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Learning from Power Sector Reform

The Case of Uganda

Catrina Godinho
Anton Eberhard

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Abstract

Uganda's power sector structure is among the most sophisticated in Sub-Saharan Africa, and Uganda is one of only a handful of countries in the region where tariffs are close to being cost reflective. While reforms were swift and comprehensive, following the 1999 Electricity Act, significant difficulties were encountered along the way that prevented the benefits of reform from materializing until much later. The failed first attempt with the Bujagali Hydropower independent power producer left the country heavily exposed to the 2005/06 and 2010/12 droughts, which in turn created difficulties for the new private distribution utility, Umeme, and led to a relaxation of the regulatory performance targets for the concession. This situation led to a buildup of frustration with the new operator and the launch of two public enquiries, which recommended termination of the concession. In 2012, with the easing of drought conditions and the completion of the Bujagali Hydropower Project following a second independent power producer arrangement, there was improvement in the availability of power. This made it possible to set more demanding performance targets for the concessionaire, Umeme, which fed through into substantial improvements in operational efficiency and accelerating service coverage. Although the reform model was eventually able to deliver results, the associated cost was comparatively high. Furthermore, the extension of the private concession model to financially unviable rural areas did not prove to be successful. Access rates began to pick up only following the adoption of a revised approach in 2012, built around government-led and donor-funded expansion of rural networks.

This paper is a product of the Energy and Extractives Global Practice. It is part of a larger effort by the World Bank to provide open access to its research and make a contribution to development policy discussions around the world. Policy Research Working Papers are also posted on the Web at http://www.worldbank.org/prwp. The authors may be contacted at anton.eberhard@gsb.uct.ac.za and catrina.godinho@gsb.uct.ac.za.

Learning from Power Sector Reform: The Case of Uganda

Catrina Godinho, Anton Eberhard[1],[2]

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JEL Codes: L9; Q4

[1] From the University of Cape Town, Graduate School of Business in South Africa.

[2] Research on this paper was conducted by Dr. Geogrey Bakkabulindi in Uganda. Valuable guidance was provided by Raihan Elahi and Mbuso Gwafila of the World Bank Country Team for Uganda.

Foreword

Rethinking Power Sector Reform, a multi-year global initiative of the World Bank's Energy and Extractives Global Practice, provides an updated assessment of experiences with power sector reform across the developing world. Its goal is to refresh our thinking on power sector reform by analyzing lessons learned over the past 25 years in countries that have undertaken various types of reforms, and by articulating a new vision based on that analysis. Critically, the initiative examines how the recent technological trends and business models that are disrupting the sector may call for new reform strategies.

Since the 1990s, a standard set of policy prescriptions for power sector reform has been widely used. Those prescriptions include vertical and horizontal unbundling of power utilities; private sector participation; creation of an independent regulator; and competition in power generation (with associated cost-recovery pricing). Although this package of reforms was adopted, at least partially, by several developing countries, momentum and uptake slowed considerably in the 2000s, and it is past time to revise our approaches in the light of experience, evidence, and technological advances.

It is our hope and intention that the revision will provide practitioners with a flexible frame of reference that can help them identify the types of reforms most likely to improve the performance of the power sector in a given country context.

With support from the World Bank's Energy Sector Management Assistance Program (ESMAP) and the Public–Private Infrastructure Advisory Facility (PPIAF), Rethinking Power Sector Reform works with partners and experts across the World Bank Group and beyond to generate evidence, analysis, and insights on key themes of interest to power sector reform practitioners and decision makers. Findings and recommendations will be published in a forthcoming report.

The research undertaken by the initiative is grounded in an in-depth exploration of the 25-year reform journey of 15 World Bank Group client countries that represent a wide variety of geographies, income levels, and approaches to reform. The countries are Colombia, Dominican Republic, Arab Republic of Egypt, India, Kenya, Morocco, Pakistan, Peru, Philippines, Senegal, Tajikistan, Tanzania, Uganda, Ukraine, and Vietnam.

An important output of the project is a series of case studies—of which this is one—that provide a narrative of the reform dynamics in each country and evaluate the impact of reforms on key dimensions of sector performance, including security of supply, operational efficiency, cost recovery and energy access. With respect to a subset of countries that pursued deeper reforms—Colombia, India, Peru and the Philippines—the project also includes a series of free-standing case studies that evaluate experience with wholesale power markets. The purpose of all the case studies is to reflect upon the experiences of individual countries, with a view to extracting lessons of broader interest to the global community. It is not the role of these papers to recommend, let alone prescribe, any particular approach in any particular country or context.

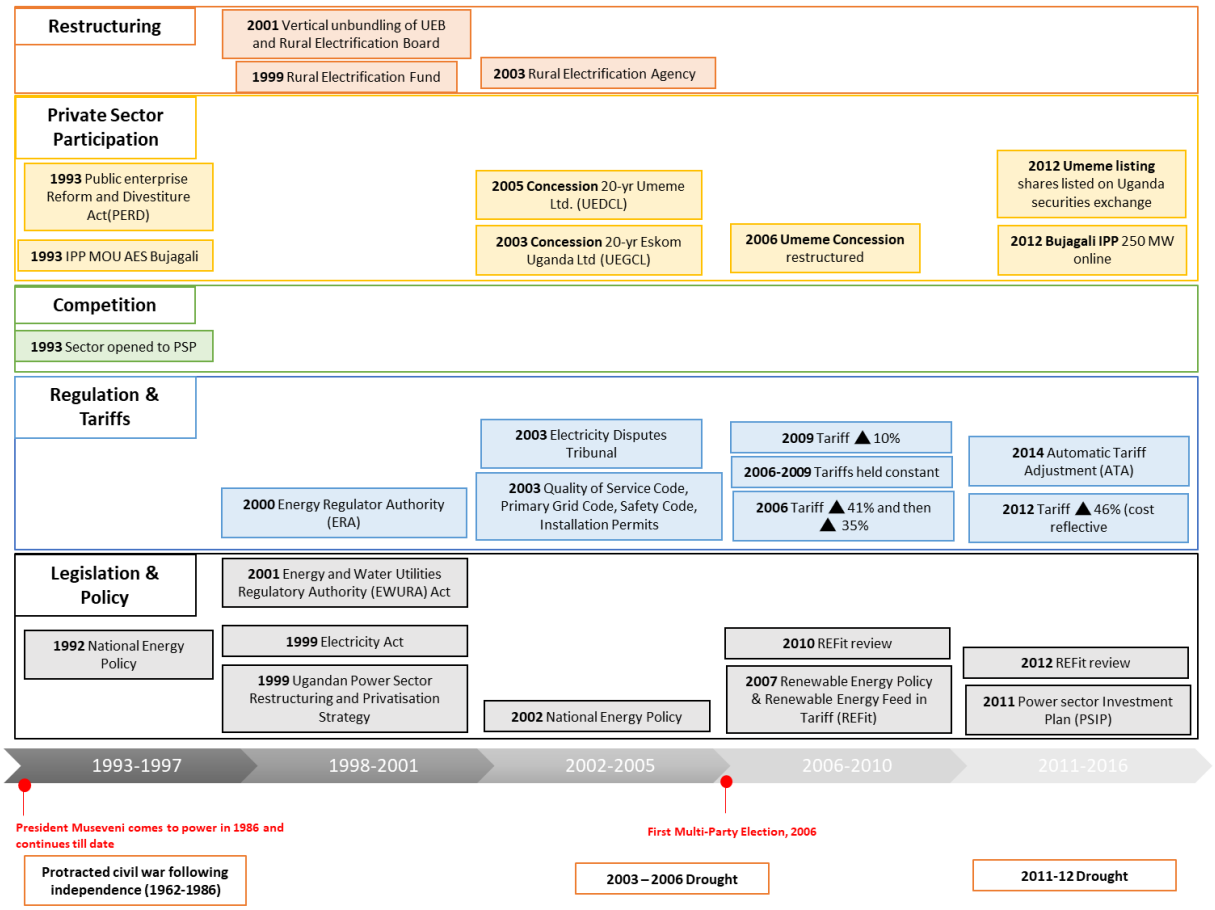
These case studies, which constitute companions to an eventual flagship report, are being published in the World Bank's Policy Research Working Paper series. As such, they represent the views of the authors alone and should not be attributed to the World Bank Group or to any other person or institution.

Part 1

1 Introduction: Rapid, extensive reforms

Among countries in Sub-Saharan Africa, Uganda is one of those that has gone furthest in implementing the power sector reform model of the 1990s; having completed vertical unbundling of the national utility, introduced private sector participation in both the electricity distribution and generation segments, established an effective independent sector regulator, and sustained near cost-reflective tariffs since 2012. Building from economywide macro-economic reforms, including the 1993 Public Enterprise Reform and Divestiture (PERD) Act, the Government of Uganda adopted the *Ugandan Power Sector Restructuring and Privatisation Strategy (PSRPS)* in June 1999. In November 1999, the Electricity Act was passed.

Figure 1: Uganda Power Sector Reform Timeline



The 1999 Electricity Act, together with the earlier PERD Statute, provided the legal framework necessary to initiate sector reforms. The Act liberalized the power sector, established the Electricity Regulatory Authority (ERA) and the Rural Electrification Fund (REF), and provided for the establishment of the successor companies of the Uganda Electricity Board (UEB). In 2001, UEB was vertically unbundled and three new companies were formed to own and operate legacy UEB assets: the Uganda Electricity Generation Company Ltd. (UEGCL), the Uganda Electricity Transmission Company Ltd. (UETCL), and the Uganda Electricity Distribution Company Ltd. (UEDCL). The Rural Electrification Board (REB) was also established in 2001, chaired by the Permanent Secretary of the Ministry of Electricity and Mineral Development (MEMD), and oversees the implementation of rural electrification activities. The Rural Electrification Agency (REA) was created as the secretariat to the REB to support the day-to-day operations. In 2003, while UEGCL retained ownership of the assets of

the Nalubaale and Kiira hydropower plants, Eskom Uganda was awarded a 20-year concession agreement for operations at both. In 2004, following extended negotiations; the Umeme[3] electricity distribution company signed a 20-year concession agreement to operate UEDCL's distribution network, with an effective commencement date of 2005. By 2006, most of the main reform measures had been completed and are still reflected in the structure of the power sector today. A summary of Uganda's main power sector institutions is presented in Box. 1.

This case study sets out to explore Uganda's power sector reform experience by drilling down into the dynamics between sector development, performance, and key reform interventions. It departs from the premise that sector reform is a means to the end of improved sector performance, and examines to what extent different reform measures bore fruit in terms of power sector outcomes. As part of a wider global study of power sector reform, the primary objective of the paper is to draw lessons from Uganda's story that are of wider relevance to policy makers and reform practitioners, rather than to offer recommendations for Uganda itself. The paper is structured into two primary sections. The first provides a detailed, chronological account of the sector's institutional development and expeditious reform trajectory – and is seated within the broader political and economic history of Uganda. The second focuses on sector performance, probing links to institutional reforms, political economy dynamics, and macro-level structures and shocks in four areas: security of supply, access and accessibility, utility performance, and financial viability.

Box. 1 Uganda's power sector institutions

Ministry of Energy and Mineral Development (MEMD): The MEMD is the focal point for energy policy matters within the Ugandan government. For public or emergency power generation projects in the past, the MEMD acted as a procurement entity, either in its own right or through the sector's parastatals.

Electricity Regulatory Authority (ERA): ERA's main responsibilities are licensing and setting electricity tariffs. ERA also defines and monitors technical standards within the sector and enforces adherence to the National Grid Code. It issues and monitors the licenses required to generate, transmit, and distribute power. ERA also sets and reviews feed-in tariffs for renewable energy (REFiT) generation projects between 1 and 20MW.

Uganda Electricity Generation Company Ltd. (UEGCL): UEGCL is the holding company for state-owned generation assets. Its main roles are: to oversee the performance of Eskom Uganda and of the thermal plant at Namanve (50 MW); to negotiate and administer engineering, procurement, and construction contracts for government/ public projects as well as all Build Own Operate Transfer (BOOT) projects, namely IPPs; and to supervise the operations and maintenance of mid-tier public projects.

Eskom Uganda Ltd.: Eskom Uganda is a subsidiary of South Africa's utility giant, Eskom Holdings. In 2003, Eskom Uganda was awarded a 20-year concession for the operation and maintenance of UEGCL's hydropower plants (Nalubaale, 180 MW, and Kiira, 200 MW).

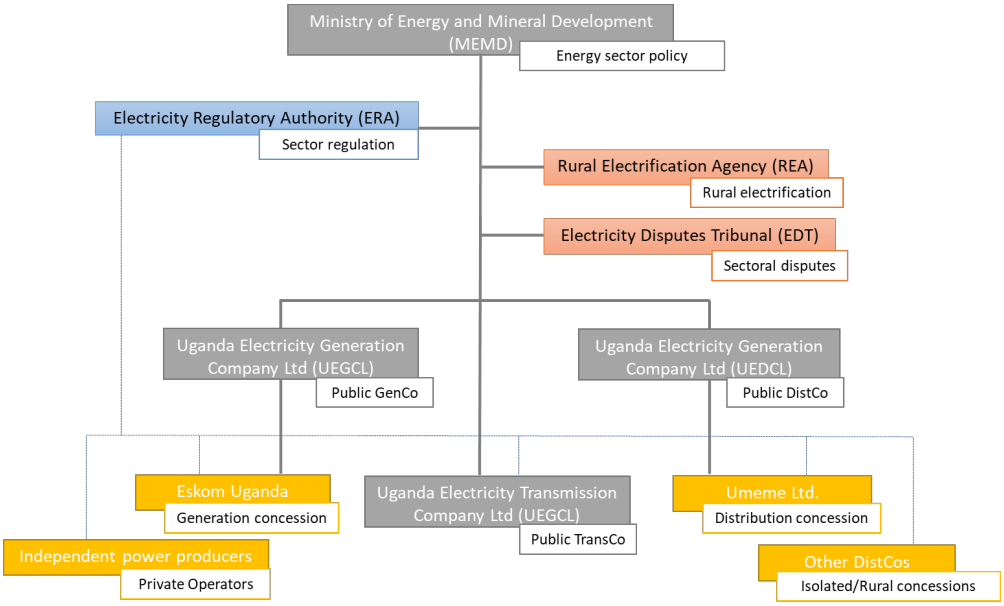
Uganda Electricity Transmission Company Ltd. (UETCL): The state-owned UETCL owns, operates, plans and procures Uganda's high-voltage transmission infrastructure (>33 kV). It also functions as the system operator, bulk single buyer (making it signatory to all PPAs), and dispatcher for almost all the electricity generated in Uganda (this excludes electricity generated within isolated grids, as the Electricity Act allows generators to sell directly to small energy co-operatives).

Uganda Electricity Distribution Company Ltd. (UEDCL): UEDCL is Uganda's holding company for state-owned distribution assets, and it both administers and supervises the private distribution concession agreement

[3] Umeme started as a joint venture between Eskom Holdings (44 percent) and Globeleq (a CDC investee, 56 percent).

(presently held by Umeme). UEDCL also operates a small number of distribution networks in rural service territories.

Umeme Ltd.: In 2005, Umeme Ltd. became the major privately owned electricity distributor in Uganda, after winning a 20-year concession to operate UEDCL's main distribution network. Umeme buys electricity at a bulk tariff from UETCL and, as of end-2017, it had approximately 1.1 million customers.



(Source: (Meyer, Eberhard, & Gratwick, 2018))[4]

[4] Meyer, R., Eberhard, A., & Gratwick, K. (2018). Uganda's power sector reform: There and back again? Energy for Sustainable Development: 43, 75-89.

2 Six phases in the evolution and reform of Uganda's power sector

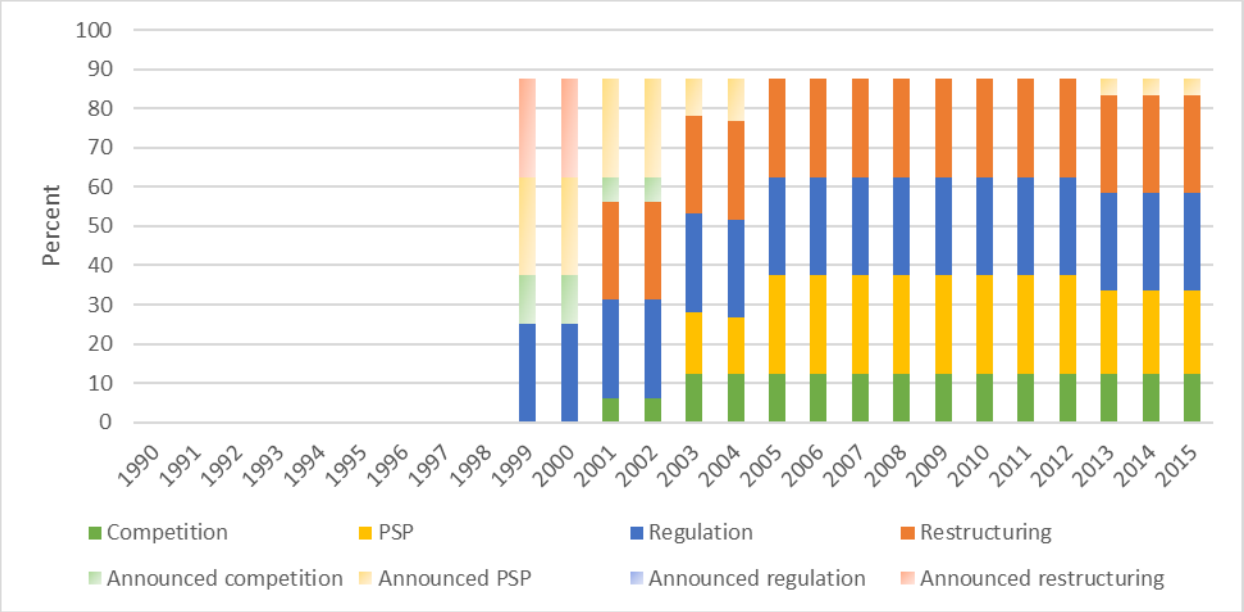
The standard package of reforms prescribed by international donors in the 1990s included four principal components: restructuring (vertical and horizontal unbundling of power utilities); private sector participation; creation of an independent regulator; and competition in power generation.

In order to aggregate across the four dimensions of power sector reform considered in this study, a simple Power Sector Reform Index is constructed. The index gives each country a score on an interval of 0 to 100 on each dimension of power sector reform. The scores are based on giving equal weight to each step on each dimension of the reform continuum (see tabulation below). The average of the four 0-100 scores is used to provide an overall summary of the extent of reform.

<table>
<tr><td>Regulation</td><td colspan="3">No regulator
= 0</td><td colspan="3">Regulator
= 100</td></tr>
<tr><td>Restructuring</td><td>Vertically integrated
= 0</td><td colspan="2">Partial vertical unbundling
= 33</td><td colspan="2">Full vertical unbundling
= 67</td><td>Vertical & horizontal unbundling = 100</td></tr>
<tr><td>Competition</td><td>Monopoly
= 0</td><td>IPPs
= 25</td><td>Single Buyer Model
= 50</td><td>Bilateral Contracts
= 75</td><td colspan="2">Competitive market
= 100</td></tr>
<tr><td>Private Sector Participation</td><td colspan="6">0.5*(Percentage of generation capacity with private sector participation)
+
0.5*(Percentage of distribution utilities with private sector participation)</td></tr>
</table>

Uganda's power sector reforms were not only comprehensive, but also relatively rapid, as can be seen in figure 2. The 1999 Electricity Act set out plans to adopt around 85 percent of the reform measures embodied in the 1990s model. Just four years later, almost 80 percent had been implemented.

