

Ex-ante Evaluation

1. Name of the Project

Country: The Kingdom of Cambodia

Project: Greater Mekong Power Network Development Project (Cambodia Growth Corridor).

(Loan Agreement: March 26, 2007, Loan Amount: 2,632 million yen, Borrower: The Royal Government of Cambodia)

2. Necessity and Relevance of JBIC's Assistance

The majority of Cambodia's power generation facilities are small-scale and diesel-powered generators which depend on imported oil, and the installation capacity for the entire country is about 190MW, which is extremely low in comparison with surrounding countries. In addition, apart from an urban grid (115kV) in the city of Phnom Penh, there is no interurban transmission grid linking Cambodia's cities. Consequently, the country's overall electrification rate remains at about 17%, which is one of the lowest among Southeast Asian countries. Against this backdrop, demand for electricity has been growing at an annual rate of about 15.5% for the past five years accompanying Cambodia's solid economic growth. At present the demand for a stable supply of electricity, including private generation to accommodate commercial operations such as hotels and stores, is extremely high, and demand for electricity is expected to increase annually at the rate of 13% or above over the next 10 years.

The present electric power sector development plan in Cambodia was formulated as the "Cambodia Energy Strategy (1996-2016)" based on a master plan prepared by the World Bank in 1998 and is revised as necessary by Cambodia's Ministry of Industry, Mines and Energy. The most recent development plan establishes the following as the basic guidelines: (1) increase in investment in power plant and transmission line projects, (2) promotion of interconnection with transmission grids in neighboring countries to enable the electricity import at reasonable rates as well as its export in the future, (3) establishment of regulations, (4) promotion of private sector entry into power development, and (5) increase in the rural electrification rate. Furthermore, the transmission line development plan in the above plan regards this project as one of the highest priority power transmission lines.

Demand for electric power in Phnom Penh and Sihanoukville is strong. Both cities are located in the "Growth Corridor" where population is dense and industries such as the textile industry are concentrated, and energy supply in that area is becoming stringent. This project, which will construct double-circuit transmission lines of about 78km in length to connect the cities of Sihanoukville and Kampot, is part of an electricity network for the greater Mekong region that will interface with a power transmission line connecting Vietnam, Takeo, and Phnom Penh, which is currently under construction through ADB assistance, and a power transmission line between Kampot to Takeo, which is currently under construction through assistance from the German development bank Kreditanstalt für Wiederaufbau (KfW). Cambodia has already signed an agreement with Vietnam to purchase electricity, and the completion of this network through this project will not only enable the supply of electricity from Vietnam to Sihanoukville but will also enable it to be supplied at a cheaper rate than at present.

In JBIC's Medium-Term Strategy for Overseas Economic Cooperation operations, the region centering on the capital Phnom Penh and Sihanoukville in Cambodia is positioned as the growth corridor area and infrastructure improvements that contribute to invigorating private sector economic activities in this area have been earmarked as priority areas. Therefore, the need for and relevance of the assistance which

JBIC will provide through this project are of a high level.

3. Project Objectives

The project will increase the electric power supply capacity, provide for the demand for electricity in Sihanoukville, and raise the rate of electrification along transmission lines by laying double-circuit 230kV electric power transmission lines in the southern part of Cambodia in the section from Kampot to Sihanoukville (about 78km), which is located in the “Growth Corridor” and by establishing new and upgrading existing relevant substations and distribution lines. Therefore, the project will contribute to the economic development of that region by improving the investment environment.

4. Project Description

(1) Target Area

Sihanoukville - Kampot

(2) Project Outline

Electric power transmission lines (2-line 230kV) will be constructed along the section from Sihanoukville to Kampot (about 78km) in the southern region of Cambodia, and substations and distribution lines in relevant areas will be either newly installed or upgraded.

(3) Total Project Cost/Loan Amount

6,179 million yen (Yen Loan Amount: 2,632 million yen; ADB assistance: equivalent to 2,360 million yen)

(4) Schedule

November 2006 to December 2010 (50 months)

The project will reach completion at the start of commercial operation of the substation facilities and electricity grid.

(5) Implementation Structure

(a) Borrower: The Royal Government of Cambodia

(b) Executing Agency: Electricité du Cambodge (EDC), Cambodia’s state-owned electricity company

(c) Operation and Maintenance System:

The operating and maintenance system will be managed by the EDC. The EDC manages the operation and maintenance of transmission lines within Phnom Penh but at present there are no 230kV high voltage transmission facilities. In the capacity-building component of this project, training will be provided to EDC staff to enable them to manage the operation and maintenance of the high voltage transmission facilities.

