

## Ex-ante Evaluation

### 1. Name of the Project

Country: The Socialist Republic of Vietnam

Project: O Mon Thermal Power Plant and Mekong Delta Transmission Network Project (IV)

(Loan Agreement: March 30, 2007; Loan Amount: 9,364 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 Vietnamese economy has achieved 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 northern Vietnam in May 2005, it is an urgent issue to take a necessary action to meet the surging electricity demand. In this regard, it is indispensable to secure adequate electricity supply capacity for the country to sustain its economic growth. While about half the population of the southern part of the country (17 million) is concentrated in the Mekong Delta, where this project is to be implemented, the only electric power facility in the region is the 183MW Can Tho Thermal Power Plant which has been in operation since the 1970s. The development of power sources in the Mekong Delta is therefore an urgent issue.

In Vietnam, it has been planned to meet the electricity demands in a region by constructing new generation facilities within the same region in order to reduce the transmission loss resulting from long-distance transmission. This project is a part of the 5<sup>th</sup> Master Plan and is intended to meet the future increase in electricity demand in the Mekong Delta region. It is planned to transfer the fuel of the thermal power plant from heavy oil to natural gas that lies on the southeast coast of Mekong Delta region. By doing so, it is anticipated that this project will bring active participation of private sector in developing natural gas fields and constructing natural gas pipelines.

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

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 the Mekong Delta and the rest of southern Vietnam by constructing a 330MW thermal power plant (660 MW when combined with existing facilities), which is located in the Mekong Delta region in southern Vietnam, together with an installation of peripheral transmission and transformer facilities, thereby contributing to the strengthening of the region's industrial competitiveness and to the improvement of public welfare.

### 4. Project Description

(1) Target Area

Can Tho City, O Mon Rural District

(2) Project Outline

In the O Mon Rural District, Can Tho City, provision of the following civil engineering works and services which are necessary for the implementation of the project will be carried out.

(a) Construction of a thermal power plant fueled by heavy oil and natural gas, and the construction of electricity transmission and transformer facilities (civil engineering works; procurement, installation, and adjustment of resources, machinery, and materials)

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

(3) Total Project Cost/Loan Amount

66,204 million yen (Yen Loan Amount: 9,364 million yen)

(Previous yen loans: Phase I, 5,900 million yen (L/A signed March 2001); Phase II, 15,594 million yen (L/A signed March 2002); Phase III, 21,689 million yen (L/A signed March 2003))

(4) Schedule

November 2002 – March 2011 (101 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: Can Tho Wholly Foreign-Owned Limited Company (power plant) and Power Transmission Company No.4 (transmission lines and transformer stations)

(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 under the “JBIC Guidelines for Environmental Considerations in Yen Loans” (established October 1999) because it involves the new construction of a large-scale thermal power plant. (Furthermore, this project also 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 for the power plant in October 1998 and for the fuel supply facilities in June 2000 by Vietnam’s Ministry of Science, Technology, and Environment (currently the Ministry of Natural Resources and Environment (MONRE)).

(iv) Anti-Pollution Measures: Environmental management during the construction period

(including ground subsidence and water pollution, etc.) is a condition of the contractors' contracts. During the operation, sulfur oxides will be disposed using desulfurization equipment and electrostatic precipitators, and nitrous oxides will clear Vietnam's emission standards by the usage of low NOx burners. Regarding the heavy oil ash and the gypsum, EVN plans to sell and export them to cement factories and construction companies. In addition, it is planned to dispose wastewater generated in the power plant through water treatment equipment.

(v) Natural Environment: The project site is located away from sensitive areas such as a national park and is not a habitat for rare species, etc., and so adverse impact on the natural environment is assumed to be minimal.

(vi) Social Environment: The acquisition of the 54.7 ha of land required for the power plant and the access road has already been completed, and the resettlement of 54 households has been completed. The transmission line and transformer station portion requires the acquisition of approximately 20 ha of land. Of the 18 households requiring resettlement for the transformer station portion, compensation of 12 households has already been completed. Furthermore, the transmission line portion requires no resettlement. Regarding the route changes in four sections and the new addition of one section in the transmission line and transformer station portion, land acquisition is expected, but resettlement is not expected to be necessary.

(vii) Other/ Monitoring: The executing agency will monitor the air quality, water quality, noise, and land acquisition.

(b) Promotion of Poverty Reduction

None

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

Since the project involves large-scale construction in the region facing a high prevalence of HIV, the executing agency has agreed on implementation of AIDS prevention measures and reporting their results. For the implementation system, it is planned to use the Japan Trust Fund (JTF) for HIV/AIDS and to have the Vietnamese NGO, Vietnam Family Planning Association (VINAFFPA) under the International Planned Parenthood federation (IPPF), conduct the implementation.

(7) Other Important Issues

None

## 5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

(a) Power Plant

Indicator	Target (2013, 2 years after completion)
Net electric energy production (GWh/year)	1,902.8 GWh
Maximum output (MW)	330 MW
Capacity factor (%)	68.5%
Availability factor (%)	89.0%
Auxiliary power ratio (%)	3.9%

Gross thermal efficiency (%)	41.9%
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(b) Transmission and Transformers

Indicator	Target (2013, 2 years after completion)
Transformer station uninterrupted ratio (%)	99%
Transmission loss (transmission lines) (%)	0.9%
Transformer loss (transformer stations) (%)	0.3%
Interruption times (transmission lines) (100 km/annual outages)	100km/1 to 2 times annually

(2) Internal Rate of Return

Based on the following premises, the Financial Internal Rate of Return is 6.3%.

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

**6. External Risk Factors**

Delay in completion of related transmission and transformer facilities.

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

In previous yen loans for projects for expansion of power plants, it has been learned that it is important to study the timing of the completion of the power plant, the transmission lines, and the transformer stations in order to maximize the realization of the project's effects. Based on this lesson learned, in the implementation of this project JBIC plans to receive reports from the executing agency so as to adequately grasp the progress condition of the transmission line and transformer station portion of the project.

**8. Plans for Future Evaluation**

(1) Indicators for Future Evaluation

(a) Power Plant

- (i) Net electric energy production (GWh/year)
- (ii) Maximum output (MW)
- (iii) Capacity factor (%)
- (iv) Availability factor (%)
- (v) Auxiliary power ratio (%)
- (vi) Gross thermal efficiency (%)

(b) Transmission and Transformers

- (vii) Transformer station uninterrupted ratio (%)
- (viii) Transmission loss (transmission lines) (%)
- (ix) Transformer loss (transformer stations) (%)

- (x) Interruption times (transmission lines) (100 km/annual outages)
- (c) Financial internal rate of return (FIRR) (%)

(2) Timing of Next Evaluation  
After project completion