Figure 2: Actual and announced reforms in Uganda, (1990–2015)



Source: Rethinking Power Sector Reform.

PSP = private sector participation.

The relative stability of Uganda's political economy centers on the 30-year leadership of President Yoweri Museveni, who came to power as leader of the National Resistance Movement Army (NRM) in 1986, after more than two decades of war and civil strife had devastated the country. Starting in the late 1980s, President Museveni has driven economic liberalization and market-oriented public sector reforms; initially under a 'no-party' system (1966-2005), and subsequently under a multiparty democracy. Uganda's political economy is characterized by the centralization of political power around the president and his party, which since won the 2006, 2011, and 2016 elections, as well as strong links between political and economic elites. The stability of the current regime has allowed for steady institutional development and improvements in governance that have facilitated the economic growth rate of 6.9 percent between 1987 and 2010 and substantial developmental gains in poverty reduction.

2.1 1930-1986: Uganda's power sector becomes another casualty of civil strife

Commercial electricity was first introduced in Uganda in the late 1930s. In 1936, the Kenya-based East African Power and Lighting Company (EAP&L) obtained a generation and distribution license from Uganda, leading to the installation of two thermal (diesel) generating stations in Kampala and Entebbe in 1938. EAP&L's presence in Uganda lasted only until 1948, when the state-owned utility - UEB - was formed and took over EAP&L's operations. Over the next two decades, the UEB developed a hydropower plant at Nalubaale (formerly known as Owen Falls) by progressively adding 15 MW generators. By 1968, the capacity of the Nalubaale plant was 150 MW – enough to meet the country's demand and to provide a surplus for export. However, Uganda was on the brink of what would be a devastating period of political, economic, and civil turmoil.

From 1962, the year of independent Uganda's first election, to 1986, the country went through a very tumultuous political period that was marred by widespread violence. Institutions such as UEB deteriorated under the incapacitated leadership, as well as conflict-related damage sustained to

strategic assets. The conflict continued until Yoweri Museveni, then leader of the National Resistance Movement Army (NRM), came to power in 1986. By then the economy was suffering the effects of long-term conflict and the power sector was no exception. Available generation capacity had fallen to 60 MW, losses were running to at least 40 percent of generation, system reliability was significantly diminished, and UEB was in operational and financial crisis. The government of Uganda soon realized the centrality of the power sector to resuscitating the economy and advancing development, and it became a priority over the next decades.

2.2 1987-1997: Building momentum with economic reform

Emerging from a period of devastating war and instability, Uganda entered a period of deep reforms directed at re-engineering the entire economy and polity. While the new government initially leaned towards a socialist, centralist model of governing, it soon became clear that a state driven approach to economic recovery and development was not feasible given limited national resources and the prevailing conditions of economic volatility. The response was to launch high-level debate on key issues, such as the exchange rate and inflation, led by the president, in which academics, civil servants, politicians, external experts and the executive arms of government would participate. Following this process, the government agreed to a package of macroeconomic reforms proposed by the International Monetary Fund in 1987 – an initial step towards stabilization. Given that the former elite had been disarmed by the end of the civil war, there were few opponents to this new course of action. By the beginning of the 1990s, the government had crafted a workable consensus on private-sector led growth, ushering in a decade of neo-liberal reforms.

To cement the path to reform and privatization, robust legislation was introduced and the newly merged Ministry of Finance, Planning and Economic Development (MoFPED) was granted significant power as an implementing agent. MoFPED brought together a critical mass of professional and technical expertise from the Ministry of Finance (MoF) and the Ministry of Planning and Economic Development (MoPED). The MoFPED leadership between 1992-2001, was an intellectual and political force in macroeconomic and power sector reforms, and was given significant liberty in managing the economy and working with donors through the period. MoFPED advanced in terms of organizational and technical capacity – making it a capable driving force in initiating and reinforcing reforms over the 1990s and well into the 2000s.

One of MoFPED's first and most important interventions with regards to power sector reforms, was the legislation of the 1993 Public Enterprises Reform and Divestiture (PERD) Act. The Act bestowed significant power on the Privatization Unit (which reported to the Finance Minister and the Secretary of the Treasury) to carry out the divestiture of public enterprises, including such responsibilities as to: cause the financial, legal, and operational analysis of the entity and the valuation of assets (both by independent actors), determine the means of divestiture, and hold discussions with the board, officers and employees (or their representatives) of public enterprises with a view to achieving a fair, reasonable and harmonious divestiture. The PERD Act provided the basis for later reforms in the power sector, though the power sector had not yet been marked for privatization in the 1993 document.

In these first years of kick-starting the economy, electricity demand ran ahead of supply, with the imbalance between the two compounded by successive droughts that diminished output from the hydropower dominated supply. At the time, only a minority of the generators at Owen Falls could

operate at any one time and the network infrastructure was dilapidated and in desperate need of refurbishment. Government and donors began ploughing money into infrastructure rehabilitation and extension in order to resuscitate the sector, but UEB - plagued by internal inefficiencies and financial difficulties - undermined such efforts by being resistant to change and slow to implement interventions targeted at improving performance. The system was operating inefficiently, quality of supply was low, technical and commercial losses high, power outages frequent and customer service nearly nonexistent.

The poor performance of UEB represented an important constraint on the economy, and gradually eroded the legitimacy of the vertically integrated state-owned model. A 1996 World Bank ESMAP report revealed the depth of the problem, noting that while many of the difficulties facing the sector "can be traced to Uganda's years of civil war and disruption, the fact that sector performance remains so weak after many years of physical recovery and much technical support make a clear case for significant institutional change". Given the financial dependence of Uganda on aid at this time – around 50 percent of the government budget in 1995 was financed through aid – external actors also played a determining role. At every stage of reforms, institutions such as the World Bank, the IMF, DFID, NORAD, and other multilateral and bilateral agencies have provided advisory, financial and technical support. Nonetheless, as noted above, the government did not just accept reforms, it embraced them. By the time the government officially set its sights on reforming UEB, there was already an emergent base of support in the public and across government, backed by the international development community. Nevertheless, there were also significant pockets of opposition particularly among those within state-owned enterprises (SOEs) and some ministries that stood to lose from such reforms. The president himself engaged extensively with these stakeholders in an attempt to build further support, providing enough of a basis for reforms to begin.

2.3 1998-2001: UEB undergoes thorough preparation for unbundling

As had been the case with macro-economic reforms at the beginning of the decade, the government once again turned to advancing robust legislation and policy to cement the path of reforms, having established a workable consensus through stakeholder engagement. Under the personal direction of the president and with support from the World Bank and broader donor community, Uganda initiated a comprehensive power sector reform program in 1998, commissioning London Economics to produce the Ugandan Power Sector Restructuring and Privatisation: New Strategy Plan and Implementation Plan, published in June 1999. The 1999 Electricity Act followed in December of the same year, providing the means for implementing decisions taken. The Act also provided for an interesting shift in jurisdiction, whereby the UEB and its successor companies would be incorporated under the Companies Act – meaning that they would fall under the jurisdiction of MoFPED. This was of course in accordance with the earlier PERD Statute (1993), revealing the influence of MoFPED in power sector reforms. The reform process was supported by external donors, including the Norwegian Water Resources and Energy Directorate, which played an important role in drafting the new energy act, including the establishment of the independent Electricity Regulatory Authority (ERA) and the development of the regulatory framework therein.

In addition to targeted stakeholder engagement and the subsequent enactment of the 1999 Electricity Act, developments within the UEB also played a key role in the success of reforms leading up to and following the enactment of the legislation. One of the contributing factors to the poor state of the

power sector had been political interference, particularly with regard to tariff-setting, investment decisions, and personnel deployment. Lacking management and financial autonomy, the UEB failed to undertake many of the most basic, modern utility management practices. There seemed to be scant formal basis for tariff-setting, little systematic reporting on sector performance, and prevalent defaulting on electricity bills by government and high-level politicians. A number of interventions to address these areas were initiated in the early- to mid-1990s. However, UEB management was slow to take action and continued to operate as usual. The government battled to bring about real change in UEB's management culture or practice. This led to the removal of a number of senior managers – including two successive managing directors (MDs) over the period 1996 to 1998. In the first case, this was on grounds of failing to implement changes in line with the government's divestiture programs, while in the second it was in association with gross financial irregularities.

Following these incidents, in 1998, an expatriate hailing from the South African Utility Eskom was recruited to the position of MD and tasked with implementing internal reforms. These included restructuring the organization into separate units, each with a designated general manager (Generation, Transmission, Distribution, Projects, Finance, and Services), staff rationalization, divestiture of non-core activities, cost control measures, the introduction of a new billing system, and improvement in customer services. Under this new leadership, staff were communicated with consistently through circulars and engaged in dialogue and seminars on reforms (including the sensitive issue of staff 'right-sizing'). The MD gave clear messages regarding the need for a utility 'turn around', emphasizing that reform was a policy decision already taken by government and that his remit was to prepare the utility for unbundling and privatization. Though staff and their unions were concerned about reforms, this communication and the provision of generous severance packages (provided by MoFPED, through the Privatisation Unit or PU) for voluntary retirement allayed fears somewhat. 'Right-sizing' was also not just about cutting staff numbers, it had an explicit focus on retaining and developing skills, with staff benefiting from training and skills development (with support from other countries, including study tours) over this period.

By the time unbundling was due to take place, the utility had been internally restructured, a new billing system had been put into place with support from the UK's Department for International Development (DFID), and the technical capacity of the streamlined staff had been advanced with support from multiple donor agencies. When UEB was unbundled in 2001, most of UEB's staff were offered positions in one of the new companies - UEGCL, UETCL, and UEDCL. Asset division was managed by the Privatization Unit, which worked well according to a Lahmeyer asset evaluation study. In this period, the World Bank debt relief program had also allowed Uganda to restructure its debt portfolio, which meant that tariffs were increased by 100 percent, instead of the 200 percent that would have otherwise been required.

However, the situation was still dire. At the time of unbundling, UEB's successor companies were close to insolvency (by normal standards) and, while a number of interventions had been made to improve collections, reduce theft, and improve performance, implementation was slow going. At the time, the major cause of the poor state of the sector was identified as UEB's lack of managerial and financial autonomy from the government which had hindered the development of a commercial business culture, accountability, and modern utility management practices. Under continuing conditions of supply crisis, battling with theft and non-payment (including from the government), and struggling with poor technical performance, Uganda embarked on the next phase of reforms, which would further remove the operational management of the power sector from direct political influence.

2.4 2002-2006: Private sector participation brings new challenges of its own

In 2002, MEMD released the new National Energy Policy, while the MoFPED's Privatization Unit drove the concessioning process for the generation and distribution segments. In 2003, Eskom Uganda was awarded a 20-year concession agreement for operations at Nalubaale and Kiira hydropower plants – though UEGCL retained ownership of the assets. In 2005, following protracted negotiations, a joint venture agreement was signed by Eskom holdings (44 percent) and Globeleq (a Commonwealth Development Corporation/CDC investee - 56 percent) to establish Umeme Ltd. In 2005 Umeme signed a 20-year concession agreement for distribution. It began operation of a one-mile radius footprint of existing urban distribution network owned by UEDCL.

In just six years, Uganda had completely restructured the power sector and put the generation and distribution businesses under private operators, providing a solid basis for sector governance through the institutionalization of clear legal, policy, and regulatory frameworks. These reforms would not have been possible without the technical expertise and support of both the Ministries – MoFPED and MEMD – as well as firm support and involvement of the president and donor community. In 2004, the president further strengthened his connection to these expert technocrats, when he took over direct responsibility for appointments of Permanent Secretaries from the Prime Minister.

Nevertheless, as these new arrangements were put in place with the private sector, a number of new challenges emerged threatening to undermine the viability of reforms in the early years.

The first and biggest challenge was to address the increasing supply-demand gap. Under the new model, new generation investments were in the domain of the private sector - but initial attempts to land the first IPP, Bujagali, failed at high cost to the economy and with a detrimental impact to perceptions around the viability of the new model. The details of this saga are discussed in Box 2.

Box 2. The Bujagali Story

In 1998, the mounting supply-demand imbalance had compelled the Minister of MEMD to award a generation license for Bujagali I through an amendment to the Electricity Act, yet parliament prevented this move until the 1999 Electricity Act was passed. As soon as the Act was passed, a privately owned US based consortium, AES Nile Power (AESNP), with whom government had an MoU since 1994, was commissioned to construct and operate the 250 MW Bujagali power plant. The direct negotiation and contracting process was woefully non-transparent. The controversy surrounding this project, from the environmental and social impacts to the opacity of the deal, undermined the viability of the project from the beginning. In response to continued controversy, complaints of corruption and local push back, the World Bank authorized the Inspection Panel to conduct an investigation. Consequently, the World Bank suspended support in 2002 and AES withdrew from the project altogether in 2003.

Using the work already done (and relinquished) by AES, Bujagali II grew out of the ashes of Bujagali I. The government, in partnership with the World Bank, put a lot of momentum behind the project, conscious of what its success or failure would mean– not only for the worsening supply situation, but also for the viability of the new power sector model. In order to salvage the legitimacy of the project, the bidding process for Bujagali II was done transparently and competitively. Following AES's withdrawal in 2003, bids were invited in 2004, with three passing through pre-qualification. The

Bujagali Energy Ltd (BEL) consortium was announced as the winning bid in the following year and financial close was reached in 2007. Concern about the environmental and social impacts persisted, but it was the cost of the project that was – and still remains – politically contentious. Although Bujagali's tariff of US 10 c/kWh was just a third of what had hitherto been paid for emergency thermal generation, it was still considered relatively high by the standards of hydropower projects in the region. A significant cost driver was the need to provide commercial returns to private investors on a large capital-intensive project of this nature.

The failure of Bujagali I and delays and cost associated with Bujagali II were a blow to reforms for a number of reasons. Firstly, the allegations of corruption surrounding the first attempt confirmed for many the long-held preconception that corruption or rent-seeking goes hand-in-hand with private sector involvement in the provision of public goods. Secondly, the resultant delays intensified the impact of the string of droughts that would follow over the next years – undermining the sector as a whole, and reforms by association. Lastly, the costs associated with the Bujagali II deal – a contract negotiated under the duress of drought, heightened 'political risk' (due in part to the Bujagali I scandal), financially weak power sector and a less favorable global economic climate (unprecedented spike in construction costs in 2007) - continue to plague public perceptions of the cost of private sector involvement in generation.

The higher tariffs of Bujagali II and controversial Bujagali I continue to be politically sensitive sticking points in Uganda.

A second major challenge was the distribution concession. Though there had been early interest from a raft of players when the concession process was initiated in 2001 (with five passing through pre-qualification), when it came to the submission of bids, interest had waned. This shift was due in part to the dilapidated state of the distribution infrastructure, as well as the controversy surrounding Bujagali I. Perceived political risks may have also played a part, as well as decreasing investor appetite for high risk markets and energy investment following the Enron scandal. Following an extended negotiation process with the Eskom-Globeleq consortium that would form Umeme Ltd., the sole bidders for the concession, an agreement was reached in 2004 – two years after the expected date. Among the terms agreed to in the negotiation was a guaranteed 20 percent rate of return for any network investments undertaken by the concessionaire.

In 2005, Umeme Ltd. took over the distribution network. In the first 6-12 months, Uganda experienced a severe drought which compounded the unfavorable supply-demand balance, leading to the renegotiation of the contract in 2006. Under the renegotiation, Umeme won a number of additional protections during a so-called "Special Provisions Period" (SPP) including a guaranteed volume of power for dispatch and an increase in the allowable ceiling of losses to 38 percent to allow for the emergency conditions. As a result, the Umeme contract became a recurring political issue which threatened to undermine the concession and, by association, the reforms through to 2013 (at least).

A third challenge in the early years, was the issue of rural electrification where private sector interest fell short of initial expectations. As suggested above, an assumption underlying the 1999 Act and the 2002 Policy was that private sector investment would flow once the sector was liberalized and the comprehensive reforms had been implemented. Given that the Umeme concession limited service responsibility to within one kilometer of the network, there was a need to find a suitable institutional model for expanding and delivering rural electrification service. In response, the Rural Electrification

Agency (REA), established in 2003, financed and built a number of grid extension projects and then brought in private operators through a concession model.

The government, through REA, divided the country into 13 service territories that were then awarded to cooperatives and local private sector, referred to as service providers, for operation. The details around the criteria used to select the service providers are unclear. Unfortunately, this approach has not been very successful either, with most of these concessions lacking the capacity and resources to operate the networks effectively. Given the small customer base and low purchasing power of rural areas, these concessions may never reach commercial viability. About 8 of the rural service providers' licenses have been cancelled due to poor performance and UEDCL is currently operating the distribution business of those service territories.

In response to these difficulties, the mandates of the Rural Electrification Fund (REF) and the Rural Electrification Agency (REA) have since evolved. REA now builds distribution lines and networks with funding from REF and development partners (including the World Bank, African Development Bank, and KfW). The agency then either hands ownership of the lines over to UEDCL for operation by Umeme (if within the Umeme footprint), or the REA retains ownership leasing them out to cooperatives or private entities for operations and maintenance. However, given the lack of capacity, these smaller operators mostly depend on REA for major maintenance and replacement of damaged plant and equipment. While Umeme and REA have made some inroads to advancing access, this is seen to be one of the oversights of the new power sector model. The Umeme concession agreement does not have access targets, and is heavily biased towards reducing losses, increasing collections, and stabilizing the service in the legacy networks inherited from UEB.

The years following unbundling and restructuring proved a steep learning curve for new entities within the sector, as well as established actors. The lines between entities were not entirely clear to begin with, despite clarity in the legislation, because of the varying capacity, skills, knowledge and resources spread across the sector. For example, UETCL employees might have continued efforts to contribute to the planning and operation of distribution sub-stations after the unbundling, because they had expertise in this area and had previously been responsible for some units, even though this was no longer in their mandate. In addition, the relationship between the PU, MEMD, and ERA over this period – especially with regards to planning, tariff setting, and the negotiation of contracts – was especially complex. The fact that ERA had to learn by doing in many instances, proved a challenge in these early years. This was mitigated, to some extent, by the role that the PU, the World Bank, and other donors played in supplementing and building capacity; although now always welcomed by the MEMD. Nevertheless, robust legislation, enduring political commitment (most importantly from the President, but also across a network of strong Ministers and PS's), and the continued support of the World Bank and donor community pushed the sector up the learning curve – advancing capacity, establishing the new sector model, and driving the development of specialized professionalism across the sector. This was a demanding task and power sector outcomes were slow to follow suit.

2.5 2007-2011: Power sector reform comes under attack

Following a 2005 referendum, the first multi-party elections (since 1980) were held in 2006. President Museveni, who had been in power for two decades by then, won by a landslide. He would go on to win again in 2011 and 2016. The reintroduction of multi-party democracy changed the dynamics in the government, particularly through the changing composition of parliament, which paved the way for greater politicization of public issues. Over the period 2007-2012, the electricity sector would be

one of the more politicized areas due to the effects of the supply-demand imbalance and associated load-shedding, which was compounded by the Bujagali II delays and successive droughts. Though commitment to reforms endured at the highest level, a number of critical sector challenges were seized upon by political actors. The new parliament was particularly active in raising questions about reforms, including the Bujagali project, tariffs, and subsidies, as well as the Umeme concession itself.

