PROJECT INFORMATION DOCUMENT (PID)
APPRAISAL STAGE

Report No.: AB5469

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<th>Project Name</th>
<th>Tanzania - Backbone Transmission Investment Project</th>
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<td>Borrower(s)</td>
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<td></td>
<td>P.O. Box 91111</td>
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<td>Tanzania</td>
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<td>Implementing Agency</td>
<td>Tanzania Electric Supply Company Ltd. (TANESCO)</td>
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<td>Dar es Salaam</td>
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<td>Tanzania</td>
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<td>Tel: (255-22) 245-1224</td>
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<td>Date of Appraisal Authorization</td>
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1. Country and Sector Background

1.1 Tanzania has an estimated population of about 42.5 million, growing annually at a rate of 3 percent. It has a land area of about 945,087 sq. km and is well endowed with natural resources such as hydropower, tin, iron ore, coal, gemstones, gold, natural gas, geothermal and nickel. Topography and climatic conditions allow cultivation of crops on about 54 percent of the land area. The economy of Tanzania depends heavily on agriculture, which accounts for around 45 percent of GDP and employs over two thirds of the work force. Other key growth sectors are mining, construction, manufacturing, and tourism - all sectors that strongly depend on a reliable and sustainable electricity supply.

1.2 Tanzania has made significant progress over the past two decades to achieve and maintain macroeconomic stability, becoming one of the best performers in Sub-Saharan Africa. The economic growth has been around 7 percent since 2000. Sound macroeconomic policies, market-oriented reforms, and debt relief have ensured a positive environment for Tanzania’s steady economic growth. However, in 2009, economic growth slowed down to 5 percent, caused by the financial crisis that affected the country, especially due to the effects on tourism, cash crops, regional manufacturing exports, and to lower capital flows related to foreign assistance and private investment.

1.3 A number of structural weaknesses including lack of infrastructure, human capital, and natural resources, will need to be addressed significantly and quickly if Tanzania is to achieve significant poverty reduction through growth. Infrastructure bottlenecks are a serious constraint to growth and private investment in Tanzania, and while some sectors, such as energy, are gradually improving their performance and institutional setup, continued improvement in the energy sector and the Public-Private Partnership (PPP) policy framework will be critical to unlock the situation. The lack of access to modern energy services continues to constrain Tanzania’s growth potential, contributes to the poverty and isolation of rural population, and affects provision of other key services, such as clean water supply, health, and education, threatening the achievement of some of the Millennium Development Goals.
1.4 Much of Tanzania’s diverse energy sources remain largely untapped. The country’s main installed generation capacities are based on hydropower (56 percent) and natural gas (34 percent). According to Tanzania Electric Supply Company Limited’s (TANESCO) short to medium term generation expansion plan (up to 2018) the majority (60 percent) of the planned generation capacity additions are expected to be based on natural gas, biomass, wind and hydropower. Most of the new generation sites are located in the South and Southeast of the country, where almost all of the renewable hydro and thermal generation resources are situated.

1.5 Tanzania’s power sector is dominated by TANESCO, a single vertically integrated national utility. TANESCO completed a Power System Master Plan in 2008, which was further updated for generation activities in August 2009 (PSMP). The PSMP provides a demand and supply assessment for the sector. Based on anticipated needs of the population and economy of Tanzania for the period up to 2033, and a least cost supply response to this demand, the PSMP indicates that the energy sales requirements for Tanzania are expected to be about 10,000 GWh in 2018 and 30,000 GWh in 2033. The long-term growth rate is expected to be an average of 7.9 percent per annum. The national peak installed capacity to meet the demand should be in the range of 2000 MW in 2018 and 6,000 MW in 2033.

1.6 The Tanzanian National Grid consists of 220 kV high-voltage transmission lines linking the major hydropower plants at Kidatu, Kihansi and Mtera to Mbeya and Dar es Salaam and feeding into the existing North-South Backbone from Iringa to Singida and extending further North to Arusha and Mwanza. In addition, a 132kV transmission system with three power stations on the Pangani River links Arusha, Dar es Salaam, and Morogoro. The National Grid also supplies electric power to Zanzibar Island over a 41 km submarine cable. The current main backbone of TANESCO’s interconnected grid comprises 3,221 km of 220 kV, 1,440 km of 132 kV and 691 km of 66kV power transmission lines. The distribution network consists of 11,314 km of 33 kV, 5,403 km of 11 kV and 23,995 km of lower voltages distribution lines. The National Grid does not cover all parts of the country, leaving a significant portion of the population without access to TANESCO electricity.

