ENERGY-RELATED SERVICES IN KENYA: IMPLICATIONS OF UNBUNDLING THE ELECTRICITY SECTOR ON TRADE IN SERVICES NEGOTIATIONS

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ABSTRACT

Electricity is a basic infrastructural service necessary for the achievement of developmental outcomes. The use of electricity, specifically, serves economic as well as social needs. It is universally accepted that electrification enhances quality of life at the household level and stimulates the economy at a broader level. Given its substantial benefits, electrification together with other sources of modern energy such as renewable energy, has been identified as essential for fulfilling the Millennium Development Goals (UNDP, 2005). In most cases, the main challenge in the achievement of these goals is the bundled nature of the electricity supply chain in majority of developing countries. This necessitated the need for policy reforms with the aim of unbundling the sector in Kenya.

The literature review sets out to consider the main features of the electricity sector to better understand the legal and regulatory reforms that have taken place in the electricity sector and the impact of the liberalization on rural electrification and the poor in society. It takes note of the changing role of government in the sector with the liberalization and privatization, which has entailed the unbundling of the vertically integrated state-owned utility that has led to the introduction of competition in some segments of the electricity sector value chain such as generation and distribution. In addition, the review considers the classification related issues arising from the reforms that have taken place in the electricity sector and the regulatory imperatives for a competitive electricity services sector. Finally, a review of the reforms in the electricity sector in Kenya is assessed together with the impact of the reforms. Furthermore, the necessary regulatory disciplines instrumental in cross-border trade in electricity services are identified.

The rationale of the study focuses mostly on the phenomenological (qualitative) and positivistic (quantitative) types of research. The focus was on identifying, analyzing and reporting patterns (themes) within data to facilitate a clear understanding of the electricity services sector in Kenya. Furthermore, the chapter on methodology presents the research population, sampling strategy, data collection, frame of analysis and a summary of how the data was analysed. Thematic analysis was used to analyse the questions.

The findings and discussion sections of the study are focused on the reforms in the electricity services sector in Kenya, the pro-competitive regulations for an effectively liberalized electricity sector, and the resultant electricity-related services. Due to the complexity of the issues in the sector, interviewees preferred to be provided with the questionnaire instead of face-to-face or telephonic interviews. The questionnaire consisted of two sections, namely the respondent's demographics and reforms in the electricity sector in Kenya. The questionnaire targeted key stakeholders in the sector and was sent to eighteen potential respondents, and of these, only fourteen were responsive.

The study concludes that reforms in the electricity sector in Kenya have brought about clarity in terms of the services that are embedded in the sector and identified the key regulatory elements necessary to enhance competition in the sector. The new services that have surfaced in Kenya, include geothermal exploration, grid connectivity through KENTRACO, generating electricity from crude oil, and ensuring that more households are connected to the national grid through the rural electrification project.

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

GLOSSARY OF TERMS

Classification: the systematic act or process undertaken to categorize ideas and objects in accordance to their shared characteristics or qualities in groups, divisions or categories in a system for recognition, differentiation and understanding.

Dismantle: To separate, break up, disassemble or take apart a thing into different parts.

Distribution of electricity: the transportation of electricity from transmission network of low-voltage to end-user or generators to end users.

Electric power: this is the product of electric current and electromotive force.

Electricity or electric power sector: the total sum of the establishments publicly or privately owned, that are in the generation, transmission, distribution, or selling of electricity.

Feed-in tariff: a tool used for policy purposes that is defined by three main characteristics, that is, guaranteed grid access, long-term contracts and guaranteed electricity purchase prices.

Generation of electricity: the harnessing of electron/electric energy by transforming other primary forms of energy by the combustion of fuel such as oil, coal or gas, or through using nuclear fission or kinetic energy from water or wind in motion.

Grid: refers to the transmission and distribution system for electricity.

Homogeneous purposive sampling: a sampling method where a sample is selected due to shared set of characteristics.

Liberalization: this means the elimination or removal of restrictions and the loosening of control of the sector by the government. In the electricity sector it entails the unbundling of the vertically integrated state-owned utility to separate entities with the introduction of competition in some parts of the electricity chain.

Megawatt a unit for measuring electric power that is equal to 1 million watts or one thousand kilowatts, which is a standard measure of the generation capacity of an electric power plant.

Megawatt-hour: the action for one hour of a unit of electric power equal to that done by one megawatt.

Natural monopoly: in Economics, a monopoly is taken to be an industry where you have high fixed costs of capital goods that makes it unprofitable for competition to be introduced in the market.

Net metering: the measure of electricity generation and consumption of a small generation facility such as a building with a solar photovoltaic (PV) or wind system, through a single meter for sale or purchase to the electricity service provider, respectively.

Open access: the ability to use of a transmission and distribution system in transporting or wheeling electricity to end-users.

Power: the energy available and usable for work to be done at the time rate of work performance, measured in horsepower, Watts, or Btu per hour.

Power pool: a form of stock market for electricity which is based on a competitive, open-access market for electrical energy.

