

Ex-Ante Evaluation (for Japanese ODA Loan)

1. Name of the Project

Country: The Republic of Kenya
Project: Olkaria-Lessos-Kisumu Transmission Lines Construction Project
Loan Agreement: December 10, 2010
Loan Amount: 12,410 million yen
Borrower: The Government of the Republic of Kenya

2. Background and Necessity of the Project

(1) Current State and Issues of the Power Sector in the Republic of Kenya

The total power generation capacity of the Republic of Kenya (hereinafter called Kenya) is 1,375 MW and the peak electricity demand (as of 2009) is 1,086 MW. The peak electricity demand has been increasing by an average of 5% per year for the last five years, and in 2013, the demand is expected to increase to 1,527 MW. To meet the future demand, it is planned to construct new power plants in Kenya and exchange power with the Republic of Uganda. However, the existing transmission lines cannot meet the future electricity demand in terms of transmission capacity. Under these circumstances, in addition to the development of power sources, it is indispensable to expand the transmission capacity and reduce the transmission losses, so as to improve the efficiency and stability of electricity supply in Kenya.

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

The overall goals of the long-term development plan “Vision 2030”, which was announced in 2008 as a national development plan, are to achieve a high standard of living, international competitiveness, and economic prosperity by 2030. Vision 2030 regards “economic”, “social”, and “political” developments as three main pillars, and it aims at achieving “sustained economic growth at 10% per annum,” “a just and cohesive society enjoying equitable social development in a clean and secure environment” and “issue-based, people centred, results oriented and accountable democratic political system.” The energy sector is regarded as the basis of these three pillars, and it is expected to contribute to economic growth, improvement of rural electrification rates and power services in urban areas.

The development of power sector has been promoted based on the “Least Cost Power Development Plan (LCPDP).” The latest version of this plan, “LCPDP 2009-2029” clarifies the investment program, which incorporates the various development plans of power sources, transmission lines and international power exchanges. The project involves the construction of transmission lines connecting Kisumu, a major city, and the Rift Valley area, where power stations are concentrated, and is defined as a high priority project in the plan.

After the 15th Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP15) in December 2009, a National Climate Change Response Strategy (NCCRS) was formulated to promote the development and use of renewable energy and energy conservation, and to mitigate the environmental impacts accompanying development. In addition, as the Kenyan Prime Minister, the Rt. Hon. Raila Amolo Odinga, stated in February 2010 on a visit to Japan, Kenya offered formal support for the Copenhagen Accord and it has a close cooperative relationship with Japan in the field of climate change.

(3) Japanese and JICA’s Policy and Operations in the Power Sector

Japan's Country Assistance Program for Kenya sets forth "Economic Infrastructure" as a priority area, and says it provides assistance for "development of energy resources to relieve the shortage of power indispensable for the country's industrial activities, giving full of consideration to conservation of the environment and the impact on the lives of residences". At the fourth Tokyo International Conference on African Development (TICAD IV), the policies for Africa, "promotion of the use of clean energy and the improvement of energy access" and "strengthening cooperation to provide a stable power supply for the whole region, and to improve the capacity to manage and maintain regional power networks" were worked out under the "Yokohama Declaration." JICA plans to make a further contribution on securing a stable power supply for Kenya and neighboring countries, as assistance to the power sector, through supports for the development of power sources with consideration to the use of renewable energy, and the improvement of domestic and international transmission lines.

In the power sector, JICA has provided ODA loans for number of projects, including "Sundu/Miriu Hydropower Project" (started in service in February 2008), "Sundu-Miriu Hydropower Project Sang'oro Power Plant" (approved in January 2007), "Olkaria I Unit 4 and 5 Geothermal Power Project" (approved in March 2010).

(4) Other Donor's Activity

The other main donors involved in Kenya's power sector include the World Bank, the French Development Agency (AFD), the European Investment Bank (EIB), the German Credit Institute for Reconstruction (KfW), and the African Development Bank. These donors provide comprehensive support, including power source development, improvement of energy transmission and distribution systems, electrification in rural areas, improvement of the organizational management capabilities of power-related organizations and other matters.

(5) Necessity of the Project

In Kenya, where power shortages have become aggravated, a stable power supply that is indispensable for economic activities is an urgent issue. The transmission lines that will be constructed in the project will supply stable electric power to the western region of Kenya where the power demand will increase, centering on Kisumu, and will connect to a 220 KV transmission line between Kenya and Uganda, which will be constructed under the Nile Equatorial Lakes Subsidiary Action Program. The transmission lines will contribute to stabilizing the power system for the whole of Kenya, through the contribution to international power exchanges with Uganda. In addition, the use of a higher voltage transmission line will improve efficiency of power transmission compared to the existing line (132 KV) and it shall contribute to mitigating the negative impact on the global environment.

In LCPDP, it is planned to develop transmission lines to meet the future power demand. Japan's Country Assistance Program for Kenya also stipulates "Economic Infrastructure" as a priority area, and the Rolling Plan for Kenya stipulates "Improvement of Electricity Access" as a development issue to strengthen support for the development of domestic and international transmission lines. From the above aspects, JICA's support for the project is highly valid and necessary.

3. Project Description

(1) Project Objective

The objective of the Project is to enhance efficiency, reliability and security of electric power supply in Kenya by constructing higher voltage transmission line systems, thereby creating a conducive investment climate and enabling economic growth in Kenya. In addition, improving the efficiency of the transmission and transmitting the renewable energy, it shall contribute to mitigating the negative impact on the global environment.

