PROJECT INFORMATION DOCUMENT (PID)
CONCEPT STAGE

Report No : AB3570

Project Name	**Mozambique Regional Transmission Development Program APL Series, Phase 1.**
Region	**AFRICA**
Sector	**Power (70%); Other domestic and international trade (30%)**
Project ID	**P108934**
Borrower(s)	**Republic of Mozambique**
Implementing Agency	**Electricidade de Mozambique (EDM)**
Environmental Category	**A**
Date PID Prepared	**June 10, 2008**
Estimated date of Appraisal Authorization	**October 15, 2009**
Estimated Date of Board Approval	**December 15, 2009**

1. Key Development Issues and rationale for Bank Involvement

Background

Regional Context. For over a decade Southern African countries have recognized the benefits of regional cooperation in development of regional electricity trading.

In August 1995, SADC member countries created the Southern Africa Power Pool (SAPP) by concluding an *Intergovernmental Memorandum of Understanding* and related agreements. The utilities of 12 Southern African countries were the original members of the SAPP. The main grid systems of Botswana, DRC, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe form the existing regional network. Angola, Malawi and Tanzania are not yet connected. In February 2006, membership in the SAPP was expanded to include private generation and transmission companies.

The SADC Protocol on Energy of 1996 commits member states to develop and use energy to support economic growth and development, poverty alleviation and improvement of the standard and quality of life throughout the sub-region. The Protocol further commits member states to the main objectives, which include co-operation in the development and utilization of energy and energy pooling to ensure security and reliability of energy supply in the most efficient and cost-effective manner. The SADC Energy Sector Action Plan of 1997 recommends that the SADC energy program concentrates on priority activities which could be implemented efficiently on a regional basis for the benefit of the entire region.

The Regional Indicative Strategic Development Plan (RISDP), approved by SADC Heads of State and Government in 2001, reaffirms the policy goal established by the SADC Protocol on Energy and identifies the following specific objectives in the electricity sector: (i) promote power pooling through the extension of grid interconnections to cover all member states and

upgrading/strengthening existing grids; and (ii) consolidate the transformation of the Southern African Power Pool (SAPP) from a co-operative to a competitive pool and create a regional electricity market.

Southern African Regional Electricity Supply Crisis and Implications for Power Trading

Sunday Times, South Africa (October 2007)

Eskom said load shedding of between 1,000MW and 2,000MW would occur today as it tried to ease the burden on South Africa's electricity supply system. This is after media reports that some 20% of the installed capacity of around 47,000MW was unavailable yesterday. Eskom started load shedding at midday yesterday when the demand for electricity started to exceed the available supply, and it said it expected the load shedding to continue until Sunday. South Africa's sole electricity generator, Eskom blamed unplanned generating unit outages, and an increased demand for electricity owing to cold weather conditions for the power cuts experienced across South Africa. **The electricity crisis has also extended beyond South Africa's borders with neighbouring countries like Namibia and Mozambique, which buy electricity from Eskom, being told to cut back.** "Eskom has declared a state of power supply emergency in accordance with the Southern African Power Pool agreement requiring all affected countries to cooperate by implementing demand-side management measures," said Namibia's state-owned NamPower, which has been asked to cut its electricity demand by 30MW. Namibia typically imports around 238MW from Eskom. **Eskom has also asked Botswana, Swaziland, Lesotho, Zimbabwe, Zambia, and southern Mozambique to cut their demand.** Meanwhile, the world's largest resources group BHP Billiton has reported that power rationing at its Hillside and Bayside aluminium smelters in South Africa and the Mozal smelter in Mozambique had impacted on production. The world's fifth-largest aluminium producer, BHP's southern African smelters together produced 1.163 million metric tons of aluminium in the financial year ended June 2006. The company said it was working closely with Eskom to mitigate the risks on its smelters, and had agreed to load shedding at times over the past month to enable Eskom to meet its demand. The exact impact on production from power rationing wasn't immediately clear. Eskom said that electricity supply was already expected to be "tight". "Eskom is doing everything to minimise the inconvenience to customers. To this end, emergency energy resources which include the use of Eskom's gas turbines and buying back power from large industrial customers will be used," it said, adding that its teams were working continuously to return the units that were on unplanned outages back to service.

All countries in Southern Africa are now facing generation capacity constraints. The impact of the generation constraints is compounded by inadequate transmission infrastructure to move electricity to locations where it is most needed.

At least 1,000MW of additional capacity will be required each year to meet demand growth in the region. While the lion's share of new load is projected in South Africa, some of the most attractive potential generation projects, from an economic and environmental point of view, are mega-projects located in neighboring countries – including Mozambique - where domestic demand is too small to justify the cost of the large projects unless a significant portion of the output is exported.

Under the leadership of the Southern African Power Pool[1] (SAPP) Coordination Center the SAPP Indicative Generation and Transmission (G&T) Expansion Plan is nearing completion. Intended as a guide, rather than a master plan, the study shows that savings of billions of dollars over the next 20 years could be achieved if a least cost G&T expansion approach involving increased regional electricity trade, is followed compared with individual countries implementing G&T expansion designed for domestic supply only.

