Ex-ante Evaluation

1. Name of the Project

Country: The Republic of Indonesia
Project: North-West Sumatra Inter-connector Transmission Line Construction Project
（Loan Agreement: 03/29/2007, Loan Amount: 16,119 million yen, Borrower: The Republic of Indonesia)

2. Necessity and Relevance of JBIC's Assistance

According to the National Electricity General Plan (2006-2026, RUKN), the peak demand for power in Indonesia nationwide in 2005 was 18,772 MW (14,424 MW in the Java-Bali system; 4,348 MW in Outer Java-Bali Systems), and peak demand is expected to grow at an average of about 6.9% annually (about 6.4% in the Java-Bali System; about 8.3% in Outer Java-Bali Systems) in the future, so alleviation of stringency in power demand is an urgent issue. Moreover, the plan states that efforts will be made to reform the power sector and to supply power to all levels of society.

Peak demand in the North Sumatra System, where the project is located, is 1,054 MW (actual demand in 2005). However, the increase in power demand accompanying economic growth is expected to raise the annual average by about 10.4%, reaching 1,910MW in 2011. Additionally, peak demand in the West Sumatra System is 1,294 MW (actual demand in 2005) but is expected to increase at an annual average of about 12.2%, reaching 2,586 MW in 2011.

On the other hand, supply reliability (hours and times of forced outages) in Sumatra is lower than the overall average for Indonesia nationwide and, therefore, the development of transmission and transformation infrastructure is an urgent issue in establishing an adequate power supply system in that region. In particular, the North Sumatra System and West Sumatra System, despite being the backbone systems in Sumatra, are not interconnected. The following can be expected from the interconnection of the two systems:

(a) With an increase in interchangeable power generation facility capacity, the impact of breakdowns and outages at power plants in the overall system will decrease relatively.
(b) An imbalance in the electric power source structure due to uneven distribution of primary energy potential such as fuel for thermal electric power stations, and hydroelectric power and geothermal power can be resolved.
(c) In comparison with the electric power supply developed through separate systems, the required supply reliability can be met using less equipment.
(d) In the future, further wide-area interconnections including both international and inter-island interconnections can be expected. Through development in this way, electric power supply provided as a single system through interconnected electric feeder lines instead of individual power supply facilities is expected to be more economical.

Japan's "Assistance Plan for Indonesia" (November 2004) places emphasis on economic infrastructure development and states providing assistance for "private sector-led sustainable growth" as a priority area and an important subject for assistance. Moreover, in JBIC's Medium-Term Strategy for Overseas Economic Cooperation Operations (April 2005), infrastructure development for sustainable growth is earmarked as a priority area. In assistance to Indonesia, economic infrastructure is also cited as a priority area essential for Indonesia's transition from a stage of

stabilization following the Asian currency crisis to a stage of growth, and therefore providing assistance for this project, which will contribute to the stable supply of electricity, is consistent with JBIC's strategy.
Therefore, JBIC's assistance is highly necessary and relevant.

3. Project Objectives

The objectives of this project are to improve the power supply capacity in both North Sumatra and West Sumatra, to ease the stringency of power demand in both the North Sumatra System and the West Sumatra System, and to improve the reliability of power supply by laying transmission lines (275kV x 2 lines), which will interconnect the two systems, by expanding existing facilities to step up voltage from 150kV to 275kV, and by interconnecting these transmission lines. In this way, the project will contribute to the economic development of both areas by improving the investment climate.

4. Project Description

(1) Target Area

North Sumatra Province and West Sumatra Province

(2) Project Outline

- Construction of overhead transmission lines (275kV x 2 lines, overall length of about 300km)
- Expansion of existing substations (2 locations) (stepping up voltage from 150kV to 275kV)
- Consulting services (bidding assistance, construction supervision, etc.)

(3) Total Project Cost/Loan Amount

21,645 million yen (Yen Loan Amount: 16,119 million yen)

(4) Schedule

January 2007 - April 2012 (64 months)
Project to be completed at the end of the guaranteed period

(5) Implementation Structure

(a) Borrower: The Republic of Indonesia
(b) Executing Agency: PT Perusahaan Listrik Negara (Persero) (State Electricity Company)
(c) Operation and Maintenance System: PT Perusahaan Listrik Negara (Persero) (State Electricity Company)

(6) Environmental and Social Considerations

(a) Environmental Effects/Land Acquisition and Resident Relocation

(i) Category: B

(ii) Reason for Categorization:

This project is classified as Category B because it does not include projects in sensitive sectors or with sensitive characteristics and does not take place in sensitive areas under the "Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations" (April 2002). Therefore, adverse effects on the environment are deemed not to

be significant.

(iii) Environmental Permit:

The environmental impact assessment report (ANDAL), the environmental management plan (RKL) and the environmental monitoring plan (RPL) relating to this project are expected to be approved by the Ministry of Environment in April 2007.

(iv) Anti-pollution Measures:

No significant adverse effects arising from this project are foreseen. However, if any form of pollution occurs during the construction, the construction operator will take appropriate remedial measures as required.

(v) Natural Environment:

This project will require deforestation of an area of about 17ha. However, in selecting the routes for constructing transmission lines, efforts will be made to avoid traversing areas and vicinities of areas where project implementation would be likely to have a significant adverse impact on the environment, such as national parks, etc. Therefore, it is likely to have a minimal adverse impact on the natural environment.

(vi) Social Environment:

The project requires land acquisition of about 40ha, which will be implemented in accordance with the country's domestic procedures. The project will not involve any involuntary resettlement..

(vii) Other/Monitoring:

The executing agency will monitor the impact of deforestation on the environment, etc., in accordance with the environmental management plan (RKL) and the environmental monitoring plan (RPL) for this project.

(b) Promotion of Poverty Reduction:

None.

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

The construction operator plans to implement HIV/AIDS prevention measures for construction workers.

(7) Other Important Issues

(a) Synergy effects can be expected with the PLN Operation Improvement System Project for Supporting Generating Facilities, which is an approved project for this fiscal year.

(b) Electricity from the Peusangan Hydroelectric Power Plant Construction Project, which is an approved project for this fiscal year, can be utilized more effectively.

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Baseline (2006)	Target (2013, 2 years

Availability Factor (%)	-	43
Forced Outage Hours per User (minutes/year)	120	0
Voltage Drop at End User (%)*	92	100
Transmission Loss (%)	-	1.3

*Ratio of the maximum drop in voltage for the standard voltage (100%)

(2) Internal Rate of Return (Financial and Economic Internal Rate of Return)

Not calculated.

6. External Risk Factors

None.

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

In the ex-post evaluations of similar past projects, it was learned that adequate patrolling could not be undertaken when transmission lines were situated about 10-20km away from trunk roads. Consequently, loss of construction materials due to theft occurred. In addition, when various problems occurred with transmission lines and pylons, considerable time was required to rectify them. However, in this project, the majority of the transmission line routes are along trunk roads and the incidence of problems like those mentioned above is not foreseen.

8. Plans for Future Evaluation

(1) Indicators for future evaluation:

(a) Availability Factor (%)

(b) Forced Outage Hours per User (minutes/year)

(c) Voltage Drop at End User (%)

(d) Transmission Loss (%)

(2) Timing of Next Evaluation

After project completion.