1.7 The PSMP has also highlighted that the North and Northwestern Tanzania including the capital Dodoma, Arusha, Moshi, Singida, Shinyanga, Mwanza, Musoma and Tabora are experiencing a fast-paced increase in the electricity demand estimated at a rate between 8 to 10 percent annually. This increase in demand is expected due to increased mining activities in the Northwest and increase in economic activity in the Northern towns. At least 12 mines (gold, copper, nickel, etc) are planning to begin operations in the Northwest of the country. These mines are expected to require between 227 to 427 MW of capacity. Given the lack of generation sources in the North and Northwestern regions, and overloading of the current 220kV single circuit Iringa-Shinyanga transmission line, the PSMP estimates a current shortage of electricity in the North and Northwestern parts of the country. The PSMP also indicates that the share of electricity consumption in the North and Northwest will increase to about 30 percent of total consumption in the interconnected system over the next several years.

1.8 Expanding access to unserved areas is an important component of the Government’s long-term economic growth plan and is one of the Government’s highest priorities in the context of the power sector which aims at connecting 100,000 new customers per year. At present, access to modern energy services is scarce outside Dar es Salaam. TANESCO serves about 803,000 customers, out of a population of about 42 million. The electricity coverage is 14 percent nationally and in single digits in most regions. Rural

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1 In 2008, TANESCO reached about 60% of the proposed target of 100,000 new customers per year.
coverage is below 2 percent. The key reasons for this low coverage include: (i) limited reach of TANESCO’s grid and low intensity of connections in the grid areas; and (ii) lack of financial and implementation capacity at TANESCO to expand the grid and rural connections; (iii) poor targeting of Government’s scarce financial resources; (iv) regulatory and financing constrains for rural electrification in general and alternative off-grid solutions in particular; and (v) relatively high costs of connection and of service provision coupled with low income, calling for alternative low-cost solutions in line with local capacity to pay.

2. Objectives

2.1 The Project Development Objective is to increase availability, reliability and quality of grid based power supply to North and Northwestern regions of Tanzania. The proposed Project will finance the first phase of a new 667 km, HVAC transmission line from Iringa to Shinyanga linking existing and future generating sources in the South and Southwest of Tanzania to the load centers in the Mwanza and Arusha regions in the North and Northwest regions.

2.2 In the medium to long term, the Project will facilitate power trade in the region in the context of multi-purpose water and energy resources development by providing the critical link between the Eastern Africa Power Pool (EAPP) and the Southern Africa Power Pool (SAPP) linking Tanzania with Kenya in the North and Zambia in the South.

3. Rationale for Bank Involvement

3.1 The proposed Project is in line with the Bank’s efforts to support development of Tanzania’s power sector. IDA has provided support to the energy sector of Tanzania for the last decade. Recent engagements have been predicated on continuing sector reform and financial recovery of the sector. Since 2007, investments in the sector have supported infrastructure improvements to allow for a faster and fuller financial recovery of TANESCO. In the same vein, the proposed Project is one of the high priority items of TANESCO 5-year investment plan that focuses on availability of power in the energy-starved North and Northwestern provinces of the country, complemented by measures aimed at improving TANESCO’s technical capacity to undertake private and public generation projects.

3.2 The proposed Project is designed as the key link for the future interconnection of the country with Kenya and Zambia, thus supporting the regional integration efforts in East Africa. More specifically, regional approaches to energy such as this Project offer scope to improve the utilization of existing supply and production capacities and potentials and to optimize new generation investments across countries. The Project will not only construct the physical infrastructure in Tanzania to increase power trade in the region, but will also help rationalize and coordinate the multiple and sometimes conflicting power trade initiatives discussed in the region by helping the countries prioritize key generation and transmission investments.

3.3 The Bank has played a key syndication role to develop the Project. The Project has been prepared based on a consultative approach with other key donors (AfDB, EIB, JICA, Korea EDCF, and the Norwegian (NORAD) and Swedish (SIDA) cooperation agencies) who have confirmed their agreement with the proposed approach and interest in working closely with the Bank on the preparation of the proposed Project and on the development of a comprehensive energy access strategy.

4. Description

4.1 The proposed Project is designed to consist of two following components:

4.2 Component 1: Construction of the transmission line. This component will finance one section of the proposed overhead 400 kV double-circuit backbone transmission interconnection between the towns of Iringa and Shinyanga, including the Fiber Optic Communication Line (FOCL) and the Shield Wire System (SWS) as localized distribution technologies; and the expansion of the associated 220kV
substations at Iringa, Dodoma, Singida and Shinyanga. This component is estimated to cost about US$434.76 million (including contingencies, but excluding taxes and duties). Specifically, the IDA credit will finance one of the three section of this transmission line, namely from Iringa to Dodoma. The proposed IDA-financed section of the transmission line will consist of one supply & install contract related to the construction of transmission line along with FOCL line. The other two sections of the transmission line (including FOCL and SWS) and the upgrade of associated substations are proposed to be financed by AfDB /JICA, EIB, and Korea EDCF, respectively.