In principle South Africa (and its generation and transmission utility Eskom) is open to the idea of importing reliable, low cost electricity and Eskom has participated actively in the preparation of the regional least cost G&T expansion plan. However, Eskom's first consideration is to ensure that domestic demand is satisfied. Eskom will not wait indefinitely for new generation and transmission in other SAPP countries, no matter how economically and environmentally attractive. The reality is that if import options are uncertain, South Africa will resort to expansion of domestic capacity, even if the costs are higher. Hence there is a critical window of opportunity to realize the best regional generation (and associated transmission) projects to meet the medium term needs. If governments, developers and development partners cannot pull together to realize the best projects during this window, second best – from and economic and environmental point of view – options will be pursued by South Africa.

Role of South Africa in Southern African Power Trade. South Africa dominates the regional power market. Seven of the 8 other countries currently interconnected on the SAPP grid rely on imports from South Africa to meet their power requirements. When South Africa experiences supply shortages, there is a direct reduction in power available to sell to SAPP countries and therefore a direct reduction in regional trade. A recent unplanned generation outage forced Eskom to notify Botswana, Swaziland, Lesotho, Zimbabwe, Zambia and Mozambique to cut their demand (as described in the October 2007 Sunday Times article shown in the box above). Eskom's role in electricity trade in SAPP is such that any measures to improve supply into the Eskom system will directly contribute to supporting continued and expanded regional electricity trade, whether the supply is sold directly to Eskom or wheeled through the Eskom grid to other off-takers. Any competitively-priced large generation and transmission investment will ultimately support continued and expanded regional power trade in SAPP.

Mozambique Context and Role in Regional Power Trade

In November 2007, the Government of Mozambique completed the historic buy-back of the 2,075MW Cahora Bassa Hydroelectric Power Generation Facility. The transaction involved raising $800 million debt under a non-recourse, commercial financing structure with no sovereign guarantee. Concession fees, taxes and dividends from Cahora Bassa will provide inflows to the treasury, increasing dramatically after the debt has been repaid. In addition, EDM buys 300MW at a price significantly lower than that of the anchor customer (Eskom, South Africa). The success of this transaction raises Mozambique's profile as an attractive destination for foreign

[1] SAPP started as a cooperative pool in which members seek to maximize economic and system reliability benefits through trade, while retaining maximum autonomy for individual members. Currently there are two market mechanisms used in SAPP energy exchanges: medium-to-long term, bi-lateral power purchase agreements and the Short Term Energy Market (STEM) where daily, weekly and monthly contracts are actively traded. There is already a significant level of electricity trading in SAPP. In the longer term SAPP aims to facilitate the development of a competitive electricity market in the SADC region and is now preparing to move to a competitive pool arrangement.

investment. It also demonstrates the benefits that can be derived from further development of Mozambique's electricity generation potential for domestic and regional markets.

Mozambique has identified 5 new regional electricity "mega- projects", potentially for export to SAPP, totaling almost 7,000MW of new generation potential. Not surprisingly, Mozambique has embarked on a strategy to expand its role as an electricity exporter with the objectives of (i) ensuring availability of least-cost generation to supply the domestic market through a percentage off-take for Mozambique from each new mega-generation plant[2]; (ii) generating revenues for the treasury which will contribute to continued strong balance of payments and robust economic growth necessary to underpin the Government's continued poverty reduction efforts[3]; (iii) and achieving a range of other economic and social benefits associated with mega-projects.

Electricidade de Mocambique (EDM) is the vertically integrated, government-owned electric utility with an installed capacity of 140 MW hydropower (of which 86 MW is available) and 109 MW in thermal power stations (of which 82 MW is available). Peak demand in Mozambique[4] is about 350 MW. EDM buys most of its power supply (300 MW) from Hidroelectrica Cahora Bassa (HCB), owner and operator of the Cahora Bassa hydropower plant. Based on recent performance, Mozambique load growth is projected at 7 percent annually from 2008 to 2010, and 5 percent thereafter. The Mozambique transmission grid is currently interconnected with Zimbabwe, South Africa, and Swaziland. About 8 percent of the population has access to electricity. Currently the Government envisages that EDM will be the Government's vehicle for state participation in the ownership of proposed mega-generation and transmission projects.

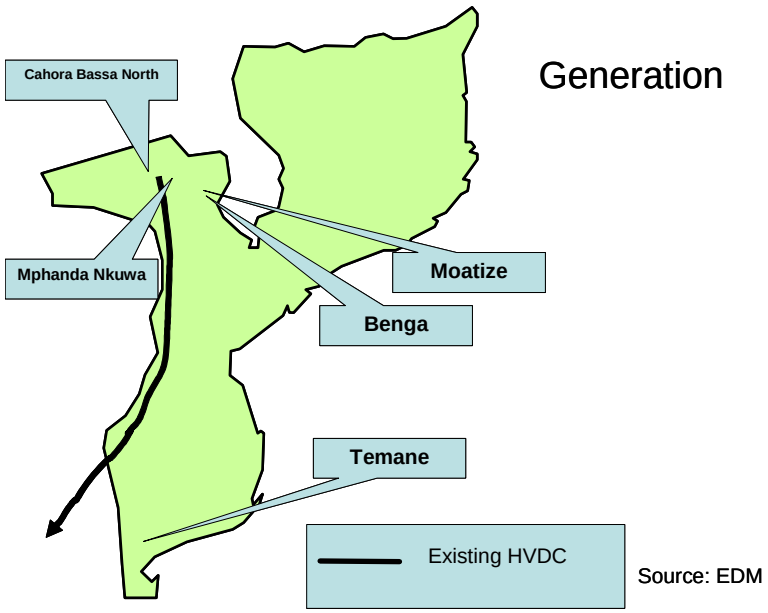
Mozambique Regional Generation Mega-projects. The generation projects are listed below and indicated on the map in Figure 1. For further detail on the Moatize and Mphanda Nkuwa projects refer to Annex 1.

