

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: Socialist Republic of Viet Nam

Project: Da Nhim Hydropower Plant Expansion Project

Loan Agreement: February 28, 2014

Loan Amount: 7,515 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

The Vietnamese economy has achieved GDP annual average growth rates higher than 6% since 2007. As a result, demand for electric power has been rising by an annual average of 12.5% and the power supply situation is tight because power supply development is not keeping up with the demand. Especially in the southern region where a large number of Japanese companies are active, annual planned power outages, etc. due to power shortages have a negative impact on the country's economic and social activities. Though total power equipment capacities (11,123 MW) exceeded the demand (10,675 MW) in 2012, demand exceeded supply in 2013 and the shortage is expected to become 2,088MW by 2015. Under this situation, it is necessary to expand power supply to the southern region.

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

The 7th National Master Plan for power development (2011–2020) plans nearly 50,000MW in total development of electric power resources across the country from 2011 to 2020. For the southern region, 23,735MW of development is planned by 2020 in response to the estimated increase of maximum power demand from 9,359MW to 26,686MW. However, the development is delayed due to a lack of funding, prolonged electric power selling negotiations, delayed construction work and other factors leading to tight power supply and demand in the southern region. In this situation, there is a recognition of urgent need for expansion of existing hydraulic power plants that would be most suitable as a peak power source and the construction period of which is relatively short. The Project aims to contribute to the reliability improvement of the electric supply to the southern region by increasing the power supply to the region.

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

Because the "Country Assistance Policy for Viet Nam," issued in December 2012, has set 'growth and competitiveness' as its focal field to support stable energy supply,

energy conservation, etc., the Project is consistent with the policy. Since the resumption of support to Viet Nam in 1992, the Government of Japan has constructed and renovated power plants with a total equipment capacity of 3,000MW including Phu My and Pha Lai Thermal Power Plant Projects through Japanese ODA loans in addition to technical cooperation such as National Power Development Support Project and Electric Power Technical Standards Promotion.

(4) Other Donor's Activities

The World Bank has supported the power sector reform and rural electrification through implementation of the Power Sector Reform Development Policy Operation Project, the Rural Energy Project, etc. The Asia Development Bank, in addition to the support to the power sector reform, supports power generation and high-voltage lines through implementation of the Song Bung 4th Hydro Electric Power Plant Construction, the Greater Mekong Sub-regional Cooperation on Power Line, and other projects. The Project does not overlap with supports implemented by other donors.

(5) Necessity of the Project

Power supply by the plant, expanded through the Project, will contribute to stable power supply in the southern region of Viet Nam around Ho Chi Minh City. This is in line with the policy of the Government of Viet Nam as well as Japan and JICA's aid policy, and therefore, the necessity and relevance of this Project are considered to be high.

3. Project Description

(1) Project Objectives

The objective of the Project is to enhance power supply capacity in the southern region by expanding the existing Da Nhim Hydropower Plant with an 80MW hydroelectric generator, etc., thereby contributing to promotion of the economic growth and international competitiveness of the region.

(2) Project Site/Target Area:

Lam Dong and Ninh Thuan provinces, Socialist Republic of Viet Nam

(3) Project Components

- 1) Civil engineering work (power plant, conduit tunnel, etc.) (Local competitive bidding)
- 2) Procurement of hydraulic equipment (hydraulic iron pipes, sluice gates, etc.) (Local competitive bidding)
- 3) Procurement of electric equipment (turbines, power generators, transformation units, etc.) (International competitive bidding)
- 4) Consulting services (construction supervision, etc.)(short-list method)

(4) Estimated Project Cost

8,886 Million Yen (Yen Loan Amount: 7,515 Million Yen)

(5) Schedule

February 2014-August 2017 (43 months in total). The Project will be completed when the service commences (in August 2016).

