Ex-ante Evaluation

1. Name of the Project
Country: India Project: Bangalore Distribution Upgradation Project (Loan Agreement: 03/30/2007; Loan Amount: 10,643 million yen; Borrower: The President of India)
2. Necessity and Relevance of JBIC's Assistance
A glance at the supply and demand of electrical power in India as a whole shows that there have been serious shortages since 1998: around 6-9 % in year-wise energy requirement; and about 11-14% in the amount of power required at peak hours. In addition, high rates of loss in power transmission and distribution (the average for the entire country of India was 32.5% in FY2003) and frequent power outages are major problems from the supply side. In the 10th 5-Year Plan (April 2002- March 2007) by the Government of India,,in addition to developing 41,110MW of new power source, the Government of India plans to build a high-voltage power transmission network to supply power effectively from the north, northeast and east of India, where electric power source is concentrated, to other regions. Additionally, from 2002, the government implemented its "Accelerated Power Development and Reform Program" for the purpose of improving the power distribution facilities. In the current administration's Common Minimum Programme (May 2004), infrastructure development, including the development of an electric power system, is a top priority. In JBIC's current Medium-Term Strategy for Overseas Economic Cooperation Operations, a priority area for assistance in India is "Economic Infrastructure Development." The assistance provided by the Project is consistent with the strategy. Bangalore, the capital city of the southern Indian state of Karnataka, has achieved rapid growth in recent years, as the center of India's software industry and as a leading industrial center where many companies, including Japanese companies, have set up their factories and offices. However, a glance at the situation of power supply in the urban area of Bangalore, including the city itself, shows that the frequent outages have acted as a bottleneck to economic activities and improvement of living standards. Thus JBIC's assistance in the Project is highly necessary.
3. Project Objectives
To improve the reliability of electricity supply through the reduction of outage duration by the development of Distribution Automation System (DAS) and related facilities in Bangalore, the capital city of the State of Karnataka, thereby contributing to local economic development and improvement of living standard of local residents in the concerned areas
4. Project Description

(1) Target Area

Urban Area of Bangalore, State of Karnataka

(2) Project Outline

    (a) Development of a distribution automation system for underground/above-ground distribution networks and related equipment

    (b) Consulting services (including detailed design, bidding assistance, construction management, capacity building, etc.)

(3) Total Project Cost/Loan Amount

14,205 million yen (Yen Loan Amount: 10,643 million yen)

(4) Schedule

April 2007 – January 2012 (58 months)

(5) Implementation Structure

    (a) Borrower: The President of India

    (b) Executing Agency: Bangalore Electricity Supply Company Limited (BESCOM)

    (c) Operation and Maintenance System: Same as (b)

(6) Environmental and Social Consideration

    (a) Environmental Effects/Land Acquisition and Resident Relocation

        (i) Category: C

        (ii) Reason for Categorization

        This Project is classified as Category C because the Project is likely to have minimal adverse impact on the environment based upon the fact that the project sector and project characteristics are not likely to exert impact and the Project is not located in a sensitive area under the "Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Consideration" (established in April 2002)..

    (b) Promotion of Poverty Reduction

    None

    (c) Promotion of Social Development (e.g. Gender Perspective)

    None

(7) Other Important Issues

- Enhancement of the organizational capacity of the executing agency will be supported by introducing training abroad, total quality management (TQM), and so on, as part of the consulting services.
- Technology developed in Japan for detecting the locations of outages is to be adopted in the main parts of the distribution automation system introduced in the Project.

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Baseline (2006)	Target (2014, 2 years after completion)
System Average Interruption Duration Index (SAIDI) (hour per annum /household)	86.2 (FY2003)	31.4
Peak Load (MW)	1,437	2,630
Distribution Loss (%)	10.62	9
Electricity Consumption (excluding loss) (GWh)	6,067	12,326
No. of Staffs dispatched for restoration work (no./hour per day)	702	0
Feeder Capacity Utilization Index (%)	48	75

(2) Internal Rate of Return

Financial Internal Rate of Return (FIRR): 14.9%

    (a) Cost: Project costs (excluding tax), operation and maintenance expenses, power purchase

    (b) Benefit: Increase in consumer surplus, reduction in cost of constructing distribution lines and sub-stations

    (c) Project Life: 30 years

6. External Risk Factors

Economic stagnation and deterioration in India and in areas surrounding the target area of the Project

7. Lessons Learned from Findings of Similar Projects Undertaken in the Past

A lesson learned from the findings of similar projects undertaken in the past is that, for the effectiveness of the Project to be fully manifested, in addition to the development of power transmission and distribution networks, it is also necessary to continuously reinforce power transmission and distribution facilities after a project is completed and implement new power development to meet potential demand. Since the state of Karnataka has already laid down a plan for strengthening the facilities in the entire power generation sector, the progress of the plan will be monitored periodically.

8. Plans for Future Evaluation

(1) Indicators for Future Evaluation

    (a) System Average Interruption Duration Index (SAIDI) (hour per annum /household)

    (b) Peak Load (MW)

    (c) Distribution Loss (%)

    (d) Electricity Consumption (excluding loss) (GWh)

    (e) No. of Staffs dispatched for restoration work (no./hour per day)

    (f) Feeder Capacity Utilization Index (%)

    (g) Internal rate of return: EIRR (%)

(2) Timing of Next Evaluation

After project completion