

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: The Democratic Socialist Republic of Sri Lanka

Project: Greater Colombo Transmission and Distribution Loss Reduction Project

Loan Agreement: March 14, 2013

Loan Amount: 15,941 million yen

Borrower: The Government of Democratic Socialist Republic of Sri Lanka

2. Background and Necessity of the Project**(1) Current State and Issues of the Power Sector in Sri Lanka**

Driven by recent economic growth (average annual growth rate: 7%), Sri Lanka's energy demand has been growing rapidly. While large-scale development of power sources to meet increasing power demand is underway, transmission and distribution networks are not enough. The improvement of transmission and distribution loss and increased transmission and distribution capacity are needed. Among other regions, the power consumption of the Greater Colombo Area, which is the economic center of the nation and represents about 50% of the national GDP, is increasing by around 10% annually. The existing main transmission lines (132 kV underground lines of about 50km in length) and transforming capacity (584MVA) in the urban area cannot meet the increasing power demand driven by urban development. On the other hand, geographical conditions limit the construction of new transmission facilities and substations on the ground. In addition, addressing increased loss of electricity due to the heavier transmission burden at medium pressure (132kV) becomes an urgent issue.

(2) Development Policies for the Power Sector in Sri Lanka and the Priority of the Project

To ensure steady power supply, the Sri Lanka Government states in its national development plan called "Mahinda Chintana" (2010-2016) that it will focus on the sustainable power development, improved access to electric service, efficient use of energy and the improvement of the power charge scheme. Among these, efficient use of energy is one of the important strategies. To achieve it, the Initiative lists the utilization of renewable energy, reduction of transmission and distribution loss, and leveraging of the purchasing power of power users to get energy-saving products. The Initiative stresses the need to reduce the transmission and distribution loss as far as possible.

To achieve these goals, the Ceylon Electricity Board (CEB) as the implementing agency analyzed the problems of the national transmission networks against the power demand forecast and long-term power-source development plan, and designed an improvement plan based on the analysis in its "Long-Term Plan for the Development of the Transmission Networks" (2011-2020). Under the plan, this Project aims to raise pressure of and enhance main transmission lines in the Capital area as large coal-fired power plants along the coast start operation, thus achieving a steady supply of electricity to urban areas and to reduce transmission/distribution loss. As such, this Project has high priority. In the city centers where many structures closely stand, transmission/distribution lines are usually built underground to avoid the relocation of local people and land acquisition. According to this policy, it has been decided during the planning phase of this Project to build the lines underground.

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

One of the focal areas of Japan's "Country Assistance Program for Sri Lanka" (June, 2012) is the "promotion of economic growth," which requires the improvement of infrastructure including electricity. Following this policy, JICA's "Country Analytical Work" also focuses on the "improvement of the power sector." This Project is in accordance with these policies. JICA has agreed to provide a total of 156.2 billion

yen to the sector, including the “Habarana-Veyangoda Transmission Line Project” (agreed in 2011 with the loan amount of 9.6 billion yen). As technical cooperation, JICA also implemented a development study called the “Master Plan Study in the Power Sector” (2004-2006).

(4) Other Donors’ Activities

Regarding energy efficiency in the power sector, the Asian Development Bank (ADB) has been supporting the development of the transmission and distribution networks and renewable energy across Sri Lanka. This project, however, will not overlap with these efforts.

(5) Necessity of the Project

This Project aims at constructing the transmission and distribution network that will support future economic growth in the Greater Colombo Area in order to meet the increasing power demand, to improve transmission and distribution loss and to improve the reliability of power supply. This purpose is in accordance with the development policies of the Government of Sri Lanka as well as the assistance policy of Japan and JICA. Therefore, it is necessary and relevant for JICA to support this project.

3. Project Description

(1) Project Objective

The objective of this Project is to construct the transmission and distribution network in the Greater Colombo Area in order to strengthen transmission and distribution capacity, to reduce transmission and distribution loss and to improve the reliability of power supply, thereby contributing to the promotion of investment and economic development.

