

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the project

Country:	United Republic of Tanzania
Project:	Kenya-Tanzania Power Interconnection Project
Loan Agreement:	January 15, 2016
Loan Amount	11,847 million yen
Borrower:	The Government of the United Republic of Tanzania

2. Background and Necessity of the Project

(1) Current State and Issues in the Energy Sector in East Africa and Tanzania

Power demand in Africa has been grown in accordance with a remarkable economic development, increasing electric power consumption between 2000 and 2009 in the whole Africa by 4.5% on an annual average basis. To meet such power demand, regional interchange of affordable and stable power by region (s regional power pool) has been initiated in Africa. The East African Power Pool (EAPP) was launched in 2005 with the participation of 10 member countries to date. A roadmap of the EAPP has been drawn to establish a power interchange market in the every East African countries in a step-by-step manner from a bilateral power interchange and efforts toward stable power supply in the region has been made by formulating a plan to interchange power from a country with abundant potential water power (Ethiopia) to a country with expected growth in power demand (Kenya and Tanzania), etc.

Being a member of the EAPP in 2010, Tanzania has accomplished stable economic growth since 2000 (2000 to 2014: average 6.8%) and expected continuous annual growth of about 7%. Energy sources in Tanzania comprise thermal power (about 60%) and hydropower (the rest of some 40%). While the power demand has been growing by about average 10% on an annual basis, existing capacity (1,376 MW, as of 2015) is unable to meet the demand in peak time (934 MW, as of December 2014) due to outdated power generation equipment, decrease in hydropower volume during water shortage, loss in transmission and distribution, etc., thereby frequent power outage (26.3 hours/month in the city of Dar es Salaam) has hindered socioeconomic activities of Tanzania. Since peak demand in 2020 is expected to achieve to approximately 1,900 MW, a planned electric power development and improvement and enhancement of transmission and distribution networks with diversified energy sources are essential to cope with such growing power demand.

(2) Development Policies for the Energy Sector in East Africa and Tanzania, and the Priority of the Project

In order to avoid power shortage caused by water shortage and other reason and in addition to the electric power development and improvement of transmission networks in the country,

power imports from and exports to neighboring countries are planned in the Power System Master Plan (PSMP) which is a plan for electric power development in Tanzania. In the plan, power imports are intended to solve power shortage in short-term while natural gas thermal power, the domestic demand of which is expected to grow, is intended to be imported in medium- and long-term. To realize such policies of the Government of Tanzania, this Project is to improve transmission lines between Kenya and Tanzania. Moreover, the Project is placed as a priority project of the energy sector in the Big Results Now Initiative (initiatives to realize outcomes in short-term by prioritizing various policies listed in a Five Year Development Plan) which the Government of Tanzania launched in February 2013. Therefore, the Project is expected to be realized at an early phase.

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

The Project is placed in a priority area of "Infrastructure development sustaining economic growth and poverty reduction" in Japan's Country Assistance Policy for the United Republic of Tanzania (June 2012) and therefore consistent with the Policy. Moreover, this Project provides support for a regional power network which can contribute to an "expanded regional infrastructure and capacity building" manifested in the "Yokohama Action Plan" adopted at TICAD V (June 2013). Japan has provided Grant Aid for the improvement of urban transmission and distribution networks in Dar es Salaam and other area and implemented the construction of backbone transmission through an ODA Loan project (Iringa-Shinyanga Backbone Transmission Investment Project (Loan Agreement in FY 2010)), together with the implementation of Technical Cooperation projects aiming to enhance capacity for planning, operation, maintenance and management of power system facilities. This Project is to connect to the past backbone transmission project at Singida (Tanzania).

(4) Other Donors' Activity

Aid coordination has been promoted in Tanzania and regular meetings have been held under the framework of joint implementation of sector strategy formulation support and aid coordination by the Government of Tanzania and donors. Assistance in the power sector provided by individual donors include: financial assistance by the World Bank and African Development Bank (hereinafter referred to as "AfDB") for various reforms in the energy sector; and regional electrification, etc. supported by EU and other European donors. The past backbone transmission project implemented by ODA Loan is ongoing in coordination with the World Bank, AfDB, the European Investment Bank, and Korea Eximbank. Moreover, as part of the plan of the EAPP, the World Bank, AfDB, Agence Française de Développement, etc. have provided their assistance to Ethiopia-Kenya power interconnection project.

