

Ex-ante Evaluation

1. Name of the Project
Country: The Republic of Indonesia Project: Asahan No. 3 Hydroelectric Power Plant Construction Project (Loan Agreement: March 29, 2006; Loan Amount: 27,642 million yen; Borrower: The Republic of Indonesia)
2. Necessity and Relevance of JBIC's Assistance
<p>According to the National Power General Plan (RUKN), the peak demand for power in Indonesia nationwide in 2003 was 20,967 MW (14,053 MW in the Java-Bali System; 6,914 MW in Outer Java-Bali Systems), and peak demand is expected to grow at an average of 6.4% annually henceforth (5.6% in the Java-Bali System; 7.8% in Outer Java-Bali Systems). Moreover, the plan states that, together with reforming the electric sector, every endeavor will be made to supply power to all levels of society.</p> <p>Peak demand in the North Sumatra System where this project is located is 1,034 MW (actual demand in 2003), and this is expected to grow at an annual average of 6.5%, to reach 1,944 MW in 2013. The system is connected to Aceh Province, and growth in power demand is expected subsequent to the strife and the rehabilitation and rebuilding there. Meanwhile, the installed capacity of the power generation facilities in this system is 1,313 MW, and taking into consideration future operation stoppages due to the aging of existing facilities and development of new power sources, the installed capacity in 2012, immediately prior to the scheduled starting date of this project's operation, is expected to be 2,163 MW. Because the power supply reserve margin in 2012 is expected to drop to 20%, development of a new power source is urgently required.</p> <p>Japan's "Assistance Plan for Indonesia" (November 2004) places emphasis on economic infrastructure development and announces support for "private sector-led sustainable development" as a priority area and an important subject for assistance. Moreover, in JBIC's current Medium-Term Strategy for Overseas Economic Cooperation Operations (April 2005), priority areas for support are infrastructure development for sustainable growth and global-scale problems, and in assistance to Indonesia, a priority area is economic infrastructure that is indispensable for returning the country to the path of sustainable development through economic reforms.</p> <p>Therefore, JBIC's assistance is highly necessary and relevant.</p>
3. Project Objectives
<p>The objective of this project is to relieve the tightness in power supply and demand in the North Sumatra System and to improve the stability of the supply by constructing a hydroelectric power plant (154 MW; run-of-river) and related transmission lines, etc., in North Sumatra Province which lies in the northern part of the island of Sumatra, and thereby to contribute to the economic development of northern Sumatra through improvement of the investment climate. Moreover, the project will contribute to the lowering of the burden placed on the global environment by using renewable energy.</p>
4. Project Description

(1) Target Area

Asahan District, North Sumatra Province

(2) Project Outline

The following will be carried out to improve the power supply capacity of the North Sumatra System.

- Construction of a hydroelectric power plant (run-of-river hydroelectric generation facilities consisting of 2 units, 77 MW each) and construction of related transmission lines of 150 kV.
- Installation of remote monitoring and communications facilities, etc.
- Installation of simple irrigation and water facilities
- Consultant services (tendering assistance, supervision of work, performance evaluation, assistance in operation and maintenance, assistance with environmental management, technology transfer and human resource development, etc.)

(3) Total Project Cost/Loan Amount

36,857 million yen (Yen Loan Amount: 27,642 million yen)

(4) Schedule

April 2006-January 2014 (94 months)

(5) Implementation Structure

- (a) Borrower: The Republic of Indonesia
- (b) Executing Agency: PT. PLN (Persero) (State Electricity Company)
- (c) Operation and Maintenance System: PT. PLN (Persero) (State Electricity Company)

(6) Environmental and Social Consideration

(a) Environmental Effects/Land Acquisition and Resident Relocation

(i) Category: A

(ii) Reason for Categorization

This project is classified as Category A because it is in the hydroelectric power generation sector, under the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established April 2002).

(iii) Environmental Permit

The EIA report has been approved in November 2004.

(iv) Anti-Pollution Measures

This project consists of a new run-of-river hydroelectric power plant, and no significant adverse impact on the river water quality is foreseen.

(v) Natural Environment

A forest preserve for the prevention of landslides lies along the planned transmission line route; however, because the amount of land required for the construction of each transmission tower is small and because the towers are separated from each other, no impact on landslides is foreseen. Moreover, the discharge of Asahan River will decline due to intake of water for

power generation, but because there is an existing dam upstream from the project site and because the types of fish living in the area affected by river diversion and in the area further downstream are the same, no significant negative impact on the river ecosystem is foreseen.

(vi) Social Environment

The project requires land acquisition of approximately 210 ha, including some that will be temporarily rented, for the aqueduct, offices, and construction site. Resettlement of a maximum of 13 households will be necessary in the area of Headrace Channel. Discussions concerning resettlement are already being held with the residents, but a study of alternative routes to further reduce the number of residents requiring resettlement is currently underway in the E/S project. Moreover, as a measure to deal with the lower water level due to the reduction in river flow volume, detailed design of water intake facilities and simple water pipe installation for existing irrigated farmland is being included in the E/S project currently underway.

(vii) Other/ Monitoring

The executing agency will monitor the river water quality and the flow volume, etc., in accordance with the environmental management plan and the environmental monitoring plan.

(b) Promotion of Poverty Reduction

None

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

The executing agency will include implementation of HIV/AIDS prevention measures in the bidding documents for the civil engineering works, and the contractors will be required to implement prevention measures.

(7) Other Important Issues

None

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Target (2016, 2 years after completion)
Maximum output (MW)	154
Unplanned stoppage time (hours/year)	44
Plant load factor (%)	92.4
Power production (GWh/year)	1,247

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

Based on the conditions below, the project's financial internal rate of return (FIRR) is 14.2%

- (a) Cost: Project cost, operation and maintenance expense
- (b) Benefit: Income from electricity sales
- (c) Project Life: 30 years

6. External Risk Factors

The risk of drought, which would affect the ability to secure water.

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

In the ex-post evaluations of previous ODA loan projects, it has been learned that, to smoothly conduct the operation and maintenance of the facilities following the start of operation, it is important to carry out a check of the operation and maintenance agency in advance. For the main portion of the project, the consultant service TOR plans to respond by introducing supervision of the operation and maintenance system.

8. Plans for Future Evaluation

(1) Indicators for Future Evaluation

- (a) Maximum output (%)
- (b) Unplanned stoppage time (hours/year)
- (c) Plant load factor (%)
- (d) Power production (GWh/year)
- (e) Financial Internal Rate of Return (%)

(2) Timing of Next Evaluation

After project completion