

# PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC14861

<b>Project Name</b>	Uganda Grid Expansion and Reinforcement Project (GERP) (P133305)
<b>Region</b>	AFRICA
<b>Country</b>	Uganda
<b>Sector(s)</b>	Transmission and Distribution of Electricity (100%)
<b>Theme(s)</b>	Rural services and infrastructure (100%)
<b>Lending Instrument</b>	Investment Project Financing
<b>Project ID</b>	P133305
<b>Borrower(s)</b>	REPUBLIC OF UGANDA
<b>Implementing Agency</b>	Ministry of Energy and Mineral Development
<b>Environmental Category</b>	A-Full Assessment
<b>Date PID Prepared/ Updated</b>	05-Dec-2014
<b>Date PID Approved/ Disclosed</b>	11-Dec-2014
<b>Estimated Date of Appraisal Completion</b>	16-Jan-2015
<b>Estimated Date of Board Approval</b>	20-Oct-2015
<b>Concept Review Decision</b>	Track II - The review did authorize the preparation to continue

## I. Introduction and Context

### Country Context

Uganda's economic management has been challenged during the last four years as macro-economic instability increased and growth slowed. A succession of shocks, including the global economic crisis, a prolonged drought and a surge of election-related public spending in 2010, and recent corruption cases have affected Uganda's macroeconomic stability. Gross domestic product (GDP) fell to 5.8 percent in 2013 (from an average of 6.3 percent from 2007-12). The economy is projected to expand by 6 percent in 2014 due to increased public investment, higher agricultural output, and a more favorable manufacturing environment. Uganda reduced poverty from 56.4 percent to 19.5 percent over the past two decades. Despite improvements in poverty reduction Uganda remains a poor country with a per capita GDP of US\$506 and a vast majority of the non-poor are classified as vulnerable. In 2012, Uganda ranked 161 out of the 187 countries on the Human Development Index.

Uganda's Vision 2040 calls for a series of structural measures to accelerate economic growth but this would require the Government to undertake initiatives to address implementation bottlenecks.

Uganda has committed to building the stock of physical capital, notably through investments in infrastructure (including transport and energy). Improving the quality of education and health services also remains a priority, particularly given the growing number of young people entering the labor market every year. Uganda also needs to diversify its export base and support private sector-led growth.

Improving access to electricity and enhancing reliability of electricity service are critical for Uganda's plans for modernization and economic growth within the next 30 years. Lack of access to electricity represents one dimension of poverty and poses a significant challenge for socioeconomic development to support the young and growing population. In the absence of electricity services, about 82 percent of the population depends on expensive and polluting energy alternatives to meet their household needs. For those with electricity, poor reliability of service delivery imposes high costs on business (including the capital cost of self-generation and loss of production), which is a constraint to competitiveness and undermines employment potential.

### **Sectoral and Institutional Context**

Since 1997, the Uganda power sector has undergone major reforms and achieved considerable progress. The objective of the reforms was to transform the electricity sector into a financially viable industry in order to improve the quality of service, increase access, and enhance overall sector efficiency. This resulted in the unbundling of the vertically integrated company, Uganda Electricity Board (UEB), into three corporate entities responsible for: (i) Generation – Uganda Electricity Generation Company Limited (UEGCL); (ii) Transmission - Uganda Electricity Transmission Company Limited (UETCL); and (iii) Distribution - Uganda Electricity Distribution Company Limited (UEDCL).

In an effort to increase efficiencies in the sector, the Government of Uganda (GoU) leased the operation of the main generation and distribution assets to the private sector under long-term concession agreements. The management and operation of UEGCL's Kira and Nalubaale hydropower stations was leased to Eskom (Uganda) Limited. The management and operation of UEDCL's distribution assets was leased to several licensed distribution companies (LDCs) of which the predominant one is Umeme Limited (around 90 percent of the market).