(2) Project Site/Target Area

Greater Colombo Area

(3) Project Components

- 1) Construction of new substations and improvement of existing substations (International Competitive Bidding)
- 2) Building new underground transmission and distribution lines (220kV, 132kV and 11kV) (International Competitive Bidding)
- 3) Procurement of special vehicles for electric equipment works (International Competitive Bidding)
- 4) Consulting services (detailed design, tender assistance, construction management, etc.) (Consultants will be short listed)

(4) Estimated Project Cost (Loan Amount)

18,839 million yen (including the agreed loan amount: 15,941 million yen)

(5) Schedule

Planned for March, 2013 to December, 2017 (a total of 58 months); The Project will be completed when the facilities begin operation (December, 2016).

(6) Project Implementation Structure

- 1) Borrower: The Government of the Democratic Socialist Republic of Sri Lanka
- 2) Executing Agency: Ministry of Power and Energy
- 3) Operation/Maintenance/Management: Ceylon Electricity Board

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

- 1) Environmental and Social Considerations
 - a) Category : B
 - b) Reason for the Categorization: Since this Project does not include any sectors or characteristics that are liable to cause adverse environmental impacts nor sensitive areas specified in the “JICA Guidelines for Environmental and Social Considerations” (published in April, 2010), it is unlikely that the Project will have severe negative impact on the environment.
 - c) Environmental Permit: The domestic laws of Sri Lanka do not mandate the preparation of the Environmental Impact Assessment (EIA) report for this project.
 - d) Anti-Pollution Measures : Since the transmission and distribution lines under this Project will be constructed in shallower parts under the roads, environmental impact including soil erosion and water pollution will be minimum.
 - e) Natural Environment : The target area of the Project does not include sensitive areas such as national parks or world heritage sites.
 - f) Social Environment : This Project does not require the relocation of local people nor land acquisition, because the transmission/distribution lines will be built under the roads and substations on the state-owned land.
 - g) Other Aspects/Monitoring: The implementing agency shall monitor noise and vibration during the construction and monitor water, air and soil quality, waste matter, noise and vibration after starting operation.
- 2) Promotion of Poverty Reduction: None in particular
- 3) Promotion of Social Development: None in particular

(8) Collaboration with Other Schemes and Donors

None in particular

(9) Other Important Issues

Reduced transmission and distribution loss will lead to fewer CO2 emissions, thereby contributing to climatic change mitigation.

4. Targeted Outcomes

(1) Quantitative Effects

1) Performance Indicators

Indicators	Baseline (Actual value in 2011)	Target (2018) (Expected value 2 years after project completion)
Transformer availability factor (%)	55	35
Transmission-line availability factor (%)	N/A	25
Reduced transmission loss (MWh)(*)	N/A	20,009
Reduced distribution loss (MWh)(*)	N/A	4,005

(*)Figures in the project target area

2) Internal Rate of Return

Based on the conditions below, the economic internal rate of return (EIRR) of this Project will be 10.11%.

Cost: Project cost (excluding taxes), and operating and maintenance costs

Benefit : Cost reduction by reduced power loss (including reduced fuel cost); and the transmission and distribution revenue from increased power supply
Project life : 30 years

(2) Qualitative Effect

Promotion of investment and economic development in the Greater Colombo Area; and climate change mitigation in Sri Lanka.

5. External Factors and Risk Control

Climatic conditions (floods, etc.)

6. Lessons Learned from Past Projects

(1) Results of Evaluation of Similar Past Projects

According to the ex-post evaluation of the “Project for the Construction of 230kV Underground Transmission Lines” in Thailand, it took longer than expected in the project to coordinate with and obtain approval from the agencies concerned that managed infrastructure near the project site. This led to a delay in project completion. The evaluation suggests that to implement in time any project that requires collaboration with multiple agencies concerned, it is important to closely consult with them from the planning phase.

(2) Lessons for the Project

Since this Project requires coordination with and approval from the agencies concerned that manage infrastructure (ports and roads), a committee consisting of the parties concerned will be established to share information and discuss on a regular basis.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Transformer availability factor (%)
- 2) Transmission-line availability factor (%)
- 3) Reduced transmission loss (MWh)
- 4) Reduced distribution loss (MWh)
- 5) Economic internal rate of return (EIRR) (%)

(2) Time of Future Evaluation

Two years after project completion