

PROJECT INFORMATION DOCUMENT (PID) CONCEPT STAGE

Report No.: PIDC3351

Project Name	AFCC2/RI Regional Transmission Interconnection between Mozambique and Malawi (P144551)
Region	AFRICA
Country	Africa
Sector(s)	Transmission and Distribution of Electricity (100%)
Theme(s)	Infrastructure services for private sector development (100%)
Lending Instrument	Specific Investment Loan
Project ID	P144551
Borrower(s)	Electricidade de Mozambique
Implementing Agency	Electricity Supply Corporation Malawi Limited (ESCOM)
Environmental Category	B-Partial Assessment
Date PID Prepared/ Updated	17-Mar-2016
Date PID Approved/ Disclosed	18-Mar-2016
Estimated Date of Appraisal Completion	
Estimated Date of Board Approval	05-Jun-2017
Concept Review Decision	Track II - The review did authorize the preparation to continue

I. Introduction and Context

Country Context

Regional Context

Southern Africa is a large region with low overall rates of access to reliable electricity supply. The 15 member states of the Southern Africa Development Community (SADC) cover a land area of some 554,919 square kilometers and a population of some 277 million. The region extends from South Africa in the south to the Democratic Republic of Congo (DRC) and Tanzania in the north. It includes the islands of Mauritius and Seychelles. Although over 80% of South Africa's population has access to electricity, the SADC region as a whole has an access rate of 24% – driven by extremely low levels of access in certain countries. Of particular relevance to this project, Mozambique has an access rate of approximately 24% and Malawi approximately 9%.

In order to enhance regional integration, the SADC member countries have created the Southern

African Power Pool (SAPP). An Intergovernmental Memorandum of Understanding (IGMOU) to set up the SAPP was signed in 1995. The utilities of 12 Southern African countries were the original members of the SAPP. The main grid systems of Botswana, the Democratic Republic of the Congo, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe form the existing regional network. Crucially, Malawi, as well as Angola and Tanzania, are not yet connected and are therefore not able to benefit from regional trade. For those that are connected, there are two market mechanisms used to promote regional trade across the SAPP: medium- to-long term, bilateral power purchase agreements; and the short-term energy (Day-Ahead) market where daily, weekly, and monthly contracts are actively traded.

The proposed Mozambique-Malawi Interconnection Project (the Project) is a relatively short but highly important interconnection that would interconnect with the ring on the eastern side of the SAPP. In particular, the transmission would start at Matambo substation in Mozambique and then travel in to Malawi and connect with the Phombeya substation. Matambo is being connected with the future Mozambique regional backbone interconnection which has dual lines that would interconnect central and southern Mozambique and also provide a high voltage direct current link to demand in South Africa. Matambo is also being interconnected to the north-eastern coast of Mozambique.

Country Context

Mozambique

Mozambique, a southeast African country of 22.9 million people, occupies an area of 800,000 square kilometers. About 70 percent of the population live and work in rural areas. The country has more than 2,500 kilometers of coastline along the southwestern rim of the Indian Ocean. It is endowed with ample arable land, water, energy, and gas and mineral resources; three deep seaports; and a relatively large potential labor pool. It is also strategically located, bordering six countries — four of them landlocked and hence dependent on Mozambique as a conduit to global markets. In addition, the country's strong ties to the regional economic engine of South Africa underscore the importance of Mozambique's economic, political, and social development to the stability and growth of the region.

For the past two decades since the end of the civil war, Mozambique recorded a sustained and impressive rate of growth. Average real GDP growth rate soared from zero percent during the 1981-92 period to 8 percent between 1993 and 2010; and real GDP per capita almost doubled after 1992, making Mozambique one of the best performing countries over the past two decades among African oil importers. In 2013 Mozambique's GDP growth was 7.1%. While growth in the immediate aftermath of the peace accords was driven by a return to political and macroeconomic stability, a first wave of structural reforms, and a post-conflict —catch-up effect in infrastructure and agriculture, more recent growth (since 1998) has been driven by policies to entice foreign investments, particularly in isolated mega-projects in mining and energy production, and strong donor support.

Malawi

Malawi is one of sub-Saharan Africa's most densely populated countries with about 134 persons/square km (total population about 16.7 million). The population is expected to reach 22.4 million by

2025. The percentage of the population living below the poverty line was around 51% in 2010. The country ranks at 170 out of 186 countries in the latest United Nations Human Development Index, with an estimated GNI per capita of US\$320.

Although the performance of the economy was unsatisfactory between 2001 and 2002, efforts by the Government have led to improved macroeconomic management and placed Malawi on a path for faster economic growth. The growth in real Gross Domestic Product (GDP) which was 1.7% in 2002 and increased to around 6.5% in 2010 and then decreased and 1.9% in 2012. As a result of the improved macroeconomic management and fiscal discipline, the country reached the HIPC completion point and benefited from cancellation of most external debt, thereby releasing resources for pro-poor activities.

