

Operation Costs and Capital Expenditure in Kenya's Electricity Sub-Sector

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About the Author...



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Abstract

This article, by IP3 Alumnus David Kemei, traces the steps and outcomes of a study carried out by the Electricity Regulatory Board (ERB) in Kenya to determine reasonable operating costs and capital expenditures for the country's electricity utilities.

Introduction

In Kenya, the electricity sub-sector falls under the Ministry of Energy (MOE), which is responsible for energy policy formulation and oversight of the organizations in the power and petroleum sub-sectors. In addition, the MOE facilitates regulation, monitoring and coordination of activities undertaken by the sector players, promotes technological advancement and provides stimulus to investment and growth in the sub-sector.

In the early 1990s, the Government of Kenya (GoK) undertook major energy policy and institutional reforms to address the imminent challenges that faced the energy sector and electricity sub-sector in particular. These policy initiatives and reforms led to the unbundling of generation from transmission and distribution of electricity and the creation of the Electricity Regulatory Board (ERB) through an act of parliament, Electric Power Act, 1997. These reforms continue to be implemented and at the moment, all public generating assets (which were previously owned by regional development authorities) are consolidated under Kenya Electricity Generating Company (KenGen) which recently sold its 30% of shares to the public leaving the balance of 70% in the hands of the Kenya Government. The transmission and distribution assets are consolidated under Kenya power & Lighting Company (KPLC) effectively making a single buyer model.

These reforms paved the way for an inflow of capital into the electricity sub-sector from private sector investors. At present there are three Independent Power Producers (IPPs) namely, Iberafrica, OrPower 4 and Tsavo power that are owned and operated by private investors. These IPPs generate and feed electricity into the national grid. This article traces the steps and outcomes of one of the studies carried out in 2002 by ERB in its quest to determine the reasonableness of Operating Costs and Capital Expenditure reported by the electricity sub-sector utilities mentioned above.

Background

Pursuant to Energy Sector Policy Framework Papers of 1992-1995 and 1996-1998 the Government of Kenya initiated power sector reforms aimed at creating arm's length commercial type-relationships between the electricity sub-sector entities and created the legal and regulatory framework that would facilitate the envisioned restructuring of the electricity sub-sector and encourage private sector participation. The generation sector is now fully liberalized with KenGen being the dominant player with the current interconnected effective capacity of 892 MW compared with IPPs combined effective capacity of 145 MW. These power producers sell electricity in bulk, under Power Purchase Agreements, which were approved by ERB, to KPLC for onward transmission (at 220 and 132kV), distribution (at 11-66kV) and supply (at 240-415V). KPLC is also responsible for dispatch of generation and system operation. These reforms resulted in the establishment of ERB as an independent electricity regulator in Kenya through an act of parliament to:

- Set, review and adjust tariffs for all entities who transmit or distribute electrical energy for sale,
- Investigate tariff structure even when no specific application for tariff adjustment has been made,
- Enforce environmental and safety regulations in the power sub-sector,
- Investigate complaints made by parties with grievances over any matter required to be regulated under the act
- Ensure that there is genuine competition where this is expected, and
- Approve electric power purchase contracts and transmission and distribution service contracts between and among electric power producers, public electricity suppliers and large retail customers.

There are plans to expand the mandate of ERB to include regulation of the petroleum sub-sector.

The act requires ERB to ensure that no particular person or entity is given undue preference or subjected to any undue disadvantages when carrying out its legal mandate. In addition, it requires the Board to ensure that tariffs are just and reasonable. ERB is also obligated by the act to ensure that investors earn a reasonable return on their investments in the electricity sub-sector by taking into account the ability of the licensee to maintain its financial integrity, attract capital, operate efficiently, and fully compensate investors for the risks assumed.



ERB Headquarters in Nairobi

The existing tariffs, whose basis was the 1997 tariff study commissioned and funded by the World Bank, was approved by the ERB and came into effect on 1st August 1999. The ERB approved base tariffs and pass through elements related to monthly fuel costs and fluctuations in foreign denominated costs that vary every month.

The ERB then embarked on a tariff policy review exercise that culminated in a stakeholder workshop where the ERB engaged stakeholders in the electricity sub-sector to dialogue and capture the stakeholder's needs and concerns regarding the new tariff policy. This stakeholder

workshop included training on best practices in tariff review and the requirements of 1997 Electric Power Act. It was at this meeting that stakeholders impressed upon the ERB the need for tariffs that reflect only costs of efficient operation and prudent projections of capital expenditures by utilities in electricity sub-sector. ERB found itself in the unenviable, but mandated situation of balancing the divergent needs of its stakeholders.