4.3 Component 1(a). The IDA financed Over Head Line (OHL) section from Iringa to Dodoma is about 225 km long and is expected to cost US$134.5 million (including contingencies, but excluding taxes and duties). The AfDB /JICA financed (under AfDB procurement procedures) OHL section from Dodoma to Singida is about 217 km and is expected to cost US$129.7 million (including contingencies, but excluding taxes and duties). The EIB financed OHL section from Singida to Shinyanga is about 225 km and is estimated to cost US$134.5 million (including contingencies, but excluding taxes and duties).

4.4 Component 1(b). The upgrade of 220 kV substations at Iringa, Dodoma, Singida and Shinyanga, including additional feeders, reactive and capacity compensation equipment and disconnections, is estimated to cost US$36.06 million (including contingencies, but excluding taxes and duties) and will be financed by Korea EDCF under tied concessional financing.

4.5 To avoid the implementation of an oversized solution and to reduce the initial investment costs, a two-stage implementation of the proposed component will be adopted. The new Iringa – Shinyanga Transmission line will be built as a 400 kV double circuit line operated at 220 kV in a first step, with a capacity of 1,000 MW (500 MW x 2), and will be upgraded to 400 kV in a second phase, with a total transmission capacity of 2000 MW (1000 MW x 2). The upgrade to 400 kV operations (Phase 2) is not a part of this Project, and is expected to be undertaken in about 7 years, when the load on the line is expected to increase. This proposed phasing of the investments will result in cost savings arising out of the 400kV switchgear (transformers, bays, protection, compensation, etc.) that will only be installed during Phase 2. No upgrade will be required in the lines since they will be constructed and designed to operate on 400kV.

4.6 Component 2: Technical Assistance to TANESCO. It is proposed that about US$10.0 million is allocated to Project technical assistance to the implementing agency for the Project (TANESCO). Upon a careful review of TANESCO’s requirements for urgent technical assistance, this component will support the implementing agency through consultancy contracts related to: (a) engineering consultant for implementation support to TANESCO; and (b) support technical, legal, financial, and safeguards capacity of TANESCO.

4.7 Component 2(a): Implementation Support: Under this subcomponent, an engineering consultant will be procured using Bank consultant guidelines to assist TANESCO with (i) Project management and supervision of design, construction and preparation for operation and maintenance of the complete investment (the full transmission line and the upgrade of substations) undertaken in Component 1; and (ii) supervision and monitoring of the implementation of the Environmental Management Plan (EMP) and Resettlement Action Plan (RAP) which will be prepared based on the existing Resettlement Policy Framework (RPF). It is expected that this implementation contract would cost about US$6 million. The services will include certifications for contractor payment, supervision during construction/implementation and preparation of reports required by IDA and TANESCO, expertise transfer and training for staff and other related matters.

4.8 Component 2(b): Under this subcomponent that supports capacity building for TANESCO, US$4 million will be allocated to support TANESCO in the following activities:

(i) Enhancing its Environmental and Social Capacity to implement this and other projects – US$500,000;

(ii) Carrying out the feasibility analysis of the Rumakali Hydropower Project – US$1 million.
(iii) Supporting TANESCO’s capacity to develop public and private generation projects through the provision of legal, technical, financial, environmental, and social advisory services. – US$2.5 million.

5. Financing

Source: ($m.)
- International Development Association (IDA) 150.00
- African Development Bank 64.85
- KOREA, Rep of: Economic Development Cooperation Fund 36.06
- EC: European Investment Bank 134.50
- JAPAN: Japan International Cooperation Agency (JICA) 64.85
- Government co-financing 18.18
- Total 468.44

6. Implementation

6.1 TANESCO, the wholly-owned government entity, will be solely responsible for implementation of the two components of the Project and the sole beneficiary of the credit. TANESCO will be individually responsible for financial, procurement and physical monitoring reports on implemented activities.

6.2 The lenders to the proposed Project have jointly agreed on implementation arrangements for the Project. The implementation of the Project will be under the overall responsibility of TANESCO’s General Manager for Transmission.

