



Regional Integration in East Africa: Creating the framework for energy development and trade in Africa

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1. Introduction

As a country continues to develop, its energy consumption levels also increase. Its provision in sufficient quantities and quality directly impacts on the growth performance and development of the economy. Consequently, developing countries like Kenya, Uganda and Tanzania need to strive to increase their energy supply base if they are to realize accelerated economies development.

Basically the availability of energy in adequate amounts and appropriate mixes has a proportionally greater direct impact on the performance of the non-agricultural sector.

In addition to being an important input in the various production sectors of the economy, energy is a significant source of revenues for any government mainly through various indirect taxes, duties and levies imposed on petroleum fuels and electricity and through income taxes paid annually by energy firms.

Countries world over have realised that regional co-operation in nearly all sectors of the economy is vital to individual country's growth. When countries co-operate, they collectively and individually benefit from enhanced economies of scale made possible by each country's comparative advantage based outputs.

In the East African region, there has been co-operation in the energy sector for many years. However, the scale needs to be enhanced, strengthened and diversified; this is indeed the objective and spirit of the East African Community.

The Council has endorsed implementation by Partner States and the Secretariat, cooperation activities and programmes in the areas of regional energy supply, harmonisation and research. Considerable work has been done in a number of identified areas including the preparation of programme for the development of a Regional Energy Master Plan.

The Regional Energy Master Plan will include the following main areas of co-operation: East African Power Master Plan; New and Renewable Sources of Energy; and Fossil Fuels.

2. East Africa Power Master Plan

On March 3rd 2003, Consultants for the Study and the EAC signed a contract for the East African Power Master Plan Study (EAPMP). The overall objective of the study is to determine whether further interconnection of the power systems of Uganda, Kenya and Tanzania is technically feasible and economically viable as growth in demand occurs over the next 20 years. The interconnection infrastructure will form an integral part of a Regional Power Master Plan aiming for a mutually beneficial development of the three Partner States' power systems.

Other objectives include:

Preparation of a least-cost expansion plan for the region taking into account interconnections;

Determination of relative merits of interconnection options (the mutual benefits that accrue from such a development); and

Determination of the costs associated with an interconnection together with the definition of mitigative measures with respect to any environmental issues.

2.1. System interconnections

The Uganda and Kenya systems are interconnected and UETCL supplies 30MW of non-firm power to KPLC from the Nalubaale and Kiira hydro plants. In addition, Uganda supplies electricity to the Kagera Region in the northwest area of Tanzania and has cross border supplies to Kenya and in the south to Rwanda. Tanzania, Kenya and Uganda plan to supply electricity to communities and towns in proximity to their borders. These cross border supply connections are not interconnected to the other countries' grids. Recent system planning studies of the Kenya and Tanzania systems show that there could be potential from an interconnection between these two systems. These potential benefits could be increased by greater capacity in the interconnection between Kenya and Uganda as well.

System planning studies have recently been completed in all the three countries. In all cases the planning and development strategy focused primarily on supply to be provided from domestic energy resources although imports from Zambia were also considered.

Prior studies of possible interconnection of the Kenyan and Tanzanian systems showed that the differences in generation type and mix between the two Partner States could be exploited for mutual benefit of both countries through the construction of a transmission line. Benefits could arise from:

- Hydro complementarities;
- Greater opportunities for the displacement of thermal energy by hydroelectric energy;
- Increased firm and secondary energy in the interconnected system due to its larger size and more diverse generation composition;
- Opportunities related to investment planning;
- Load diversity; and
- System operation

An interconnection with Uganda would enhance the prospects for realizing

2.2 Outcome of the study

The Final Phase II Report which draws from Final Phase I, Preliminary Task and System Analysis Reports issued earlier and adds several items to those covered in these reports namely; the investment costs, risk analysis, long run marginal costs and plan justification, has been completed.

The Final Report presents details of the generation and transmission system expansion planning for the region, provides the results of the economic analysis indicating the possible benefits that could be obtained by increasing the interchanges of electricity amongst Partner States, outlines the investment necessary to implement the recommended system expansion plan and provides a plan justification.