[2] In Mozambique, the projected unit cost of electricity produced from the large, export-based generation projects is lower than the unit cost of output from smaller greenfield generation projects that could provide incremental increases in capacity that could be fully absorbed in Mozambique's domestic market. Hence obtaining a percentage (e.g. 5% - 15%) of the low cost output of the export-based projects is expected to be the least cost approach to meeting Mozambique's domestic demand.

[3] Mega-projects have been a major factor in the recent sustained growth, as indicated in this excerpt from the PRSC 4: draft PAD: "Economic expansion has been made possible by overall macroeconomic stability, policy reforms and continuing strong donor support, permitting broad-based expansion across most sectors of the economy, and a series of significant foreign investment projects ("megaprojects"). As a result, Mozambique's exports increased dramatically in the late 1990s and early 2000s, with average growth rates of 10.6 percent and 25.4 percent in 1995-1999 and 2000-2006, respectively. *Most of this growth, however, was driven by exports from megaprojects*…..". The same document indicates that future mega-projects are expected to make an equally-significant contribution to continued growth.

[4] Excluding Mozal Aluminum Smelter, which imports power from South Africa.

Figure 1: Location of Planned Power Projects in Mozambique[5]



(i) **Temane**[6]: a 450-500 MW Gas-fired Combined Cycle. Maputo Province. Strategic Partner/ private developer selected. Indicative cost: $0.6 billion. Target commissioning date: **2012**.

(ii) **Moatize**: mine-mouth coal-fired power plant, initially 1,200MW, up to additional 1,200MW in second phase. Tete Province. Strategic Partner selected. Indicative cost: $1.7 billion Target commissioning date for first phase: **2013**.

(iii) **Mphanda Nkuwa**: 1,500MW hydropower plant. Tete Province. Strategic partner selected. Indicative cost: $1.5 - $1.9 billion. Target commissioning date for first turbine: **2015.**

(iv) **Cahora Bassa North Bank**: 850 – 1,000MW hydropower plant on the north bank of the existing Cahora Bassa dam. Tete Province. Update on cost and timing are underway following the conclusion of the Cahora Bassa buy-back transaction. Studies indicate this project should come on-line after Mphanda Nkuwa, to optimize hydrological management and maximize revenues.

[5] Source: EDM

[6] Following negotiations with the gas supplier, the gas available for power generation in the near term is expected to be sufficient for about 450 to 500MW base load combined cycle. The original concept of a 1,000 MW power plant located near the gas production site in Temane, Inhambane Province has been revised. The location will be near load centers and the gas pipeline in the south. Due to the change in location, this project is unlikely to be a key element in the development of the North-South Transmission Backbone.

(v) **Benga**: initial proposal similar to the Moatize project: mine-mouth coal-fired power plant, initially 1,000MW. Tete Province. At an early stage of development, strategic partner not in place. Award of the coal mining concession pending.

Projects (ii), (iii), (iv) and (v) are referred to subsequently as the "Tete projects", as they are located within about 150km of one another in Tete Province.

The first three mega-projects have the following features in common (discussions on Cahora Bassa North Bank and Benga are at a very preliminary stage):

- Private sector strategic partner;
- Limited-recourse financing strategy;
- Debt will be raised on the basis of a long-term power purchase agreement with an anchor off-taker that commercial banks consider to be credit-worthy;
- Each generation project will compete with other mega-projects, e.g. in Mozambique, South Africa and other SAPP countries, for the same set of off-takers (of which Eskom South Africa is likely to be the major one). Hence there will be considerable pressure on the developers to keep costs as low as possible to be competitive.
- EDM will be allocated a small percentage of the output at a preferential price.

For all the Tete projects:

- The cost of transmission will be a make-or-break factor in competing with other mega-projects, hence all developers agree on the need to keep costs as low as possible and to cooperate to find a least-cost overall solution for transmission.

The North-South Transmission backbone. The proposed North-South Transmission "backbone" system, will connect the planned new generation projects in Tete with the high voltage Motraco system[7] in the south between Maputo and South Africa. The backbone is a requirement to realize the full generation potential and thereby achieve the low-cost power supply to Mozambique and the region, and export-based revenues for Mozambique. The transmission backbone project is a key element of Mozambique's plan to build a reliable electricity grid at the national level which is required to maintain steady and geographically-equitable growth.

"Eastcor"