The economy is predominately agricultural with about 80% of the population living in rural areas. In 2009, Malawi experienced some setbacks, including a general shortage of foreign exchange, which damaged its ability to pay for imports, and investment fell by 23%. Overall, in the long-term, although several improvements are noted, there are still impediments to sustainable long-term growth such as unreliable power, water shortages, poor telecommunications infrastructure, and high costs of services.

Sectoral and Institutional Context

Mozambique Power Sector

Due to rising demand and improved access, Mozambique currently faces a deficit of electricity generation. According to the EDAP/AFD Master Plan for Electricidade de Mocambique (EdM), the overall basic generation capacity available to EdM in 2011 was 465 MW, whereas the peak load demand in 2011 was 618 MW. According to EdM's data from 2013, current available capacity is 610 MW against peak demand of 745 MW, which means the country still faces a deficit equal to 135 MW. With projections for continued robust economic growth in Mozambique, a key challenge for Mozambique is to ensure that affordable electricity supply is available to meet the growing demand. The short-term solution has been additional non-firm purchases from Eskom.

New projects based on existing natural gas reserves from the Pande/Temane region - are increasing generation capacity to support the projected major expansion in domestic and regional demand. The recently commissioned Aggreko plant has added 132 MW of installed capacity to the previously existing 107 MW (the latter will phase-out in June 2014). Neither of these supply exclusively to Mozambique though. EdM, the Mozambican vertically integrated utility, has jointly invested with Sasol (of South Africa) in a new gas engine plant known as Central Termica Ressano Garcia (CTRG) with 175 MW of generation capacity, which will start operating by the end of June 2014. This will supply exclusively to EdM. Additionally, two further plants are under construction, including Kuvananga (at Chokwe) and Gigawatt at Ressano Garcia, bringing 40 MW and 100 MW respectively. There are further projects at development stage at the moment with less certainty as to their commissioning date.

In the medium term, Mozambique is in possession of abundant natural energy resources for power generation at regional scale and is looking for reliable infrastructure to export power. This is particularly so for hydropower and coal in the Zambezi valley as well as natural gas in the Pande/Temane area and in the off-shore Rovuma Basin/northern Cabo Delgado province. The total hydropower resources are estimated at approximately 12,000 MW and the proven gas and coal

reserves are estimated at 127 billion cubic meters of gas and 13.1 billion tons of coal.

In the power sector, a number of large projects are planned in the medium term for use within Mozambique – but also for significant export. The STE project will lead to a more interconnected SAPP system and there are additional generation projects planned for other parts of the SAPP that would flow through the SAPP interconnected grid. A number of these projects could be used to export power to Malawi.

The Mozambique power transmission system is in significant need of reinforcement. Areas of particular focus in terms of expansion of the grid include greater connectivity across the region – i.e. the regional transmission link between central Mozambique (Matambo substation) and the southern Maputo region – and also reinforcement of the transmission supplying the north-east (around Nacala) where demand is expected to increase rapidly and where there is currently limited redundancy in the system. The shortest route between the SAPP and the Nacala region would be using a line running from Matambo to Nacala through Malawi. A Mozambique to Malawi transmission line would be the first phase of such a link from the SAPP to the north-east.

Malawi Power Sector

Currently, electricity supply cannot meet demand and new capacity is urgently needed in the generation system. Peak demand in Malawi is forecast to grow approximately 8-9% per annum over the next decade. Peak demand is currently about 400 MW and Malawi has installed hydropower capacity of 349 MW of which about 267 MW is available. Unlike Mozambique, Malawi is not interconnected to neighboring grids and therefore is unable to import power to meet the gap. Load shedding is a regular day-to-day occurrence for all but priority customers of ESCOM, and is estimated to frequently exceed 40MW, or over 10% of peak demand.

The country generates 98% of its grid-supplied electrical power through six run-of-river hydropower projects on the Shire River. Due to the non-diversified sources of power, Malawi faces significant hydrological risks and is vulnerable to drought-induced power crisis. Malawi recently increased its domestic power generation capacity through the expansion of the Kapichira Hydropower Station (“Kapichira II”) also on the Shire River, which added 64 MW. The expansion was completed by the end of December 2013. However, even with Kapichira II in operation, peak deficits in Malawi will continue.

Imports of power from the SAPP through a regional interconnector with Mozambique and further development of hydropower separate of the Shire River are part of Malawi’s strategy to meet its growing demand. A screening analysis of new generation sites undertaken in the most recent system expansion studies identified various possible hydropower generation sites.

