests, Government of India, and Bureau of Energy Efficiency, Government of India is finalized and promulgated for CFL lamps being introduced all over the country. Provisions of the regulations will thereafter govern handling and disposal. The manual has been translated into the local language, discussed with the stakeholders including municipal officials in each city, and disclosed in each of the cities as well as on the project sponsor's website.

X. List of Factual Technical Documents

- Project Idea Note (PIN)
- Project Design Document (PDD)
- Community Benefits Plan (CBP)
- Integrated Safeguards Data Sheet (ISDS)
- Operations Monitoring Plan (OMP)
- Environmental Management Manuals for MCs
- Carbon Agreement Template between AEL and MCs
- SSC-CDM Methodology (Type II: Energy efficiency improvement projects, Category: C. Demand-side energy efficiency activities for specific technologies)

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