Privatization: the transfer of ownership of business, property, industry or provision of service from public or government to the private sector.

Public service: refers to a service that is provided to the public in general, which has a specific public interest role such as in terms of status or ownership of an entity.

Spot price: a financial instrument that is used to shift price risks for buyers and sellers to reduce their exposure in the spot market to price volatility.

Supply of electricity: involves the contracting and selling of electric energy to end-users, it includes metering, billing and activities related to customer advice, provision of information and financing.

Take-or-pay commitments: these are long-term power purchase agreements which encompasses the reduction of demand risk for the independent power producer (IPP) by transferring the IPP's fuel costs either to the consumer or a government funded subsidy.

Terawatt: unit for measuring electric power that is equal to one trillion watts or one million megawatts.

Terawatt-hour: the action for one hour of a unit of electric power equal to that done by one terawatt.

Transmission: the transportation of high-voltage electricity, which involves the transfer of bulk electrical energy from generators or import sources to the distribution system or large consumer end-users.

Unbundling: the process of breaking down a large company into smaller parts and sharing the responsibilities among the different stakeholders. In the electricity sector this is the dismantling of the vertically integrated state-owned into four main parts, namely: generation, transmission, distribution and supply, with some of the resultant parts being kept as monopolies, while others are partially or fully liberalized or privatized.

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DEDICATION

I dedicate this thesis to my daughter, Ayanda Wairimu Ndoria, and my husband, Robert Ndoria Thuku, without whom it would not have been possible to do this thesis. My love for you is limitless!

CHAPTER 1

INTRODUCTION

Electricity is a basic infrastructural service necessary to achieve to developmental outcomes. The use of electricity, specifically, serves economic as well as social needs. While in the context of much of the developed world, and possibly, in the urban areas of the developing world, there is, indeed, even a conflict in policy perceptions as to whether electricity services should be subsidized and if the economic and social benefits that electrification is meant to provide proportionate with developmental expectations. These issues have been the basis for considerable developmental debate. However, what is clear is that development policies will continue to stress investment in infrastructure, especially in the electricity segment of the economy. Given this fact, an understanding of the consequences that result from and the determinants that shape the use of any such basic service is imperative for the design of more effective future policies as well as for the analysis of those of the past. Unbundling the electricity sector has been considered as one of the much needed policy by governments and other key players in the sector.

It is universally accepted that electrification enhances quality of life at the household level and stimulates economy at a broader level. An immediate benefit of electrification comes through improved lighting, which promotes extended hours of study and reading and other household chores, and in turn contributes to better educational achievements. Lighting can also benefit many other household activities, such as sewing by women, social gatherings after dark, and many others. Communication devices such as radios and television also improve the access to information by and can provide entertainment to family members. In

addition, household's economic activities both from inside and outside home benefit tremendously from electricity. For instance, crop productivity can be increased by the application of electric irrigation pumps, businesses can be operated longer hours in the evening, electric tools and machinery can impart efficiency and production growth to the modern industrial sector, the list is endless.

Given its substantial benefits, electrification together with other sources of modern energy, such as renewable energy, has been identified as essential for fulfilling the Millennium Development Goals (MDGs) (UNDP, 2005). The World Bank views electrification as an integral part of development and has supported electrification projects in many developing countries. The main tailback that stands between the achievements of all these goals is the bundled nature of the electricity supply chain in most developing countries. This necessitated the need of policy reforms with the aim of unbundling the sector in Kenya.

While a lot has been written on the energy sector and in particular, the electricity sector and trade in services in general, there is little information on energy-related services in African countries, although the sector in Kenya is fairly documented and information is accessible. This study will consider the emerging electricity-related services that have evolved since the introduction of reforms to dismantle the state-owned power utility in Kenya. Furthermore, following the unbundling of the electricity sector in Kenya, the need for a stand-alone classification of electricity-related services is necessary as this was not developed during the Uruguay Round at the World Trade Organization (WTO) when trade in services negotiations were introduced.

The trade in services negotiations at the WTO culminated to the comprehensive agreement in the area known as the General Agreement on Trade in Services (GATS). Although some of the Regional Economic Communities (RECs), such as the East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA), and Southern African Development Community (SADC) have identified energy-related services sector, including the electricity services sector, as a priority sector in the on-going negotiations on trade in services, no effort has been made to develop a classification of the sector in sub-Saharan Africa.

Therefore, this study undertakes a review of the electricity sector in Kenya and the necessary regulatory disciplines that are fundamental for the efficient functioning of an electricity services sector including the classification of electricity services as part of the wider energy-related services sector. Dealing with the classification issue in electricity-related services is instrumental in providing clarity in the services that have developed in the sector and how Kenya would handle the sector in regional and multilateral negotiations. The regulatory elements, which will be taken in an abstract form, can be instrumental for inclusion in a reference paper to support the liberalization and enhancement of cross-border trade in the electricity services sector in the region.