6.3 The Technical Assistance component of the proposed Project will finance an Owners Implementation Support Firm (OISF) – engineering and safeguards consultants to assist TANESCO with: (i) overall Project management and supervision of design, construction and preparation for operation and maintenance of the complete investment (the full transmission line and the upgrade of substations); and (ii) supervision and monitoring of the implementation of the Environmental and Social Management Plan (ESMP) and the Resettlement Action Plan (RAP), based on an agreed monitoring plan. In addition, the OISF will supervise the implementation of an HIV/AIDS awareness and prevention plan in the Project areas to mitigate the possible spread of HIV/AIDS as contractors bring outside workers to the area. The terms of reference for this critical OISF will be agreed to jointly by the lenders.

7. Sustainability

7.1 There are two key factors that determine the sustainability of the Project’s development objective:

(a) **Sound and timely expansion of least cost generation in Tanzania.** The current generation capacity and the proposed generation expansion plan under the PSMP (largely through hydropower, wind and gas) is considered adequate for meeting the growing loads in the North and Northwest of Tanzania by reinforcing the existing transmission grid. In addition, it is expected that by 2016, up to 200 MW of power will be available for import from Kenya in case of power deficits or emergencies.²

(b) **Financial viability of TANESCO.** The electricity sales of 2007 increased by 26 percent compared to Year 2006, which enabled TANESCO to improve its overall gross margin from -60 percent in 2006 to -32 percent in 2007 as a percentage of sales. Notwithstanding the 21.7 percent increase in tariff in 2008, the

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² To review the impact of delays in the execution of the PSMP, sensitivity analyses have been carried out. A minus 20 percent load scenario has been analyzed by reducing (i) demand; and (ii) supply. The energy deficit resulting from three years delayed implementation of the planned power plants represents an average deficit of 17 percent compared to the expected energy demand. The minus 20 percent load scenario therefore represents a delay of generation projects implementation of more than three years’ time. In this load scenario the implementation of Phase 2 becomes necessary only in the year 2024. In both cases, the transmission line has important economic benefits for the country, as shown in the economic analysis.
electricity tariffs barely meet operational expenditures, but provide about 60–65 percent of full electricity supply costs. The sustainability of new investments and commercial viability of TANESCO will be at risk, until the levels of electricity tariff levels become reasonable. To mitigate this risk, TANESCO has submitted to EWURA a multi-year application for tariff increase to meet full cost recovery.

8. Lessons Learned from Past Operations in the Country/Sector

8.1 The Bank’s experience with power sector projects (generation, transmission, sector reforms, etc) has been duly incorporated in the proposed Project. For public sector implemented projects, these include the following:

8.2 Financial viability of utilities. Increased transmission capacity requires, at a minimum, a stress-tested financial recovery plan for financially recovering utilities. Investments for corresponding generation, transmission and distribution capacity in the sector should be targeted to improve the cash flow to the utilities. Therefore, it is well regarded that targeted interventions in utility’s transmission and distribution system can simultaneously improve service, reduce technical and commercial losses and increase revenues and that such interventions are critical as utilities increase in size. In addition, a financially viable and operationally sustainable utility is of key importance to promote private investments in the sector.

8.3 Continued coordination among donor partners during implementation. Prior experience has also shown the need for close coordination among co-financiers during the implementation phase in order to ensure efficient procurement and implementation of components, as well as compatibility of lending terms and conditions. The Project has been prepared with close coordination with Development Partners and IDA has led the effort in convening and coordinating the financing for the Project. IDA proposes to lead the coordination of the donor group during the implementation stage of the Project as well.

8.4 Commitment of local and provincial authorities to implementation of the safeguards mitigation plan. Prior Bank experience in the implementation of transmission projects has revealed some specific areas that require special attention, including thorough analyses to ensure that facilities are designed and routed to minimize the social impact. Thus, commitments by provincial governments and public participation to improve safeguard implementation processes are key factors to successful environmental management. These issues have been addressed in the Project’s environmental and social impact assessment.

9. Safeguard Policies (including public consultation)

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<td>Projects in Disputed Areas (OP/BP 7.60)*</td>
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<td>Projects on International Waterways (OP/BP 7.50)</td>
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10. List of Factual Technical Documents

* By supporting the proposed project, the Bank does not intend to prejudice the final determination of the parties' claims on the disputed areas
b. Environmental and Social Impact Assessments (ESIA) for the Proposed 400kV Power Transmission Line Iringa-Dodoma-Singida –Shinyanga, MVV Decon, July 2009
c. Resettlement Action Plan (RAP) for the Proposed 400kV Power Transmission Line Iringa-Dodoma-Singida-Shinyanga, MVV Decon, July 2009
e. Power System Master Plan, SNC Lavalin International, Sep 2008

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