While Bujagali II (box 2) was being negotiated, the delays of Bujagali I had necessitated the procurement of power from costly emergency power producers (EPPs) and resulted in devastating load-shedding in and between the 2005-06 and 2011-2012 droughts, which coincided with electoral periods. Though retail tariff increases were possible in 2006 (after the elections), the first one amounting to 41 percent followed by a second one of 35 percent, the government took on the burden of subsequent cost increases through direct budgetary support to UETCL (bulk supplier) and capacity payments to thermal units so as to avoid further pass-through to tariffs. As at the end of 2012, the government had provided subsidies of UGX 1,048 billion (equivalent to US$ 390 million) to ensure that Uganda's electricity tariffs remained comparable to those of other East African Community (EAC) countries.

Following the 2006 elections, certain quarters had begun to challenge the Umeme concession on the basis of the 20 percent return on investment, increasing tariffs, and subsidies. In response, the new minister established a Commission of Inquiry into tariffs. The inquiry was proceeded by police raids of the offices of ERA, Umeme, UETCL, among others in June 2009, for the purposes of collecting information about electricity tariffs from documents, files and computer systems. Thereafter, ERA responded to pressures by reducing the electricity tariff by 10 percent at the end of 2009, further increasing financial strain on the government and power utilities Umeme and UETCL. During the same period, the Minister appointed three new members to the ERA Board, while suspending the ERA CEO at the end of 2010, on the grounds of failure to comply with a policy directive on power procurement. This case was still being fought in the courts in 2016. The report resulting from the Minister's Commission of Inquiry recommended the termination of the Umeme concession, although this was rejected by the incumbent PS, leading to further tensions. Despite the political controversy created by the report, the president was clear on the matter of the Umeme concession and has been reported as saying that: 'Government policy has been implemented and I do not walk backwards'.

In 2011, a second Inquiry was undertaken by an Ad Hoc Parliamentary Committee established to investigate the electricity sector. Once again, however, the 2012 recommendation of the Committee to terminate the Umeme (and Eskom) concessions was not followed by the executive arm of the government, which is not compelled to comply with parliamentary recommendations of this nature. Some of the issues raised by the Committee, such as Umeme's 20 percent return on investment and the relaxation of targets that had been negotiated under the Special Provisions Period (SPP), continue to plague dialogue on the outcomes and value of reforms, while others, such as the accuracy of information about Umeme's performance, have since been put to rest.

Umeme's survival through this turbulent period can be attributed to a number of factors. The first is the strength of its contractual agreements with the government. At the time of negotiations, Umeme undoubtedly had the upper hand because of the dilapidated state of Uganda's power sector, the fact that it was the only viable bidder, and because of the experience and financial clout that its core shareholders brought to the table (specifically, the CDC). The contract thus provides comprehensive protections, including against the failure of ERA to approve tariff adjustments in accordance with the

tariff methodology in the distribution and supply license, government default on payments, and the premature termination of the concession contract, afforded through escrow accounts, a World Bank Letter of Credit and Partial Risk Guarantee provided at the time of signing the contract, and, ultimately, strict legal obligations that the agreement placed on the government.

The 2006 amendments, made possible due to the bargaining power afforded by an 18-month exit clause favoring Umeme in the original agreements, further protected the company from the supply-side crisis by introducing the SPP. Under the SPP (which would last until Bujagali came online), Umeme was guaranteed a certain amount of power for dispatch and was allowed a ceiling of 38 percent on losses – which had increased due to theft associated with tariff increases and load-shedding. While the amendments caused a furor in parliament, the years which followed would prove the necessity of such stringent risk mitigation measures. Looking at these extraordinary protections, it is also understandable why Umeme was singled out in the Commission of Inquiry and by the Ad hoc Parliamentary Committee.

The second factor in Umeme's survival, was the consistent support that Umeme received from the highest levels. The President's view was influenced by advice from bureaucrats regarded as knowledgeable technical experts with decades of experience in the sector. At the same time, the president sought out information from all quarters, including antagonists. There is also a requirement for the government to pay a hefty buyout penalty in the event of terminating the Umeme concession. Hence, the decision to retain the Umeme concession, despite calls for its termination, illustrated how primacy was given to techno-economic reasoning even while due attention is paid to political pressures and realities.

Lastly, but importantly, Umeme was able to improve its performance and defend its approach from 2011 onward – albeit a full six years after the signature of the concession contract. Umeme's longstanding strategy of bringing in investment to resuscitate the sector, increasing collections, and then re-investing in the sector had allowed it to eventually meet, and in some cases exceed, the targets set by ERA. Umeme's success in attracting the needed investment meant the national treasury was unburdened from the task of funding network strengthening and stabilization tasks, leading to strong government support for the utility. At the time of the Ad Hoc Parliamentary Inquiry, ERA and Umeme advanced stakeholder engagement and dialogue on Umeme's role and performance, in some cases correcting the misinformation that had previously been publicized. In this sense, 2011 marked the beginning of better and wider stakeholder engagement.

Ultimately, President Museveni, supported by robust sector legislation, was able to successfully defend some aspects of the new sector model. However, the battles were hard won and indicated that the new model may need some adjustment. Toward the end of this period, a number of moves were taking shape that would develop through to the next. In 2010, the MEMD PS made a designation by letter (to ERA, not official law) that new projects over 25 MW would be taken on by the government. Meanwhile, private projects under 20 MW were being incentivized by the Renewable Energy Feed-in Tariff (REFiT), which had been developed through the 2007 Renewable Energy Policy. In this, Uganda was again a front runner in the region, one of the first countries to attract investment into small IPPs. Umeme began preparation for an initial public offering (IPO) of its shares on the Ugandan Securities Exchange, while ERA – under new leadership – prepared to review Umeme targets. Both were refocusing their attention by looking to wider stakeholder engagement and considering their social contracts.

2.6 2012-2018: The reform matures, but the future is unclear

The commissioning of the 250 MW Bujagali hydropower IPP in 2012 marked a major shift in the sector. At the same time, tariffs were raised by 46 percent (which, due to the government restructuring of UEDCL debts, meant that tariffs were now near cost reflective), and Umeme listed its shares through an initial public offering (IPO) on the Uganda Securities Exchange. Almost all at once, the sector seemed more stable, customers were finally feeling benefits, and the government had shed most of the weight of tariff subsidies (with the exception of capacity payments for the remaining thermal power plants with a total capacity of 100 MW). In the following year, the Global Energy Transfer Feed-in Tariff scheme (GET FiT) was initiated, with a view to attracting small to medium renewable energy IPPs with DFI front-loaded premium payments to developers. In the same year, the President awarded the Karuma (600 MW) and Isimba (183 MW) public power projects to two Chinese companies (Sinohydro and CWE, respectively). In 2014, ERA introduced the quarterly Automatic Tariff Adjustment (ATA). Each of these developments has advanced the sector, though not entirely in line with the model envisioned in the 1999 Act and 2002 Policy.

With Bujagali online, the full 170 MW of thermal power that had been dispatched to meet peak demand was no longer needed, nor were the expensive subsidies the government had been providing to prevent these costs from being passed on to consumers – which were up to 56 percent of the tariff according to some reports. The Minister of MoFPED, finally able to address the issue, wrote to ERA to ask that they deal with the tariff. ERA held consultative meetings over a month-long period, leading to a tariff adjustment of 46 percent in 2012. In the same year an Automatic Tariff Adjustment (ATA) was proposed, which would allow for a periodic automatic tariff adjustment according to fuel cost, local inflation and exchange rate fluctuations. However, the Uganda Manufacturers Association (UMA) took ERA to court over the proposed ATA, arguing that regular adjustments would prevent manufacturers from properly pricing their products and perpetuate instability in the sector. While ERA initially filed a defense, cognizant of the risks of politicization of such a high-profile court case, ERA quickly changed tactic to one of proactive and systematic engagement with affected stakeholders. Thus, ERA allowed the UMA to undertake their own study of ATA's (looking at Kenya's adoption of a similar policy), skillfully represented their case in the media by identifying and engaging with respected expert reporters, appealed to MPs that were viewed as opposing the ATA, and fostered relations with the Private Sector Foundation of Uganda (PSFU). Thanks to all these efforts, the ATA mechanism was remarkably implemented in January 2014, with the agreement that it would be a quarterly rather than monthly adjustment, as had been proposed originally. ERA was able to raise tariffs by 18 percent again from January 2016, despite the pre-electoral timing, following consultation and with the approval of the President.

Around the same time, ERA also initiated a review of the Umeme targets. Given that the "special provision period" (SPP) had come to an end, targets were raised substantially. In addition, two amendments were advanced through the target review – both of which came straight from the 2009 Ministerial Commission report, perhaps an indication of the influence of recently appointed board members who had previously sat on the Ad Hoc Parliamentary Committee. The first amendment called for the equalization of the tax in the tariff with the taxes which Umeme paid, the second called for the reconciliation of higher than predicted sales and Umeme's profits. Both would require an adjustment of the tariff methodology. Again, this issue was taken to the courts but was finally settled amicably in May 2016 and again, thanks to constructive engagement aimed at balancing the needs of different

stakeholders. Over this period, ERA is seen to have matured, earning the respect of stakeholders across the sector.

Another, less controversial regulatory success has been the government's GET FiT program, supported by the World Bank, KfW and other donor agencies. The World Bank provided US$ 160 million partial risk guarantee to commercial lenders to finance projects under GET FiT. However, most of the projects under GET FiT received debt financing from development financing institutions (DFIs), which were not eligible to benefit from the World Bank guarantee. After two years of keeping the World Bank guarantee open to allow commercial lenders to lend funds to the GET FiT projects, the World Bank cancelled its guarantee scheme. GET FiT has been more successful than the earlier REFiT programs, which had only procured 6 RE IPPs, with 13 GET FiT RE projects currently under construction and 4 more to begin soon, as well as two plants that have already been commissioned. GET FiT is set to contribute 157 MW by 2018. The success of GET FiT in attracting private investments hinged on the fact that the program addressed the inherent sector bottlenecks of insufficient incentives, a patchy enabling environment and high capacity demands on the government. GET-FiT supported small hydropower, biomass (bagasse), and solar PV power plants. On the solar PV front, the energy costs were comparatively higher than what has been recorded elsewhere in the region due smaller scale and nascence of the grid connected solar market in Uganda. The program has created an enabling investment environment by developing a competitive procurement system and standardized and bankable transaction documents, e.g. Power Purchase Agreements (PPAs) between IPPs and the off-taker (UETCL), Implementation Agreements between developers and the government, and Direct Agreements between debt financiers and the government or investors. Additionally, GET FiT has provided targeted technical assistance to the regulator in order to build institutional capacity.

The same can be said for Umeme, which has advanced public and political confidence in the company through listing its shares on the Uganda Securities Exchange in 2012 and cross listing on the Nairobi Stock Exchange in 2013. Approximately 6,000 Ugandans now have shares in Umeme and the National Social Security Fund (NSSF) has recently become the majority shareholder (with 23 percent) - this has generated significant public goodwill. The listing attracted other investors too – such as Investec and Liberty – which has won the President's goodwill, as he sees this move as having opened the door for such high caliber investment to enter other sectors in the Ugandan economy. In the case of Umeme, developments over this phase have served to open the power sector – not only to the private sector, but to a wider and more diverse set of Ugandan stakeholders, including the general public.

Although the 1999 Electricity Act does not make provision for new public generation, a public EPC procurement process was launched for Karuma. Karuma had previously been marked as a Public-Private Partnership (PPP) of 250 MW, under development by a Norwegian company since the late 1990s. However, the company lost its exclusive license in 2008 after failing to raise sufficient funds for the project. Following this failure, and at a time when the sector was in the midst of load-shedding caused by the Bujagali IPP delays, the government moved towards a model that allowed for a bigger role for government and at the same time decided to expand the size of the plant to 600 MW. The donor community, as well as Western investors, withdrew support/interest due the environmental and social impacts associated with the increased plant size. When the EPC procurement process for Karuma was initiated, MEMD was thus already on its back foot. When allegations of bribery and corruption emerged in 2012, the process came to a halt. In an unpredictable move, the government awarded the Karuma *and* Isimba projects to Chinese companies Sinohydro and CWE, respectively,

through a process of direct negotiation when the two country premiers met at the BRICS conference in South Africa in 2013.

This move has been justified as an attempt to bring tariffs down, through decreasing upstream costs. Rather than public projects, many speak of Karuma and Isimba as variants of the PPP model. Yet, while the tariffs have reportedly been set at 4.8c and 5.2c respectively[5] (less than half the Bujagali tariff), the true costs are unclear, and the viability of these projects is also yet to be proven. Both projects remain controversial and are expected to shift Uganda into a position of substantial excess supply. Under the take-or-pay agreements, the country will have to pay for this power even if demand does not materialize, internally or externally, and this will have a negative impact on the sustainability of the sector.

While there is uncertainty regarding the new generation projects and how they will impact the sector financially, some of the government's recent decisions could lead to the reversal of the entire reform process itself. With constant questions being raised about the high rate of return for UMEME and the consequent high tariffs becoming a political issue, the government is looking to make some drastic changes in the sector. In September 2018, the cabinet decided to merge the generation, distribution and transmission agencies under the MEMD. This decision once implemented would effectively reverse the restructuring of UEB and leave the UEDCL concession (UMEME) with an uncertain future.

[5] These have not been confirmed publicly, but were provided by one of the interviewees who has seen the contracts.

3 The impact of the reforms on sector performance and institutions along four dimensions

Uganda's 1999 power reform strategy document *(PSRPS)* was developed with the objectives of making the sector financially viable without subsidies, increasing efficiency and improving commercial performance, increasing supply to match the growing demand, improving the reliability and quality of electricity supply, attracting private sector investment, and advancing opportunities to export electricity. These ambitions set the basis for the adoption and swift implementation of comprehensive market-oriented reforms, as discussed above. Having charted Uganda's reform experience, this section turns to consider the implications for sector performance and development. This evidence-based analysis first considers improvements in Uganda's power sector performance over the period 1990-2015 along four key dimensions:

- Security of supply
- Access and affordability
- Efficiency and financial viability
- Tariffs and cost recovery.

For each aspect of performance, we evaluate the extent to which the various institutional reforms, or lack thereof, are responsible for how performance has evolved.

3.1 Security of Supply

3.1.1 Performance

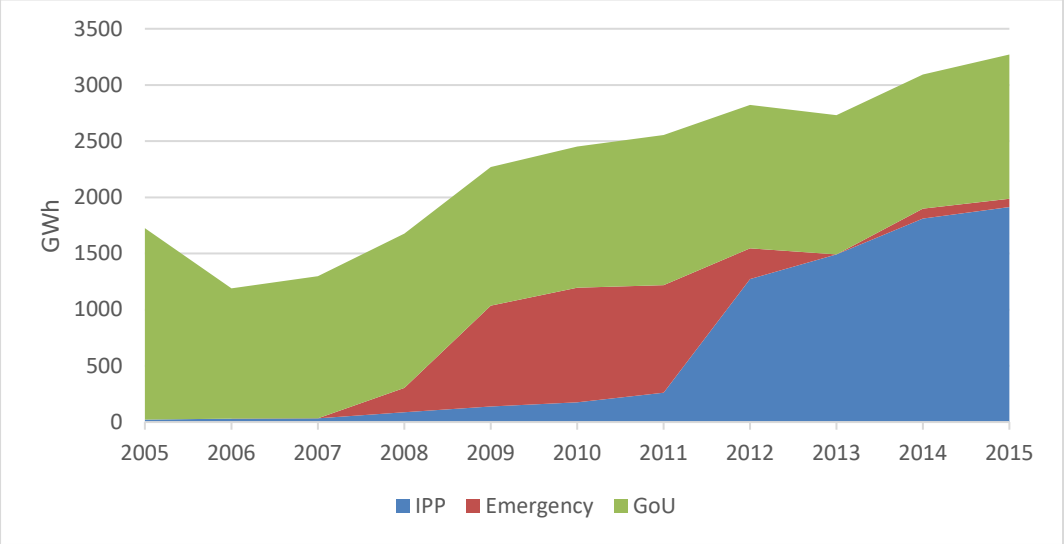
Uganda had suffered decades of inadequate and insecure supply during the conflicts of the 1960s, 1970s and 1980s. At the heart of the issue was inadequate supply, which stood at just 150 MW in 1990 – though in reality power supplied was much lower, due to the low availability factor. The national power utility did not perform well, contributing to high technical and commercial losses, and unable to invest in new capacity needed. Adding to these structural and institutional issues, Uganda's limited installed capacity was primarily hydro based, making it vulnerable to drought. Increasing capacity was clearly of the utmost importance for sector recovery and economic growth.

The first projects aimed at improving the structural challenges were initiated ahead of reforms, beginning in the 1980s with the re-entry of World Bank funding through Power Project II. Through this project, existing capacity and network infrastructure was refurbished. This period was characterized by the refurbishment and reconstruction of existing infrastructure that had become outdated, dilapidated or had been laid waste during the previous period of turmoil. Improvements to the security of supply were slow. Toward the end of the 1990s, Owen Falls (now Nalubaale) had been refurbished and extended to raise its capacity to 180 MW. Construction of a second power plant, Kiira, began in 1993. Comprising of five 40 MW plants (200 MW total), all units were commissioned by 2003. During the 1990s, power outages and brown outs were frequent and quality of supply poor, with severe costs to the economy and customers.

Though the commissioning of Kiira reduced these pressures slightly, growth in demand was outstripping that in supply by a considerable margin. With the first failed attempt at an IPP (Bujagali I), the situation deteriorated. When drought struck in 2005, the government was compelled to procure expensive emergency power, and associated imported fuel costs and volatility, and accept the relatively more expensive Bujagali II IPP contract offer. Furthermore, an amendment to the Umeme distribution concession was made necessary because of the unforeseen adverse conditions. During

this time, critical work on increasing capacity and improving network infrastructure was deferred in order to deal with the crisis. When a second drought hit in 2011, the government had to resort to substantial emergency power supply, and was now exposed to fuel supply risks – supply was insufficient and highly insecure.

Figure 3: Power generation in Uganda, 2005 – 2015[6]



Then, in 2012, Bujagali was commissioned adding 250 MW to the grid – practically doubling installed capacity overnight, allowing the government to phase out the emergency power plants. By 2015, installed capacity had reached 879 MW, including 79 percent from hydropower, 15 percent co-generation, and the rest from thermal generation. A number of small independent power projects (SIPPs), including those procured through GET FiT (which contribute 58 MW currently, with 100 MW under construction) are also coming online. Installed capacity per capita increased drastically, from around 8.4 MW per million just before reforms were instituted in 1996 to 21.43 MW per million in 2017.

In addition to these developments, two much larger projects, the Karuma (600 MW) and Isimba (183 MW) hydro-power plants, were approved in 2013. When these plants are commissioned, the ownership structure of Uganda's generation sector will shift markedly towards government ownership (table 1).