According to WTO (2010) the energy sector consists of the following sub-sectors: electricity, gas, oil, coal, renewable energy, nuclear energy and other energy-related sectors such as carbon-capture and storage, energy efficiency and related services. The energy sector is a vital enabler of trade both for goods and services, thus making it part of the infrastructural services

sector, which includes transport, telecommunications, water and financial services. These services constitute the backbone of the economy in all countries because of their direct and indirect contribution to growth, income generation and higher welfare. The energy sector encompasses a number of activities and sources of power including electricity, gas and oil.

Energy-related services are those activities that are incidental to the development, exploration, production, transportation, distribution of energy or its resources by energy companies (WTO, 2010). The energy-related services sector has emerged due to reforms undertaken by most countries, both developed and developing since the early 1980s. Across the world, market liberalization has become the cornerstone of energy policies (Bonneville & Rialhe, 2005). This has led to a significant change in the structure of the energy market as state monopolies are dismantled due to privatization and liberalization, and an emergence of services activities. In the energy sector, liberalization may take one or a combination of the following forms: privatization of energy assets owned by the state utility firm, changes to the organization structure of energy sectors to bring in competition, and the establishment of an independent regulator for the sector.

In sub-Saharan African countries, the International Monetary Fund (IMF) and the World Bank were instrumental in initiating and ensuring the privatization and liberalization of the energy sector through their structural adjustment programmes towards the end of the last century. These structural changes in the sector have created interest to negotiate energy-related services in the ongoing services negotiations at the World Trade Organization (WTO) and regional level.

Trade in services activities in the energy sector, which constitute value addition in the chain from the location of the potential energy source to the distribution to the final consumer, have gained dynamism due to a number of factors. These factors include a significant increase in energy demand, privatization and energy markets liberalization, a significant increase in energy sector investments and application of new technologies in the sector (Abugattas & Zarrilli, 2007). As energy underpins basically any human activity, it is a precondition for socioeconomic development. However, many African countries are constrained by minimal access to commercial energy by majority of the population impeding economic growth and development.

In the electricity sector, reforms have been witnessed in most countries, which have entailed the unbundling of state-owned vertically integrated electricity supply industry and driven primarily by their failure to deliver services (Pollitt, 2007). Due to the value of the electricity sector for economic activities, the efficiency and security of supply is necessary to ensure well-functioning markets, adequate supplies and acceptable prices for access. This is very important, as electricity is a different type of good, which cannot be readily stored. It requires a delicate balance of supply and demand being simultaneously undertaken in a continuous manner. Because majority of African countries have undertaken several reforms in the sector by liberalizing and privatizing the previously state-owned monopolies, this sector has been prioritized in the regional economic communities (RECs) trade in services negotiations of the COMESA and SADC. However, the EAC did not include it in its first round of negotiations on trade in services.

Reforms in the electricity sector in Kenya were initiated in 1996 with the dismantling of the state-owned power utility and the creation of an independent regulatory body, the Electricity Board of Kenya, which became operational in 1997. This led to the unbundling of the vertically integrated electricity supply company into two, namely the Kenya Generating Company Limited (KenGen) which is concerned with generation of electricity, and Kenya Power and Lighting Company (KPLC) which handles the transmission, distribution and supply of electricity. In this way, the generation aspect of the value chain was liberalized whereas other sections were privatized.

Kenya's economic blueprint, Vision 2030 launched in 2008, considers energy as one of the key infrastructural enablers of the economic, social and political pillars. It commits the government to structural, policy and institutional reforms in the energy sector by increasing installed power generation, enhancing access to electricity, putting in place a strong energy sector regulatory framework and improving the operational efficiency of power utilities. In addition, it encourages private investment in generation of power, delinking generation of power from its distribution, and connecting Kenya to energy-surplus countries in the region. The Kenya Vision 2030 further calls for exploration and development of new sources of energy and the tapping of geothermal power, coal, and other renewable energy sources such as solar and wind.

The study will attempt to answer the following questions:

1. Have the reforms in the electricity sector in Kenya brought about new services and have they enhanced trade and competition in the sector?
2. How can the electricity-related services sector be better classified nationally and regionally in alignment with pro-competitive disciplines?

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This section will consider the features of the electricity sector which gives it a strategic position in the modern Kenyan economy. Further, the literature review will reflect on the legal and regulatory reforms that have taken place in the electricity sector and the impact of the liberalization on rural electrification and the poor in society, considering the changing role of government in the sector. Liberalization and privatization in the electricity sector has involved the unbundling of the vertically integrated state-owned utility. This has led to the introduction of competition in some segments of the electricity sector value chain such as generation and distribution. This review will also consider the classification related issues arising from the reforms that have taken place in the electricity sector and the regulatory imperatives for a competitive electricity services sector. Finally, a review of the reforms in the electricity sector in Kenya will be undertaken to assess the impact of the reforms and identify the services that have emerged in the sector. This will establish the necessary regulatory disciplines instrumental in cross-border trade in electricity services.