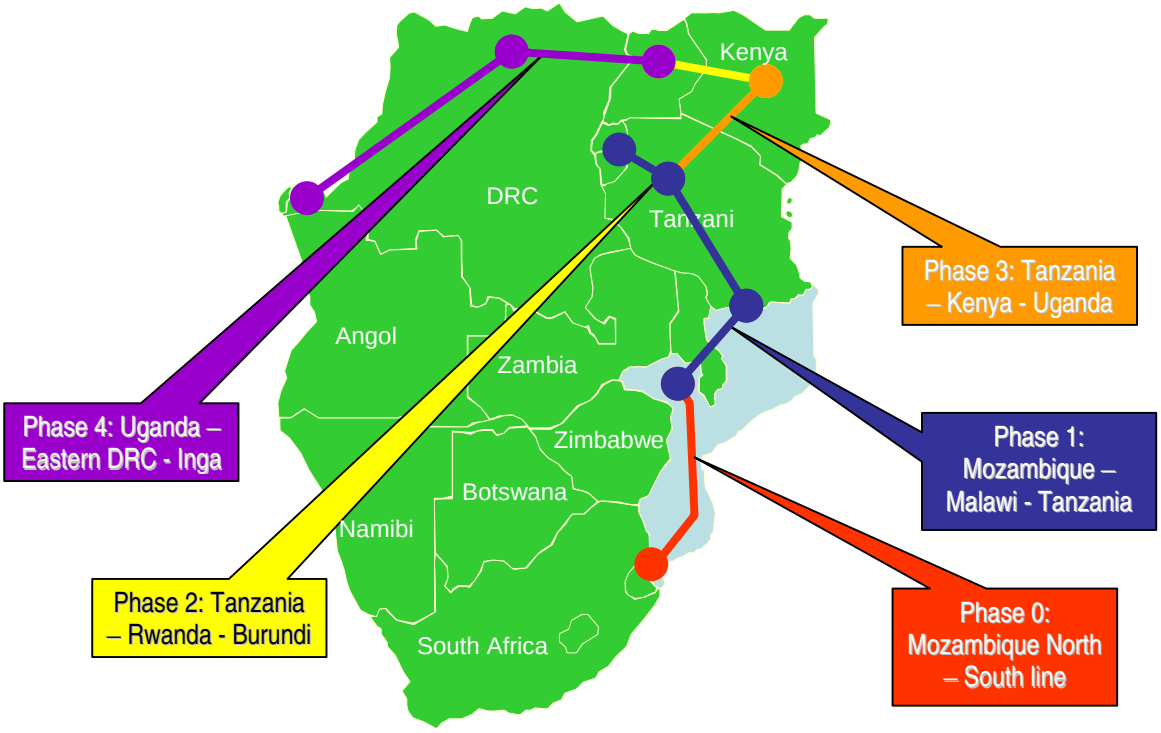
In the future the proposed transmission backbone system in Mozambique could form the basis for an Eastern Transmission Corridor connecting the Southern and East African power markets. The concept of an "Eastern Power Corridor" or "Eastcor" has already been proposed jointly by the SAPP Coordination Center, Eskom and EDM [8] as a key element in the connection of the Southern and East African power markets. "Phase 0" of the Eastcor would be the Mozambique

[7] The "Motraco system" is owned and operated by the Motraco Company – a joint venture by the state-owned electric power utilties of Mozambique, Swaziland and South Africa: EDM, SEB and Eskom respectively. Motraco is a limited liability company which wheels power from Eskom in South Africa to the Mozal Aluminium Smelter near Maputo in Mozambique.

[8] "Planning the Eastern Power Corridor of Southern Africa": Pat Naidoo, Senior General Manager, Eskom South Africa; Lawrence Musaba, Manager of the Southern African Power Pool Coordination Center; Augusto de Sousa Fernando, Executive Director Transmission, Generation and Market Operation, EDM; Mark Dingle, Principle Technical Engineer, Project Development Department, Eskom. IEEE paper, 2007

North-South backbone transmission line, followed by subsequent phases extending the Eastcor to connect with Malawi (already scheduled and financed), Tanzania, Rwanda, Burundi, Kenya, Uganda and ultimately via Eastern DRC across to the Inga System in Western DRC. The concept is illustrated in figure 3. The planned large generation stations in the Tete area of Mozambique provide the necessary balancing and stability for the first stages of "Eastcor". The Eastcor concept has begun in an *ad hoc* fashion. Mozambique already has transmission interconnections with Swaziland, South Africa and Zimbabwe, firmly anchoring Mozambique as a key trading partner and providing a trading route in the SAPP. Interconnection with Malawi is scheduled to be commissioned in 2011. Mozambique and Tanzania are exploring the possibility of a cross-border transmission link in the next few years. Together with existing and planned interconnections, realization of the North-South backbone would catalyze the Eastcor regional concept.

Figure 2: Eastern Corridor of Southern Africa Approaching Strategy – Phase 2 to 4



Role of World Bank and Other Development Partners

Development Partner Coordination on Regional Energy Issues. In January 2007, Norway assumed the role of lead for the international cooperating partners (ICPs) to SADC in energy.

The first joint meeting of ICPs and SADC energy secretariat took place in November 2007, with participation from 8 ICPs including the World Bank. This initiative is closely coordinated with the SAPP Coordination Center. Many of the issues to be addressed under the SADC energy framework will be relevant for, and contribute to the success of the generation and transmission developments planned in Mozambique, including the North-South Transmission Backbone project.

World Bank support for the proposed APL 1: Mozambique Regional Transmission Development Stage 1: North-South Transmission Backbone Project was envisioned in the Mozambique Country Partnership Strategy, as a key component required for the development of the export-based generation projects with resulting benefits for Mozambique and the regional power market. Key lessons from past and on-going analytical work are (i) that there are huge economic benefits arising from a regional approach to development of electricity generation and transmission infrastructure and (ii) that without a concerted effort, the complexities of regional projects pose an initial level of transaction cost and uncertainty that if not mitigated, for example by assistance from unbiased third parties such as development partners, can result in economically less attractive, but simpler domestic projects going forward.

To date EIB, Norway, and IFC have expressed possible interest in contributing to financing the proposed north-south transmission backbone system. The possibility of accessing Carbon Financing is being actively explored. Application has been made for co-financing, both for investment and technical assistance during preparation and implementation, from the Africa Catalytic Growth Fund. An application for PPIAF funding for technical assistance for EDM is in process. Financing from export-import agencies will be explored as required.