Table 1: Funding and ownership of generation capacity in Uganda in 2016 and 2020[7]

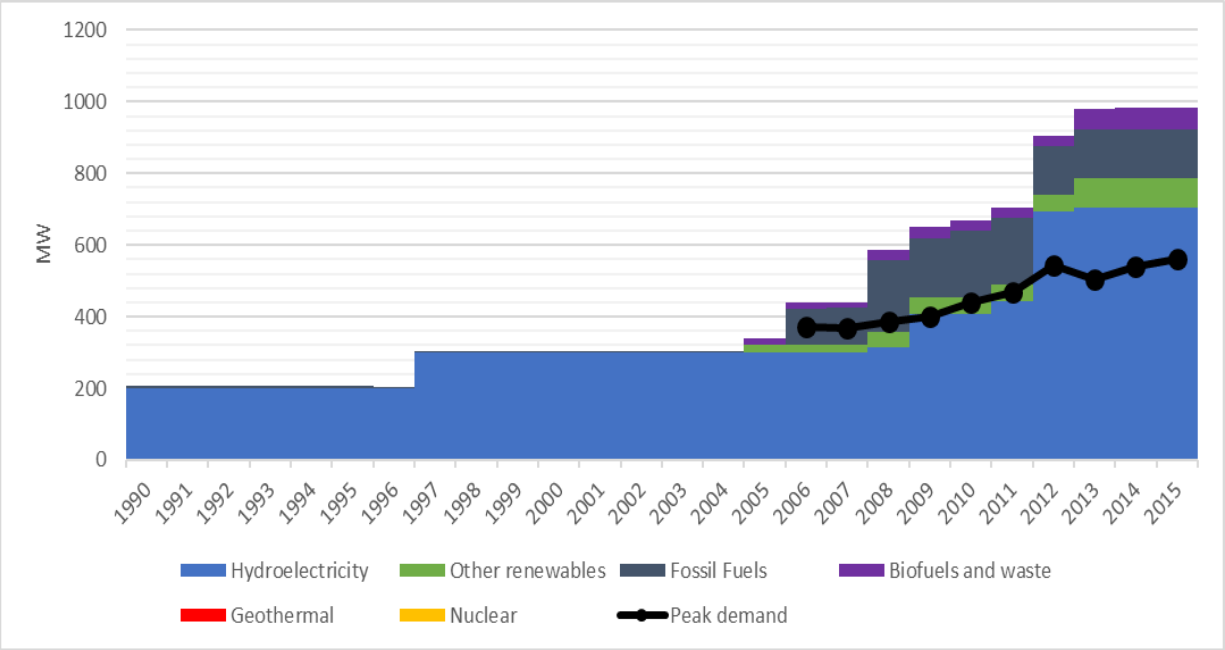
Ownership/funding Installed	**Capacity, 2016**	**Expected capacity, 2020**
Government/state-owned utility (Including Chinese built and funded)	42%	67%
Emergency	15%	6%
IPP	42%	25%

[6] Meyer, R., Eberhard, A., & Gratwick, K. (2018). Uganda's power sector reform: There and back again? Energy for Sustainable Development: 43, 75-89.
[7] Ibid.

While robust demand growth is certainly a pressing concern, there is concern that these plants could tip Uganda into a situation of over supply – which, due to the take-or-pay contracts, could be costly for the country. The excess supply situation may persist for between eight and twelve years if substantial step loads are not connected to the system. The government believes that excess supply and envisaged low end-user tariffs will help in usher in future demand. At the same time efforts are being made to establish industrial parks across the country and to strengthen the regional interconnections for power export to neighboring countries such as Kenya, Rwanda, Tanzania, and the Democratic Republic of Congo. In the meanwhile, ERA has introduced a time-of-use demand side management program whereby tariffs for industrial customers are increased to incentivize a shift in consumption from peak to off-peak and shoulder periods. In addition, the government is promoting the development of the SIPPs that can be commissioned faster and could be developed simultaneously with Isimba and Karuma without imposing additional financial and managerial burden on the government. In the medium- to long term-term, there is an increasing need to extend and strengthen the transmission and distribution infrastructure, in order to improve availability, reliability, and efficiency of service to existing and emerging demand centers.

Uganda's path to security of supply has been a bumpy one, imposing heavy fiscal and economic burdens on the country, due to its history of conflicts and droughts. Nevertheless, there is no doubt that the country is close to achieving a much stronger position with regard to supply security than at the outset.

Figure 4: Installed capacity and demand in Uganda, 1990-2015



3.1.2 Institutions

The government has developed five-year National Development Plans (NDP) since 2010. The NDP is a comprehensive plan compiled with the objective of providing a framework for accelerated economic growth to support socioeconomic transformation for prosperity. All other sector plans are meant to be aligned with the NDP.

MEMD's Energy Resources Department is responsible for forecasting national demand and supply, and the development of political consensus and decision-making on policies governing the electricity

sector. Since its establishment in 2001, the regulator – ERA – has been in charge of producing a power generation master plan. This is a relatively unusual institutional arrangement, as the line ministry often has a bigger role in planning. Yet, given the technical capacity of ERA, this approach makes sense in Uganda. Nevertheless, the ERA plan is only indicative and when it comes to approving and implementing plans, MEMD is ultimately responsible and this has emerged as a critical weakness.

Currently, the main planning document for Uganda's electricity sector – the Power Sector Investment Plan (2009-2030) – has no regulatory or legal standing, has not been officially updated since MEMD approved the plan in 2011, and does not seem to have been used as a guide for sector investment decisions. Lacking formalized and followed planning structures, the current arrangement is not conducive to optimal system expansion. As a result, investment decisions and processes are uncoordinated – often carried out by individual entities, sometimes leading to sub-par investments as regards timing, location, and technology. This also effects transmission and distribution planning, which is becoming more complex due to the demands of balancing an expanding system while trying to accommodate new generation projects which are often planned without the involvement of UETCL. More recent plans include UETCL's Grid Development Plan (2015-2030) and ERA's Least Cost Generation Plan (2016-2025) – which is yet to be approved by MEMD, as well as Umeme and REA's annual investment plans. Without MEMD's approval of ERA's 2016 Plan or effective consolidation of other entities development plans, and given the poor track record when it comes to implementing the 2011 Investment Plan, centralized planning is a weak link in Uganda's power development trajectory.

Weak central coordination, enforceability, and regularity in planning arrangements is a critical sector challenge. For the time being, the MEMD implements a joint sector review annually, to establish developments in and the overall status of the sector. Additionally, MEMD has a Joint Sector Working Group, which is responsible for the coordination of the activities of all the players in the market. Cross-sectoral planning (between the electricity sector and other sectors, such as agriculture and industry) is limited. Benchmarking Uganda's institutional framework for planning against a number of best practice criteria yields a score of 43 percent and 75 percent, for generation and transmission planning respectively (table 2).

Table 2: Institutional arrangements for power sector planning and procurement in Uganda and comparators, 2015[8]

Planning and procurement	Kenya	Senegal	Tanzania	Uganda	International benchmark
Generation Planning	86%	43%	43%	43%	56%
Transmission Planning	75%	100%	75%	75%	72%
Procurement of Generation	100%	50%	100%	95%	85%
Transmission Procurement	67%	42%	92%	92%	64%

Note: Scores based on index developed for the Rethinking Power Sector Reform Project. For more details go to project website at http://www.esmap.org/rethinking_power_sector_reform

The Electricity Act clearly stipulates that IPPs be developed under ERA's direction and that public Engineering, Procurement and Construction (EPC) projects will be implemented through parastatals

[8] For the detailed planning and procurement index, see the annex.

such as UEGCL and UETCL.[9] Though legislation foresees no *direct* role for the government in developing or procuring new generation capacity, in practice the MEMD (as well as the Presidency) has taken the lead in several procurements since 2005, including thermal EPPs.[10] During this period, the procedures laid out in the Electricity Act were largely overlooked, especially when it came to the procurement of EPPs which were awarded on a non-competitive basis in response to supply shortages and delays with IPPs and other projects. With the exception of the Bujagali IPP and GET FiT SIPPs, procurement has not been undertaken on a transparent basis, but has primarily been the result of direct negotiation of unsolicited bids. This duality – between legislation and what happens in practice – is revealed in Uganda's relatively high generation procurement score of 95 percent, benchmarked against other countries in the study.

When it comes to benchmarking procurement in transmission, Uganda also scores relatively well (92 percent). This high score also reflects what is a very strong framework on paper but is inadequate in practice. This will become a critical area going forward, with the investment required for a conservative growth path (set in the Grid Development Plan) as high as US$3.8 billion over the next 15 years. Investments in transmission infrastructure have largely been financed by government contributions and concessional loans from multilateral development banks and other development partners. At times, investment requirements have had to be postponed until the resources became available. The current capacity of UETCL to implement investment plans and undertake procurement is inadequate and would ideally require further capacity-building efforts to better manage system expansion going forward.

3.1.3 Summary

Starting from a low base, installed capacity has increased markedly in the past 15 years – from around 150 MW to over 850 MW. With several projects in the pipeline, including two GoU/Chinese funded PPPs, this figure is set to double by 2020. Even with new IPP projects under construction (Achwa-83MW) reflecting an increasing private participation in power generation, it is still not strong enough to allow for a reduction in public funding for large investments in generation. Though moving forward this may not be a major issue as the country is expected to have excess supply for the foreseeable future. Security of supply has tended to improve in big steps, often long overdue, rather than on a proactive and steady basis. Though security of supply is improving, and planning and procurement frameworks (at least on paper) are relatively robust, implementation has often fallen short of the official regulatory framework, with plans not being adhered to and non-competitive procurement practices still in use. With increased institutional complexity, there is a need to strengthen coordination – specifically between different segments.

3.2 Access and Affordability

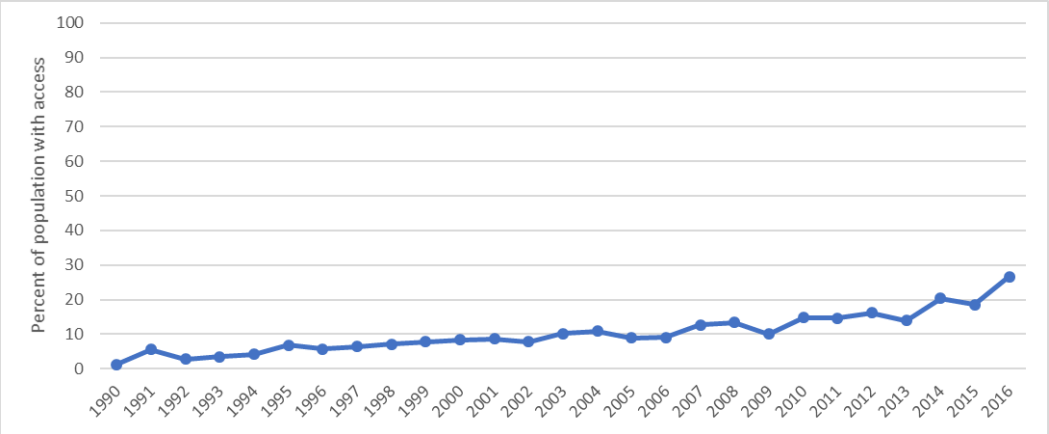
3.2.1 Performance

Advances in access were slow to materialize in the first decade of reforms. Starting from a low base (with about 5 percent of the population having access to electricity in 1991) and contending with extreme supply insecurity and rapid demand growth, access only increased to 15 percent by 2010. However, in access as in other dimensions of performance, the 2010-12 period marked a turning point.

[9] Meyer, R., Eberhard, A., & Gratwick, K. (2018). Uganda's power sector reform: There and back again? Energy for Sustainable Development: 43, 75-89.
[10] Ibid.

Bolstered by improved performance in other segments, the proliferation of regional programs and other efforts to address the access gap in Sub-Saharan Africa (Power Africa, SE4All, etc.), and the mobilization of high-level political will – electricity access has shown remarkable acceleration in a relatively short period, with access reaching 26 percent by 2016, albeit still a very low level and lower than the targets set by the country.

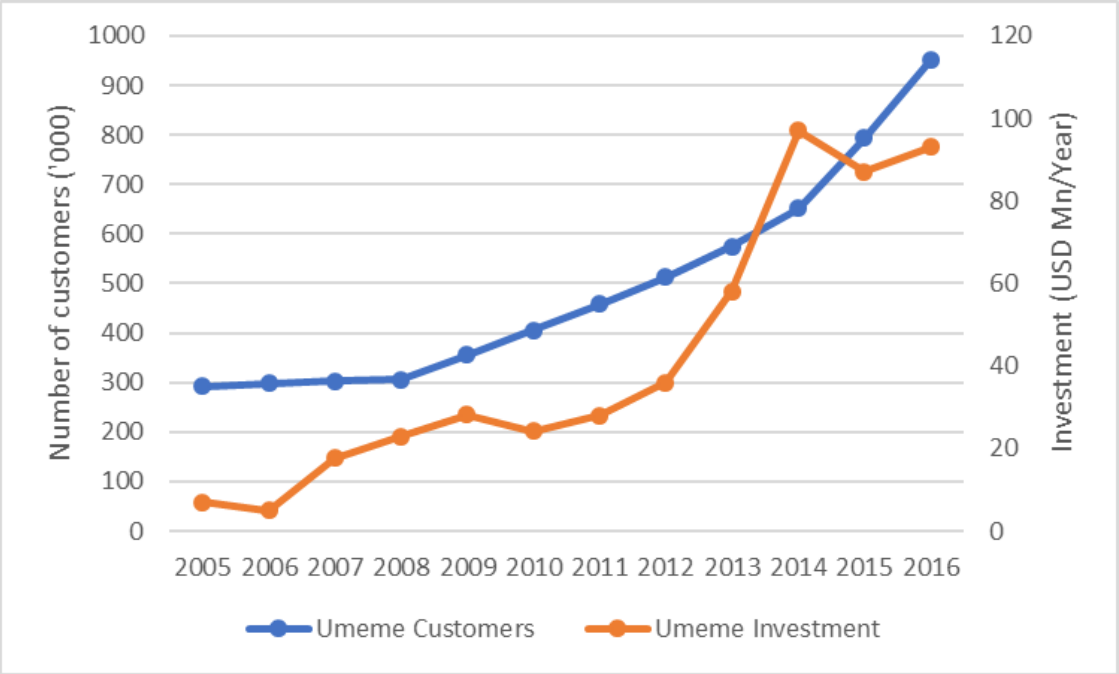
Figure 5: Electricity access in Uganda, 1990-2016



Source: Tracking SDG7 report, 2017

UMEME has successfully increased electrification in urban and peri-urban areas, but most electrification has been "deepening" within existing service areas, as the concession contract does not incentivize grid expansion and limits Umeme's activities to within a 1-km radius of the existing distribution lines. A large part of the increase in access can be attributed to various public and donor led initiatives focused on expanding access such as- the World Bank funded Output Based Aid (OBA) Densification Project (which started in 2015) and Peri Urban Programme (ongoing), and the KFW funded Densification program (which began in 2017). UMEME is responsible for implementing household connections within its service area under these programs. Urban access rates reached almost 60 percent in 2016 with the number of Umeme customers trebling (from 2005), as can be seen in figure 6. Umeme's 2017 Annual Report indicates a further increase of 174,477 customers – meaning that Umeme's customer base is now 1.1 million. While the donor/public funded access programs are excluded from the 20 percent rate of return stipulation, UMEME's push to increase its customer base has come under criticism for the high rate of return on investment that the utility is assured. However, in recent years, ERA has rejected sizable portions of Umeme's proposed Asset Additions in their tariff applications – resulting in substantial claw backs through the tariff, which could have a negative effect on the upward trend in connections.

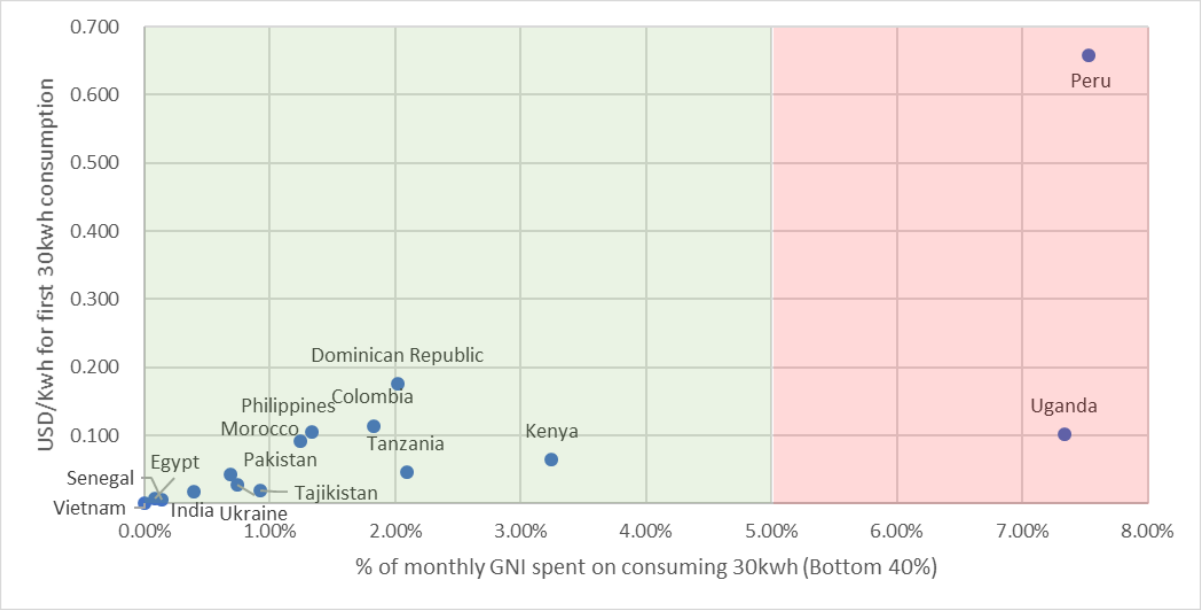
Figure 6: Umeme's customer base and investment, 2005-2016



Source: Umeme annual and financial reports 2005-2016

Advances in rural access have been more modest, increasing very slowly from a base rate of 1 percent in 1997 to 10 percent in 2017. Initially, the government expected that the private sector would play a central role in advancing rural electricity access. This was the basis of the Rural Electrification Strategy and Plan (RESP) 2001 – 2010. REA financed and built a number of grid extension projects and then brought in private operators through the concession model. In total, 10 licenses were awarded to six operators. However, the first 10 years saw little improvement in access rates, marked by limited private investment in rural distribution, which is considered to be economically unviable. Most of the operators have been unable to maintain financial viability in rural areas, and connections have been slower than hoped for. As a result, the government shifted its strategy - still developing rural distribution infrastructure, but only inviting private investors to operate the grids once they become commercially viable and continuing to provide support through subsidies that cover the cost of major maintenance and offer technical assistance. Based on this shift, the government launched the RESP II (2012 – 2022) in 2013. Through this plan, the government has set out to advance rural electrification through the creation of distribution service territories that will eventually be handed over to private operators. This approach is also a policy shift from the Electricity Act of 1999, mirroring the general shift towards greater state involvement in the sector.

Figure 7: Affordability of subsistence consumption in Uganda, 2016



Source: RISE, 2018

While access has improved over the last several years, high tariffs are a significant challenge in improving electrification further. Figure 7 compares affordability of power tariffs for some of the access deficit countries. In Uganda, for a subsistence 30kwh monthly consumption, the bottom 40 percent of the population need to spend over 7 percent of their household income, making power very expensive. Apart from a lifeline tariff, the government heavily subsidizes connection costs in Umeme's service area with customer's paying 25 percent of the actual cost. However, with UMEME getting to treat the remaining 75 percent as an investment, on which it is guaranteed a 20 percent return, access expansion through UMEME is an expensive proposition.

3.2.2 Institutions

Overall, Uganda scores relatively well on regulation related to access via grid-connection scoring 79 percent (table 3). ERA has also been proactive in taking measures to protect the affordability of service for low-income households, during a period when tariffs have been repeatedly adjusted to meet cost recovery goals. This has been achieved through the incorporation of a lifeline tariff, whereby the first 15 units of electricity consumed are priced at 20 percent of the tariff. In addition, the grid tariff (in UMEME's concession area) has a rural electrification levy that is used to support the Rural Electrification Agency's (REA's) access drive. The government, through the Rural Electrification Agency and with the support of development partners, also provides free connections for low-income rural households through programs such as Grid Densification and Output-Based Aid. The regulator, in liaison with REA, also developed the guidelines for utilization of low-cost household connection equipment (Ready Board) which reduces wiring costs for low-income households.

