

## Ex-ante Evaluation

<b>1. Name of the Project</b>
Country: The Socialist Republic of Vietnam Project: Ninh Binh II Thermal Power Plant Construction Project (II) (Loan Agreement: March 31, 2006; Loan Amount: 29,421 million yen; Borrower: The Government of the Socialist Republic of Vietnam)
<b>2. Necessity and Relevance of JBIC's Assistance</b>
<p>Since the introduction of the “doi moi” (renovation) policy, Vietnam has achieved rapid economic growth, and in recent years, the GDP growth rate has been 6% to 7%. Accordingly, the demand for electric power increased by an average of 15.3% annually nationwide from 2000 to 2004, and the forecast is for continued increases averaging 16% annually until 2010. As exemplified by the widespread power outage in May 2005 in northern Vietnam, it is urgently required to address rapid growth in demand for electric power. For sustainable economic growth in Vietnam henceforth, it is indispensable to gain the ability to supply that can satisfy this vigorous growth in demand. Particularly in northern Vietnam as of 2004 (in the dry season), the peak demand (3,704 MW) exceeded the power generation facility capacity (2,830 MW).</p> <p>In Vietnam, when developing new energy sources, it is planned to supply the energy demand of each region with energy produced in the same region in order to minimize losses caused by long-distance transmission. This project is a part of the 5<sup>th</sup> master plan and is the most economical response to the increasing demand for electric power in northern Vietnam because it utilizes coal produced in northern Vietnam as fuel. Meanwhile, because coal-fired thermal power plants impact the environment more heavily than other forms of power generation due to their emission of soot and sulfur oxides, assistance is required for constructing an environmental management system.</p> <p>In JBIC's current Medium-Term Strategy for Overseas Economic Cooperation Operations, emphasis is placed on the priority area of “infrastructure development for sustainable growth,” and assistance is to be extended for development of economic infrastructure for which there is a strong need, such as energy.</p> <p>Therefore, JBIC's assistance is highly necessary and relevant.</p>
<b>3. Project Objectives</b>
The objective of this project is to promote the realization of a stable supply of electric power in four provinces of northern Vietnam where population and industry are concentrated by newly constructing a coal-fired thermal power plant (330 MW) adjacent to the existing Ninh Binh power plant located 105 km south of Hanoi, and thereby contribute to improve competitiveness of Vietnam's industry and public welfare.
<b>4. Project Description</b>

(1) Target Area

City of Ninh Binh, Ninh Binh Province

(2) Project Outline

Civil works and services that are necessary for the implementation of the project in the city of Ninh Binh will be provided as follows.

- (a) Construction of a coal-fired thermal power plant (civil engineering works, procurement and installation of materials and equipment, etc.)
- (b) Consulting services (tendering and contract assistance, construction supervision, etc.)

(3) Total Project Cost/Loan Amount

44,659 million yen (Yen Loan Amount: 29,421 million yen)

Note: The previous yen loan for Phase I was 4,433 million yen (Loan agreement: March 2005)

(4) Schedule

January 2005-December 2011 (84 months)

(5) Implementation Structure

- (a) Borrower: The Government of the Socialist Republic of Vietnam
- (b) Executing Agency: Electricity of Vietnam
- (c) Operation and Maintenance System: Electricity of Vietnam

(6) Environmental and Social Consideration

(a) Environmental Impacts/Land Acquisition and Resettlement

(i) Category: A

(ii) Reason for Categorization

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

(iii) Environmental Permit

The EIA report for the project was approved in October 2004 by Vietnam’s Ministry of Natural Resources and Environment (MONRE).

(iv) Anti-Pollution Measures

Following the start of the power plant operation, the air quality is expected to meet environmental standards (ground-level concentration restrictions) and emissions standards for soot, sulfur dioxide, and nitrogen oxides because environment monitoring devices will be installed. Regarding wastewater, ash pond wastewater will not be discharged to the external environment because it will be recycled. Moreover, a waterproof sheet will be placed in the bottom of the ash pond to prevent leakage. Warm wastewater is expected to meet Vietnam’s emission standards.

(v) Natural Environment

The project site is not located in or around national parks, nationally designated protected areas, or any habitats of rare species, so no significant adverse impact is foreseen.

(vi) Social Environment

The project is expected to require the resettlement of 328 households. A public consultation was held for the project in October 2004, where it was confirmed that there is no particular opposition to the project. Currently, resettlement is being implemented in accordance with the basic resettlement plan prepared by the executing agency.

(vii) Other/ Monitoring

The executing agency will implement monitoring of the state of resettlement and compensation, air quality, water quality, and noise.

(b) Promotion of Poverty Reduction

None

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

Because this is a large-scale infrastructure project in a country where there is concern over spreading HIV infection, it is planned to include measures against HIV/AIDS for the construction workers in the bidding documents and to have the contractors implement those measures in cooperation with the local health authorities.

(7) Other Important Issues

None

**5. Outcome Targets**

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Target (2012, 1 year after completion)
Maximum output (MW)	330
Plant load factor (%)	68.5
Electric thermal efficiency (%)	39.0
Electricity production (GWh/year)	1,800
Stoppages due to human error (hours)	0

(2) Internal Rate of Return

Financial internal rate of return (FIRR): 6.6%

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

(b) Benefit: Income from sale of electricity

(c) Project Life: 25 years

**6. External Risk Factors**

Delay in completion of the related electricity transmission project

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

In previous ODA loans for power plant construction or expansion projects, it has been learned that it is important to review, as necessary, the state of operation of the overall facilities, including preexisting parts, and the impact on the environment and society as well as to study the

environmental and social measures taken in the loan project. Based on the lessons learned, it is planned in this project to receive a report from the executing agency so that an adequate understanding may be gained of operating condition of the existing Ninh Binh thermal power plant and the environmental and social impact.

### **8. Plans for Future Evaluation**

#### (1) Indicators for Future Evaluation

- (a) Maximum output (MW)
- (b) Plant load factor (%)
- (c) Electric thermal efficiency (%)
- (d) Electricity production (GWh/year)
- (e) Stoppages due to human error (hours)
- (f) Financial internal rate of return (FIRR) (%)

#### (2) Timing of Next Evaluation

After project completion