2. **Proposed Program and Project Development Objective(s)**

Program- Regional Development Objective: Catalyzing the implementation of private sector investment in generation and transmission developments that are consistent with the "SAPP Indicative Generation and Transmission Expansion Plan", specifically focusing on opportunities where WBG support can mobilize significant amounts of private capital.

APL 1 Project Development Objective: Build the first stage of the Mozambique north-south transmission backbone system required to evacuate electricity from the planned Tete Power Plants which will (i) enable competitively-priced electricity to reach the Southern Africa Power Pool network, (ii) enable the provision of a supply of least-cost generation at a high level of reliability to the Mozambique domestic market thereby improving access, and (iii) enable the generation of revenues for the Mozambique treasury which will significantly contribute to continued strong balance of payments and robust economic growth necessary to underpin the Government's continued poverty reduction efforts.

3. **Preliminary Program Description**

The scale of the financing required to meet the regional demand for electricity is such that public sector financing alone cannot provide the resources necessary. There will have to be a large amount of private capital mobilized to realize the required expansion in generation and transmission investments in the SAPP. In order to play a catalyzing role in these developments, WB needs a mechanism for providing catalytic support on time and in the form needed (i.e. credit

/ loan / guarantee etc.) to facilitate participation of private sector sponsors and financing. A ***horizontal APL Program*** is proposed as the appropriate WB instrument to provide this catalytic support: ***Catalyzing Private Participation in SAPP Generation and Transmission Expansion Multi-Phase APL Program.***

A critical element of such an instrument is flexibility. Hence it would be important to design the program based on criteria for eligibility, which would support financing of eligible privately-led investments progressively identified as a part of the evolving SAPP generation and transmission system. While the SAPP Indicative Generation and Transmission Expansion Plan will be an important guide to selection of projects to potentially be included in the proposed APL program, the SAPP Indicative Generation and Transmission Expansion Plan is based only on economic considerations. Private sector in selecting and financing investments in SAPP will take into account the economic and financial viability of any new generation and transmission projects, but other considerations will also be important, e.g. perceived risk, strategic requirements of off-takers, conditions by commercial lenders, transmission constraints, etc. Hence the World Bank support mechanism through the proposed APL program would avoid prescribing the order and specific set of projects to be included in the horizontal APL series. Instead the World Bank support mechanism would explicitly recognize the factors that will be key for private participants. In addition, the World Bank support would limit conditions to those that are relevant to each specific project – and would avoid imposing conditions relating to the progress or performance of other projects where the same private party is not involved and/ or where a government outside the host country(ies) is involved as this would expose the implementing private party to risks which they cannot manage, mitigate or price.

Proposed Eligibility Criteria

Countries would become eligible for WB support under the proposed horizontal APL program:

- if they are a member of SAPP and are abiding by the SAPP guidelines; and if the World Bank is satisfied that the country / borrower has the ability to effectively participate in regional trade (e.g. reasonable tariffs, policy, regulatory, legal systems that allow for import and export of power; necessary technical capacity to integrate into the SAPP network) or the proposed project under the APL program could assist in addressing any deficiencies as needed.

- Along with these general criteria, there would be requirements relating to normal World Bank due diligence in terms of Bank standard requirements (fiduciary, safeguards) and that the proposed project fits into the WB country partnership strategy(ies).

Projects would be considered on the basis of:

- Project is private-sector led or critical for private investments in the power sector and leverages considerable private sector finance for the power sector. (This could include transmission line investments that are public sector-financed but are necessary to move forward with a privately-financed Generation project).

- Project is (i) identified in SAPP Indicative Generation Transmission Expansion Study, or (ii) a transmission investment (domestic or trans-boundary) that is necessary to implement a generation project that is identified in SAPP Indicative Generation Transmission Expansion Study; or (iii) a new Generation or Transmission project that can be demonstrated to be competitive (taking into account cost, timing, market and

financing) with projects mentioned in the plan. This last criterion is necessary since the plan will be a guide rather than a master plan, and should not exclude the possibility of new, competitive projects being considered as they are identified and developed.

- The process for the selection of the private party, financing plan, risk sharing arrangements are acceptable to the Bank and the project entity agrees to comply with Bank's policies and guidelines.

- WB is satisfied that the proposed project has regional benefits.

Preliminary Project Description: APL 1 - Mozambique Regional Transmission Development Program Stage 1

The timing of the mega-generation projects and phased development of the North-South Transmission backbone system have to be synchronized. In order for project sponsors to reach financial close for the generation investments it will be necessary to demonstrate that financing for the transmission, required to evacuate electricity from the new power plants, is also committed. Similarly, financing for the transmission investment cannot be arranged without a high degree of certainty regarding the generation investments.

The Moatize and Mphanda Nkuwa generation project sponsors have set out ambitious schedules, based on a perceived window of opportunity in terms of selling electricity to Eskom[9]. Individually, each of the generation projects and the north-south transmission backbone project have huge financing requirements which will be tackled on a project finance basis, with significant amounts expected from commercial lenders. The timing of the generation developments will depend on several factors not completely within the control of the developers or the Government (e.g. completion of fuel supply agreement, power off-take agreements etc.). Considering the shorter construction time for thermal-based generation compared to hydro, it appears likely that the Moatize project will be commissioned first, and it is possible that the first units of the Mphanda Nkuwa project could come on line a few years later.