However, the model of small-scale rural concessions with the private sector did not prove to be very successful, with 8 of 12 concessions back under UEDCL's management. The small distribution concessioners lacked the capacity and resources to implement household concessions at a large scale. Further, the service areas they were given are characterized by poor agrarian households who cannot

afford internal house wiring costs and the upfront connection charges. These, and high loss networks that they operate make it impossible for the service providers to break even.

When it comes to off-grid electrification, Uganda's regulatory framework is less well developed. Both the government and its development partners have tended to prioritize grid-extension, which need not be the most cost-effective approach to reaching more remote rural populations. REA has also been under-resourced, especially doing periods of crisis (up until 2012) – where its funding was diverted to other entities. As off-grid solutions become increasingly attractive, regulation will need to adapt and REA's mandate and authority expanded and clarified in policy and legislation.

On mini-grids, Uganda has implemented about 67 percent of good practice measures (table 3). In order to reduce the cost and administrative burden of start-up mini-grids, the regulator awards license exemptions: a light handed and less costly approach to access regulation. The regulatory framework also considers how mini-grid operators may need to be compensated for investments, such as those in generation assets, that could become stranded upon the arrival of the grid (see the annex).

However, on solar home systems, Uganda has still to adopt about half of good practice measures (table 3) and continues to lag behind its neighbors. For example, solar home systems sold per million people totaled 7,500 in Rwanda and 9,800 in Tanzania between 2014 and 2016. Over the same period, Uganda only sold 2,500.

Table 3: Regulatory framework for electricity access in Uganda and comparators, 2015[11]

	Kenya	Senegal	Tanzania	Uganda	International benchmark
Energy Access Regulation	81%	28%	81%	65%	56%
Regulation of New Connections	75%	50%	94%	79%	65%
Regulation of solar home systems	100%	0%	50%	50%	66%
Regulation of mini-grids	67%	33%	100%	67%	44%

Note: Scores based on index developed for the Rethinking Power Sector Reform Project. For more details go to project website at http://www.esmap.org/rethinking_power_sector_reform

3.2.3 Summary

Advancing access was not given sufficient attention in the early years of reform. Once the reforms were implemented the expectation that small-scale private rural concessionaires would invest in rural electrification proved to be overoptimistic. Consequently, access rates barely moved in the decade following the 1999 Electricity Act and onset of reforms, with Uganda beginning to lag noticeably when compared to neighboring countries. Thanks to a change in strategy around 2012, Uganda has begun to catch up with electrification reaching 26 percent in 2017, though still behind neighboring countries. This shift is attributable to strong donor and public funded OBA and densification programs and support for rural electrification programs led by REA. Nevertheless, Uganda has so far largely overlooked the electrification potential provided by solar home systems.

On November 1, 2018 the Government of Uganda launched its Electricity Connections policy. Under this policy, all low voltage consumers who can be connected either by one pole or zero pole will be eligible to get electricity connection without paying for the connection fee. The government has

[11] For the detailed access regulation index, see the annex.

adopted this policy as it identified connection fee charges as the major barrier of increasing electricity access in Uganda. The successful results of the OBA approaches also helped the government to adopt this new policy. REA has been nominated as the implementing agency of this policy and they are expected to connect about 300,000 new connections annually under this policy framework.

3.3 Efficiency & Financial Viability

3.3.1 Performance

The persistently poor governance and performance of the vertically integrated, monopoly state-owned utility, UEB, was a primary impetus for reforms. Despite increased investment into hard infrastructure, efforts at internal reform and improving governance had been near impossible to implement over the 1980s and early 1990s, in a context where utility staff enjoyed political patronage and entitlement without much accountability to customers. A 1996 ESMAP study found that UEB had recorded steady losses, when suitable allowances were made for bad debts and doubtful accounts receivable and concluded that the utility was financially unviable. UEB's financial difficulties stemmed mainly from high system losses, inaccurate billing and poor collections (i.e. mainly the distribution segment), as well as inefficient and bloated staff costs (which increased from 22 percent to 43 percent of total expenditure between 1989 and 1994). Higher level governance arrangements also undermined the commercial operation of the utility, with the MEMD directly responsible for approving tariffs and appointing the Board of Directors. By the early 1990s, UEB was only collecting revenue for a third of the power generated, with the government itself showing a poor track record of paying for electricity. Some progress was made ahead of the implementation of restructuring and regulatory reforms, when an external CEO was recruited and tasked with implementing preparatory internal reforms, including staff rationalization, the division of generation, transmission and distribution segments (which would later become separate companies), and widespread stakeholder engagement with the public and staff members.

Figure 8: Collection rate & distribution losses for Umeme, 2005-2015

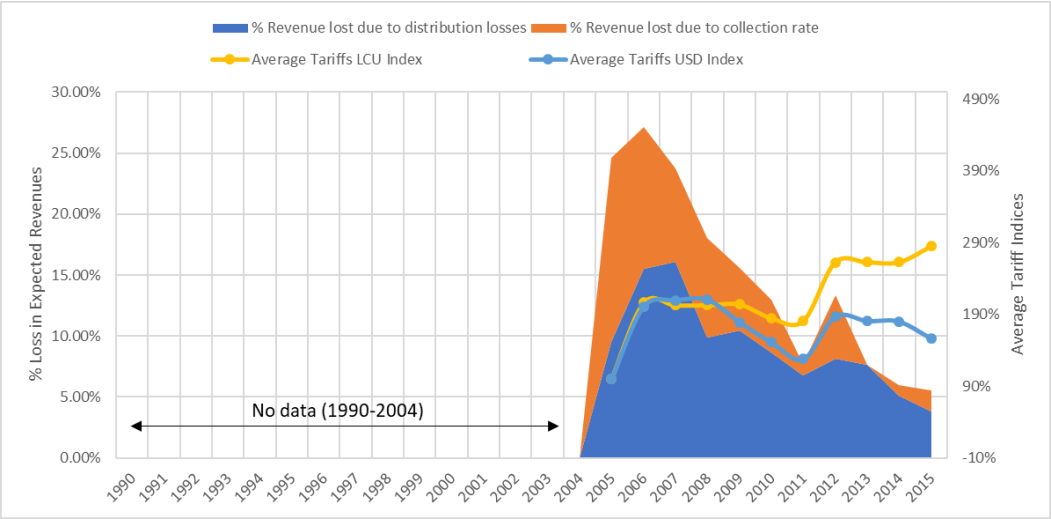
Source: Rethinking Power Sector Reform Project

Following the unbundling of UEB into separate generation, transmission, and distribution companies in 2001, the next step – the concessioning of the distribution segment – proved a challenge in part due to poor performance in this area over the preceding decades and the dilapidated state of the distribution infrastructure. By 2005, when a concession agreement was finally reached with Umeme, losses were close to 40 percent. As can be seen in figure 9 below, when Umeme took over, 25 percent

of the revenues it would have had if the utility was running in a range considered to be efficient in the region were absorbed by commercial and technical losses. Though some ground had been made in increasing collection rates – which stood at 80 percent in 2005, supply was about to become more expensive with the 2006 drought and ongoing delays with the Bujagali IPP contract necessitating the procurement of expensive EPPs. This situation contributed to the enactment of the "special provisions period" or SPP up until 2012, during which Umeme was not bound to the performance targets originally envisaged in the concession agreement, in recognition of the fact that the supply side crisis and freezing of the tariffs effectively undermined the company's ability to make much ground when it came to reducing losses and extending the network. For this reason, many viewed the concession to have been a mistake or failure in the first years, leading to two official inquiries were initiated, both of which recommended the termination of the concession agreement.

Nevertheless, over time, collections started to improve, distribution losses were harnessed and brought steadily down, and the general health of the utility showed signs of recovery. Looking at figure 8, these advances are evident even before Bujagali was commissioned in 2012, which relieved pressure on the sector as a whole. With the boon of an additional 250 MW coming online, tariffs increasing to cost reflective levels in 2012, and under the new and more stringent performance targets set by ERA in 2012, Umeme has eventually begun to deliver on expectations. Losses have been brought down from around 38 percent in the mid-2000s to 17 percent in 2017, collections are close to 100 percent (with 76 percent of customers on pre-paid metering), and the customer base has more than trebled; all substantial achievements. However, one must make the distinction that these inefficiencies do not take in to account the quality of supply which remains an issue in Uganda.

Figure 9: Evolution of Umeme's operational inefficiencies & end-user tariffs, 2005-2015

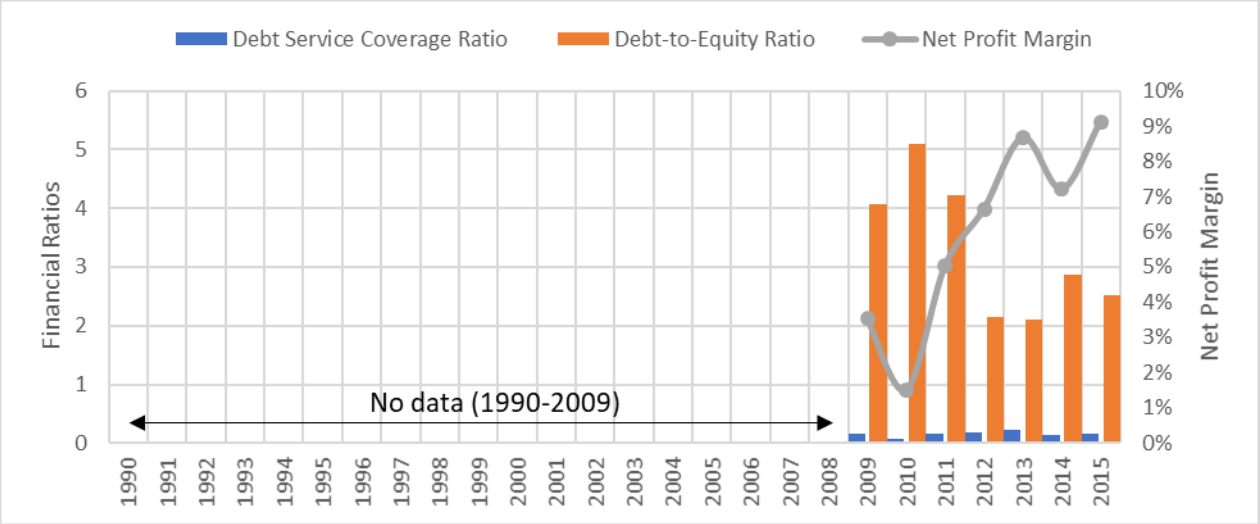


Source: Rethinking Power Sector Reform Project

When it comes to Umeme's financial performance, a similar picture emerges. The company's financial performance began to improve in the early years of the concession, as a result of tariff regulation and the tariff protection mechanism built into the concession agreement, which led to a 75 percent adjustment in retail tariffs in 2006. However, the situation strengthened further in 2012 with the listing of Umeme's shares and the government decision to restructure UEDCL's debt, coinciding with the tightening of the regulatory performance framework tightened combined with further tariff increases. In figure 11 below, an overview of Umeme's top shareholders is presented as of December 31, 2017. As can be seen, the National Social Security Fund is the principal shareholder, which is

important to maintaining local support for the company and allaying concerns around foreign interests in companies of key strategic interest. In addition, many local Ugandans and employees of Umeme hold shares, which provides a broader base of support for the company, as well as feeding dividends back into local shareholders hands.

Figure 10: Evolution of Umeme's profit margin & debt ratio, 2009-2015



Source: Rethinking Power Sector Reform Project

Figure 11: Umeme's Shareholding in 2017

	Name	31 December 2017		31 December 2016	
		Number of shares	Percentage shareholding	Number of shares	Percentage shareholding
1	National Social Security Fund	376,315,085	23.2%	376,315,085	23.2%
2	Allan Gray	156,332,791	9.6%	89,301,435	5.5%
3	Kimberlite Frontier Africa Master Fund	134,186,083	8.3%	107,197,587	6.6%
4	Investec Asset management Africa	71,913,402	4.4%	78,616,769	4.8%
5	Utilico Emerging Markets Limited	69,911,788	4.3%	69,911,788	4.3%
6	The Africa Emerging Markets Fund	64,063,887	3.9%	55,250,672	3.4%
7	International Finance Corporation	45,220,900	2.8%	45,220,900	2.8%
8	Coronation Global Opportunities Fund	42,125,470	2.6%	42,125,470	2.6%
9	Imara S P Reid (Pty) Ltd	40,078,109	2.5%	957,014	0.1%
10	Duet Fund	39,796,024	2.5%	44,796,024	2.8%
11	Others	583,934,466	36%	714,185,261	43.9%
		1,623,878,005	**100%**	**1,623,878,005**	**100%**

Source: Umeme annual report, 2017

3.3.2 Institutions[12,13]

Uganda's power sector restructuring was among the most extensive in Sub-Saharan Africa. The Ugandan power sector is fully vertically unbundled into generation, transmission, and distribution segments. In generation, state owned generation assets are currently managed under a concession agreement with Eskom Uganda, while IPPs supply power under PPAs. In 2016, 42 percent of installed

[12] For a more detailed look at the indices used in this section, see the annex.
[13] Data for utility governance indicators were collected in 2015. Given the dynamic nature of governance frameworks, specific conditions may have changed since then.

capacity comprised of privately owned and operated IPPs, while the remainder are state-owned by under the management of private companies. In the distribution segment, Umeme Ltd. was awarded a 20-year concession for the main distribution network in 2005 and concessions have since been awarded for small rural networks. The bulk (in terms of network infrastructure and connections) of the distribution network and functions is thus under private management. The extensive restructuring undertaken is reflected in Uganda's scores for restructuring and private sector participation relative to the global benchmark group, as well as other countries in the region, as can be seen in table 4. The company is licensed and regulated by the regulator, ERA. Furthermore, Umeme is listed on the Uganda Securities Exchange (USE) and cross listed on the Nairobi Securities Exchange (NSE).

Table 4: Comparing the extent of utility restructuring in Uganda and comparators, 2015[14]

	Kenya	Senegal	Tanzania	Uganda	International benchmark
Utility Restructuring	**25%**	**0%**	**0%**	**55%**	**45%**
Vertical Unbundling	50%	0%	0%	60%	55%
Horizontal Unbundling	0%	0%	0%	50%	34%
Pvt sector participation	**16%**	**11%**	**3%**	**38%**	**24%**
PSP in Generation	25%	34%	10%	53%	41%
PSP in Distribution	25%	1%	0%	63%	16%
PSP in Transmission	0%	0%	0%	0%	14%

Note: Scores based on index developed for the Rethinking Power Sector Reform Project. For more details go to project website at http://www.esmap.org/rethinking_power_sector_reform
PSP = private sector participation

The Company has a unitary board structure, where the roles of Chairman and Managing Director/Chief Executive Officer are separate and distinct, and the chairman is an independent and non-executive director. Umeme's Board of Directors is responsible for the oversight of the company's affairs, and operates according to set governance conventions. The Company is a corporate member of the Institute of Corporate Governance of Uganda and is bound by the Corporate Governance Guidelines of the Capital Markets Authority (CMA) and the Corporate Governance requirements of the Uganda Securities Exchange.

The Board maintains a clear framework in the delegation of authority to ensure that the company runs smoothly. Six committees have been established in this regard, the: Audit Committee; Environmental, Social and Governance Committee; Customer Service and Loss Reduction Committee; Remuneration Committee; Nomination Committee; and the Strategic Review Committee. Each committee has established terms of reference (ToRs), which set out the committee's responsibilities, scope of authority, composition and procedural mandate. Day-to-day compliance and risk management is undertaken by the management team, though the Directors do engage with and guide management in the execution of their duties.

[14] For the detailed restructuring and private sector participation index, see the annex.

Table 5 Corporate governance of utilities in Uganda and comparators, 2015[15]

	Kenya	Senegal	Tanzania	Uganda	International
	Kenya Power	SENELEC	TANESCO	UMEME	benchmark
Overall Utility Governance	**90%**	**65%**	**61%**	**80%**	63%
Corporate Governance	100%	74%	57%	85%	62%
Accountability	*100%*	*58%*	*58%*	*92%*	60%
Autonomy (SOEs)	*100%*	*89%*	*56%*	*78%*	63%

Note: Scores based on index developed for the Rethinking Power Sector Reform Project. For more details go to project website at http://www.esmap.org/rethinking_power_sector_reform

Umeme scores 77 percent on our financial discipline index, its primary black mark being that the company does not have a credit-rating. Umeme prepares annual financial statements according to the requirements of International Reporting Financial Standards (IFRS). It is also audited by external auditors approved by the Institute of Professional Accountants of Uganda. Umeme's concession contract includes performance targets set by the ERA. Umeme has to meet these targets and thus does not have any shareholder targets. If Umeme's operational performance matches the targets set by the regulator, assuming no growth in sales volume during the retail tariff year, its annual return from operating the electricity distribution concession will be equal to a contractually allowed return on its capital investments of 20 percent. This contractual return is set through the life of the concession.

Table 6: Utility Management index of utilities in Uganda and comparators, 2015[16]

	Kenya	Senegal	Tanzania	Uganda	International
	Kenya Power	SENELEC	TANESCO	UMEME	benchmark
Utility Management	**80%**	**56%**	**65%**	**76%**	64%
Financial Discipline	*76%*	*57%*	*64%*	*77%*	59%
Human Resource	*64%*	*57%*	*71%*	*71%*	62%
Information and Technology	*100%*	*53%*	*60%*	*80%*	71%

Note: Scores based on index developed for the Rethinking Power Sector Reform Project. For more details go to project website at http://www.esmap.org/rethinking_power_sector_reform

Umeme's human resource framework reflects and is in line with the 2006 Employment Act. There is a strong focus on staff development and the company runs a training school, the Umeme Academy in Jinja, which offers various programs through which employees can develop their professional skills. Umeme's salary package is competitive in the industry and the company is a popular employment destination for University graduates and professionals. The company offers performance-based bonus plans, yearly salary increments, and employee stock schemes rewards. Umeme's staff comprise a diversity of professions, including engineering, operations, finance, IT, HR, research and development, corporate affairs, law, communications, sales, customer care and other cross-cutting disciplines. Recruitment into the company is conducted in one of three ways: internships for university students in their second or third years; graduate recruitment, which involves an intensive rotation training program to provide a holistic understanding of the business; and professional recruitment of experienced individuals normally through adverts in national newspapers, radios and online. The company has employed the latest IT solutions to improve its quality of service.

[15] For the detailed corporate governance index, see the annex.

[16] For the detailed utility management index, see the annex.

3.3.3 Summary

Despite extensive structural reforms and private sector engagement in the main distribution utility, improvements in the operational and financial performance of the sector took some time to fully materialize, partly due to the coincidence of the drought period leading to serious power shortages and escalating costs of generation, and the associated loosening of the performance framework for the concessionaire. These circumstances understandably led some to question the concession arrangement. Since 2012, there have been notable improvements in operational efficiency and financial performance. These reflect the restoration of normal supply conditions, as well as the introduction of a much tighter regulatory performance framework. Enhanced incentives resulting from the stock exchange listing of the company may also have played a role. The company also enjoyed considerable support, in the form of a World Bank guarantee directed at safeguarding payment of bills by public sector institutions, as well as donor funding for access programs. Despite these improvements, concerns remain regarding the fixed 20 percent profit margin on investments that was incorporated into the original concession contract, and its implications for consumer tariffs.

