

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country : Socialist Republic of Viet Nam

Project : O Mon Thermal Power Plant Unit No.2 Construction Project (II)

Loan Agreement : March 22, 2013

Loan Amount : ¥6,221,000,000

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 7% in recent years, which has accordingly caused the increase in the electric demands reaching 13.4% as an annual average from 2006 to 2010, with the increase of maximum power demand by around 1.7 times from 10,187MW to 17,165MW. Meanwhile, the development of electric sources has been delayed behind the plan in “the 6th National Power Development Master Plan” (2006~2015) due to financial shortage and so forth. As a result, the balance of supply and demand in the electric power faced stringent conditions, which has affected negatively on economic and social activities in the country. This was obvious, especially in the period of 2009~2010 when the scarce rainfall declined the power generation from the hydropower plants, rolling blackouts were implemented during the summer season in Hanoi and Ho Chi Minh.

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

In order to respond to the rapid increase in power demand of the country, power development projects with a total installed capacity of about 50,000MW are scheduled to be commissioned from 2011 to 2020 in “the 7th National Electricity Master Plan” approved in 2011. Out of this plan, there are power development projects with a total capacity of 23,735MW scheduled to implement in the south of Vietnam by 2020 in order to satisfy the maximum power demand forecast increasing the maximum power demand from 9,359MW to 26,686MW.

Taken into account that natural gas can be produced in the southern part of Viet Nam, “the 7th National Electricity Master Plan” envisages power development projects in the south of Vietnam focusing on the gas-fired power plants, in which the Project has been listed as one of the power development projects.

(3) Japan and JICA’s Policy and Operations in the Electricity Sector

Country Assistance Policy for Viet Nam in December 2012 has set a focus on “growth

and strong competitiveness”, articulating its commitment to support the country in ensuring stable supply of energy and promoting energy conservation. In addition, the Rolling Plan also envisages “stable supply of energy/energy conservation promotion” as part of the consolidation of economic infrastructure and access service enhancement which are considered key development issues in the Sector. The Project has been formulated in line with the Plan. It is planned that several power plants are to be constructed intensively in O Mon District. The construction of Unit No.1 of O Mon 1 was financed through the Japanese ODA Loan (Approved Amount: 52,547 Million Yen, the operation has already started). The construction of O Mon 3 is planned to finance as well.

(4) Other Donor’s Activities

The World Bank has focused on the assistance for power sector reform and rural electrification, while Asia Development Bank has implemented its supporting operations for, in addition to the sector reform, the power generation/high-voltage network system utilizing Ordinary Capital Resource (OCR). Beside these, there are plans of constructing power plants through Chinese and Korean funds. Asia Development Bank and KfW (Kreditanstalt für Wiederaufbau) is to co-finance construction of O Mon 4.

(5) Necessity of the Project

The Project intends to respond to the rapid increase of power demand in the southern area of Viet Nam, through constructing a new power plant in the southern area where the power supply and demand has been stringent. This is in line with aid focal fields assumed by the Government of Japan and JICA, as well as the development policies of the Government of Viet Nam. In addition, this is a project contributing to the mitigation of the climate change since greenhouse gas emissions will be controlled, taken into account that natural gas is to be utilized as a fuel once the natural gas is ready to be supplied despite the heavy oil to be used as a fuel in the first period after the operation starts. The Project expects a fund shortage due to inevitable conditions such as price escalation which was not assumed, and therefore, the Government of Viet Nam, in addition to its own national budget appropriation, has submitted a request for additional Japanese ODA loan assistance. Out of all the Project components, the procurement for the construction of oil/gas-fired power plant was completed in August 2012. Commencement of the construction work is scheduled in September 2012 and completion of construction will be in October 2015. Necessity and relevance of continuous support by JICA for implementation of the Project are considered to be high.

3. Project Description

(1) Project Objectives

The objective of the Project is to meet increasing power demand in Mekong Delta region in the south of Vietnam by constructing 330MW Unit of oil/gas-fired in O Mon Power Complex, thereby contributing to economic growth and strengthening international competitiveness of the region.

(2) Project Site/Target Area

O Mon District, Can Tho City, the Socialist Republic of Viet Nam

(3) Project Components

- 1) Construction of an oil/gas-fired power plant (330MW x 1 unit) (civil works, procurement of construction materials, installation, and so forth)
- 2) Consulting service (assistance to bidding procedures, supervision, and so forth)

(4) Estimated Project Cost (Loan Amount)

48,202,000,000 yen (including this time of Japanese ODA loan targeted amount: 6,221,000,000 yen)

(5) Schedule

From March 2004 to October 2017 (164 months in total)

Completion of the Project: October 2015 - when the facilities are placed in service

(6) Project Implementation Structure

- 1) Borrower: The Government of the Socialist Republic of Viet Nam
- 2) Executing Agency: Vietnam Electricity
- 3) Operation and Management/Maintenance and Supervisory Structure: Power Generation Corporation 2