The transmission company, Uganda Electricity Transmission Company Limited (UETCL) remained as public company given the strategic importance to expand electricity services across the country. UETCL has a leading role in operating and maintaining the high voltage transmission grid (66 kV and above) to meet the national demand, ensuring reliability and quality of supply. Additionally, it has the responsibility for investment planning and extension of the transmission network to evacuate power from new generation plans. UETCL is the single buyer of electricity produced by all generators connected to the main grid, the wholesaler of electricity to the distribution companies linked to the main grid, and it is in charge of all electricity exports and imports. As result of such structure, UETCL has a key role in expanding access to electricity services by providing supply to the licensed distribution companies, while also enabling power supply to be evacuated.

Uganda's power market structure. The Electricity Regulator Authority (ERA) regulates sector activities by issuing power related licenses, setting tariffs, and developing and reinforcing performance standards for electricity services. A tariff increase of about 50 percent was completed in 2012 resulting in a close to cost reflective tariff. UETCL is the single off-taker of electricity from the government-owned generation companies, Independent Power Producers (IPPs) and even from

embedded Small Private Power Producers (SPPPs) that are connected to the distribution network. In turn, UETCL sells electricity to the distribution companies at Bulk Supply Tariff (BST). The BST is supposed to cover the cost of purchasing power from the generation companies, the cost of operating and maintaining the transmission network, debt services obligations, and contributions to future capital investments.

Previous financial situation of the power sector indicates the fragile and exposed position towards UETCL financial performance. From 2005 to 2011 the financial situation of UETCL was compromised due to the bulk supply tariff (BST) did not to cover levelized cost of generation, a severe decline in hydropower output, delay in commissioning Bujagali 250 MW hydropower plant requiring the rental power plants to operate for a longer period than initially envisaged, and foreign currency fluctuation. As a result, GoU had to provide a subsidy to UETCL from about US\$ 85 million in 2006 to about US\$ 247 million in 2011. The recent commissioning of Bujagali and the increase of the tariff ordered by ERA improved the financial situation. However, the future financial performance of UETCL depends on: (a) the average cost of power generation, (b) operating performance of UETCL, (c) the level of cost of generation allowed through the BST of UETCL, (d) GoU payments for electricity, and (e) other external parameters. This will require a continuous monitoring of the financial situation of the sector to implement timely measures to avoid the energy crises experienced in the past.

Despite the progress achieved in the sector, the GoU still faces some significant challenges to secure adequate electricity supply. The current rapid growth of demand for electricity will surpass the current available generation by 2016. The gap is expected to remain until the planned large hydropower plans of Karuma (600 MW) and Isimba (183 MW) are commissioned around 2020. As an additional effort to avoid power shortages and reliance on expensive rental power plants, the GoU is also promoting the development of SPPPs that can be commissioned faster and could be developed simultaneously without imposing financial and managerial burden on the government. However, transmission lines are required to evacuate and transport the power from the SPPPs to the demand centers.

The power sector reforms and increase in generation capacity have not translated into greater access to electricity services and 86 percent of the population still remain without electricity services. To address this challenge, the GoU has approved a Rural Electrification Strategy Plan (RESP) for 2013-2022, which provides a road map to increase access to electricity from 14 percent in 2013 to 26 percent by 2022. The plan indicates the series of investments in distribution and off-grid solutions. It also requires the Rural Electrification Agency (REA) to work in collaboration with UETCL to facilitate implementation transmission and distribution infrastructure necessary to meet rural and national power needs.

Inadequate and constraint transmission capacity represents also a bottleneck for increasing access to electricity services and fully utilize the generation installed capacity. The inadequate coverage of transmission lines is also preventing some of the SPPPs and isolated distribution companies to fully utilize the generation capacity that are currently providing electricity services. As an example, the West Nile Rural Electrification Company Limited (WENRECO) has an installed capacity of around 3.5MW, with the potential to increase renewable generation, but the existing load on the isolated system is not sufficient to absorb the generation available and the lack of transmission interconnection prevents WENRECO to supply customers outside its distribution network.