A key feature in the design of APL 1 to support the development of the North-South transmission line is flexibility. Support for the north-south transmission backbone project must be designed to (i) provide early clarity on the commercial and technical design for the whole transmission backbone system; (ii) mobilize financing for the first stage of the transmission backbone system on the schedule planned for the first Tete power plant; and (iii) mobilize financing for the subsequent stages of the transmission backbone system on the schedule planned for the subsequent Tete generation projects.

EDM has hired consultants under World Bank financing to undertake a least cost integrated transmission backbone system study. The consultants have completed the inception report which was presented to the key stakeholders (ME, EDM, developers, Eskom, WB etc.) on April 4, 2008. The inception report presents two options for staged development of the transmission system. The option which, according to the initial assessment, best fulfils the objectives, is as follows:

[9] For each generation project, financing will be raised on the basis of future revenues "guaranteed" by a Power Purchase Agreement (PPA) with a credit-worthy off-taker. Eskom has a strong credit rating and an off-take agreement with Eskom would be considered "bankable" by commercial lenders. Other existing and potential credit-worthy off-takers would be Nampower in Namibia, Botswana Power Corporation in Botswana, and potentially large mining or industrial enterprises of which several are planned to be established in Mozambique.

- Stage 1 (linked with the first stages of new generation i.e.1,200 MW at Moatize, possibly 700 MW at Mphanda Nkuwa, and possibly 500MW at Benga)[10]: One or two HVAC lines from Matambo (Tete) to Maputo (2013);
- Stage 2 (linked with the next increment of new generation capacity i.e. another 1,200 MW at Moatize, 700 MW at Mphanda Nkuwa): A second HVAC line if only a single circuit is included in the first stage. Upgrade the existing Songo-Apollo HVDC system from 1920 MW to 3300 MW if technically feasible[11] (2014).
- Stage 3 (linked with, Cahora Bassa North, and the recently-proposed Benga coal-fired generation project): Build new 4,000 MW HVDC system from Matambo to KwaZulu Natal in South Africa (2015).

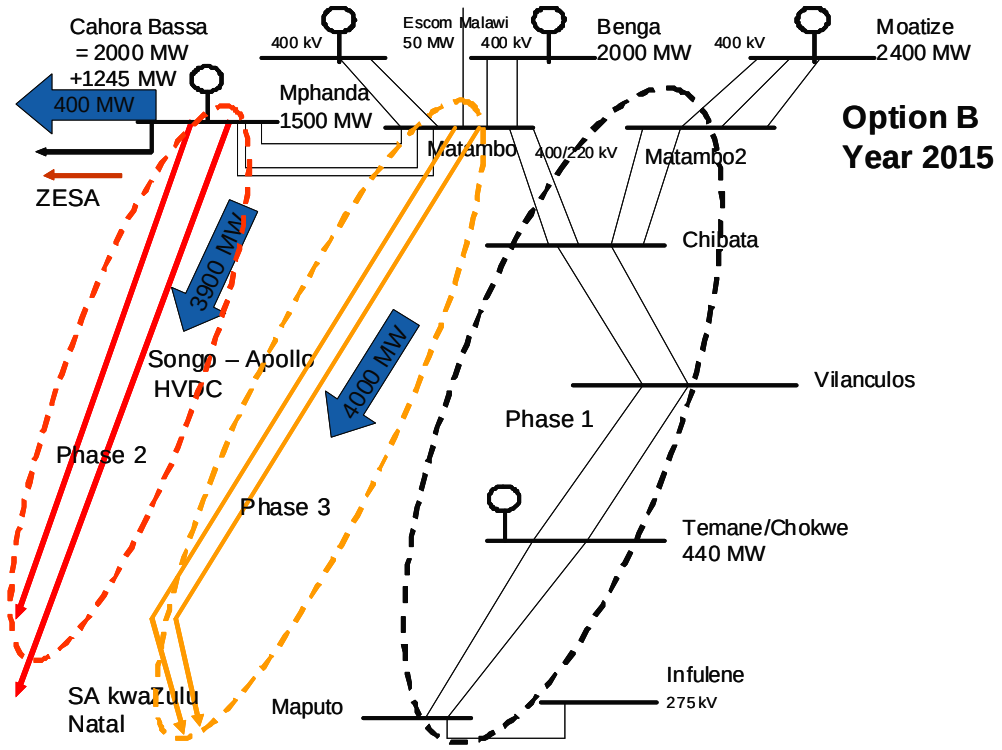
The following single line transmission diagram (figure 3 below) depicts the preliminary view of the staged development of the above transmission system based on the inception report. This will be updated when the final report is received at the end of July, 2008. The transmission links from the generating stations to the Matambo substation will be the responsibility of respective generators and will be financed and constructed by the consortium developing the particular generating station.

Depending on the timing of the second and third stages of the transmission backbone, there could be a subsequent project in this APL series to support further stages of the north-south transmission backbone.

[10] The technical feasibility of commissioning only one HVAC line with the first increment of new generation (e.g. 1200 MW) in Tete is being investigated. The second line would in that case be commissioned with the next phase of generation.

[11] Detailed technical work is required to determine the technical feasibility of the upgrade. HCB and Eskom are engaged in discussions and the assessment is expected to be completed March 2009.