3.4 Tariffs & Cost Recovery

3.4.1 Performance

The financial viability of the sector largely depends on achieving cost-reflective tariffs. To assess Uganda's progress toward cost recovery, a detailed analysis of the sector's financials was conducted for the past four years. The analysis sets benchmarks for three levels of cost recovery: (i) operating costs only; (ii) operating costs plus limited capital costs, such as debt service; and (iii) full capital costs on current and planned future investments. The financial viability analysis does not account for costs associated with service delivery that are covered separately by other parties, for example if a donor provides concessional capital. In a second stage, the analysis evaluates the sector against a full-cost-recovery benchmark that incorporates any costs that are currently subsidized. Data for the analysis were available only for the period 2012–2016.

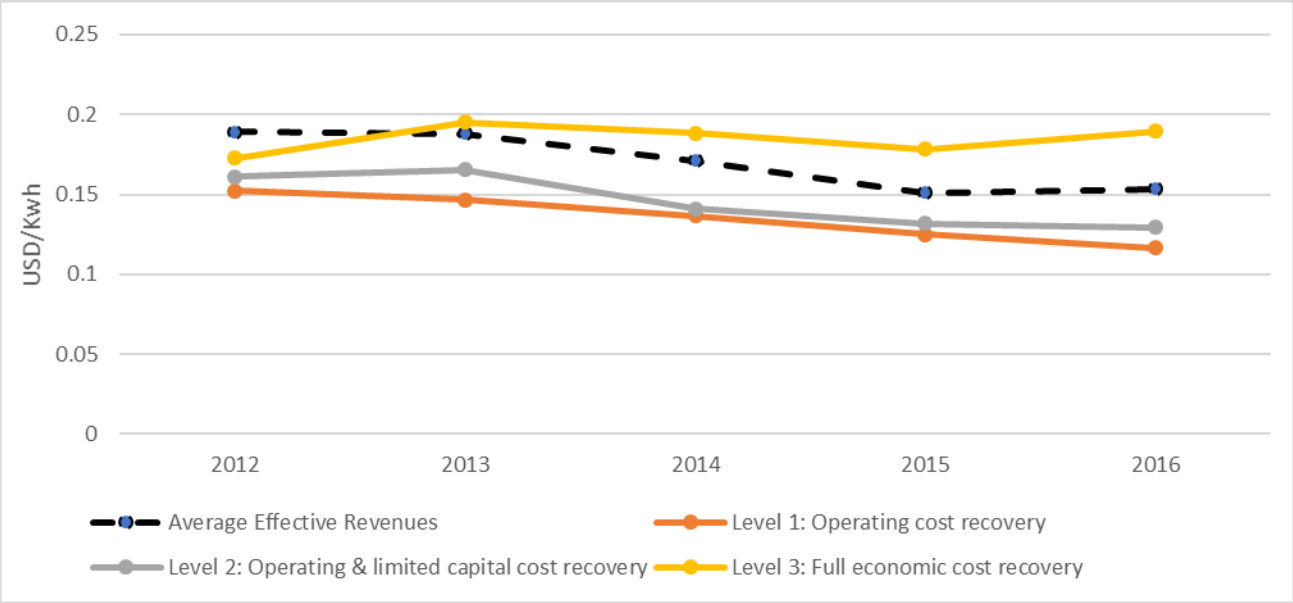
The results from the second stage show that tariffs are broadly cost-reflecting throughout 2012-16, in the sense that the utility is able to cover full operating costs as well as limited capital costs (including debt service, principal repayments and dividend requirements). This is true even when government subsidies are taken into account. The Government of Uganda currently subsidizes payments for available capacity by the power suppliers, a legacy of emergency power deals struck during the extended supply crisis, and makes capital grants to support the rehabilitation and construction of transmission assets, including those constructed by REA. However, no operating costs of the distribution company are covered by the government through budgetary transfers or provision of subsidized goods and services.

Tariffs have followed the general trend in cost fluctuations at level two cost recovery, because of annual updates and quarterly automatic adjustments for inflation, exchange rate, and oil price fluctuations. Nevertheless, tariffs still fall short of what may be needed to cover the full costs of historic and future investments (figure 12). UMEME is working to upgrade the distribution grid to keep up with increasing access and demand and its investments in 2016 totaled US $93 million, or about 24 percent of revenue. This money came entirely through tariffs, IFI loans, and commercial loans. The utility currently has loans from IFC, Standard Chartered Bank, and Stanbic Bank Uganda and the

financing costs increased in 2016 (average of 6.1 percent, compared to 5.7 percent in 2012) because of an increase in the total debt and increase in London Interbank Offered Rate by 57 basis points. Given its strong financials, it is not surprising that UMEME has been able to cover its debt service in each year, with debt service coverage ratios well above 1 in years 2012-2016.

Adequate funding and financing for the investment plan has improved UMEME's technical and financial performance. The utility has made a profit in each year 2012-2016 and is able to pay dividends to its shareholders.

Figure 12: Evolution of full financial cost recovery for Umeme, 2012–2016

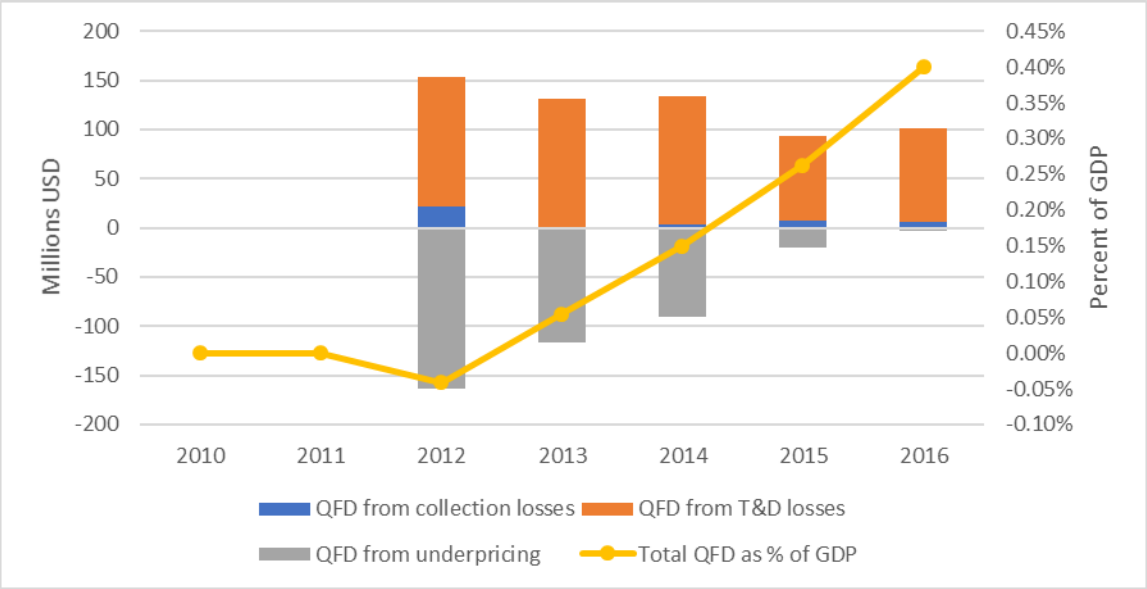


Source: Rethinking Power Sector Reform Project

The quasi-fiscal deficit (QFD) is a measure that compares the revenues of a fully efficient utility charging full capital-cost-recovery tariffs, with those of a real utility. The measure captures the size of the economic gap between efficient costs and revenues and can be disaggregated to reflect how much is attributable to underpricing, undercollection of revenues, and excessive distribution losses. In 2016, QFD comprised on average 0.30 percent of nominal GDP of Uganda (figure 13). There has been a steady increase in the QFD level primarily because the surplus due to average revenues exceeding level two costs has been declining. While there is no QfD attributable to under-recovery of costs, as average revenues still exceed level two cost recovery tariffs, the two are getting closer over time as can be seen in figure 13 wiping out the surplus.

Electricity losses make up over 90 percent of the QfD attributable to UMEME. While system losses declined from 30.0 percent in 2012 to 23.6 percent in 2016, they are still much above the normative level of 5 percent chosen for the study, resulting in a USD 99 million deficit in 2016. Uncollected revenues made up a very small part of total QfD in 2016. Collections reached 100 percent in 2013 but have contributed to the QFD in all other years of the study.

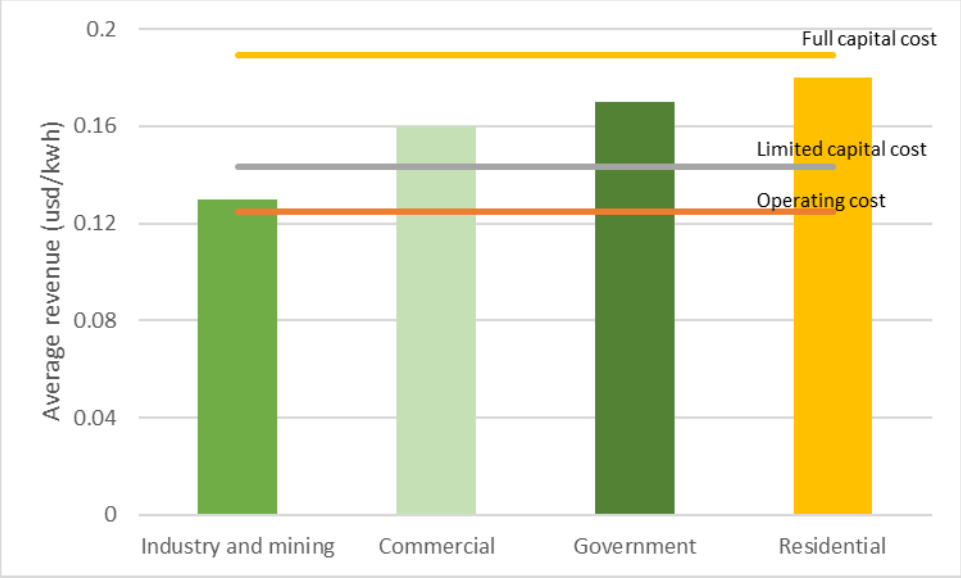
Figure 13: Quasi-fiscal deficit attributable to Umeme, 2012–2016



Source: Rethinking Power Sector Reform Project

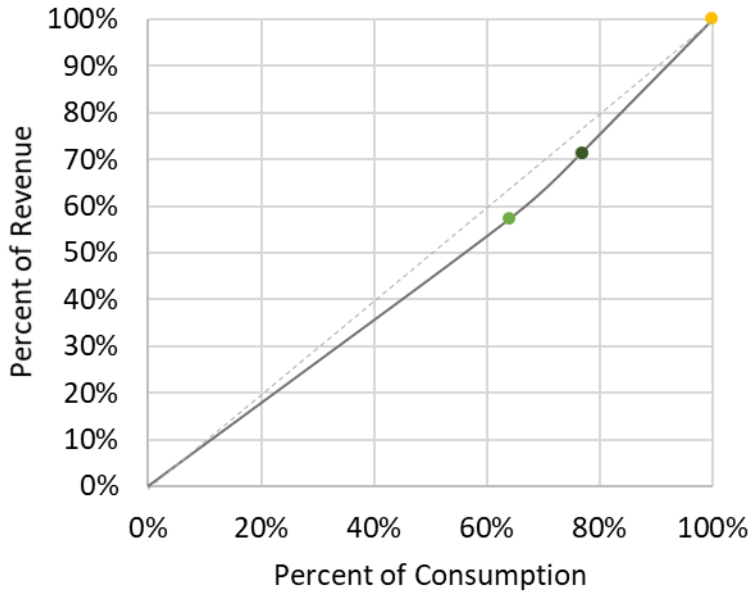
All customer classes, except industry and mining have revenues that exceed level 2 cost recovery. Average revenues for residential customers, which make up 23 percent of consumption, are almost at the level of full capital costs recovery. While residential customers have a two-tier increasing block tariff, street lighting has a single volumetric tariff, and commercial and industrial customers have time-of-use tariffs, with larger industrial customers at lower tariff levels than smaller ones. Figure 14 shows the average tariff revenue for each customer class compared to cost-recovery levels 1-3. Figure 15 compares the percent of consumption for each customer class to the percent of revenue from that class.

Figure 14. Average tariff revenue and cost recovery level by customer group, 2016



Source: Rethinking Power Sector Reform Project

Figure 15. Percentage of revenue against percentage of consumption by customer group, 2016



Source: Rethinking Power Sector Reform Project

On the transmission side, the government subsidizes UETCL's generation capacity payments and provides grants for transmission construction and rehabilitation. In the period of analysis, between 21 percent-75 percent of investments (UETCL) were funded by capital transfers (75 percent in 2012, 39 percent in 2013, 21 percent in 2014 and 31 percent in 2015). Weighted average interest rate on UETCL's borrowings, comprising of very concessional loans from IDA, African Development Bank (AfDB), Japanese Bank of International Cooperation (JBIC) and Agence Française de Development (AFD) is less than 1 percent.

3.4.2 Institutions[17]

Following the establishment of the independent regulator (ERA) through the 1999 Electricity Act, it was operationalized in 2001 and a set of regulations were issued in 2003. In Table 7 below, these are outlined. Among other things, the regulator is responsible for: issuing licenses for electricity generation, transmission, distribution or sale of electricity, and the ownership or operation of transmission systems; establishing a tariff structure, and reviewing and approving tariffs; establishing and enforcing sector standards; and, advising the Minister on matters regarding the needs of the electricity sector, including the production of a power generation master plan as noted above.

Table 7: Regulations issued by ERA in 2003

Code	Details

[17] For a more detailed look at the indices used in this section, see the annex.

The Electricity (Tariff Code) Regulations	Applies to holders of licenses for generation, transmission, system operation, bulk supply, distribution, sale of electricity, export or import, and any other licensed activity; set licenses conditions and the components of tariffs computation.
The Electricity (Quality of Service Code) Regulations	Applies to licensed activities undertaken by persons holding licenses for generation, transmission, system operation, bulk supply, distribution, sale, import or export of electricity and to the interaction between licensees, and between licensees and consumers – and sets provisions regarding minimum service standards, service interruptions, recording and reporting of interruptions, information to consumers, consumer complaints and dispute resolution, service discontinuity, among others.
The Electricity (Primary Grid Code) Regulations	Provides the guidelines and procedures for the licensees of the electric power system to operate the Uganda power system, containing: - System Operations Code (which provides guidelines, criteria and procedures to promote coordinated operation of the Grid System in Uganda); - the Scheduling and Dispatch Code; and, - the Distribution and Retail Sales Code (whose purpose is to regulate the distribution of electricity by a licensee to its consumers, the connection of a consumer's electrical installation to the distribution system, the connection of embedded generating units to the distribution system, the connection of the distribution system to the transmission grid, and the retail sales of electricity to consumers, so that they are all undertaken in a safe, efficient and reliable manner). It also contains provisions on asset management; connection, quality, reliability and safety of supply; embedded generation billing and payment; among others.

A good framework for regulatory governance must balance regulatory accountability to stakeholders with an adequate degree of autonomy for regulatory decision-making. The legal basis for ERA's existence is primary legislation (the 1999 Electricity Act), reflecting international best practices. Benchmarking analysis suggests Uganda performs well on autonomy as well as accountability, both in absolute terms and relative to African neighbors. In terms of accountability, ERA scores well across indicators with the exception of non-government participation in decision making processes on wholesale or PPA prices and oversight of regulated utilities (table 8). ERA undertakes widespread stakeholder engagement with the public, sector agencies, private sector, the media, and government before key decisions are passed. This transparent mode of engagement has earned the regulator public and political respect, which provides a strong foundation from which ERA can independently carry out its responsibilities. In terms of autonomy, ERA's funding is established by law (although there is a fair degree of political discretion in the funds available to the regulator), its decision-making

mandate is wide-ranging, it enjoys a high level of independence when it comes to organizational structure and rules, and there are no formal provisions (at least) under which a ministry or other government body can overturn any of its decisions (see the annex).

Table 8: Formal regulatory governance in Uganda and comparators, 2015[18]

Indicators	Kenya	Senegal	Tanzania	Uganda	International benchmark
Regulatory Governance	56%	50%	65%	59%	59%
Accountability	95%	70%	95%	74%	83%
Regulatory Oversight	*100%*	*67%*	*100%*	*67%*	81%
Legal Appeals	*100%*	*100%*	*100%*	*100%*	100%
Transparency	*85%*	*44%*	*85%*	*55%*	67%
Autonomy	59%	71%	68%	81%	71%
Decision-Making Autonomy	*79%*	*33%*	*86%*	*85%*	79%
Budgetary Autonomy	*94%*	*100%*	*100%*	*100%*	80%
Leadership Autonomy	*63%*	*50%*	*88%*	*88%*	66%
Managerial Autonomy	*0%*	*100%*	*0%*	*50%*	59%

Note: Scores based on index developed for the Rethinking Power Sector Reform Project. For more details go to project website at http://www.esmap.org/rethinking_power_sector_reform

With ERA's powers and capabilities seemingly in line with international best practices, its legal authority over tariff setting and other regulatory functions has also been supported by strong and capable leadership.

Broadly speaking, there are three sets of tariffs: generation tariffs, arising from the PPAs between generators (Eskom Uganda and IPPs) and the single buyer (UETCL), which are approved by ERA; Bulk Supply Tariffs, charged by UETCL to the distribution companies; and End-user Tariffs, charged by distribution companies (mainly Umeme Ltd) to end-users. There are some particularities in the determination of each of these tariffs but, in general, they all follow required revenues (RR) methodology and a rate of return (ROR) regulation is applied. In the case of Umeme, the allowed ROR follows the 20 percent fixed rate of return that is embodied in Umeme's concession contract. The principles governing tariff-setting for end-user tariffs are clearly articulated in the relevant codes and are based on marginal and average costs. A significant limitation of the tariff-setting process is the absence of regulatory accounting standards to structure the submission of cost information from the regulated companies.

ERA sets tariffs through a multi-year tariff setting process (of three-years duration) that is based on revenue requirements and end-user tariffs have been adjusted quarterly, adapting to a certain set of macroeconomic indexes, including the USD-shilling exchange rate, inflation, and the oil price, since the implementation of the ATA in 2014.