(5) Necessity of the Project

This Project is in line with the development policies of the Government of Tanzania as well as assistance policies of the Government of Japan and JICA. Moreover, this Project can contribute to the international commitment of TICAD V. Therefore, it is highly necessary and relevant for JICA to support this Project.

3. Project Description

(1) Project Objectives

The objective of the Project is to promote power interchange and increase power supply reliability in Eastern African countries as well as to ensure stable and reliable power supply in Tanzania by constructing transmission lines and related substation in Tanzania within the project to construct 400kV transmission lines and related substations from Singida in Tanzania to Isinya in Kenya, thereby contributing to economic vitalization in Tanzania including the improvement of the standards of life and industrial development.

(2) Project Site

Singida, Manyara and Arusha Regions

(3) Project Components

1) Project Planning

Transmission lines between Kenya and Tanzania which constitute a part of the EAPP are constructed and related substations are installed. Based on a co-financing scheme with AfDB (Accelerated Co-Financing Facility for Africa (hereinafter referred to as “ACFA”)) under “Enhanced Private Sector Assistance for Africa,” this Project is implemented as a joint co-financing project. The whole project in Kenya except the scope of this Project is solely financed by AfDB.

2) Civil Work and Procurements of materials and equipment

Amid ① to ③ of the whole project as below, JICA is to support civil works in Tanzania targeting transmission lines and related substations in particular, in Tanzania (① and ② implemented in Tanzania) through this Project.

① Transmission line (Total length: 507.5 km, two 400kV lines, of which JICA supports 414.4 km in Tanzania)

② Substation (JICA support)

③ Local distribution network

3) Consulting Service

(Financed by AfDB for bidding assistance, detailed design review, construction plan review, construction supervision, and environmental pollution monitoring)

(4) Estimated Project Cost (Loan Amount)

31,215 million yen (Loan Amount: 11,847 million yen)

(5) Schedule

August 2015 to March 2020 (56 months in total). Project completion is defined as when the facility operation is commenced (December 2018).

(6) Project Implementation Structure

1) Borrower: The Government of the United Republic of Tanzania

2) Executing Agency: Tanzania Electric Supply Company Ltd.: (TANESCO)

3) Operation and Maintenance System

TANESCO's section in charge of transmission line is responsible for operation while its maintenance and management section is in charge of maintenance.

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

1) Environmental and Social Consideration

- ① Category: A
- ② Reason for Categorization: The project falls into the power transmission and distribution lines sector and located in a sensitive area under the JICA Guidelines for Environmental and Social Considerations (issued in April 2010, hereinafter referred to as the "JICA Environmental Guidelines"). AfDB also categorizes this Project as "Category 1," which is equivalent to JICA's "Category A."
- ③ Environmental Permit: The Environmental and Social Impact Assessment (hereinafter referred to as "ESIA") report was prepared by the executing agency and approved by the Minister for the Environment under the Vice President's Office in March 8, 2014 after being reviewed by the National Environmental Management Council.
- ④ Anti-Pollution Measures: Complying with Tanzanian laws and regulations, measures to be taken to minimize impact of air quality, noise and vibration, etc. during the construction period by covering the bed of truck to reduce dust, etc., and limiting speed of construction vehicles and construction hours. As measures for river water pollution caused by soil degradation, its impact is minimized by concentrating construction works in dry season, cutting the least number of trees, etc. After the commencement of services, impact of water pollution caused by soil degradation is minimized by taking landslide measures (installation of box culvert, etc.) and other response.
- ⑤ Natural Environment: This project is located in and around sensitive areas such as national parks, important birds areas, etc. Moreover, since the Project's transmission lines extend over two Wildlife Management Areas, such extension will be approved by the Ministry of Natural Resources and Tourism and the Wildlife Management Areas prior to the commencement of construction works. As existence of wild animals and waterfowls have also been observed in the project site, adjustment of the height of transmission lines, change of steel tower design, minimization of the number of steel towers constructed in marshlands, installation of reflectors and other measures are taken.
- ⑥ Social Environment: The Project will require about 3,143 hectares for land acquisition and resettlement of 253 households. They will be implemented in accordance with the procedures of Tanzania and the Resettlement Action Plan (RAP) prepared based on the JICA Environmental Guidelines. At a consultation meeting with residents held in the process of RAP preparation, explanation of project description, compensation and resettlement assistance, grievance redress mechanism, etc. were given and no specific adverse opinion of the participant against this Project is observed. Moreover, since those affected residents include Barbaig, an indigenous ethnic group, the construction

work is implemented with their rites taken into consideration in accordance with the Vulnerable People’s Plan prepared based on the JICA Environmental Guidelines.