(6) Project Implementation Structure

- 1) Borrower: The Government of the Socialist Republic of Viet Nam
- 2) Guarantor: None
- 3) Executing Agency: Da Nhim–Ham Thuan–Da Mi Hydro Power Joint-Stock Company (DHD)
- 4) Operation and Maintenance Structure: DHD

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

- 1) Environmental and Social Consideration
 - (1) Category: B
 - (2) Reason for Categorization: The project is not considered to be a large-scale hydropower sector project, is not located in a sensitive area, and has none of the sensitive characteristics under the JICA guidelines for environmental and social considerations (April, 2010), it is not likely to have significant adverse impact on the environment.
 - (3) Environmental Permit: the Environmental Impact Assessment (EIA) report concerning the Project was approved by Viet Nam's Ministry of Natural Resource and Environment in July 2013.
 - (4) Anti-Pollution Measures: against air-pollution, noise and vibration due to construction traffic and water pollution, etc. due to drilling operations, measures including watering, speed limiting and work volume reduction during the rainy season (to prevent increase of muddy water) will be taken to meet the domestic emission and environmental standards of Viet Nam.
 - (5) Natural Environment: the project site is not located in or around sensitive areas such as a national park, and so any adverse impact on the natural environment is assumed to be minimal.
 - (6) Social Environment: this project requires the acquisition of 12.23 ha of land and the executing agency will proceed with the land acquisition in accordance with the domestic procedures of Viet Nam and JICA Guidelines for Environmental and Social Considerations. The project does not require resettlement of residents. There has been no opposing voice concerning the project from residents to be affected.

- (7) **Other / Monitoring:** DHD's environmental department will monitor air and water quality, noise, etc. during the construction, and water quality, etc. after starting the service provision.
- 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 Persons with Disabilities, etc.):** Because this is a large project that will concentrate a larger number of construction workers at a single site for a long period of time, the executing body will directly sign a contract with a service provider to take HIV/AIDS countermeasures for the construction workers.
- (8) **Collaboration with Other Donors:** None in particular
- (9) **Other Important Issues:** Da Nhim Hydropower Plant, which was constructed as a post-war reparation, started operation in 1964 and a Japanese ODA loan was provided for the plant's rehabilitation in 1997. The project will expand the plant that was constructed and rehabilitated through the cooperation.

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators (Operation and Effect Indicators)

Indicator	Baseline (2013)	Target (2018) [2 years after project completion]
Maximum output (MW)	160	240
power generating at sending end (GWh/year)	1,018.72	1,110.78
Facility utilization factor (%)*	-	31.45
Operating ratio (%)*	-	85

* Expanded part (80MW)

2) Internal Rate of Return

The Economic Internal Rate of Return (EIRR) of the project is 15.83% and the Financial Internal Rate of Return (FIRR) is 2.52% based on the following premises:

[EIRR] Cost: Equipment, operation and maintenance management costs involved in the expansion

Benefit: Equipment, operation and maintenance management costs of an alternative thermal power plant

Project life: 40 years

[FIRR] Cost: Equipment, operation and maintenance management costs involved in the expansion

Benefit: Revenue from selling the power generated by the expanded part

Project life: 40 years

(2) Qualitative Effects: Promoting the economic growth of the southern region of Viet Nam through stable power supply in the region

5. External Factors and Risk Control

None in particular

6. Lessons Learned from Past Projects

1) Evaluation results from similar Projects

The ex-post evaluation of the "Sirikit Hydroelectric Project Unit 4 in Thailand" gives a lesson that it is important to implement appropriate preventive maintenance and regular inspection through effective use of the technologies and knowledge of the Center of Excellence for Hydro Plant (CEHP) that unifies technical support and training for all hydro plants.

2) In light of the abovementioned lesson, appropriate preventive maintenance and regular inspection will be implemented through checking/repair and training will be provided to power plants by an engineering service center owned by DHD.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Maximum output (MW)
- 2) Power generating at sending end (GWh/year)
- 3) Facility utilization factor (%)
- 4) Operating ratio (%)
- 5) Economic Internal Rate of Return (EIRR)(%)
- 6) Financial Internal Rate of Return (FIRR)(%)

(2) Timing

2 years after project completion

END