When the Plan is implemented the peoples of East Africa will be to a greater extent, assured of sufficient and reliable power supply at reasonably affordable tariffs.

The main infrastructure features of the Plan will include the creation of the East African Power Grid through interconnection of the National Grids. An East African Power Pool will also be established meaning that there will be an automatic sharing of Power Generation, Distribution and Management of Power Trade and technical functions.

The Study makes conclusions in favour of an integrated planning scenario. It recommends an integrated generation expansion sequence with Kenya importing Tanzania's gas generated electricity and Uganda's hydro generation. The integrated generation and transmission expansion plan is favourable to the region and should be adopted for implementation based on the following expected benefits:

- A full integration of power sector makes sound economic sense as it brings about efficiency, lowers cost generally and largely guarantees steady supply ;
- Has a net present value benefit estimated at US\$500 million compared to each country developing its own resources;
- Facilitates development of large scale, least cost, renewable hydro;
- Increases usage of indigenous resources particularly natural gas and promotes more exploration throughout East Africa;
- Takes advantage of hydro complementarity, reduces hydrology risk and increases energy output;
- Reduces dependence on imported hydrocarbons;
- Is cost effective and Kyoto friendly; and
- Is a good foundation for economic partnerships among EAC Partner States.

The major projects in the integrated plan include:

- Karuma-Uganda;
- Kalagala-Uganda;
- Ayago North-Uganda;
- Ruhudji-Tanzania;
- Mpanga and Masigira-Tanzania;
- Geothermal in Kenya; and
- Gas fired turbines and combined cycle in Tanzania.

The implementation of an integrated generation and transmission expansion plan requires certain institutions, rules and regulations to be put in place. These include:

- An Institutional and Operational Central Control Centre;
- An East African grid code; and

- Power trade rules and regulations leading to the East African Power Pool Regime.

The East African Community Partner States would commission studies to formulate the necessary rules and institutional structures that are necessary to operate the East African system in an integrated manner in order to reap the benefits identified in the Power Master Plan Study.

In addition, the Partner States have agreed as follows:

- The Partner States reaffirm their commitment to the Plan and agree to undertake the necessary measures to implement a fully integrated power sector in East Africa.
- Fast track implementation of the Arusha-Nairobi and Jinja-Lessos 220 kV transmission lines.
- Fast track implementation of Songo Songo gas fired generation and hydro generation at Bujagali.
- The transmission ring around Lake Victoria should be considered in the medium term to supply loads in the Kagera Region and increase reliability of the network in the lake zone.
- The establishment of the East African Power Pool should be pursued.
- Full feasibility studies should be carried out for candidate projects in the plan where such studies do not exist.
- Efforts should be made to incorporate renewable energy and rural electrification strategies in the EAPMP updates.

To inform selected child labourers about the TBP, the WFCL and what classifies a task as “hazardous”

- To create a forum where the youth can discuss, debate and analyze their situations
- To motivate the participants to share information on the WFCL with other child labourers not able to attend
- To learn from child labourers ways to improve their welfare

2.3 Other issues on cross-boarder interconnection

Meanwhile, a cross-border electrification programme is being implemented. We expect the Power Utilities would conclude agreements for undertaking the cross border town’s electrification. The inter-utility agreements for the cross border electrification would address issues including but not limited to:

- Construction, maintenance and operation of power networks; and
- Bulk supply, billing and collection of revenue.

Technical discussions are continuing between the Power Utilities on the cross border connectivity covering border towns, which have been identified as follows:

- Isebania (Kenya)/Sirari (Tanzania)
- Namanga (Kenya)/Namanga (Tanzania)
- Lungalunga (Kenya)/Horohoro (Tanzania)
- Taveta (Kenya)/Holili (Tanzania)
- Lwakhakha (Kenya)/Lwakhakha (Uganda)
- Mutukula (Uganda)/Mutukula (Tanzania)
- Kikagati (Uganda)/Murango (Tanzania).