Figure 3: Staged Development of the Planned North-South Transmission Backbone[12]



Proposed Transmission Special Purpose Vehicle (SPV) A Transmission SPV would be established to develop, own and operate the planned new transmission backbone system under a BO(O)T arrangement. Initially the Transmission SPV would focus on the development of the first stage of the system, associated with the first new Tete generation project. EDM, along with the generation developers and possibly other interested parties would hold equity in the Transmission SPV. This would then become the vehicle for the development of subsequent stages of the north-south transmission backbone system. The developers for the Tete generation projects would contribute equity and assist in financing of the development of the first and subsequent stages of the integrated North-South transmission backbone system. Having an existing revenue-earning commercial entity in place for the first stage could potentially facilitate the financing of the second and third stages of the transmission backbone system.

Proposed EDM Role In the near term, EDM will play a lead role in technical coordination of the key stakeholders of the north-south Transmission System. EDM is also expected to have significant equity in the Trasnsmission SPV. Over the medium-to-long term, full ownership and responsibility for operation of the backbone system would revert to the Government as per the planned BO(O)T arrangement. EDM, as the state-owned electric utility (or potentially a state-owned, successor transmission company derived from EDM), would be the Government's designated vehicle for transmission assets and operations. The transition from the current relatively small domestic utility to an owner and system operator of a key SAPP transmission corridor will take some years. The APL structure will enable the World Bank and EDM (and

[12] Source: EDM

other partners as appropriate) to work together over the medium to long term in implementing the transition successfully.

Transmission System Coordination Working Group A Transmission System Coordination Working Group (WG) has been convened, with EdM taking the lead role in coordination on technical issues. EDM, Ministry of Energy and each generation developer are represented. ESKOM will be invited to participate in the deliberations of the working group as appropriate. The purpose of the WG is to ensure coordination regarding commercial and technical considerations for the north-south Transmission backbone project.

Taking into account these project design criteria, the following Project is proposed:

- **APL 1: MOZAMBIQUE REGIONAL TRANSMISSION DEVELOPMENT PROGRAM STAGE 1**: (indicative cost $900 million) would contribute to financing the investment and technical assistance focused on the development of the first stage of the North-South Transmission backbone line required for the first Tete Generation project(s).

The components of the proposed project would be:

- Component A: IDA credit and PRG[13] to contribute to the financing of the transmission and substation investment.

- Component B: technical assistance to EDM (and possibly Ministry of Energy) related to their roles in the north-south transmission backbone project.

Proposed IDA financing would be $90 million (1/3 from Mozambique IDA allocation and 2/3 from regional IDA) - to be split about $60m for EDM equity in the Transmission SPV and technical assistance and $30m available for an IDA PRG.

As the north-south transmission backbone system and related generation projects are planned to be implemented under project financing structures, the developers have indicated that additional Bank support through a PRG in support of commercial debt required to finance the projects may be required. Once the developers have finalized their approach towards financing of the transmission and generation projects for stage 1 and a request for PRG is received (from GOM) the team will update the PCN and circulate for management concurrence. In view of the possible IDA constraints, the team also proposes to explore the possibility of IBRD enclave PRG in support of these operations.[14]

Thorough due diligence on both the transmission and generation aspects with respect to financing approach and risks, and ownership structure and participants will be undertaken at an early stage of preparation, to ensure that risks are fully understood and that the proposed structure and ownership are acceptable. Due diligence regarding the fuel supply agreement and power supply agreement(s) will be undertaken as these agreements are prepared. The due diligence assessment would be presented and discussed at the decision meeting.

[13] As indicated earlier an updated PCN with the PRG term sheet would be circulated once a request from GOM is received.

[14] The PCN currently proposes US $30 million for an IDA PRG.

Alternative approaches being considered Alternative approaches considered for the proposed Transmission project relate to the structure of the North-South Transmission Backbone SPV and the roles of EDM and the private sponsors of the generation projects. Financing of the transmission system is a challenge both because of the complexity and the magnitude of the financing required and the need to phase the development of the transmission backbone system to match the commissioning of the generating stations. Despite distributed financing and construction responsibilities for generation and transmission, it is essential that the overall system is managed and operated in an integrated manner and workable commercial arrangements are in place. Additionally, in order to minimize the resources required for evacuation of power the transmission backbone system needs to be designed and constructed in a least cost manner. The original concept, reflected in the proposals from the strategic developers of Mphanda Nkuwa and Moatize generation projects, was that each generation developer should have responsibility of the development of the associated transmission requirements. However, all parties – GOM, EDM and developers - are keen to arrive at the optimal structure which would attract private financing as well as ensure efficient operation of the integrated system at least cost.

The Ministry of Energy has hired a consultant to assess the options for the commercial structure of a transmission company/ies that would support development of a least cost integrated approach to the overall North-South transmission backbone system. The final report is expected in August 2008. Based on the review, they would recommend the optimal ownership and implementation structure which can: (i) lead to the development of a least cost transmission system for the above generating stations in a phased manner matching the development of the generating plants; (ii) facilitate the phased financing of the transmission system under limited recourse structure; (iii) enable efficient and coordinated operation of the system including optimal dispatch and operation of the plants; (iv) assist in developing simple and workable commercial arrangements for transmission system use and operation of the system; (v) allow the flexibility in the long term to facilitate the ownership of the system by the Mozambican power utility. Recommendations from the study will be the basis for designing the structure of the transmission SPV.

