

Ex-ante Evaluation

1. Name of the Project

Country: The Socialist Republic of Vietnam

Project: Nghi Son Thermal Power Plant Construction Project

(Loan Agreement: March 30, 2007; Loan Amount: 20,943 million yen; Borrower: The Government of the Socialist Republic of Vietnam)

2. Necessity and Relevance of JBIC's Assistance

Since the introduction of *Doi Moi* (renovation) policy, the Vietnam has exhibited rapid economic growth, with a GDP growth rate of 7% to 8% in recent years. Reflecting this rapid economic growth, the demand for electricity nationwide has increased at an annual average of 16% since 2000, and this trend is expected to continue through 2010. As experienced by the large-scale blackouts in May 2005 in northern Vietnam, where this project will be implemented, an adequate response to the surging electricity demand is an urgent issue. Up till now, the shortage is being supplemented by electricity transmitted from the south, but such long distance transmission has created unnecessary transmission loss. Accordingly, the Vietnamese government is making an effort to meet high electricity demand by developing new power supply within the same region.

To meet expected electricity demand growth in the north, the government of Vietnam is planning to develop, on the same site, a power generation complex with total capacity of 1,800 MW. The participation of independent power producers (IPPs) is expected in this regard. During construction of Units 1 and 2 (total capacity of 600 MW), a basic infrastructure such as the cooling water supply and discharge piping, ash pit facilities and port facilities for receiving coal will be developed at the site, alleviating business risks for Unit 3 and thereafter by the IPPs and encourages future private-sector investment.

In JBIC's Medium-Term Strategy for Overseas Economic Cooperation Operations, a priority area for assistance is "a foundation for sustained growth," and an emphasis is put on the development of economic infrastructure such as electric power, which is the base of socio-economic activities.

This project contributes to the strengthening of Vietnam's power generation capacity and to provide stable electric power supply by constructing a new power plant, and is consistent with JBIC's assistance policy.

Thus given the above, JBIC's assistance for this project is highly necessary and relevant.

3. Project Objectives

The objective of this project is to increase the electric power supply capacity in northern and central Vietnam by constructing a 600 MW (300 MW × 2 units) coal-fired thermal power plant and related facilities in the Nghi Son Industrial Park in Thanh Hoa Province, thereby contributing to the strengthening of industrial competitiveness and the improvement of public welfare in that region.

4. Project Description

(1) Target Area

Tinh Gia District, Thanh Hoa Province

(2) Project Outline

(a) Construction of a coal-fired thermal power plant (300 MW × 2 units) (including civil engineering work (including installation of water supply and discharge piping and coal-storage facilities), procurement and installation of materials and equipment, and construction of port facilities for receiving coal)

(b) Consulting services (bidding assistance and construction supervision, etc.)

(3) Total Project Cost/Loan Amount

85,150 million yen (Yen Loan Amount: 72,377 million yen)

Phase I Loan (this project): 20,943 million yen

(4) Schedule

April 2007 – April 2014 (85 months)

The project will be completed when the guarantee period is completed.

(5) Implementation Structure

(a) Borrower: The Government of the Socialist Republic of Vietnam

(b) Executing Agency: Vietnam Electricity (EVN)

(c) Operation and Maintenance System: Nghi Son Thermal Power Plant

(6) Environmental and Social Consideration

(a) Environmental Impacts/Land Acquisition and Resettlement

(i) Category: A

(ii) Reason for Categorization: This project falls into a thermal power generation sector project which is likely to have significant adverse impact on the environment under the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Consideration” (established in April 2002). Thus this project is classified as Category A

(iii) Environmental Permit: The Environmental Impact Assessment (EIA) report concerning this project was approved by Vietnam’s Ministry of Natural Resources and Environment (MONRE) in December 2005. Moreover, the supplemental EIA report that was prepared due to an alteration in the location of the discharge channel and the outlet in August 2006 was approved by MONRE in November 2006.

(iv) Anti-Pollution Measures : Particulate matter, sulfur dioxide, and nitrous oxides are all expected to satisfy Vietnam’s environmental standards (ground-level concentration restrictions) and emissions standards as a result of the installation of electrostatic precipitators, desulphurization equipment, and low NOx burners. Regarding wastewater, because the discharge from the ash pit will be reused, it will not be released outside, and a waterproof sheet will be installed in the bottom of the ash pit to prevent leakage. Warm wastewater is expected to meet Vietnam’s discharge standards.

(v) Natural Environment: The project site is located away from sensitive areas such as a

national park, and so adverse impact on the natural environment is considered to be minimal.

(vi) Social Environment: This project is expected to require resettlement of 152 households, and the resettlement is scheduled to be undertaken by Thanh Hoa Province in accordance with the resettlement plan. Residents were informed of the project outline at a resident discussion meeting held in September 2006, and it was confirmed that there is no particular opposition expressed to this project. Moreover, the project requires acquisition of approximately 164 ha of land, and EVN is proceeding with acquisition in accordance with the domestic acquisition process.

(vii) Other/ Monitoring: EVN is responsible for monitoring air quality, water quality, noise, and resident relocation.

(b) Promotion of Poverty Reduction

None

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

It is planned to include an obligation of the contractor to implement AIDS prevention measures for the construction workers, since this project involves large-scale construction in a country with high prevalence of HIV infection.

(7) Other Important Issues

None

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Baseline	Target (2016, 2 years after completion)
Maximum output (MW)	-	600
Plant load factor (%)	-	More than 68%
Plant efficiency (%)	-	39.64
Availability factor (%)	-	92%
Auxiliary power rate (%)	-	Less than 9.5%
Outage by human error (hours)	-	0
Outage by human error (times)	-	0
Planned outage by periodic inspection (hours)	-	Less than 720 hours

(2) Internal Rate of Return

Based on the following premises, the Financial Internal Rate of Return is 6.2%.

(a) Cost: Project cost, operation and maintenance costs

(b) Benefit: Income from electricity sales

(c) Project Life: 30 years

6. External Risk Factors

Delays in coordination with the construction plans of petrochemical plant and the industrial park by Vietnam's Ministry of Industry (MOI) on the project site, changes in the overall development plan for

the Nghi Son region, and delays in construction of the pipeline for industrial-use water

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

In yen loan projects for power plant expansion in the past, it was learned that it is important to give adequate consideration to the form of the operation and maintenance system. Based on this lesson learned, in this project, an adequate operation and maintenance system will be prepared, and the executing agency has agreed to send reports and confer with JBIC when there are changes in the organization of the project management unit, etc., so that conditions may be sufficiently understood

8. Plans for Future Evaluation

(1) Indicators for Future Evaluation

- (a) Maximum output (MW)
- (b) Plant load factor (%)
- (c) Plant efficiency (%)
- (d) Availability factor (%)
- (e) Auxiliary power ratio (%)
- (f) Outage due to human error (hours)
- (g) Outage due to human error (times)
- (h) Planned outage due to periodic inspection (hours)
- (i) Financial internal rate of return (FIRR) (%)

(2) Timing of Next Evaluation

After project completion