According to the International Energy Agency (IEA), growth in electricity demand in sub-Saharan Africa (SSA) from 2016 will be about 6 per cent per year, with the electricity sector expected to triple by the year 2040, to reach 1 300 terawatt hours (TWh), and power generation total capacity quadrupling to 385 GW with the proposed and current government measures and policies. These developments can be supported by much needed investments in the power sector as SSA is considered to have abundant resources in primary energy such

as oil, coal and renewable energy (hydro, geothermal, solar and wind) that can be used to offset this demand. The use of technological innovations can be instrumental in assisting with the establishment of modern and sustainable renewable energy (OECD &IEA, 2016).

The electricity sector, which can also be referred to as the electric industry, relies on a network for the supply of electric power to consumers as the final product. Network industries, such as those found in the electricity and telecommunication sectors, have activities that can be considered competitive and others as natural monopolies. Liberalization in both network industries have taken a similar path, though the one in the electric industry has been more complex due to its technical and economic nature. In the electricity chain, generation of electricity has potential of being competitive while the transmission and distribution of electricity are monopolistic by nature (Hernandez, 2008; WTO, 2010).

In most developing and developed countries, the privatization and liberalization of vertically integrated state-owned electric utilities brought about the dismantling of the utilities into a number of different entities either partially or fully state-owned or fully privatized. The vertically integrated state-owned monopoly is unbundled into four main activities, namely generation, transmission, distribution and supply. In this vertical restructuring of the monopolies, there is clear separation of production into the transmission and distribution activities, and the generation and supply activities, and all parts tare competitive (Evans, 2006; Melly, 2003).

Therefore, it is important to look at how the electricity related services sector has evolved and the regulatory principles that have been put in place, as well as identify the services activities that have emerged from liberalization in the sector. Basically, this would form the basis for regional and multilateral negotiations in the area of trade in services as relates to the electricity sector. It is also important to note that due to the nature of the electricity sector, it would be difficult to have a clear-cut definition of the electricity services sector. However, this can be dealt with by considering the activities that constitute the electricity-related services sector and thus, the classification of the sector.

2.2 Features of the electricity sector

The electricity sector is considered to play a key strategic position in modern economies and societies. It makes a significant contribution to development and is an important enabler to other services sectors, especially in manufacturing. The electricity industry directly determines international competitiveness. The prices for electricity compared to other countries determines the prices for exports, both in goods and services, which might diminish the competitiveness of a country's industries internationally (Melly, 2003).

Because the transmission and distribution services in the electricity sector have particular features of being considered public services and natural monopolies, it makes it critical for governments to develop legal and regulatory frameworks at the national, regional, and multilateral levels. These regulations are geared towards the maximization of competition benefits such as lowering prices and ensuring access to electricity grids by the general public through public policies (Hernandez, 2008).

Access to electricity and other public services such as education, healthcare, and clean water is crucial for improving conditions of life. Social development is directly affected by the availability of electricity and the conditions for access to supplies. This explains why governments traditionally felt that the sector being strategic for national development, required regulation to ensure that there is provision of universal service and protection of the consumer. Therefore, electricity prices were controlled by governments. In addition, due to the environmental and safety impact in the production and use of electricity, activities in the sector are regulated (Hernandez, 2008; Selivanova, 2014).

There are other characteristics of the electricity industry that necessitate tougher government regulation and have an impact on the design of regulatory regimes. First, fluctuations in demand due to weather patterns determine usage of electricity for cooling or heating. Furthermore, demand also fluctuates at different times during the day. This creates a 'peak-demand problem', which means that for the supply of the whole load to be taken care of, capacity should be equal to or be more than the load all the time. Otherwise, there will be interruptions in supply causing blackouts or brownouts that may lead to significant economic damage. Outages when the supply of electricity is lower than the required load are costly (Cameron, 2007).

Second, the need for supply through fixed networks for transportation and delivery of electricity to end users makes transmission a natural monopoly (WTO, 2010). This is further complicated by the fact that it is costly to develop electricity infrastructure which requires

large amounts of capital with sunk costs for its construction and even maintenance. This is used as a justification for providing for anti-competitive elements such as investors requesting for exclusive rights for a specified period and obligations for long term contracts, for instance, inclusion of 'take-or-pay' commitments (Selivanova, 2014).

Third, as indicated by Bhattachryya (2011), Cameron (2007) and WTO (2010), it is difficult to store large amounts of electricity at low costs. Cameron (2007), also suggested that this makes the production and supply of electricity a multiple time-differentiated product meaning that electricity produced at one point in time may not be a direct substitute for electricity at another point in time. According to Bhattachryya (2011), the production of electricity uses several modes of technologies from diverse substitute fuels that can be grouped into two main groups, namely conventional and non-conventional. The conventional group is made up of thermal and hydro, while the non-conventional consists of renewable energy sources such as solar, wind, and geothermal. Cronje (2013) suggested that where the generation of electricity is through a secondary source such as combustion of fuels, renewable energy or nuclear energy, then it is not easy to store the electricity and therefore, it has to be distributed simultaneously to users through transmission and distribution grids.