Other / Monitoring: Based on the environmental monitoring plan and monitoring forms agreed at the appraisal, contractors monitor air quality, water quality, noise and vibration, etc. during the construction period while the executing agency monitors soil degradation, water quality, noise and vibration, etc. after the commencement of services. Monitoring of ecosystem around the project site will be led by the Tanzania Wildlife Research Institute, an affiliated institute of Ministry of Natural Resources and Tourism, during the construction period and after the commencement of services.

2) Poverty Reduction

None

3) Social Development (e.g. Gender Perspective, Measure for Infectious Diseases Including HIV/AIDS, Participatory Development, Consideration for the Handicapped, etc.)

The executing agency will oblige a construction company to take countermeasures for AIDS infection to workers and neighboring residents.

8) Collaboration with Other Donors

As noted above, this Project consists of a part of the whole co-financing project with AfDB. The northern part of transmission lines of this Project will connect to the transmission line which will be constructed by AfDB’s finance from Inisya in southern Kenya to Namanga divided by the Kenya-Tanzania border. The southern part of this Project’s transmission lines will connect to the transmission line constructed by the past ODA Loan project, “Iringa-Shinyanga Backbone Transmission Investment Project.” Moreover, the World Bank, AfDB, AFD and other donor is implementing Ethiopia-Kenya power interconnection project which presupposes import of power from Ethiopia, being scheduled to be completed before the completion of this Project in September 2018.

(9) Other Important Issues:

JICA will conduct a joint supervision mission with AfDB several times in a year.

4. Targeted Outcomes

(1) Quantitative Effects (Operation and Effect Indicator)

Indicators	Baseline (2013)	Target (2020) [2 years after Project Completion]
Increase in power interchange volume (GWh)	n/a	1,051
No. of outages in northern Tanzania (time/year)	27	20

(2) Qualitative Effects

Improvements in the standards of life in Tanzania and East African countries and promotion

of economic activities

(3) Internal Rate of Return

Based on the conditions indicated below, the economic internal rate of return (EIRR) including all lots of this Project will be 25.2%. The financial internal rate of return (FIRR) is not calculated as charges of power trading, etc. are being negotiated among countries concerned.

【EIRR】

Cost: Construction cost, operation and maintenance cost

Benefit: Power generation cost saving (fuel cost saving, electric power development volume reduction)

Project life: 25 years

5. External Factors and Risk Control

- (1) Preconditions: land acquisition and resettlement of local residents
- (2) External conditions: progress of transmission line development in surrounding area, conclusion of the agreement on charge of power trading, etc.

6. Lessons Learned from Past Projects

Lessons Learned from Findings of Similar Projects Undertaken in the Past

(1) Findings of Similar Projects

For a project requires for the connection to existing equipment, arranging technical specifications and agreeing on solution procedures and responsibility for a problem occurs with personnel in charge of the existing equipment at the preparation phase of bidding documents are essential for smooth implementation of the project, which was indicated in ex-post evaluation, etc. for transmission project implemented by JICA in the past. Moreover, in “Ethiopia-Kenya power interconnection project” being implemented by the World Bank, AfDB and AFD, the construction of interconnection between countries requires collaboration among various persons concerned from engineers to the political level for a smooth project implementation. Thus, the project has established an inclusive system to monitor the progress in Ethiopia and Kenya both from technical and political aspects.

(2) Lessons Learned to the Project

This Project will connect to the past project “Iringa-Shinyanga Backbone Transmission Investment Project” at Singida in Tanzania as well as to Ethiopia-Kenya power interconnection project at Inisya in Kenya. Thus, consultant services of this Project will include support of coordination with each division in charge. Moreover, as this Project has to be promoted with the project in Kenya in an integrated manner, the progress of the projects are managed by appointing a joint project coordinator who manage the implementation structure in both Tanzania and Kenya, thereby securing a political commitment which is essential for a smooth implementation of international interconnection project.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Increase in power interchange volume (GWh)
- 2) The number of outages in northern Tanzania (time/year)
- 3) Economic internal rate of return (EIRR) %

(2) Timing

Two years after project completion