

Ex-ante Evaluation

1. Name of the Project

Country: People's Republic of Bangladesh

Project: Grid Substations and Associated Transmission Lines Development Project

Loan Agreement: June 29, 2006; Loan Amount: 4,642 million yen; Borrower: The Government of the People's Republic of Bangladesh

2. Necessity and Relevance of JBIC's Assistance

Peak power demand in Bangladesh has been increasing at a yearly rate of around 8%, and a high growth rate of around 8-10% is projected for the future. Yet capital investment has not kept up with the increase in demand, so that electrical overloads occur at substations and transmission lines because of delays in improvements to electrical transmission and conversion facilities. As a result, various regions are forced to limit supplies of electricity by such means as rolling blackouts. To cope with the rapid increases in demand, the Power Grid Company of Bangladesh Ltd. (PGCB), which is in charge of the power transmission sector, is planning and carrying out the new installation and expansion of substations and the new installation of transmission lines. In particular, major urban areas such as Dhaka, Comilla and Chittagong, and their surrounding regions are currently already facing tightening supply and demand, and it is predicted that demand will exceed transmission capacity within the next few years. Problems like frequent power outages and severe low voltage are becoming significant impediments to economic activity, particularly that of small and medium enterprises (SMEs) which do not have privately-owned power generators. Due to the fact that a reliable, high-quality electrical power supply is essential as a basis for economic growth, the improvement of electrical transmission and conversion facilities to cope with the increasing demand is urgent necessity.

Within its 「Bangladesh Power Sector Development Plan and Strategy」 (January 2004) the Bangladesh Government raises three points by way of a far-sighted vision for the power sector. The three points are: (a) to guarantee a supply of power which makes it possible for everyone to use electricity by the year 2020, (b) to supply high-quality and highly reliable electrical power, and (c) to supply electrical power at a reasonable price. As a future expansion plan for the electrical transmission and conversion sector, the Bangladesh Government is planning to newly install approximately 10,000km of transmission lines and to increase capacity of 230kV/132kV substations by approximately 17,500MVA, and 132/33kV substations by approximately 12,000MVA by the year 2020. The PGCB has demonstrated favorable performance since its founding, and the Bangladesh Government is currently promoting the splitting up of the Bangladesh Power Development Board (BPDB) as a part of power sector reforms. In order to promote and solidify such effort, there is enormous significance in assisting the PGCB as a successful reform example.

The Japan Bank for International Cooperation (JBIC) has placed “infrastructure development for sustainable growth” as a priority area within its Medium-Term Strategy for Overseas Economic Cooperation Operations and has declared its policy of providing assistance for economic and social

infrastructure which constitutes the foundation for the activities of the private sector. Furthermore, JBIC has placed “assistance for the development of key economic infrastructure for the promotion of economic growth” in the abovementioned medium-term strategy as a priority sector for its assistance to Bangladesh.

Based on the above, JBIC’s assistance in this project is highly necessary and relevant.

3. Project Objectives

This project will newly install and expand substations and transmission lines in both major urban areas and the surrounding regions in which rapid increases in demand are expected for the future. Consequently it aims to provide a stable supply of power and to improve reliability, thereby contributing to the economic and social development of the country.

4. Project Description

(1) Target Area

The cities of Dhaka, Comilla, and Chittagong and their surrounding regions

(2) Project Outline

The project will carry out the civil engineering work and procurement of machinery necessary for project implementation in the target areas mentioned above as described below.

- (a) New installation of substations (4 locations)
- (b) Expansion of substations (electrical transformers and other related facilities, etc.) (4 locations)
- (c) Construction of transmission lines (80km) to the newly installed substations

(3) Total Project Cost/Loan Amount

Total Project Cost: 7,234 million yen (Yen Loan Amount: 4,642 million yen)

(4) Schedule

Planned for June 2006-June 2009 (36 months in total)

(5) Implementation Structure

- (a) Borrower: The Government of the People’s Republic of Bangladesh
- (b) Executing Agency: Power Grid Company of Bangladesh Ltd. (PGCB)
- (c) Operation and Maintenance System: Same as (b)

(6) Environmental and Social Considerations

(a) Environmental Effects/Land Acquisition and Resident Relocation

(i) Category: B

(ii) Reason for Categorization:

This project does not fall under the category of sectors or attributes prone to producing effects and areas which are easily affected as listed in the JBIC Guidelines for Confirmation of Environmental and Social Considerations (established April 2002). For this reason, and because it has been judged that undesirable effects on the environment will not be significant, this project falls into Category B.