Fourth, electricity or power stations have different technical and financial specifications that are based on the raw materials and technology used for generation. The raw material or primary sources for electricity production are mainly gas, hydrocarbons, oil, uranium, and coal (Cameron, 2007). Due to the exhaustible nature of hydrocarbons which are considered to have irregular distribution, issues of security of supply of electricity arise thus making it a

strategic political matter. This builds barriers to entry and requires technical coordination. Furthermore, there is need for flexibility in the scale of generation to ensure rapid response to demand changes (Cameron, 2007; Selivanova, 2014).

2.3 Electricity sector reforms and government intervention

The main elements that are involved in the reform of the electricity sector are introduction of changes to the structure of the sector and its regulation (Melly, 2003). As shown in Figure 2.1, traditionally in most countries, the electricity industry comprised of one large monopoly provider that was responsible for the four components of the electric power value chain, namely generation, transmission, distribution and supply. In addition, it was believed that network bound systems were assets of national strategic interest and hence, it was more economical to have a sole entity because of their nature of production and operation of the transmission grids (Cameron, 2007; Selivanova, 2014).

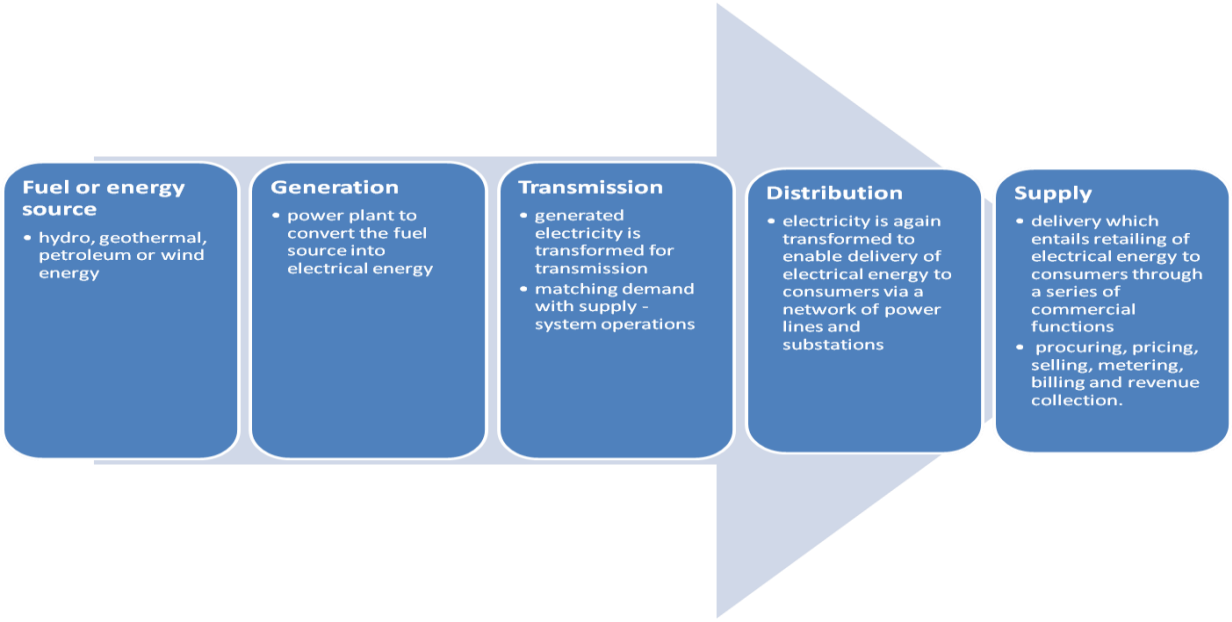

Figure 2.1: The electricity industry value chain

Technological advances have been instrumental in changing these views as most governments concluded that a sole provider is no longer a prerequisite but that there is need to introduce competition in some segments of the value chain such as generation and retail supply that would lead to more efficiency. However, the transmission and distribution segments remain under government control as these re considered natural monopolies and it would not be necessary to have competing grids (Cali et al., 2008; OECD, 2005; Melly, 2003).

According to Gratwick and Eberhard (2008), the reasons for introduction of reforms in the electricity industry was different for developed and developing countries. In developed countries, reforms were targeted towards improvement of economic efficiency with respect to the pricing of electric power to ensure lower tariffs while for developing countries, reforms were meant to deal with inefficiencies brought about by financial mismanagement and lack of relevant technical capacity that led to an increase in tariffs. In addition, developing countries needed the participation of the private sector to raise funds for expansion of the electricity infrastructure.

Since the early 1990s, there have been major changes in the electricity industry in many countries as operations and decision-making in the sector shifted from being dominated by governments in a planned manner to being private sector oriented. This is summarized in Table 2.1.