(6) Environmental and Social Considerations

(a) Environmental Effects/Land Acquisition and Resident Relocation

(i) Category: B

(ii) Reason for Categorization

This project is classified as Category B because it is believed that the project will not have a

significant negative environmental impact given that the sector and the project do not have characteristics that are likely to exert an impact, and the characteristics of the region are not susceptible to impact based on the “Japan Bank for International Cooperation Guidelines for Confirmation of Environmental and Social Considerations” (established 2002).

(iii) Environmental Permit

The Initial Environmental Examination (IEE) for this project was approved by Cambodia’s Ministry of Environment in October 2006.

(iv) Anti-Pollution Measures

There are plans to implement appropriate anti-pollution measures in accordance with the Environmental Management Plan (EMP).

(v) Natural Environment

The transmission line route will pass through a buffer area abutting onto national parks and protected areas, but little of the affected area of the region is forested and there are no habitats of valuable species located there, so it is believed that the project will have a minimal adverse impact on the natural environment.

(vi) Social Environment

The project involves land acquisition of about 4ha and accompanying the land acquisition the relocation of 12 households is expected. Procedures for the acquisition of the land and the relocation of the residents will be implemented in accordance with that country’s domestic procedures.

(vii) Other/Monitoring

For this project, the EDC will undertake the monitoring of noise, vibrations, water quality, land subsidence, and the relocation of the residents, etc.

(b) Promotion of Poverty Reduction

The introduction of rural electrification is planned for regions where electricity will be supplied by electric power transmission lines and is expected to improve the living environment of the residents in those regions.

(c) Promotion of Social Development (Gender Perspective, measures against infective diseases such as AIDS, participatory development, consideration for handicapped persons, etc.)

The rate of HIV infection in Cambodia at 2.6% (2003) is high in comparison with surrounding countries, and the government of Cambodia has been promoting measures to prevent AIDS. JBIC plans to include the implementation of AIDS prevention measures for workers in the project in the tendering documents. In addition, the ADB plans to conduct information sessions and AIDS prevention activities for people in the region and for workers. JBIC will collaborate and coordinate its activities with the ADB in this area.

(7) Other Important Issues: None in particular

5. Outcome Targets

(1) Evaluation Indicators (Operation and Effect Indicator)

Indicator	Baseline (2004)	Target (2012, two years after completion)
Operating rate of electric power transmission facilities (%)	-	Within 100%
Rate of electrification (Kampot)	Urban areas: 50% Rural areas: 8%	Urban areas: 75% Rural areas: 35%
Rate of electrification (Sihanoukville)	Urban areas: 60% Rural areas: 13%	Urban areas: 75% Rural areas: 35%
Rate of distribution loss	Kampot: 35% Sihanoukville: 13%	Kampot: 12% Sihanoukville: 12%

(2) No. of Benefactors

Outside of the project scope, due to the difficulty in calculating the direct number of benefactors

(3) Internal Rate of Return (Financial and Economic Internal Rate of Return)

Based on the assumptions below, the Economic Internal Rate of Return (EIRR) will be 21.6%, and the Financial Internal Rate of Return (FIRR) will be 13.6%.

Economic Internal Rate of Return (EIRR)

(a) Cost: Project cost (excluding tax), operation and maintenance expense

(b) Benefit: Cost of new electric power supply to provide for new demand had new transmission lines not been laid

(c) Project Life: 30 years

Financial Internal Rate of Return (FIRR)

(a) Cost: Project cost, operation and maintenance expense

(b) Benefit: Revenue from electricity charges

(c) Project life: 30 years

6. External Risk Factors

Delay in the completion period of other interconnecting transmission line construction projects from Vietnam for which other donors are providing assistance and other external factors such as a rise in the transmission unit price

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

In past yen-loan projects involving the construction of electric power transmission lines, it has been learned that clarifying the position of individual projects in the overall electric power sector is important. In undertaking this project, JBIC confirmed the importance of this project during the formation stage of the project and its conformity with Cambodia's development plans.

8. Plans for Future Evaluation

(1) Indicators for Future Evaluation

- (1) Operating rate of electric power transmission facilities (%)
- (2) Rate of electrification (%)
- (3) Distribution loss (%)

(2) Timing of Next Evaluation

Two years after completion of the project