(iii) Environmental Permit

An initial environmental impact assessment (EIA) report for this project has gained the approval of the Department of Environment (DoE) of the Bangladesh Government.

(iv) Anti-Pollution Measures

During construction work, measures are arranged to be taken such as spraying water to prevent the scattering of soil, sand, and other materials. Moreover, appropriate management will be performed so that the surrounding soil does not become contaminated with materials such as paint and grease.

(v) Natural Environment:

There are no protected areas or habitats for valuable species at the substation construction sites or in the areas surrounding the routes for transmission lines and no particularly negative environmental effects are foreseen.

(vi) Social Environment:

Approximately 6.5ha of land is slated to be acquired for the planned sites for the construction of new substations, and procedures will be taken based upon Bangladesh's Land Acquisition Act. Appropriate compensation will be provided for losses to agricultural products incurred through this project during the construction period for transmission lines pursuant to Bangladesh's national laws. The relocation of residents will not be required.

(vii) Others/Monitoring:

The executing agency and others will monitor aspects such as the status of air quality and soil contamination during the construction work.

(b) Promotion of Poverty Reduction

None in particular.

(c) Promotion of Social Development (e.g. Gender Perspective): None in particular.

(7) Other Important Issues

Experts employed by the Japan International Cooperation Agency (JICA) are scheduled to be dispatched to the project sites of the PGCB which has a jurisdiction over substations targeted by this project to improve management capacity regarding operation and maintenance through Total Quality Management (TQM). This will be done through the coordination with a JICA technical cooperation project.

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Baseline (2005)	Target (2012 [three years after completion of project])
Facility utilization rate (%) (Note 1)	88.14%	100% or less
Load rejection (MW) (Note 2)	78MW (overall)	0MW
Voltage drop ratio (%) (Note 3)	81% (average)	100%±10%

(Note 1) Average values for existing substations targeted by this project. For the facility utilization rate concerning newly installed substations, the utilization rates for substations currently providing electrical power to the same areas are used. It is

	<p>desired that the facility utilization rate of the substations does not exceed 100%. Even though they are currently below 100%, it is projected that they will exceed 100% within the next few years unless this project is implemented.</p>
(Note 2)	<p>Refers to the halt in the supply of power from these installations made for their protection when demand outstrips the supply capacity of electrical transmission and conversion facilities.</p>
(Note 3)	<p>Refers to the maximum ratio (%) of voltage dropped relative to the standard voltage. Voltage is constantly fluctuating, even if only by a miniscule amount. If the range of the fluctuation exceeds a fixed rate it will produce negative effects such as causing the machinery and electrical appliances in the demand side (factories and homes) to stop functioning. As a result, it will require the reduction of the voltage to bring the voltage drop ratio back to within a stable range. The numerical values represent the current voltage drop ratio (base value) at the planned sites for the installation of new substations and the voltage drop ratio (target value) after the new installation of the substations.</p>
6. External Risk Factors	
Delays in construction projects for new power generators.	
7. Lessons Learned from Findings of Similar Projects Undertaken in the Past	
<p>In previous ex-post evaluations it has been pointed out that the dispatch of JICA experts which makes the coordination with ODA loan projects a part of the Terms of Reference (TOR) is effective for ensuring the sustainability of ODA loan projects. Because of this, this project also aims to improve management capacity regarding operation and maintenance at the project sites pertaining to this project in cooperation with JICA.</p>	
8. Plans for Future Evaluation	
<p>(1) Indicators for Future Evaluation</p> <ul style="list-style-type: none"> (a) Facility utilization rate (%) (b) Load rejection (MW) (c) Voltage drop ratio (%) <p>(2) Timing of Next Evaluation</p> <p>After project completion</p>	