

Ex-ante Evaluation

1. Name of the Project

Country: The Socialist Republic of Viet Nam

Project: Nghi Son Thermal Power Plant Construction Project (III)

L/A signed on: November 2, 2011

L/A Amount: ¥40,330,000,000

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

In recent years, Viet Nam has recorded a high growth rate of around 8% in its Gross Domestic Product (GDP). Reflecting this rapid economic growth, the nationwide electricity demand increased at an annual average of 13.5% over the five years from 2005 to 2009 and peak demand increased 1.3 times, from 10,500 to 13,800 MW. Though this trend has been affected by the recent global economic crisis and concurrent recession, it is expected to recover high economic growth in Viet Nam as the mid- and long-term trend. The Sixth National Power Development Master Plan approved in 2007 expects that the power demand will increase annually by 17% through 2015, requiring nearly 30,000 MW in power development between 2008 and 2015. However, due to the delay of investment plans for the power development described in the master plan, the balance of electric power supply and demand in Viet Nam has been strained, and forced to implement rolling blackouts during peak demand period.

(2) Development Policy for the Power Sector in Viet Nam and the Priority of the Project In Viet Nam, energy resources are unevenly distributed. Primary energy sources for power plants in the northern area are hydro and coal-fired power plants, while those in the south use natural gas. In response to surging power demand, development plans were formulated under the Sixth National Power Development Master Plan, including construction of coal-fired power plants in the short-term, as well as nuclear power plants and pumped-storage power plants in the med- to long-term. The total installed capacity for power plants in 2009 is 17,669 MW and hydroelectric power generation accounts for 38% of this, however, in the future, it is planned to increase its proportion of coal-fired power plants.

(3) Japan and JICA's country assistance program and achievements in the power sector In the Country Assistance Program for Viet Nam formulated in July 2009 by the Government of Japan, a priority area for assistance is "promotion of economic growth and strengthening of international competitiveness" and in which assistance for power generation has been considered as one of the important sectors. Therefore, this project is implemented in accordance with this assistance program. The first time sliced loan for the construction of Nghi Son Thermal Power Plant was approved in 2006 (20,943,000,000 yen) followed by the second loan (29,852,000,000 yen) in 2010. Further, this project also incorporates the outputs of technical cooperation, including "Electric Power Technical Standards Promotion in Viet Nam". Moreover, a study for controlling GHG emissions at Vietnamese coal-fired power plants has been implemented and input to the Project.

(4) Assistance by Other Aid Organizations

The World Bank has emphasized assistance for power sector reform and rural electrification. The Asian Development Bank (ADB) sets policy on further enhancing assistance for power generation and high voltage lines by providing Ordinary Capital Resources (OCR).

(5) Necessity of the Project

This project is highly relevant in terms of Japan and JICA's priority areas. Since the Government of Viet Nam government recognizes needs for construction of coal-fired power plants in the northern region of Viet Nam, implementation of this project is considered to be highly relevant and necessary.

3. Project Description

(1) Project Objectives

To construct a new coal-fired Thermal Power Plant with capacity of 600 MW (300MW×2 Units) in the Nghi Son Economic Zone, for meeting the increasing power demand in North part of Viet Nam, thereby contributing to promote economic growth and strengthening international competitiveness of the region.

(2) Program Site/Target Area: Tinh Gia District, Thanh Hoa Province in the Socialist Republic of Viet Nam

(3) Project Outline:

- 1) Construction of coal-fired power plant (300 megawatt x 2 units)
- 2) Consulting service (design and supervision, etc.)

(4) Total Project Cost

111,461,000,000 yen (Japanese ODA loan portion: 91,124,000,000 yen)

(5) Schedule:

From March 2007 to February 2016 (108 months in total)

Completion of project: February 2014—when the facilities are placed in service

(6) Implementation Structure

- 1) Borrower: The Government of the Socialist Republic of Viet Nam
- 2) Executing Agency: Vietnam Electricity
- 3) Operation and Maintenance System: Nghi Son 1 Thermal Power Plant

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

1) Environmental and social consideration:

i. Category: A

ii. Justification: This project falls into a category of “Thermal Power” and “Sensitive Sectors” as per the JBIC Guidelines for Confirmation of Environmental and Social Considerations (issued April 2002). Therefore, it is classified as Category A.

iii. Environmental approval: The Environmental Impact Assessment (EIA) report for this project was approved by Ministry of Natural Resources and Environment

(MONRE) in December 2005. Due to changes in water outlet/discharge channel locations in August 2006, an additional EIA report was prepared and approved by MONRE in November 2006.