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

- 1) Environmental and Social Consideration
 - ① Category: A
 - ② Reason for the Categorization: The Project is categorized in a large-scale thermal power sector raised in JBIC Guidelines for Confirmation of Environmental and Social Considerations (issued April 2002).
 - ③ Environmental Permit: The EIA (Environmental Impact Assessment) report for the Project was approved by the Ministry of Science and Technology, and Environment in October 1998.
 - ④ Anti-Pollution Measures: As to the impacts of land subsidence, water pollution,

and so forth, proper measures are to be taken, with the assistance of the consultants. For the air pollution and drainage after commencement of the Project, relevant measures are to be prepared to meet each drainage and environmental standard in compliance with the Vietnamese laws by installing desulphurization facilities and drainage treatment devices.

- ⑤ Natural Environment: The target site for the Project is not regarded as a sensitive area such as national parks, and their peripheral areas and it is assumed that an adverse impacts on natural environment will be kept minimum.
 - ⑥ Social Environment: Relevant procedures for the land acquisition and resettlement were already completed in 2000, and there will be no more necessity of land acquisition and resettlement.
 - ⑦ Other/Monitoring: Environment Sector of GENECO2 will conduct the monitoring of air pollution, water quality, noise and so forth.
- 2) Promotion of Poverty Reduction: None in particular
- 3) Promotion of Social Development: (e.g. Gender Perspective, Measures for Infectious Diseases including HIV/AIDS, Participatory Development, Consideration for the Person with Disability etc.): AIDS control measures will be taken for construction workers by the contractor(s)

(8) Collaboration with Other Donors:

None in particular

(9) Other Important Issues:

It was assumed that the maximum capacity was 300MW in the original objective of the Project in FY2003. In addition, support for establishment of One-Member Limited Liability Company was included in the original scopes of work. However, the maximum capacity was modified to 330MW after signing contract, and establishment of One-Member Limited Liability Company was conducted by the Vietnamese side.

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicators)

Indicators	Baseline (2012)	Target (2017) 【Two years after project completion】
Maximum Output Power (MW)	-	330
Transmission End Electric Power Amount (Gwh/year)	-	1,924.560
Capacity Usage Rate (%)	-	68.49
Operation Rate (%)	-	89.04

Auxiliary Power Ratio (%)	-	5.03 (heavy oil)、2.80 (gas)
Gross Thermal Efficiency (%)	-	41.97 (heavy oil)、39.09 (gas)
Outage due to human error (hour)	-	0
Outage due to machine breakdown (hour)	-	240
Planned outage for regular inspection (hour)	-	720

2) Internal Rate of Return

Based on the conditions indicated below, the Financial Internal Rate of Return (FIRR) of the Project is estimated to 5.54%. Meanwhile, the Economic Internal Rate of Return (EIRR) of the Project is not to be calculated, since it is difficult to calculate benefits regarding alternative effects, taken into account that it is difficult to precisely grasp the number of consumers, who have conducted in-house power generation, out of the electricity consumers connected to the grid, because of the unstable power supply.

FIRR

Cost: Project cost, operation and maintenance expenses, fuel cost

Benefit: Income from electric power selling

Project Life: 30 years

(2) Qualitative Effects

To achieve stable power supply, improve living conditions of local residents, mitigate impacts of the climate change, and to facilitate economic growth in the southern area

5. External Factors and Risk Control

Delays in supply schedule of gas as fuel.

6. Lessons Learned from Past Projects

(1) Assessment results from similar projects:

An ex-post project evaluation of “Gas-Turbine Power Generation Project (Rangoon)” in Myanmar showed an example that a supply shortage of the natural gas which was planned to be used as a fuel caused an incomplete operation of the power plant during the first few years after the operation started. That evaluation suggested a lesson to learn that it is necessary to collect the information not only from an executing agency but also from natural gas suppliers directly. .

(2) Lessons for the Project:

Regarding the implementation of the Project, the preparatory survey of O Mon 3 had

succeeded in confirming as to the contract years of gas supply and estimated amount of gas, and so forth, as well as in collecting relevant information on the progress of gas supply contract agreement directly from companies which are assumed to be responsible for gas supply. It is planned to continue to be informed from both those companies responsible for gas supply and the executing agency to grasp the progress over the gas supply contract agreement in the coming period.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Maximum Output (MW)
- 2) Net Electricity Energy Production (Gwh/year)
- 3) Plant Load Factor (%)
- 4) Availability Factor (%)
- 5) Auxiliary Power Ratio (%)
- 6) Plant Efficiency (%)
- 7) Forced Outage Hours (human errors) (hour)
- 8) Forced Outage Hours (machine troubles) (hour)
- 9) Planned Outage Hours by Periodical Inspection (hour)
- 10) Financial Internal Rate of Return (%)

(2) Timing

Two years after project completion

END