Transmission system expansion and strengthening of the national grid are critical a development priority to ensure energy supply and increase access to electricity. The Grid Investment Plan was developed by UETCL and is regularly updated to establish the future investment needs to meet the national load growth, generation developments, universal access and regional interconnection. Considering the base scenario with a conservative growth demand for electricity, UETCL will require around US\$2 billion investment in transmission network from 2013 to 2020.

A project prioritization exercise was conducted by UETCL with two typical general objectives for transmission expansion:

Increase transmission capacity to provide reliable electricity services. The objectives are to (i) increase transmission capacity across the country to increase access at the lowest cost; (ii) upgrade the backbone transmission network to enhance its technical performance and decrease losses; (iii) to make provision for interconnections that will facilitate increased electricity trade with neighboring countries such as Kenya, DRC, Tanzania, Rwanda, and South Sudan. Although the reliability of the existing transmission network is within the good practice parameters, the plan also indicates the need to reinforce and upgrade some sections of the transmission network given the age of the equipment, expected demand growth, and the need for automated operation and control in order to maintain the same reliability levels.

Increase transmission capacity to accommodate generation supply into the system. The objective is to provide a resilient means to evacuate power from generating plants (existing, under construction, and planned).

The government is commissioning a study on the power sector reforms to examine the effectiveness and impacts to support economic development, including the single buyer model of UETCL. The review will evaluate the current policy and regulatory set up for the whole sector, as well as the human resources and financial constraints facing the institutions. Based on the review, recommendations will be made in order to (i) increase the ability of the sector to attract and sustain adequate investments (including from the private sector); (ii) increase access; (iii) improving reliability and security of supply; and (iv) improving operational efficiency of the sector. The assessment will be financed by the Bank-financed project ESDP and it is expected to be finalized within 12 months. The team will closely follow up the progress, assessment and recommendations during the preparation of the proposed project in relation of the single buyer model in place in Uganda and the implications for the overall sector. However, the current model is not expected to be change, even in the short-term, and UTCL's will still play the critical role of undertaking investments in physical infrastructure to expand the system, reducing losses and improving reliability.

The GoU has requested the Bank to provide financing to support UETCL to the transmission expansion program and strengthening of the grid (See Table 1 - UETCL Investment Plan 2013 – 2020).

### **Relationship to CAS**

The World Bank Group's Country Partnership Strategy (CPS) for FY2011-2015, aligned with Uganda's National Development Plan, will support structural transformation of the economy. The CAS is based on four pillars to achieve such objective by promoting inclusive and sustainable economic growth, enhancing public infrastructure and delivery of services, strengthening human

capital development, and improving governance. Additionally, the strategy emphasizes the need for increased interconnectivity for regional integration.

In terms of infrastructure for the power sector, the CAS further expands on the need to meet the increasing demand for electricity and to provide reliable electricity service for inclusive and sustainable economic growth. The proposed Grid Expansion and Reinforcement Project (GERP) is contained in the Uganda's CPS which seeks to increase power infrastructure to support economic development and sustainable human capital development through the provision of electricity services, as well as setting up the foundations for regional integration.

## **II. Proposed Development Objective(s)**

### **Proposed Development Objective(s) (From PCN)**

The Project Development Objective (PDO) is to increase transmission capacity of Uganda interconnected system.

### **Key Results (From PCN)**

Progress toward achieving the PDO Outcomes will be measured by the following Project Outcome Indicators:

- Transmission capacity in the sub-system (in MW);
- Reduction in technical losses in the sub-system (in percent);
- Reduction in the number of power outages that are linked to malfunctions in the sub-system (in number).

## **III. Preliminary Description**

### **Concept Description**

The proposed Grid Expansion and Reinforcement Project (GERP) will finance a strategic section of Uganda Grid Investment Plan, focusing on the priority to extend the national transmission system and to interconnect three isolated systems in Gulu, Nebbi and Anua, and will provide financing for rehabilitation of the existing transmission infrastructure to maintain its current performance.

