

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: Socialist Republic of Viet Nam

Project: Thai Binh Thermal Power Plant and Transmission Lines Construction Project (I)

Loan Agreement: November 10, 2009

Loan Amount: 20,737 million Yen

Borrower: The Government of the Socialist Republic of Viet Nam

2. Background and Necessity of the Project

(1) Current State and Issues of the Power Sector in Viet Nam

Vietnam has recorded high GDP growth rate of around 8% in recent years. Reflecting such rapid economic growth, power demand has increased at an average annual rate of 15%, and maximum power demand has increased 3.3 fold from 3,200MW to 10,500MW in the past ten years up to 2005. While this trend may be affected by the recent global economic crisis, it is expected that Viet Nam's economy will recover in 2010. The Sixth National Power Development Master Plan, approved in 2007, projects a 17% annual increase in power demand up till 2015, which will require the development of some 30 GW of power generation between 2008 and 2015. However, most investment projects mentioned in the Master Plan are largely fallen behind, and the delay is straining further the unstable power demand-supply balance in Viet Nam.

(2) Development Policies for the Power Sector in Viet Nam and the Priority of the Project

Viet Nam is endowed with various natural resources. In the northern part of the country, power plants mainly run on hydropower and domestic coal, and in the south, they mainly run on natural gas. In anticipation of future increases in power demand, however, the Sixth National Power Development Master Plan calls for the construction of more coal-fired thermal power plants over the short term and the development of nuclear power plants and pumped-storage power plants over the medium to long term. As of July 2008, the total installed capacity of the power plant in the country is 15,060MW, of which hydropower plants accounts for almost 40%. Power policies seek to increase the ratio of coal-fired thermal power plants in the future.

(3) Japan and JICA's Policy and Operations in the Power Sector

Japan's Country Assistance Program (CAP) for Viet Nam (July 2009) identifies cooperation in the area of stable resource/energy supply as an important part of "Growth Acceleration," one of the priority areas of Japan's assistance to Viet Nam, and defines assistance relating to increasing power generation (and particularly key power generation facilities) as a priority issue. Therefore, the project conforms to Japan's assistance policy. In response to the CAP, JICA plans to address the issue of increasing power supply capacity as a measure related to "Promotion of Economic Growth and International Competitiveness". The development of power generation facilities and transmission lines is included among the programs for stable energy supply, and the project will be implemented as part of that initiative.

(4) Other Donors' Activity

The World Bank (WB) is concentrating on supporting power sector reforms and rural electrification. The Asian Development Bank (ADB) is focusing on further strengthening the profitability of the power generation and high-pressure systems sector by providing funds from its Ordinary Capital Resources (OCR), in addition to promoting sector reforms.

(5) Necessity of the Project

The project aims to efficiently address pressing demands for power and contribute to securing a stable power supply in northern Viet Nam by constructing a coal-fired thermal power plant that runs on domestic coal, in Thai Binh Province. It accords with Japan's and JICA's priority assistance areas, and JICA's support of the project is both highly necessary and relevant.

3. Project Description

(1) Project Objective

The objective of the project is to meet the increasing power demand in Viet Nam through construction of new coal-fired thermal power plant (600MW) and related transmission network, in Thai Binh Province, thereby contributing to the socio-economic development of the country.

(2) Project Site/Target Area

Thai Thuy District, Thai Binh Province

(3) Project Components

1) Construction of Thai Binh Thermal Power Plant (300MW x 2 units)

- ① Civil engineering works (cooling water intake/discharge channels, port facilities including coal unloading facilities, etc.)
- ② Material procurement and installation (turbine, boiler, power generator, flue gas desulfurization unit, etc.)

2) Construction of a 220kV transmission line (approx. 30km)

3) Consulting services (short-list method)

(4) Estimated Project Cost (Loan Amount)

82,199 million Yen (Loan amount for the first phase: 20,737 million Yen)

(5) Schedule

November 2009 – May 2017 (91 months; planned). To be completed with the commencement of operations (May 2015).