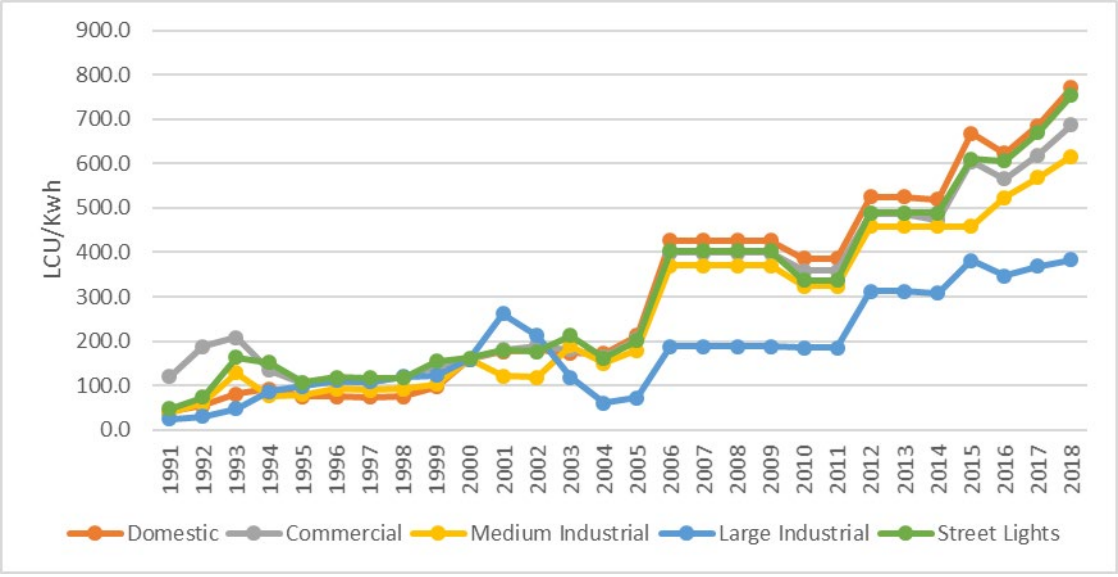
Between 2005 and 2012, the electricity sector revenue requirements were met through a combination of tariffs paid by end-users and subsidies paid by the government (directly from Treasury) and development partners. In these years of chronic crisis, ERA played an important role in maintaining tariff levels – though the government would pay the difference to keep end-user tariffs at a politically manageable level. However, ERA's influence is seen to have increased in the years up to and following

[18] For detailed regulatory indices, see the annex.

the commissioning of Bujagali, supporting the government's decision to suspend subsidies so as to channel funds into other priority infrastructure development projects by engaging with stakeholders and running public information initiatives in order to make the upward adjustment of the end-user tariff by 46 percent in January 2012 feasible. Furthermore, the introduction of the quarterly ATA mechanism for end-user tariffs, which was promoted by ERA for years and which effectively floats electricity prices on the basis of macroeconomic parameters (beyond political control), could not have occurred without ERA's new standing in the sector.

Tariff regulation, as undertaken by ERA, has generally been implemented in accordance with the legal provisions of the Electricity Act. Since the start of the Umeme concession, ERA has applied tariff increases whose cumulative effect has been to increase the average tariff about threefold in Uganda shilling terms. Uganda has experienced multiple tariff adjustments of around 40 percent at a time, and even one 100 percent tariff hike (table 9) . These have been associated either with critical junctures in the reform process, or with emergency supply conditions caused by drought. By and large, the tariff adjustments recommended by the regulator have been implemented, although during the drought period the government decided to introduce subsidies to avoid the need for further tariff increases. Also, following the controversy surrounding the Ministerial Commission's Inquiry into the performance of Umeme, the regulator came under pressure to allow a modest tariff drop of 10 percent. In US dollar terms, the residential tariff has increased from US$0.09 (1990) to US$0.19 (2017) per kilowatt-hour- an increase of 111 percent while in the same time period the tariffs in Ugandan shillings have seen an increase of over 1800 percent .

Figure 16. Actual tariffs in Uganda, by customer class



Source: REA

Regarding the specific substance of the methodology used for tariff regulation, Uganda scores better than other countries in the region and the global benchmark group on the dimension of regulatory substance (92 percent). The regulatory framework for tariffs includes a clear definition of "cost recovery", which is limited to legitimate costs that can be regarded as prudent, used and useful, known and measurable. Thus, only efficient costs are passed through to prices and there are incentive mechanisms in place to lower transmission and distribution losses, O&M costs, as well as to improve collection rates. Regulated entities are required to submit financial information following regulatory

accounting standards. However, since the regulator has not yet developed standards, International Financial Reporting Standards (IFRS) apply.

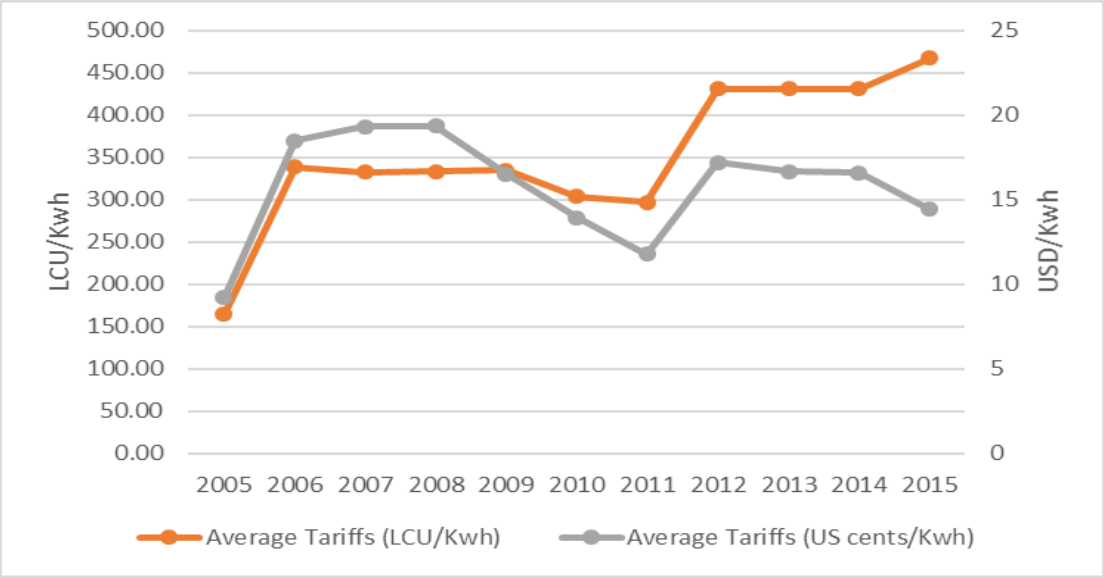
Uganda is one of only a few countries in Sub-Saharan Africa to have introduced since January 2014 a quarterly Automatic Tariff Adjustment that allows formula-based pass-through of changes in consumer and producer prices, as well as exchange rates and oil prices up to a maximum of 10 percent in any given quarter. Since 2014, the ATA has resulted in quarterly tariffs being adjusted in the range of -2.2 percent to 4.8 percent depending on the variables measured.

ERA has authority not only to determine tariff levels, but also to approve tariff structures proposed by utilities. The Tariff Code states that tariffs shall reflect short term variations in costs and that shall be structured and developed in such way as to reflect variations in costs imposed on the system by the time of use, seasonal factors, consumer load profile, voltage levels and similar factors.

Table 9: History of regulatory tariff revisions for Umeme

Date	Tariff Adjustment		Comments
	Proposed by Regulator	Applied by Utility	
2006	+41%	+41%	Needed to cover additional costs of EPPs during drought period
2006 (II)	+35%	+35%	
2009	0%	-10%	Made in response to Ministerial Commission of Inquiry into Umeme concession
2012	+46.0%	+46.0%	Made following commissioning of Bujagali
2013	+8.9%	+8.9%	Supplementary increase made to offset change in government policy on subsidies.
2016	+18.0%	+18.0%	Routine regulatory tariff review.
2001-16	+357.12%	+321.41%	

Figure 17: Average tariffs in Uganda, Ugandan shillings vs USD



ERA also performs well when it comes to market regulation, scoring 83 percent. However, this high score does not translate in to performance on the ground as the government can and has undertaken

direct negotiation of new power projects, with ERA only coming in at a later stage to provide licenses, as occurred for example with the recent Karuma and Isimba licenses. The government has also developed incentives, such as concessional loans, sovereign guarantees, and feed-in tariffs, in order to attract private sector participation and investment in new generation.

Table 10. Formal regulatory substance in Uganda and comparators, 2015[19]

Indicators	Kenya	Senegal	Tanzania	Uganda	International benchmark
Regulatory Substance	81%	73%	83%	78%	76%
Tariff Regulation	88%	76%	88%	92%	77%
Regulatory Framework for Tariffs	*100%*	*86%*	*100%*	*100%*	90%
Determination of Tariffs	*75%*	*67%*	*75%*	*83%*	64%
Quality Regulation	54%	42%	63%	58%	75%
Quality of Service Standards	*75%*	*50%*	*75%*	*50%*	82%
Quality of Service Enforcement	*33%*	*33%*	*50%*	*67%*	68%
Market Entry Regulation	100%	100%	100%	83%	77%
Permitting New Entrants	*100%*	*100%*	*100%*	*100%*	90%
PPA Approvals	*100%*	*NAP*	*100%*	*67%*	57%

Note: Scores based on index developed for the Rethinking Power Sector Reform Project. For more details go to project website at http://www.esmap.org/rethinking_power_sector_reform

Turning to the issue of quality regulation, ERA's performance is more in line with other Sub-Saharan African countries in the global benchmark group – all of which are below the average (table 10). Though the 2003 Grid Code and the Quality of Service Code for Uganda prescribe a number of methods that can be used to derive and describe compliance to quality of service and supply standards and the Electricity Act sets legal provisions for the regulator to enforce these standards through penalties, the impact and implementation of these codes has been somewhat limited by the lack of adequate infrastructure for remote control and monitoring systems. What's more, there are no fines for failing to meet published quality of service performance targets and related technical data is not disclosed to the public. In fact, quality of supply remains a major concern and despite ERA setting quality of supply standards there is inadequate monitoring and enforcement.

3.4.3 Summary

The steady development of regulatory capacity, autonomy and accountability has proved to be one of the most successful aspects of reforms in Uganda. ERA has benefited from strong legislation and (in its early years) the support of the MoFPED in steadily building capacity and a robust regulatory culture, that has increasingly been able to engage constructively with stakeholders. Uganda is one of the only countries in the region where the sector is considered broadly financially viable and tariffs are close to cost-reflective although power remains expensive. Uganda outperforms other countries in the region and the global benchmark group when it comes to tariff regulation. The historic record shows that the regulator has been able to implement the successive substantial tariff increases needed to get close to cost recovery for the sector. In fact, ERA is one of the few regulators among the rethinking economies where there is not much difference between the written legal and regulatory framework and the actual perception of how these are implemented (table 11). However, in the case of quality

[19] For detailed regulatory indices, see the annex.

regulation, ERA has not been able to keep up its high performance with inadequate monitoring and enforcement of quality of supply and service in the country.

Table 11 Power sector regulation in Uganda: de jure vs perceived performance[20]

Indicators	De Jure	Perceived
Overall Regulation	**46%**	**48%**
Regulatory Governance	59%	68%
Accountability	74%	88%
Regulatory Oversight	*67%*	100%
Legal Appeals	*100%*	100%
Transparency	*55%*	64%
Autonomy	81%	78%
Decision-Making Autonomy	*85%*	62%
Budgetary Autonomy	*100%*	100%
Leadership Autonomy	*88%*	100%
Managerial Autonomy	*50%*	50%
Regulatory Substance	78%	71%
Tariff Regulation	92%	83%
Regulatory Framework for Tariffs	*100%*	100%
Determination of Tariffs	*83%*	67%
Quality Regulation	58%	46%
Quality of Service Standards	*50%*	25%
Quality of Service Enforcement	*67%*	67%
Market Entry Regulation	83%	83%
Permitting New Entrants	*100%*	100%
PPA Approvals	*67%*	67%

[20] The perceived indicators are higher than the de jure indicators, indicating that the some of the best practices are applied even though they are not part of the written rules and regulations.

4 Conclusion: Extensive reforms, future challenges, and useful lessons

Uganda's power sector structure is among the most sophisticated in Sub-Saharan Africa, with a fully unbundled utility, an independent regulator, and private concessions in generation and distribution segments, as well as Independent Power Producers. Moreover, Uganda is one of only a handful of countries in the region where tariffs are close to being cost reflective. While reforms were swift and comprehensive, following the 1999 Electricity Act, significant difficulties were encountered along the way that prevented the benefits of reform from materializing until much later. The failed first attempt with the Bujagali Hydropower IPP left the country heavily exposed to the 2005/06 and 2010/12 droughts, which in turn created difficulties for the new private distribution utility, Umeme, and led to a relaxation of the regulatory performance targets for the concession. This situation led to a build-up of frustration with the new operator and the launch of two public enquiries, both of which recommended termination of the concession. Only in 2012, with the easing of drought conditions and the completion of the Bujagali Hydropower Project following a second IPP arrangement, was there a material improvement in the availability of power. This made it possible to set more demanding performance targets for the concessionaire, Umeme, which fed through into substantial improvements in operational efficiency and accelerating service coverage. While the reform model was eventually able to deliver results, the associated cost was comparatively high due to the 20 percent guaranteed rate of return in the Umeme concession, as well as the US$0.10 per kilowatt-hour power purchase tariff under Bujagali. Furthermore, the extension of the private concession model to financially unviable rural areas did not prove to be successful, and it was only following the adoption of a revised approach in 2012, built around government-led donor-funded expansion of rural networks, that access rates finally began to pick up.

By way of conclusion, this section provides a summary assessment of how Uganda's power sector performance on key dimensions such as security of supply, access and affordability, sector efficiency and cost recovery evolved since the inception of reforms in 1999, and in particular evaluates the extent to which different institutional reforms may or may not have contributed to the evolution of performance (table 12). Thereafter, it goes on to distill some of the main lessons learned from Uganda's experience that may be relevant to the wider global community.

On security of supply, Uganda has moved from a situation of acute supply shortages and vulnerability to drought in the early 2000s, to an acceptable supply-demand balance currently, and the expectation of a potentially sizeable surplus once two new hydro-power projects are completed. Diversification away from hydro-power has so far been limited to small-scale developments in wind, solar and small-scale hydropower through the GET FiT program. Notwithstanding this good outcome, the journey has been characterized by major delays in the commissioning of plants that left the country suffering from serious power shortages during the period 2006-12 and shouldering a heavy financial burden associated with Emergency Power Projects. Furthermore, the first round Bujagali project illustrated the governance challenges associated with the IPP model, while the second round Bujagali project illustrated that costs could still be significant even when the procurement process was carefully structured. These experiences have led the government to move back towards a public procurement process for the two ongoing hydro projects at Karuma and Isimba. The underlying reason for the difficulties Uganda experienced in achieving security of supply was a lack of focus on strengthening capacity for generation planning and procurement of new plants, which remain a vulnerability.

On access and affordability, Uganda's reform process predates the upswing of universal access on the political agenda. Thus, despite electrification of only 8 percent in 1999, access was not really a focus of the reform. During the early 2000s, the power supply crisis combined with the lack of explicit access targets for the private concessionaire, Umeme, meant that progress on electrification was modest in urban areas. At the same time, reliance on 10 small-scale private concessionaires to lead service expansion in rural areas yielded limited results due to the lack of financial viability of the service areas. However, a change of strategy around 2012 led to a marked acceleration with access climbing from 16 percent in 2012 to 27 percent in 2016. This was achieved by implementing programs with substantial donor finance to support grid densification and reduce connection charges. At the same time, public investment for rural electrification was scaled up through REA. However, high electricity tariffs present a significant challenge in expanding access as power bills consume a large part of household incomes for the bottom half of the society. Nevertheless, Uganda's electrification strategy remains heavily grid focused, and has yet to fully harness the potential of off-grid approaches.

On operational efficiency and financial viability, Umeme's performance was initially slow to improve due to the difficulties created by power shortages and the relaxation of targets during the "special provisions period". This led to significant discontent manifest in two separate public enquiries that recommended the termination of the concession in 2009 and 2011. However, following the commission of Bujagali in 2012 and the setting of new regulatory targets, performance showed a marked improvement. Relative to the starting point in 2005, collection rates climbed from 80 percent to almost 100 percent, while technical losses fell from 38 percent in 2005 to 17 percent in 2016. These figures place Umeme among the better performing utilities in Sub-Saharan Africa. The company has also shown rising profitability and – following its listing on the Ugandan Securities Exchange in 2012 – has been able to attract local and international investors. Nevertheless, based on the terms of its concession contract, Umeme is allowed a fixed 20 percent rate of return on all investments allowed by the regulator, and this has had a significant impact on consumer tariffs.

On tariffs and cost-recovery, Uganda has been successful in establishing a capable regulatory entity in the form of ERA. The tariff regulation process follows international standards and has been applied according to design on at least half a dozen occasions, including many when the requisite tariff adjustments have been well into double digits. As a result, Umeme is one of only a handful of utilities in Sub-Saharan Africa to be close to complete cost recovery through tariffs. Notwithstanding, this has meant that electricity consumers have faced cumulative nominal tariff increases of nearly threefold since the onset of the reform process; albeit that the US dollar value of the tariff has only moved from $0.11 to $0.19. Finally, the introduction of an Automatic Tariff Adjustment mechanism in 2014, which was done through a process of careful stakeholder consultation, further safeguards the financial equilibrium of the sector from exogenous factors such as the oil price, the exchange rate and price inflation.

Table 12: Summary of Uganda's power sector reform efforts

	Performance	Institutions
Security of Supply	After decades of insufficient supply and then drought related crises, Uganda has experienced greater stability since the commissioning of the Bujagali Hydropower	Opening the market to IPPs did not deliver intended benefits immediately, due to Uganda's relatively low attractiveness to

	IPP, in 2012 and a raft of smaller renewable IPPs, through GET FiT, from 2015 onward. Though the supply-demand balance is again tightening, Uganda will likely move into a situation of surplus once two large hydro projects (Isimba and Karuma) underway come online as forecast.	investors in the 1990s/2000s and decreased risk appetite following the Enron scandal. The commissioning of Bujagali brought immediate sector-wide benefits. Yet the high cost of the project, weakened appetite for the continuation of this approach, leading the Government to revert to more of a state-led approach. Two fundamental issues remain unresolved. First, the lack of formalized arrangements for adhering to system planning and timely procurement of plants, and second, the lack of coordination among various entities in the sector.
Access & Affordability	Long term progress has been slow, but emerging indications suggest a dramatic improvement in recent years – driven by increased political support, ambitious targets and development partner programmes. Major gains have been made in urban areas, less so in rural areas. Affordability is a significant issue.	The private distribution model has helped to increase access in urban areas, but only once close regulatory supervision and substantial donor funding came into play. Private concessionaires did not prove to be effective in rural areas due to weak financial viability. Greater government involvement in rural areas, with support from development partner programs, proving to be more fruitful.
Efficiency & Financial Viability	Following a slow start from 2005-10, operational efficiency and financial performance of the utility subsequently improved considerably under private management (Umeme). Uganda is one of the only countries in Sub-Saharan Africa that has a financially viable power sector.	The 20-year private concession model has begun to deliver in Uganda, due to strong legal agreements and supportive regulation. However, the early years of the concession were largely lost due to the exceptional pressures caused by the power supply crisis.
Tariffs & Cost Recovery	Uganda is one of the only countries in Sub-Saharan Africa with cost-reflective tariffs (since 2012), made possible through effective regulation and strong legislation. The flipside of this is that consumers have shouldered substantial cumulative tariff increases.	The regulator, ERA, benefits from a good legislative foundation and has built strong technical capacity and effective stakeholder engagement strategies. Uganda operates a sound tariff review methodology, and has also succeeded in implementing an Automatic Tariff Adjustment Mechanism.

Uganda's rich power sector reform experience offers a number of important lessons for other countries that are considering these kinds of reforms.

First, even when reforms are rapidly implemented, results may be slow to materialize if sector fundamentals are not yet in place. Uganda's adoption of power sector reform was swift and comprehensive, with unbundling, privatization, liberalization and regulation all being introduced within a few years. Nevertheless, the fundamental shortage of electricity in the power system prevented the distribution concessionaire from operating effectively and led to a long delay before

performance improvements started to come through. There is clearly a danger in advancing with distribution reforms, until the generation sector can deliver on power supply, since power shortages seriously impair the performance of distribution utilities yet lie largely beyond their control.

Second, political support for a reform process can be expected to dwindle unless results are demonstrated relatively quickly. The several years of delay between the awarding of the Umeme concession and the full turnaround in the company's performance led to mounting frustration among stakeholders, leading to two successive official inquiries on the concession. Even though the concessionaire eventually delivered substantial improvements in operational efficiency, coverage and financial viability; it can be difficult to overcome such perceptions once they have been formed.