Participants at a stakeholder workshop on the new tariff policy

Objectives of the Study

Following the aforementioned stakeholder workshop, ERB commissioned an independent study to establish the appropriate levels of operation costs and capital expenditure in electricity sub-sector. The main objective of the study was that the ERB aimed to establish tariffs that accurately reflect the costs of efficient operation of generation, transmission and distribution as well as prudent future capital expenditure to cater for load growth, replacement and refurbishment of capital assets as well as reduction of losses. The other objectives of the study were:

1. Establishing the prudence of projected operating and maintenance cost, including underlying assumptions and benchmarking against similar entities elsewhere in the world;
2. Establishing the reasonableness of projected capital expenditure, including relevant assumptions, based on realistic future development targets for the electricity sub-sector;
3. Quantifying potential savings in power production costs;
4. Benchmarking of the operational costs and performance of utilities in Kenya against other utilities in the world that operate with similar operating environment;
5. Considering the above, recommend appropriate levels of power purchase costs, operating and maintenance costs and capital expenditure to be included in formulating tariffs;
6. Propose practical ways for the monitoring, by ERB, of the approved levels of the costs, and
7. Determine objective and non-discriminatory merit order of dispatch.

Scope of Work

In order to achieve the above stated objectives, the scope of work was designed to include the following tasks:

- Detailed study of recent and past operating costs incurred by utilities in Kenya and the extent to which utilities are employing best practices in running their respective businesses.
- Based on determined efficient operation of power plants, derive an objective and non-discriminatory merit order of dispatch of available generation capacity,

- Detailed review and advise on the prudence of the projected costs of utilities including the scope of potential savings from efficiency improvements,
- Carry out critical scrutiny of utilities proposals for capital expenditure with a view to establishing their reasonableness and advising on the appropriate levels of investments needed for replacement and refurbishment of ageing assets, to increase efficiency, reduce losses, and to meet new load growth,
- Categorize capital expenditure into growth-related and non-growth related and investigate whether design standards applicable to system expansion are consistent with loss reduction and quality of service projects on the system, and

Review assumptions made in arriving at projected future operational costs and capital expenditures.

Study Outcomes

The study into the projected capital and operating expenditure of utilities in the electricity sub-sector in Kenya commenced in June 2002 and was finalized in November 2002. The findings of this study are summarized below:

- KenGen – The study identified specific KenGen plants that do require future capital expenditure and some that do not. Operating costs at some KenGen power stations appeared high in comparison to international norms, and the study recommended measures to reduce these costs.
- KPLC – The study revealed that KPLC's transmission costs conformed to reasonable costs in developing countries. However, the utility's systems need significant capital investment due to long periods of under investment, and concluded that forecasts for distribution system capital expenditure were inadequate to provide for loss reduction. The study also showed that in terms of operating efficiency, KPLC was less efficient compared to similarly sized utilities in Ecuador, Jamaica, and Europe. At the time of the study, losses on the KPLC system stood at 21.3% segregated into technical losses at 15.4% and non technical losses at 5.9% which were higher than would be expected for an efficiently designed and operated network of the size of the Kenyan system. Since the study, there has been an improvement in total system losses to 18.1%.
- IPPs – The study found that there were no forecast capital expenditures for the IPPs. The consultants found operating expenditures provided by IPPs to be reasonable, but were unable to quantify the savings that would be accruing from more efficient dispatch.
- The study found several inconsistencies in the way utilities capture and report data, and recommended a uniform system of data reporting, to simplify and improve ERB's monitoring function.

Overall, the study unearthed and opened an eye to the regulator on what goes on in reported operating expenditures. The report and findings of the study were discussed and adopted at yet another stakeholders' forum.

Conclusion

To succeed in regulation of electricity sub-sector in Kenya, we at ERB subscribe to the tenets of best practice in every aspect of regulation and we go to great lengths to acquire the necessary tools and resources to make it a reality. ERB has not perfected the art of best practice in regulation but it is putting in a lot of effort to improve in areas of weakness. Since best practice in regulation is the backbone of its philosophy, ERB provided a forum to dialogue with stakeholders on its draft tariff review policy. ERB recognized her limitation of lack of capacity to carry out the assignment, and made the strategic decision to engage a consultant to carry out the independent study.

For further information on the activities of Electricity Regulatory Board (ERB) of Kenya, kindly visit www.erb.go.ke. Or feel free to contact the author, Mr. David Kemei, Financial Analyst, at david.kemei@erb.go.ke.

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