Table 2.1: General regulatory characteristics of the electricity industry before and after sectoral reforms by most governments

Pre-reforms	Post reforms
Exclusive rights to network infrastructure, through licenses or concessions	Freedom of entry and investment in competitive activities; privatization and market entry measures to allow for both local and foreign players
Prohibited competition	Splitting of activities to facilitate the introduction where possible introduction of competition to parts of the sector
In depth regulation	Independent supervision of the model and regulation of the sector to manage the market and protect consumers
Vertically-integrated operations	Separation of the value chain activities and access to infrastructure and networks
Guaranteed compensation based on historical costs	Freedom of contract and formation of competitive pricing and establishment of commercial pricing
Centralized control, with focused planning	De-centralization of control and integrated use of information technology

Source: Adapted from Cali et al. (2008); Cameron (2007); and Selivanova (2014).

Melly (2003) suggested that there are three basic elements in a comprehensive market reform plan of the electricity industry, that is, privatization of government owned assets, reorganization of management control, and regulatory reform. In undertaking the reforms, countries are following different approaches with some being more comprehensive than others.

Privatization in the electricity industry occurred with the inclusion of the private sector in the industry whereby government sold part or the whole of its assets to private businesses. Reorganization of management control involves the introduction of competition to parts of the electricity value chain, through vertical and horizontal restructuring approaches. Vertical restructuring involves the unbundling of the four main activities (generation, transmission, distribution and supply) of the vertically-integrated state-owned monopoly into different production stages as previously described (Evans, 2006; Melly, 2003). Horizontal restructuring, in general, involves the reduction of control of the limited number of companies directing large portions of the generation capacity.

According to OECD (2005), there are major benefits and opportunities for a country undertaking liberalization and regulatory reform of the electricity industry as well as significant challenges. In majority of the countries that had state owned electric power systems and no prior experience with regulatory issues, Melly (2003) recommended undertaking regulatory reform in the electricity sector. Generally, regulatory supervision is mostly on the transmission and distribution segments to ensure equal access for producers and consumers to the network systems. This calls for the regulations to guarantee non-discriminatory third-party access to electricity transmission and distribution networks.

Several authors have suggested that following the introduction of reforms in both developed and developing countries, a standard model of the reform process was developed and this set the stage for full liberalization of the electricity markets (Gratwick & Eberhard, 2008; Kapika, 2013; Cronje, 2013). These steps include:

a. Corporatization: Separation of the electricity utility into different legal entities with rights and obligations;
b. Commercialization: Improvement of performance through cost recovery pricing, metering improvements, billing and collections and adoption of internationally recognized accounting practices;
c. Enactment of legislation: developing and adopting the requisite legislation on energy that provides the legal basis for restructuring that allows the participation of private and foreign firms;
d. Independent regulator: establishment of a regulator for the introduction of efficiency, fairness and transparency in industry management, preventing anticompetitive practices, encourage investment and consumer protection;
e. Restructuring: unbundling of the government owned utility vertically and/or horizontally, and introducing competition;
f. Independent Power Producers (IPPs): institute private investment in the generation segment of the electricity value chain with the introduction of long-term power-purchase agreements;
g. Divestiture of generation assets: full or partial divesting of government owned generation assets;
h. Divestiture of distribution assets: full or partial divesting of government owned distribution assets; and
i. Competition: introduction of competition in the retail and wholesale electricity markets,

Some countries with more advanced electricity industries have included additional elements to the standard model that are mainly associated with the introduction of full competition in the electricity retail and wholesale markets. These are listed in Table 2.2. For the success of the standard model in introducing competitive retail and wholesale electricity markets, the pre-requisites are unbundling, commercialization, and corporatization.

Table 2.2: Additional elements to the standard model for electricity industry reform

Additional steps	Description
Demand side issues	Consumption mostly metered hourly with customers being exposed to the spot price
Trading arrangements	Consolidation of system operations based on an integrated trading arrangement, which separates traders from the system
Transmission business model	Consolidated for profit regulated transmission company which incorporates the system operator and provides arrangements for pricing and expansions, but separate from the traders
Supply side issues	Fully liberalize supply of electricity by removing barriers to entry and introducing horizontal restructuring through expansion of control of market power by divesting utility generation into smaller portions
Retail access	Availability of default provision due to well performing production markets means more choices for customers and thus requires broad mechanisms for settlement and customers to be educated

2.4 Liberalization, rural electrification and the poor

Having universal access to electricity services has two main components, namely affordability and physical connection. According to Evans (2006), advanced nations who are members of the Organization for Economic Co-operation and Development (OECD) have accomplished the

goal of having the policy aim of access to electric power with electrification connection rates almost 100%. In contrast, both access to electricity and affordability in developing countries still remains a challenge. Therefore, if the supply of electricity is liberalized with the introduction of competition, then this might lead to lower prices with improved services and availability, which will benefit poor consumers.

In order to provide electricity services to remote parts of the countries, many developing countries introduced rural electrification programmes that were run by state owned electric companies that were subsidized. Nevertheless, these programmes faced several constraints due to the substantial capital required to extend the power networks into areas that do not generate much revenue. With the unbundling of state owned electric companies, a more innovative approach to rural electrification has been developed by countries to ensure that the policy goal of access to electricity for all is achieved.