Third, planning and procurement capabilities are essential to the functioning of the sector, yet too often overlooked in power sector reforms. Lack of coordination among various entities in the sector is proving to be a critical issue. Deficiencies in the procurement process surrounding the first Bujagali project were responsible for the delays in project implementation and ultimately left Uganda exposed to drought conditions and power shortages. Yet strengthening planning and procurement capabilities – to ensure that least cost projects can be procured at least cost – did not feature as part of the reform agenda.

Fourth, relying solely on the profit motive of the distribution utility is unlikely to provide a strong enough incentive for accelerating electrification. Uganda initially relied largely on private concessionaires both in urban and rural areas, but progress was slow. This was due to the weak financial viability of extending service, as well as barriers created by high connection charges. Turning this around required a substantial injection of government and donor resources.

Fifth, private sector investment may come at a significant cost. Despite being an unproven market, Uganda was successful in capturing a substantial amount of private sector investment both in generation (more than $1.0b) and in distribution (US$565m by Umeme), freeing-up significant fiscal resources that could eventually be directed towards energy access and other social goals. Nevertheless, private investors required significant compensation for the associated risks. The Umeme concession entailed a fixed rate of return of 20 percent on investments, while the Bujagali Hydro-power Project required a power purchase tariff of US$0.10 per kilowatt-hour. The need to recover these costs from consumers necessitated cumulative threefold tariff increases for consumers since the outset of reform.

Sixth, a capable regulator can contribute significantly to sector outcomes. Uganda was able to create a strong regulatory competence that proved critical to the implementation of the reform. On the one hand, the regulator played a pivotal role in the achievement and maintenance of cost recovery in the sector, managing a series of challenging tariff reviews and introducing the Automatic Tariff Adjustment mechanism. On the other hand, the regulator's enforcement of the performance targets negotiated under the contract helped to ensure that the concessionaire delivered on key results.

To conclude, Uganda's experience illustrates the complexity of power sector reform and the need for all the different parts of the sector – from generation to distribution, from planning to regulation – to function effectively if significant and sustainable improvements are to be achieved.

5 Annex: Detailed RPSR Indices

A. Generation and transmission planning index for Uganda and comparators, 2015

	Kenya	Senegal	Tanzania	Uganda	International Benchmark
Generation Planning	86%	43%	43%	43%	56%
Country has a generation master plan	○	○	○	○	94%
Country has an overall energy plan	○	●	●	○	65%
Competent entity is responsible for producing the plan	○	○	○	○	88%
Inter-governmental committee oversees the planning unit	○	●	●	●	29%
Power generation system plan is mandatory	●	○	●	●	19%
Plan leads to timely initiation of procurement	○	●	●	●	38%
Planning process is transparent and participatory	○	●	○	●	59%
Transmission Planning	75%	100%	75%	75%	72%
Competent entity is responsible for producing the plan	○	○	○	○	100%
Explicitly linked to power generation plans	○	○	○	○	88%
Plan is mandatory	●	○	●	●	29%
Planning process is transparent and participatory	○	○	○	○	71%

B. Generation and transmission procurement index for Uganda and comparators, 2015

	Kenya	Senegal	Tanzania	Uganda	International Benchmark
Procurement of Generation	100%	50%	100%	95%	85%
There is a framework for procurement	○	●	○	○	82%
Country allows International competetive bidding or public auctions for procurement	○	○	○	○	94%
Types of procurement methods allowed					
Unsolicited bids	○	●	○	○	29%
Direct negotiation	○	●	○	●	47%
International competitive tendering	○	○	○	○	88%
Public auctions	●	●	●	○	41%
Stand-alone capacity market	●	●	●	●	0%
Auction design score	NAP	NAP	NAP	0.86	80%
Country uses public auctions for procurement	●	●	●	○	41%
Clear and comprehensive established rules	*NAP*	*NAP*	*NAP*	○	100%
Credible penalties for violating the rules	*NAP*	*NAP*	*NAP*	○	86%
Guarantees and penalties to ensure timely completion	*NAP*	*NAP*	*NAP*	○	86%
Standard, non-negotiable contracts	*NAP*	*NAP*	*NAP*	○	86%
Stapled financing terms or risk mitigation instruments	*NAP*	*NAP*	*NAP*	○	86%
No concerns regarding the transparency and fairness of the auction	*NAP*	*NAP*	*NAP*	●	14%
Efforts to inform and attract bidders to the auction	*NAP*	*NAP*	*NAP*	○	100%
Transmission Procurement	67%	42%	92%	92%	64%
Framework for procurement of new transmission lines	○	●	○	○	59%
Methods used to procure new transmission-	●	●	●	●	69%
Competitive tender	●	○	○	○	65%
Direct negotiation	●	○	○	○	24%
All projects are awarded to the incumbent transmission company	○	●	●	●	47%

○	Satisfactory result
●	Unsatrifactory result
NAP	Not applicable
NAV	Not available

C. Access policy framework index for Uganda and comparators, 2015

	Kenya	Senegal	Tanzania	Uganda	International benchmark
Energy Access Regulation	81%	28%	81%	65%	56%
Regulation of New Connections	75%	50%	94%	79%	65%
Roles of regulator, utility, rural electrification agency clearly defined	○	○	○	○	93%
Utilities have regulatory obligation to connect new customers	○	○	○	○	94%
Regulatory entity has authority to approve connection charges for new customers	○	●	○	○	71%
Connection charges are set using shallow entry	○	NAP	○	○	58%
Government provides subsidy for new connections	○	●	○	○	53%
Connection has to be provided in a specified time	○	○	○	○	94%
Regulatory entity monitors tiem taken to provide new connections	●	○	○	○	44%
Regulator has authority to levy penalties for not connecting customers on time	NAP	○	○	●	71%
Time taken to provide connections publicly available	●	●	○	●	24%
There are connection charges	○	●	○	○	94%
Customer pays limited connection charges	●	NAP	●	●	43%
Connection charge is publicly available	○	●	○	○	71%
Regulation of solar home systems	100%	0%	50%	50%	66%
Minimum technical standards and post-installation warranty requirements for solar home systems	○	●	○	○	71%
Regulator reviews and approves prices of surplus SHS sales of electricity to the grid operator	○	NAV	●	●	62%
Regulation of mini-grids	67%	33%	100%	67%	44%
Privately owned mini-grids legally allowed to operate	○	○	○	○	81%
Clear options for mini-grid operator when the interconnected grid reaches the area, including compensation	●	●	○	●	7%
Subsidy or other mechanism to help mini-grid operators recover their costs	○	●	○	○	47%

D. Corporate governance- accountability index for Uganda and comparators, 2015

Corporate Governance	Kenya Kenya Power	Senegal SENELEC	Tanzania TANESCO	Uganda UMEME	International benchmark
Accountability	100%	58%	58%	92%	60%
Private or public shareholders appoint board	○	●	●	○	36%
Transparent process exists for Board selection	○	●	●	●	36%
Board members cannot be removed at will	○	●	●	○	29%
Chairperson & CEO are separate positions	○	○	○	○	75%
Function of Company Secretary exists	○	○	○	○	82%
Board Sub-Committees for different issues	○	○	○	○	68%
Audit committee of the Board	○	○	○	○	71%
Board Code of Conduct exists	○	●	○	○	64%
Requirement to declare conflicts of interest	○	○	○	○	75%
Utility has carried out any third party transactions in last five yrs	○	○	○	○	46%
Minority shareholders' rights are protected	○	●	●	○	39%
Utility publishes an Annual Report	○	○	●	○	93%

○	Satisfactory result
●	Unsatrifactory result
NAP	Not applicable
NAV	Not available

E. Corporate governance- autonomy index for Uganda and comparators, 2015

Corporate Governance	Kenya Kenya Power	Senegal SENELEC	Tanzania TANESCO	Uganda UMEME	International benchmark
Autonomy (SOEs)	100%	89%	56%	78%	63%
Board is the final body to take decision on-					
Defining corporate strategy	○	○	○	○	96%
Approving business plans	○	○	○	○	96%
Setting and monitoring performing objectives	○	○	○	○	92%
Selecting, appointing and overseeing the CEO	○	○	●	○	56%
Raising capital from debt	○	○	●	○	68%
Raising capital from equity	○	○	●	○	48%
Major capital expenditures	○	○	○	○	88%
Deciding and implementing tariff adjustments	○	○	●	●	24%
Human resource hiring and firing decisions	○	●	○	●	72%

F. Utility management- financial discipline index for Uganda and comparators, 2015

Utility Management	Kenya Kenya Power	Senegal SENELEC	Tanzania TANESCO	Uganda UMEME	International benchmark
Financial Discipline	76%	57%	64%	77%	59%
Utility has a credit rating	●	●	●	●	36%
Utility can issue new bonds	○	●	●	○	36%
Utility can issue new equity	○	○	●	○	26%
Utility pays dividends to shareholders	○	●	●	○	29%
Public service obligations are explicitly defined	○	●	●	●	46%
PSO is publicly disclosed	●	NAP	NAP	NAP	38%
PSOs are costed	●	NAP	NAP	NAP	0%
PSOs are compensated by government	●	NAP	NAP	NAP	0%
Utility required to meet financial performance targets	○	●	○	NAP	52%
System of internal financial controls exists	○	○	○	○	96%
Internal audit function exists	○	○	○	○	93%
Utility is subject to state auditing procedures	○	○	○	●	71%
Financial accounts are produced	○	○	○	○	96%
Financial accounts are audited by external auditor	○	○	○	○	93%
Financial accounts are publicly disclosed	○	○	○	○	79%
Financial accounts meet national standards	○	○	○	○	82%
Financial accounts meet international standards	○	●	○	○	57%

○	Satisfactory result
●	Unsatrifactory result
NAP	Not applicable
NAV	Not available

G. Utility management- human resources index for Uganda and comparators, 2015

Utility Management	Kenya Kenya Power	Senegal SENELEC	Tanzania TANESCO	Uganda UMEME	International benchmark
Human Resource	64%	57%	71%	71%	62%
Annual staff performance reviews exist	○	○	○	○	93%
Employees receive performance related bonuses	○	●	○	○	70%
Employees can be fired for poor performance	○	○	○	○	79%
Government employment regulation don't apply	●	○	●	●	26%
Wages not based on government pay scales	●	○	○	○	48%
Staff training policy exists	○	●	○	○	86%
Managers are free to hire employees	●	●	●	●	12%
Managers are free to fire employees	●	●	●	●	24%
Managers can execute budget	○	○	○	●	60%
Managers can implement investment projects	●	○	●	○	44%
Recruitment involves advertisment of positions	○	●	○	○	71%
Recruitment involves short-listing candidates	○	●	○	○	89%
Recruitment involves interviewing candidates	○	○	○	○	82%
Recruitment involves reference checks	○	○	○	○	75%

H. Utility management- information & technology index for Uganda and comparator, 2015

Utility Management	Kenya Kenya Power	Senegal SENELEC	Tanzania TANESCO	Uganda UMEME	International benchmark
Information and Technology	100%	53%	60%	80%	71%
SCADA system	○	○	○	○	93%
IT system to support incidence resolution	○	○	●	○	75%
IT system to support distribution management	○	○	●	○	79%
IT system to support energy management	○	○	●	●	64%
Geographic Information System (GIS)	○	●	○	○	78%
KPIs are used to monitor quality of supply	○	○	○	○	100%
Advanced Metering Infrastructure (AMI)	○	●	●	○	52%
Accurate customer database	○	○	○	○	96%
Call center for dealing with customer complaints	○	○	○	○	96%
Website for submission of customer complaints	○	●	○	●	85%
Customer satisfaction regularly monitored	○	●	○	●	59%
Commercial management system (CMS)	○	●	●	○	41%
Resource Management System (RMS)	○	●	●	○	35%
KPIs are used to monitor commercial cycle	○	○	○	○	86%
KPIs are used to monitor corporate resource management	○	●	○	○	54%

○	Satisfactory result
●	Unsatrifactory result
NAP	Not applicable
NAV	Not available

I. Regulatory governance- accountability index for Uganda and comparators, 2015

Regulatory governance		Kenya	Senegal	Tanzania	Uganda	International benchmark
Accountability		**95%**	**70%**	**95%**	**74%**	83%
Regulatory oversight		100%	67%	100%	67%	81%
Regulator's objectives formally stated in law		○	○	○	○	100%
Regulator required to report on its activities		○	○	○	○	88%
Independent third party evaluations of regulator have taken place		○	●	○	●	56%
Legal appeals		100%	100%	100%	100%	100%
Legally established process to challenge/appeal		○	○	○	○	100%
Transparency		85%	44%	85%	55%	67%
Publicly availabe annual reports		○	○	○	○	94%
Recommendations are required to be made public		●	●	●	●	33%
Government body receiving recommendations required to respond publicly		●	●	●	●	33%
Regulator is required to publish its decisions on-	End-user tariffs	○	○	○	○	100%
	Licensing generation or supply	○	○	○	○	100%
	Wholesale or PPA prices and contract terms	○	NAP	○	○	100%
	Market design	○	NAP	○	NAP	100%
	Oversight of regulated utilities	○	●	○	●	85%
Regulatory decision-making process legally requires the participation of non-government stakeholders in case of-	End-user tariffs	○	○	○	○	69%
	Licensing generation or supply	○	●	○	○	69%
	Wholesale or PPA prices and contract terms	○	NAP	○	●	38%
	Market design	○	NAP	○	NAP	30%
	Oversight of regulated utilities	○	●	○	●	38%

○	Satisfactory result
●	Unsatrifactory result
NAP	Not applicable
NAV	Not available

J. Regulatory governance- autonomy index for Uganda and comparators, 2015

Regulatory governance		Kenya	Senegal	Tanzania	Uganda	International benchmark
Autonomy		**59%**	**71%**	**68%**	**81%**	**71%**
Decision-making autonomy		**79%**	**33%**	**86%**	**85%**	**79%**
Areas where entity has a mandate to regulate-	End-user tariffs	○	○	○	○	100%
	Quality of supply and service	○	○	○	○	100%
	Electrification or increased access to energy	○	●	○	○	53%
Decision of the regulatory entity are legally binding in the area of-	End-user tariffs	○	○	○	○	88%
	Grid access charges	○	●	○	○	87%
	PPA/wholesale prices	○	NAP	○	○	92%
	Quality of supply/service	○	●	○	○	87%
	Market design	●	NAP	●	NAP	50%
	Licensing	○	●	○	○	85%
	Utility oversight	●	●	○	○	71%
Government body rejecting or modifying regulatory decisions		●	●	●	●	17%
Law precribes decision making process for-	End-user tariffs	○	○	○	○	94%
	Grid access charges	○	●	○	●	81%
	Quality of supply/service	○	●	○	○	87%
Budgetary autonomy		**94%**	**100%**	**100%**	**100%**	**80%**
Funding for regulator established by law		○	○	○	○	100%
Percentage of regulator's budget that comes from levies or taxes		0.88	1	1	1	59%
Leadership autonomy		**63%**	**50%**	**88%**	**88%**	**66%**
Legal basis for existence is primary legislation		○	○	○	○	100%
Power to determine own organizational structure and rules		●	●	○	○	50%
Power to determine the allocation and use of budget		●	●	○	●	44%
Legal requirements or restrictions regarding professional profile of leadership		○	○	○	○	94%
There is a fixed term for the leadership of the regulatory entity		○	○	○	○	88%
Legal provisions under which leadership an be removed from office		○	○	●	○	75%
Current leadership of entity connected to government or utilities		●	●	○	○	25%
Over 60% of employees are in technical positions		○	●	○	○	57%
Managerial autonomy		**0%**	**100%**	**0%**	**50%**	**59%**
Pay scale not linked to govt pay scale or is 90% of utility pay scale		●	○	●	●	53%
Not required to follow govt employment regulations		●	○	●	○	63%

○	Satisfactory result
●	Unsatrifactory result
NAP	Not applicable
NAV	Not available

K. Regulatory substance- tariff regulation index for Uganda and comparators, 2015

Regulatory substance	Kenya	Senegal	Tanzania	Uganda	International Benchmark
Tariff regulation	88%	76%	88%	92%	77%
Regulatory framework for tariffs	100%	86%	100%	100%	90%
Objectives in determining tariffs mentioned explicitly in policy or legal mandate	○	○	○	○	100%
Principles of tariff-setting clearly articulated	○	○	○	○	88%
Authority over the tariff level	○	○	○	○	94%
Clear definition of "cost recovery"	○	●	○	○	88%
Legitimacy of costs is used as a basis for tariff calculations	○	○	○	○	88%
Tariff-setting based on a clearly specified regulatory framework	○	○	○	○	88%
Frequency and schedule of revisions determined by law or regulation	NAP	○	NAP	NAP	75%
Determination of tariffs	75%	67%	75%	83%	64%
Publicly available written formula is to be used for tariff setting and utilities are legally required to adhere to it	○	○	○	○	88%
Avoid passing-through inefficient costs to customers	○	○	○	○	76%
Requirement to submit financial information according to set standards	●	●	●	○	53%
Users bear the costs of incentive mechanisms for renewable energy generation	○	NAP	○	●	75%
Regulatory mechanisms to compensate generators for the provision of firm capacity or ancillary services	NAP	NAP	NAP	○	58%
Utilities are compensated for the costs of stranded assets	NAP	NAP	NAP	○	25%

○	Satisfactory result
●	Unsatrifactory result
NAP	Not applicable
NAV	Not available

L. Regulatory substance- quality of supply index for Uganda and comparators, 2015

Regulatory substance	Kenya	Senegal	Tanzania	Uganda	International benchmark
Quality regulation	54%	42%	63%	58%	75%
Quality of service standards	75%	50%	75%	50%	82%
Requirement to meet quality of service standards	○	○	○	○	100%
Specific quality of service standards are formally written and publicly available for- quality of the product, quality of the service and customer service	○	○	○	○	97%
Performance on quality of service standards is public	○	●	●	●	71%
Fines for failing to meet quality of service standards	●	●	○	●	59%
Quality of service enforcement	33%	33%	50%	67%	68%
Requirement to report technical data on a periodic basis	○	○	○	○	100%
Regulator specifies how to collect technical performance data	●	●	○	○	71%
Regulator reviews or validates technical performance data	●	●	○	○	47%
Automated information management systems are required to measure the quality or reliability of the power supply	○	●	●	○	71%
Measurements of the quality or reliability of power supply are made public	●	●	●	●	65%
Financial incentives to meet customer service standards or increase customer satisfaction	●	○	●	●	53%

○	Satisfactory result
●	Unsatrifactory result
NAP	Not applicable
NAV	Not available

M. Regulatory substance- market entry index for Uganda and comparators, 2015

Regulatory substance	Kenya	Senegal	Tanzania	Uganda	International benchmark
Market entry regulation	100%	100%	100%	83%	77%
Permitting new entrants	100%	100%	100%	100%	90%
Responsible for monitoring compliance with the terms of the license or permit	○	○	○	○	88%
Authority to impose penalties for violating license or permit terms	○	○	○	○	100%
Penalties are formally written and publicly available	○	○	○	○	80%
Provisions to force companies to relinquish licenses or permits for violation	○	○	○	○	100%
PPA approvals	100%	NAP	100%	67%	57%
Legally required to approve all power sales contracts either directly or indirectly	○	●	○	○	59%
Approve or refuse a proposed PPA in a legally specified period of time	○	NAP	○	●	60%
Authority over the process by which utilities can select or procure power from IPPs	○	○	○	○	50%

○	Satisfactory result
●	Unsatrifactory result
NAP	Not applicable
NAV	Not available