The project will allow further expansion and strengthen the reliability of power supply in the interconnected system. The project will support the most common economic activities in the areas of agribusiness and small and medium enterprises, as well as to create the conditions for expanding electricity services to new households. At the same time, the project will serve as a basis for interconnecting the Uganda national power system to Democratic Republic of Congo.

The project's main components, to be discussed with the government, are the following:

Component 1. Construction of the transmission line. (Estimated cost \$85 million)

The objective of this component is to increase transmission capacity of the system and to interconnect isolated systems of Lira, Gulu, Nebbi and Arua to the national transmission system through the construction of a 132kV transmission line with an approximate length of 380 km. The project will also finance the extension of the existing Lira substation, and three new substations of 132/33kV at Gulu, Nebbi and Arua. The line will enable the interconnection of future renewable based power plants that are planned in the West Nile area to the integrated power system and will

facilitate the full utilization of existing generation plants in the isolated systems. Based on a benchmarking analysis, the estimated cost is around \$85 million, and this will be confirmed based on the feasibility study that is currently under preparation (See Annex 2).

Component 2. Rehabilitation of existing transmission infrastructure. (Estimated cost \$10 million)

The objective of this component is to rehabilitate and upgrade some of the key substations. It will also provide automation, control and monitoring equipment required to enhance the controllability, monitoring and operational flexibility of the transmission network. This component is being complemented by other sources of funding currently under implementation.

Component 3. Technical assistance. (Estimated cost \$5 million)

This component aims at supporting project implementation and review of the financial situation of UETCL. Upon review of UETCL's requirements for technical assistance, this component will support the implementing agency through consultancy contracts related to: (i) engineering/safeguard supervision and monitoring consultant for implementation support for the proposed transmission line, and (ii) review of the financial situation of the power sector through the UETCL. For the latter activity, it is proposed to hire a Financial Advisor to perform a thorough financial analysis of the UETCL. The Adviser will assess the company's ability to undertake its capital investment program, the availability to undertake Power Purchase Agreement (PPA) commitments, and will develop a financing plan intended to optimize the company's resources and financing options.

Project readiness.

Technical aspects. A feasibility study, financed under a Bank project ESDP, is being carried out in order to define the technical specifications, cost estimates of the project, the synchronization requirements with the existing grid, the preliminary line routing, and bidding documents.

Safeguards. A consultant has already been hired by UETCL under the ESDP project to carry out the environmental and social impact assessment (ESIA) and the resettlement action plan (RAP). These studies will identify potential environmental and social impacts of the project and devise mitigation and monitoring measures and will commence once an indication of the line routing is defined.

After consultations with the environmental and safeguards specialists, it was recommended that the project be categorized as "A" given the natural environment and settlement patterns within project area. The project may affect environmental sensitive areas such as wetlands, forests, national/game parks, and in addition affect an area broader than the sites subject to physical works in terms of land acquisition and its likely impacts that include displacement and loss of livelihoods. The location of the Lira substation does not have sufficient space for extension given that it is surrounded by households and community centers. This might require additional land acquisition in order to avoid a major relocation of households in the immediate vicinity of the existing substation.

#### IV. Safeguard Policies that might apply

Safeguard Policies Triggered by the Project	Yes	No	TBD
Environmental Assessment OP/BP 4.01	x		

Natural Habitats OP/BP 4.04	x		
Forests OP/BP 4.36	x		
Pest Management OP 4.09		x	
Physical Cultural Resources OP/BP 4.11	x		
Indigenous Peoples OP/BP 4.10		x	
Involuntary Resettlement OP/BP 4.12	x		
Safety of Dams OP/BP 4.37		x	
Projects on International Waterways OP/BP 7.50		x	
Projects in Disputed Areas OP/BP 7.60		x	

## V. Financing (in USD Million)

Total Project Cost:	100.00	Total Bank Financing:	100.00
Financing Gap:	0.00		
<b>Financing Source</b>			<b>Amount</b>
BORROWER/RECIPIENT			0.00
International Development Association (IDA)			100.00
Total			100.00

## VI. Contact point

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