2.5 Classification of the electricity services sector

2.5.1 Is electricity a good or a service?

To situate the electricity services sector and provide clarity in terms of classification, it is important to be clear whether electricity is a good or service or which sections of the electricity chain is a good or service. Therefore, for appropriate regulatory interventions and negotiations purposes, it is important to distinguish what would be considered a service in the electricity sector.

Under the GATS negotiations at the WTO, this issue has been discussed extensively to clarify whether electricity should be considered a good or service. According to UNCTAD (2001) and Evans (2002), when the General Agreement on Tariffs and Trade (GATT) was drawn up, the negotiators had decided that electricity was not a good. However, tariff bindings on electricity were included in some Contracting Parties GATT commitments. Furthermore, there seems to be agreement that the primary and secondary production of electricity does not constitute services as elaborated in the GATS. Cronje (2013) suggested that the production of electricity can be considered a manufacturing activity since the process of transforming the different fuels into electrical energy is a feature of manufacturing that was dealt with under GATT rules. Nevertheless, electricity is also considered a service since it has the characteristic that it cannot be stored.

Because the electricity market structure, until recently, was predominately comprised of vertically integrated state-owned suppliers performing all the activities in the electricity value chain, then this industry had no reason to distinguish between the good and services components of electricity. However, recent reforms within the electricity sector in some countries have introduced elements of competition leading to the dismantling of electricity sector activities and therefore, the distinction between the good and service parts (Cronje, 2013).

Both UNCTAD (2001) and Evans (2002) concluded that electricity can be considered both a good and service. This is guided by the fact that the transformation of electricity through the combustion of fuels into electrons is a manufacturing process while at the same time, as

mentioned earlier, electricity has the characteristic of not being storable and thus must be consumed as it is produced, which makes it a service. However, WTO (2005, 2010) cautions that it is particularly difficult to distinguish trade in services from trade in goods in activities related to the production and transformation in the electricity business. On the other hand, when provided independently, transportation and distribution are considered as services (UNCTAD, 2001). It is therefore important to distinguish between the production processes and the services related to production within the electricity sector (Cronje, 2013).

In contrast, Cottier et al. (2009) argue that rules that govern goods infer to a tangible thing which is separate from the process of production and distribution channels. Thus, they consider electricity which is supported by networks and grids as more of services than a good even though there exist some elements of physical property. They further contend that being a classic network industry, GATS principles providing for progressive liberalization and conditionalities of services disciplines are best suited to deal with the electricity sector. Therefore, these authors concluded that electricity should no longer be handled as a good but as a service.

Steinkamp (2014), quips that 'No one ever says, "If you don't pay your electricity bill they will turn off your good." Rather, the common vernacular is that "they will shut off your service."'

2.5.2 Classification of the electricity services sector at the WTO

The WTO sectoral classification list of services as used in the GATS negotiations under the Uruguay Round, the "W/120" of 1991 has no separate entry for the electricity services sector.

This has been attributed to the fact that when the W/120 was under negotiation during the Uruguay Round, the electricity sector was basically dominated by vertically integrated state-owned companies that were monopolies. However, with the reforms that have been undertaken by most governments in the electricity sector leading to the unbundling of the sector, numerous electricity-related services have emerged and highlighted the need for a stand-alone classification of the services in the electricity sector for better understanding of the parts of the market open for trading in given economies (Hernandez, 2008).

The Central Product Classification (CPC), which is also used concurrently with the W/120 under the GATS negotiations, was developed by the United Nations Statistics Division. The CPC classifies electricity related products under different sections of both goods and services. This can be attributed to the intricacy of the electricity sector which includes a number of different intermediate products (Pineau, 2004). Several versions of the CPC have been released since the Uruguay Round which used the Provisional CPC of 1989.

In the current dispensation (post Uruguay Round), the classification of electricity services covers a variety of sources and activities that can be categorized as shown in Table 2.3.

Table 2.3: Categories and activities for classification of the electricity services sector

Category	**Activities**
Exploration and production of electricity	Drilling, extraction, generation
Construction of electricity facilities	Construction and engineering Installation of equipment

	Maintenance, repair, dismantling
Services related to the electricity network	Transportation, transmission, distribution of electricity
	Electricity connection services
	Services ancillary to the electricity sector
Supply of electricity	Wholesale sales of energy products
	Retail sales of energy products
	Trading
	Brokering
Scientific and technical	Consulting services
	Testing and analysis
Services for final use	Energy audit
	Energy management
	Metering
	Billing
Other electricity-related services	Real estate services
	Rental and leasing of equipment

Source: Adapted from Poretti and Rios-Herran (2006); and WTO (2010).

Current GATS negotiations need to resolve the ambiguity in the classification of electricity products in classification systems so as to advance trade in the electricity services sector. The development of a stand-alone classification of the electricity services sector would also be instrumental in advancing trade in services negotiations at the regional level.