- iv. Pollution control: Measures will be taken to fulfill emission allowances for air pollution after commencement of the project.
- v. Natural environment: The Project site is not situated in sensitive areas such as national parks and their peripheral areas and it is assumed that an adverse effect on the natural environment will be kept to minimum.
- vi. Social environment: This project requires land acquisition of 230 ha, including the area for construction of common facilities with Nghi Son No. 2 Thermal Power Plant (to be constructed by Build-Operate-Transfer (BOT) method). Further, the project requires resettlement of 579 households including the resettlement for Nghi Son No. 2 Thermal Power Plant. The land acquisition and resettlement procedure were implemented in compliance with the Vietnamese laws and the Decision by Thanh Hoa Province (Decision No: 4366/2009/QD-UBND) that specifies policies of resettlement for the Nghi Son industrial park and resettlement for the Project site was completed in June 2011.
- vii. Monitoring/other: An environmental department of Vietnam Electricity (EVN) will take in charge of monitoring air quality, water quality and noise during construction. After the facility is in service, those parameters will be monitored by the Environment Department of Nghi Son No.1 Thermal Power Plant. As of June 2011, monitoring during construction is being carried out as planned and no particular problems have been confirmed.
- 2) Poverty reduction: None in particular
- 3) Promotion of social development: (e.g. gender perspective, measures for infectious diseases including AIDS, participatory development, considerations for persons with disabilities, etc.): The project is a large-scale infrastructure development project to be implemented in the areas with high HIV/AIDS prevalence rates. Hence, AIDS control measures will be taken for construction workers by the contractor(s) together with labor unions, youth associations, and a management committee for Nghi Son industrial park based on an agreement.

(8) Partnership with other donors: None in particular

(9) Other important issues: None in particular

4. Program's Effects

(1) Quantitative Effect

1) Operation and Effect Indicators

Indicator	Baseline	Target (2016) 【Two years after program completion】
Maximum output (MW)	-	600
Power generation at sending end (GWh)	-	3232.8
Plant load factor (%)	-	More than 68.0
Availability factor (%)	-	92.0
Auxiliary power rate (%)	-	10.2 or less

Plant efficiency (%)	-	39.6
Outage by human error (hours)	-	0
Outage by human error (frequency)	-	0
Planned outage by periodical inspections (hours)	-	Less than 720

2) Internal Rate of Return

Based on the following premises, the Financial Internal Rate of Return (FIRR) for this project is 5.03%

Cost: Project cost (excluding tax) and operation and maintenance expenses

Benefit: Income by selling electric power

Project life: 30 years

(2) Qualitative Effect

To achieve stable power supply in northern areas, facilitate economic growth and enhance international competitiveness

5. External Risk Factors and Control

None in particular

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

From ex-post evaluations of ODA loans for past power plant construction projects, it was learned that an executing agency should principally take measures for environmental considerations. However, it has been pointed out that it is important to approach the executing agency by JICA to implement measures as necessary. Based on the above lessons, JICA requests executing agency to submit project reports in order to better understand conditions for implementing environmental monitoring during construction or after completion. Furthermore, measures for reduction of Greenhouse Gas (GHG) emissions will be introduced for coal-fired power plants in order to reduce environmental impact based on the results of the above Special Assistance for Project Implementation (SAPI).

7. Plans for Future Evaluation

(1) Indicators for Future Evaluation

- 1) Maximum output power (MW)
- 2) Power generation at sending end (GWh)
- 3) Plant load factor (%)
- 4) Availability factor (%)
- 5) Auxiliary power rate (%)
- 6) Plant efficiency (%)
- 7) Outage by human error (hours)
- 8) Outage by human error (frequency)
- 9) Planned outage by periodical inspections (hours)
- 10) Financial internal rate of return (FIRR) (%)

(2) Timing of the Next Evaluation: Two years after project completion