The forecast of the government of Malawi (GoM) for expected supply capacity is based on the supposition of an increase in hydro power generation by 2020 (in particular through the Lower Fufu project) and of a substantial investment in coal fired power generation after 2020. Although expectations of considerably increased domestic power generation appear optimistic, the Government of Malawi considers transmission export capacity as important going forward. Given the non-dispatchable nature of most of Malawi’s run-of-river generation on the Shire River, it is reasonable to assume that there would be some export through a transmission link during off-peak periods for Malawi.

Relationship to CAS

The proposed project is aligned with the Mozambique Country Partnership Strategy (CPS) FY12-15. The CPS takes as its starting point the country's own vision of its development goals and its strategy for achieving them. The CPS is consistent with the IDA policy framework's main themes of climate change, gender considerations, and regional integration and is also embedded within the framework of the Africa Regional Strategy.

The proposed Project is in line with the Malawi FY13-FY16 CAS, which is in turn, fully aligned with the Government's Second Malawi Growth and Development Strategy (MGDS II), adopted in April 2012 and the subsequent Economic Recovery Plan launched in October 2012. The CAS states that the World Bank will support the Government in addressing critical growth constraints, so as to help Malawi achieve a more sustainable, diversified and inclusive growth. High among the focus areas in the CAS are efforts to enhance economic productivity via investments in infrastructure, notably via improved energy supply. Malawi's energy sector needs both public and private investments to eliminate energy shortages, by upgrading transmission and distribution systems to reduce energy losses and improving both energy efficiency and transmission interconnections to the Southern African Power Pool (SAPP) to diversify supply sources.

The Project will also support the Regional Integration Assistance Strategy (RIAS) for Africa's Strategic Pillar I on Regional Infrastructure and the Bank Africa Strategy's two pillars: the first pillar which promotes competitiveness, including through support to infrastructure development and attracting private sector investments; and the second pillar that aims to reduce vulnerability and increase resilience to macroeconomic (e.g. high oil prices) and climate variability shocks (e.g. dependence on hydropower) as well as its foundation that emphasizes improving governance and public sector capacity.

II. Proposed Development Objective(s)

Proposed Development Objective(s) (From PCN)

The proposed Project Development Objectives are to enable: i) increased access to diversified supply of electricity for Malawi; and (ii) expanded opportunities for Malawi and Mozambique's to benefit from bilateral and regional power trading on SAPP.

Key Results (From PCN)

The Outcome Indicators would be:

- Transmission line constructed under the project (km)
- Substations reinforced/built under the project (no.)
- EdM and ESCOM staff trained in construction and operation of regional transmission lines and substations (no.)
- Number of project beneficiaries, (% of which female).

III. Preliminary Description

Concept Description

On April 3, 2013, the Governments of Mozambique and Malawi signed a Memorandum of Understanding (MOU) for (i) the interconnection of power systems from the Matambo substation in Tete, Mozambique, to the Phombeya substation in Balaka, Malawi; and (ii) extension of the

interconnection of power systems from Phombeya substation in Republic of Malawi to Nacala, Mozambique as a potential second phase (not included under the proposed project).

In that context, the two countries have formally established a Project Steering Committee and have agreed to establish a Technical Committee headed by EdM and ESCOM and to set-up a Joint Project Implementation Unit for the day to day activities of the Project. In addition, the two countries have agreed to request funds from the Bank-administered Norwegian Trust Fund (NTF) for project preparation.

The proposed project will consist of two components: (A) Mozambique - Malawi Interconnection; (B) Technical Assistance and Project Management Support to EDM and ESCOM.

Component A: Construction of the transmission interconnection from the Mozambique electricity grid to the Malawi electricity grid, thereby interconnecting Malawi with the Southern Africa Power Pool network. On the Mozambique side this would include construction of approximately 135 km of transmission line (likely to be 400 kV but requiring confirmation by the feasibility work) including carrying out required landmine clearing activities on limited portions of the transmission line route, the extension of the existing Matambo substation, development and implementation of a Resettlement Action Plan, as per the Resettlement Policy Framework, once the exact route is determined. On the Malawi side this would include construction of approximately 75 km of transmission line (likely to be 400 kV but requiring confirmation by the feasibility work), installation of a new substation, development and implementation of a Resettlement Action Plan, as per the Resettlement Policy Framework, once the exact route is determined, and the studies, works, engineering and project management support required to complete the interconnection.

Component B: Technical Assistance and Project Management Support to EdM and ESCOM to help on the implementation of the Project. This includes an engineering/safeguard supervision and monitoring consultant for implementation support for the proposed transmission line, and related capacity building and training. This component will also include support for preparation of feasibility studies for new generation projects.

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:	124.50	Total Bank Financing:	120.00
Financing Gap:	0.00		
Financing Source			Amount
BORROWER/RECIPIENT			0.00
International Development Association (IDA)			120.00
Free-standing TFs AFR Sustainable Development			4.50
Total			124.50

VI. Contact point

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