(6) Project Implementation Structure

1) Borrower: The Government of the Socialist Republic of Viet Nam

2) Executing Agency: (Power plant) Vietnam Electricity, (Transmission line) National Power Transmission Corporation

3) Operation and Maintenance System: (Power plant) Ninh Binh Thermal Power Joint Stock Company, (Transmission line) No.1 Power Transmission Corporation

(7) Environmental and Social Consideration/Poverty Reduction/Social Development

1) Environmental and Social Consideration

① Category: A

② Reason for Categorization: The project is classified as Category A, because it applies to the thermal power plant sector under the "JBIC Guidelines for

Confirmation of Environmental and Social Considerations (April 2002).”

- ③ Environmental Permit: (Power plant) An Environmental Impact Assessment (EIA) report was approved by the Ministry of Natural Resources and Environment in March 2009. (Transmission line) No EIA is required. Instead, an environmental protection permit was by the Thai Binh Province People’s Committee in February 2009.
 - ④ Anti-Pollution Measures: (Power plant) Viet Nam’s domestic standards and World Bank standards¹ for air quality will be satisfied by installing a desulfurization unit, and standards for warm-water discharge will be met by ambient discharge through a discharge channel. (Transmission line) The levels of air quality, noise, and vibration produced mainly during construction work will conform to Viet Nam’s domestic standards.
 - ⑤ Natural Environment: The project site is not located in or around an area that would be readily affected by the project, such as a national park, and any adverse impacts on the natural environment are expected to be minimal.
 - ⑥ Social Environment: (Power plant) Around 250ha of land will be acquired in line with the required domestic procedures in Viet Nam. No resident relocation will be necessary. (Transmission line) The acquisition of around 5ha of land will require one household to relocate, but the land will be acquired in line with the required domestic procedures in Viet Nam.
 - ⑦ Other/Monitoring: During construction, air quality, water quality, noise and vibration, and the state of livelihood recovery by affected residents will be monitored by the Implementing Agency, and after commencement of operations, the power company that will be established to operate the power plant.
- 2) Promotion of Poverty Reduction: None
- 3) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Diseases Including HIV/AIDS, Participatory Development, Consideration for the Handicapped, etc.): The HIV/AIDS Prevention Center, managed by the Thai Binh Province People’s Committee, plans to implement measures to protect construction workers and local residents from HIV/AIDS, using state budget.
- (8) Collaboration with Other Donors: None
- (9) Other Important Issues: Collaboration with a technical cooperation project is being considered within the framework of the stable energy supply program.

4. Targeted Outcomes

(1) Performance Indicators (Operation and Effect Indicator)

Indicator	Baseline (Actual Value in 2008)	Target (2017) [Expected value 2 years after project completion]
Maximum output (MW)	-	600

¹ Pollution Prevention Abatement Handbook 1998

Net electric energy production (GWh/year)	-	> 3,276
Plant load factor (%)	-	> 68.5
Gross thermal efficiency (%)	-	> 39.9
Availability factor (%)	-	> 92.0
Auxiliary power ratio (%)	-	< 9.0
Outage hours (human error) (hr)	-	0
Outage hours (mechanical error) (hr)	-	< 218
Outage hours (regular inspection) (hr)	-	480

(2) Internal Rate of Return

Based on the conditions indicated below, the Financial Internal Rate of Return (FIRR) of the project is 7.4%.

Cost: Construction cost, operation/maintenance management costs

Benefit: Revenue from power sales

Project Life: 25 years

5. External Factors and Risk Control

None

6. Lessons Learned from Past Projects

Ex-post evaluations of past ODA loan projects related to the construction of power plants note that the implementing agency itself has the primary responsibility to integrate environmental considerations in the project, and JICA, for its part, should encourage the implementing agency to take action as necessary to ensure proper environmental countermeasures. Based on this lesson, the project will support the implementing agency's capacity to strengthen environmental monitoring by providing consulting services as appropriate.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Maximum output (MW)
- 2) Net electric energy production (GWh/year)
- 3) Plant load factor (%)
- 4) Gross thermal efficiency (%)
- 5) Availability factor (%)
- 6) Auxiliary power ratio (%)
- 7) Outage hours (human error) (hr)
- 8) Outage hours (mechanical error) (hr)
- 9) Outage hours (regular inspection) (hr)
- 10) Financial internal rate of return (%)

(2) Timing

2 years after project completion