Issues regarding possible partnerships and co-financing with other international agencies As these projects are being structured as BO(O)T operations the lead in mobilizing financing would be taken by the private developers. The financing structure will likely include participation of several multi-lateral and bi-lateral organizations, as well as sponsor equity and commercial debt. To the extent feasible the possibility of concessional debt for the project from bilateral and multilateral source would be explored.

4. **Safeguard Policies that might apply**

The following safeguard policies would *potentially* apply for APL 1:

Safeguard Policies Triggered	**Yes**	**No**	**TBD**
Environmental Assessment (OP/BP 4.01)	**X**		
Natural Habitats (OP/BP 4.04)	**X**		
This will be determined by the EIA.			
Forests (OP/BP 4.36)	**X**		
This will be determined by the ESIA.			
Pest Management (OP 4.09)		**X**	
Physical Cultural Resources (OP/BP 4.11)	**X**		
This will be determined by the ESIA.			

Safeguard Policies Triggered	Yes	No	TBD
Indigenous Peoples (OP/BP 4.10)		**X**	
Involuntary Resettlement (OP/BP 4.12)	**X**		
This will be determined by the ESIA			
Safety of Dams (OP/BP 4.37) If it is determined that the Mphanda Nkuwa hydropower generation project is an "associated" project for the first stage of the Transmission Backbone project, then this OP/BP would be triggered.			**X**
Projects on International Waterways (OP/BP7.50) If it is determined that the Mphanda Nkuwa hydropower generation project is an "associated" project for the first stage of the Transmission Backbone project, then this OP/BP would be triggered.			**X**
Projects in Disputed Areas (OP/BP 7.60)		**X**	

EDM has provided a draft TOR for the Environmental and Social Impact Assessment (ESIA) for the proposed Transmission Backbone project for comment from the World Bank. The World Bank will also provide comments on the TOR for the Strategic Environmental Assessment (SEA) and respective Mitigation / Management Plans for the North-South Transmission Backbone project. The World Bank will have the opportunity to comment on drafts of the reports. The studies will be in accordance with Mozambican law and with the environmental, social and safeguard policies and environmental, health and safety guidelines (including on consultation and disclosure) of the development partners contributing to the financing the project, including the World Bank. The studies will also be in accordance with the Equator Principles to which most of the larger private financiers in the world adhere at present.

For the Transmission Backbone project, as per OP/BP 4.12, a Resettlement Action Plan (RAP) will be prepared in accordance with the World Bank's requirements and procedures. It is likely that the exact location of the right of way may not be known at appraisal. In this case a Resettlement Policy Framework (RPF) will be prepared and made available according to the World Bank guidelines on disclosure[15]. In this case the RAP would be prepared during project preparation. Proposed mechanisms will be discussed and agreed with the World Bank. The Transmission Backbone project-specific ESIA study, the Strategic Environmental Assessment, and either the RPF or RAP as appropriate will be prepared and disclosed before appraisal and 120 days before presentation to the World Bank Board.

The first generation project(s) to come on line will be considered associated facility(ies) for the first stage of the North-South Transmission Backbone System. The expected schedule for the development of the generation projects is under review and is subject to change during project preparation based on technical, commercial or financing considerations. Currently the Moatize coal-fired or the Mphanda Nkuwa hydropower generation projects are likely candidates to anchor the first stage of the transmission backbone. As the generation schedule and the phasing of the transmission system development are firmed up, it will be determined which of these projects would be considered associated with the first stage of the Transmission Backbone project. In

[15] EDM has recently prepared a Resettlement Policy Framework for the World Bank-assisted Mozambique-Malawi Transmission Interconnection Project. Consideration will be given to updating and modifying the existing EDM RPF to accommodate the specific characteristics of the proposed Transmission Backbone project.

addition to a SEA and project-specific ESIA for the Transmission Backbone Project (Category A), an ESIA and Resettlement Action Plan for any associated generation project(s) would be prepared and disclosed before appraisal and 120 days before presentation of the project to the World Bank Board. With regard to the Moatize coal-based generation project, the coal would be from a coal mine for which the concession has already been awarded to a private company. Development and operation of the mine is designed for the export of high grade coal, rather than for the development of the proposed power plant. Hence the coal mining development is not considered associated with the transmission backbone project.

Specifically in relation to the planned Mphanda Nkuwa hydropower development on the Zambezi River, a multi-donor financed study: *The Zambezi basin multi-sector Investment Opportunity Analysis* is already underway. The overall objective of the study is to provide decision support guidance to the main stakeholders responsible for managing and developing water and related resources in the Zambezi River basin. This guidance will be based on a multi-sectoral economic analysis of growth-focused development options and investment potential from both a basin and country perspective for the eight riparian countries. The study will identify the main characteristics of existing and planned infrastructure projects (e.g. dams, irrigation, perimeters, etc.) and will draw from the analysis the main diagnostic elements, problems and constraints of cross-cutting issues (e.g. environmental, socioeconomic, institutional, etc.). The results will be summarized in a "detailed socioeconomic assessment". The findings and recommendations of the study will be incorporated in the safeguards assessment of the Mphanda Nkuwa generation project as appropriate based on the stage of the development of the project[16].

5. Tentative Financing		($ million)
Source:		
BORROWER/RECIPIENT		xx
International Development Association (IDA)		$90
Other (tbd)		xx
IDA Guarantee (tbd)		xx
	Total	$900

6. Contact Point

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[16] Further information can be located at the World Bank infoshop under the title of "*The Zambezi basin multi-sector Investment Opportunity Analysis*".