As regards development of Integrated Policy on Rural Electrification, it is worth noting that all the three Partner States have established policies on rural electrification.

- Kenya has already developed a Rural Electrification Master Plan and is currently updating it.
- Tanzania is in the process of procuring a Consultant to undertake Rural Electrification master Plan Study.
- Uganda has already established the Rural Electrification Master Plan Strategy.

At regional level, it has been agreed that there is need for exchange of national rural electrification policies for purposes of harmonising them.

3. New and renewable sources of energy

The new and renewable energy technologies in the Region that have capacity for greater socio-economic translation include; Biomass; Solar; Biogas; Mini and micro-hydro power; wind, Geothermal; and Municipal waste.

The following issues have been agreed upon at regional level:

- Each country should undertake a detailed inventory of all technologies (RE) and submit to the EAC Secretariat for processing into a regional inventory.
- The region should develop standards and codes of practice on RE technologies. It should also review and harmonise some standards to support efficiency, wide adoption or increased access to these technologies and enhance safety.

Currently, Partner States exchange notes between themselves on status of development of standards and codes of practice with a view to start harmonization process.

The Partner States are now in the process of developing a Regional Renewable Energy and Energy Conservation and Efficiency programme and Master Plan as well as plan and exhibitions of the Renewable Technologies at Regional level.

4. Fossil fuels

The Songo Songo gas field offshore Tanzania is finally being developed and the pipelines and other infrastructure developments have been built paving the way for commercial utilisation of the huge gas discoveries. In this respect, the Partner States have agreed to enter into negotiations to support and promote the use of gas so as to facilitate quicker utilisation of gas from Songo Songo. They have also agreed to support efforts to construct the gas pipeline to Mombasa.

One of the main objectives of the East African Community is to promote sustainable utilisation of natural resources of the three Partner States, so as to raise the standard of living and to improve the quality of life of the people.

Kenya, Uganda and Tanzania represent a regional market whose current import bill of petroleum products is in excess of US\$ 1 billion per year. The three countries share sedimentary basin systems with largely untested petroleum potential

In view of the fact that all the three Partner States are using over 50% of their foreign currency revenues on importation of petroleum products and that the region has the potential for petroleum occurrences. In that regard the Partner States have agreed to hold Petroleum Conferences on a biannual basis where the countries would meet interested oil companies to present and discuss the petroleum potential and investment opportunities. The 1st Conference was held in March 2003 in Nairobi Kenya while the 2nd Conference took place in March 2005 at Entebbe in Uganda. Both conferences were highly successful. Already this initiative has generated considerable interest from our Development Partners and from local stakeholders.

The overall objective is to promote the petroleum potential in East Africa by:

- Presenting the geology of its sedimentary basins;
- Highlighting the Petroleum Potential of these basins;
- Providing the fiscal and legal framework currently pertaining in East Africa.

It is expected that Conferences will continue to:

- Attract investment in petroleum exploration in East Africa.
- Avail information on the following:
 - The Petroleum Geology of East Africa;
 - Status of licensing and the legal/fiscal frameworks of East Africa; and
 - Joint promotion efforts of East Africa as a region.

4.1. Harmonization

The three Partner States have started the harmonisation of policies, fiscal and legal regimes for petroleum exploration and development in East Africa. This process has reached a stage of engaging a consultant to make recommendations on appropriate modalities. It is estimated that the consultancy services would cost US\$ 250,000. Terms of Reference for the consultancy services have been developed.

The main objective of developing the three sub-sectors simultaneously is to ensure focussed energy resources exploitation and utilisation as well as complementarity due to natural linkages that exist between and among them.

Reliable, affordable and efficient Energy supplies will guarantee faster economic growth and facilitate regional trade at a wider scale both in increased volumes and value. Therefore, the importance of adequate power supplies to production and trade promotion activities cannot be over-emphasised.

The EAC will put more emphasis and identify energy as a priority in its 3rd Development Strategy 2006-2010.

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