(2) Project Site/Target Area

Olkaria (Rift Valley Province), Lessos (Rift Valley Province), and Kisumu (Nyanza Province)

(3) Project Components

Construction of Olkaria-Lessos-Kisumu transmission lines and the expansion of substations

- i) Civil works (construction of a 220 KV transmission line (Olkaria-Lessos, approximately 213 km, Lessos-Kisumu, approximately 77 km) and expansion of substations in three places)
- ii) Procurement of materials and equipment (materials and equipment related to transmission lines and substations)
- iii) Consulting services (detailed design, tender assistance, construction supervision, and so on)
 - Procurement method: International competitive bidding
 - Consultant: Short list method
 - Execution method: Contracting method

(4) Total Project Cost

13,894 million yen (ODA Loan amount: 12,410 million yen)

(5) Schedule

The planned implementation schedule is from December 2010 to June 2017 (79 months in total). The Project will be deemed complete when the facilities begin operating in June 2016.

(6) Project Implementation Structure

- 1) Borrower: The Government of the Republic of Kenya
- 2) Executing Agency: Kenya Electricity Transmission Company: KETRACO
- 3) Operation and Maintenance System: Same as 2)

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

1) Environmental and Social Consideration

- (i) Category: A
- (ii) Reason for Categorization: The Project is categorized as A because the power transmission and distribution lines sector falls under a sensitive sector and its characteristics and area fall under sensitive characteristics and sensitive areas stipulated in the JBIC Guidelines for Confirmation of Environmental and Social Considerations (formulated in April 2002).

- (iii) Environmental Permit: The environmental and social impact assessment (ESIA) report regarding the project was formulated by the executing agency and approved with a collateral condition by the National Environmental Management Authority (NEMA) on March 12, 2010. The EIA license was issued on March 23, 2010. The contents of the collateral conditions are general in nature, requiring the executing agency mainly to obey environment-related laws and regulations and to conduct monitoring.
- (iv) Anti-Pollution Measures: In order to mitigate the impact of air pollution, noise, and vibration during the construction, according to the Kenyan domestic law, measures are to be taken such as the mitigation of dust using water sprinkling or covering the platform, installing sound arresters on construction vehicles, the limitation of construction at night, and so on.
- (v) Natural Environment: The transmission lines constructed in the project will partly pass through protected forests and national parks, however, in these areas the impact will be minimized by constructing them parallel to the existing transmission lines. In addition, though the vegetation below the transmission lines will be cut down, mitigation measures such as alternative tree planting will be carried out, thus no major impact is expected on the natural environment.
- (vi) Social Environment: It is expected that obtaining approximately 620 acres of easement and the resettlement of 400 households will be needed. Discussions have been held on the resettlement action plan formulated by the executing agency, between the executing agency and the affected residents. The easement obtainment and resident resettlement will be conducted according to the Kenyan domestic laws and the plan.
- (vii) Other/Monitoring: The executing agency will monitor air and water quality, noise, ecosystems, resident resettlement, etc.

2) Promotion of Poverty Reduction: None

3) Promotion of Social Development (e.g. Gender Perspective, Measure for Infectious Diseases Including HIV/AIDS, Participatory Development, Consideration for the Handicapped, etc.): The executing agency requires the construction company to take measures to prevent HIV/AIDS infection among construction workers and neighboring residents.

(8) Collaboration with Other Donors: None

4. Targeted Outcomes

(1) Operation and Effect Indicators

Indicator		Target (2018) [Two years after project completion]
(i) Capacity Operation rate (%)	Olkaria-Lessos T/L	38.4
	Lessos-Kisumu T/L	19.8
(ii) Outage per substation(Min/Year) in Target Area		0
(iii) Outage Times (Times/year) in Target Area		0
(iv) Transmission Line Loss(%)		3.44
(v) Electricity Supply (GWh)	Olkaria-Lessos T/L	2,276
	Lessos-Kisumu T/L	352

(2) Internal Rate of Return

Based on the conditions listed below, the Economic Internal Rate of Return (EIRR) of the Project will be 24.87%.

Cost: Project costs (excluding taxes and duties), operation and maintenance costs
Benefit: Reduction in the construction costs and operating and maintenance costs for alternative coal-fired thermal power plants
Project Life: 30 years

5. External Factors and Risk Control

(1) Executing system

The executing agency, KETRACO, is a relatively new organization established in 2008. Its policy is to promote improvement of the execution of systems including increases in personnel, and this should not be changed.

(2) Obtaining easements and resident resettlement

The implementation of obtaining easements and resident resettlement should not deviate significantly from the plan.

6. Lessons Learned from Past Projects

Ex-post evaluations of the past projects related to the improvement of transmission lines and the transformation of power system have shown that it is necessary to continuously improve the facilities and newly develop power sources to meet the potential demand, so as to fully realize the project effects. To respond to this situation, Kenya estimates that the power demand will increase by 10% yearly over the next twenty years, and at the time of the appraisal, confirmed the development plan for power sources and transmission lines, and power exchanges with the neighboring countries. It will be confirmed through the executing agency that power source development in the Olkaria region, the promotion of power exchanges with the neighboring countries, and facility improvements will affect the realization of the effects of the project, and when necessary, these effects will be considered in the detailed plan.

7. Plan for Future Evaluation

(1) Indicators to be Used

- 1) Capacity Operating Rate (%)
- 2) Outage per substation (Min/year) in Target Area
- 3) Outage Time (Times/year) in Target Area
- 4) Transmission Line Loss (%)
- 5) Electricity Supply (GWh)
- 6) EIRR (%)

(2) Timing

Two years after project completion