2.6 Regulatory imperatives for a competitive electricity services sector

Development in the energy sector typically results from governments creating a conducive environment through the enactment of an energy policy, including the electricity sector, that

encourages the emergence of an energy industry that is competitive. Governments have the basic responsibility of ensuring supply of affordable and reliable energy and therefore, regulate the energy sector to pursue different policy aims such as universal access to energy goods and services by the population, mitigating environmental effects of energy production and consumption, diversification of energy sources for security of supply, and the conservation and sustainable use of natural resources (WTO, 2010).

At the WTO, the agreements have generally been focused on the removal of restrictions and barriers to goods trade and ensuring progressive liberalization in the case of trade in services, both in terms of providing market access and similar treatment between foreign and local service suppliers. However, in trade in services, it has become clear that in some sectors, particularly those that rely on networks, the mere elimination of limitations to market entry is not sufficient for the achievement of liberalized trade (Hernandez, 2008). Therefore, there is need to identify critical regulatory disciplines that are fundamental for ensuring competition and trade in the electricity services sector.

During the GATS negotiations at the WTO, it was discovered that the general obligations and commitments by governments in the basic GATS framework in the telecommunications sector are not enough to reduce trade barriers that are associated with domestic regulations. This led in the introduction of sector specific disciplines for the telecommunication sector under the Telecommunication Reference Paper (TRP), which contains principles providing for competitive safeguards and the avoidance of anti-competitive practices. The anti-competitive practices mentioned in the TRP deal with engaging in cross subsidization that is anti-

competitive, use of information from competitors with anticompetitive results, and denial of technical information in a timely manner to competing suppliers network which is relevant for their provision of service.

The capital-intensive nature of the energy sector thus requires significant investments to source, produce and transport energy. With liberalization, there has been expansion in business and investment opportunities for service suppliers. Legal reforms in the electricity sector have mainly focused on the unbundling or dismantling of state-owned monopolies that owned and managed the utilities, leading to the commercialization and privatization of segments of the chain. This has led to the entry of new competitors particularly in the generation and retail business. However, even after the unbundling of the sector, these monopolies in most cases, maintain dominance in the market as they still control the transmission and distribution segments of the network. Consequently, this impedes or discriminates new entrants into the market and therefore tilts competition. In this regard, governments need to develop electricity specific rules and regulations that would be used to ensure service suppliers are treated fairly.

As mentioned earlier, the electricity sector is a network-based industry. In general, industries that depend on networks have common characteristics. First, they depend on a network to supply products to end-users such as in the case of transmission and distribution that form the core of the electricity industry. Thus, without the transmission and distribution grids which are central to the functioning of the network, it would be impossible to supply electricity to final consumers. This means that liberalization of the electricity market can be

affected by the companies that control the network, which gives them ample opportunity to guarantee competition in the industry. Therefore, providing non-discriminatory access to the grid is fundamental to ensuring free competition (Hernandez, 2008; WTO, 2010).

Second, the network itself is naturally a monopoly. From an economic point of view, it would not be efficient to have a duplicate network transmission and distribution as this would limits competition. In the case of the electricity sector, the cost associated with building a second grid network to carry electricity would be too enormous. However, the behavior of entities that provide services as monopolies tend to affect the industry as a whole.

Third, there is potential for competition in the final services provided by the industry to end-consumers. Nevertheless, the monopolistic utility that owns the transmission and distribution network may also have developed activities relating to retailing of electricity and thus may not be willing to provide transmission services to other retailing companies that are competitors in their market. This could impede the price of electricity and free competition (Hernandez, 2008).

Therefore, in any given national market, it would be difficult to have foreign firms competing in the transmission and distribution network services. But at the national level, competition that includes foreign companies can be envisaged in the construction, maintenance, and operation of newly established networks. In this case, the newly established service suppliers in the transmission and distribution services would benefit from the GATS negotiations as relates to market access and national treatment. It would also be important to ensure fair

conditions for access to the electricity retail service and the other emerging electricity services where there is potential for competition such as metering, brokering, trading, and billing.

2.6.1 The Electric Industry: Third Party Access to the Network

At the WTO, the GATS focused on market access and national treatment negotiations for the elimination of restrictions and barriers to trade in services, with progressive liberalization principle embedded for future negotiations. However, the GATS has no provision for competence issues except in the case of the Telecommunication Reference Paper (TRP) that was negotiated at a time when most countries were in the process of liberalizing and privatizing the telecommunication sector.

The TRP covers disciplines related to interconnection, requiring that major suppliers provide connection to their network at any technically feasible point. Similarly, in the electricity sector, there is need to ensure that all players have access to the transmission and distribution network in non-discriminatory conditions, terms and rates that are reasonable, transparent and take into account economic feasibility.

Third party access (TPA) in the electricity sector is the provision of open access to the transmission and distribution network for electricity services suppliers such as those involved in the generation, trading and retailing of electricity. In the electricity sector, TPA is essential for developing competitive national and cross-border electricity markets. It constitutes a regulatory element that is fundamental to liberalization of the electricity services industry for trading purposes, both at the national and regional levels.

TPA permits third parties, including those competing with the network owner, to use the network for a fee. In the liberalization of the electricity sector, as in most network based sectors such as telecommunication, gas and oil, it has become apparent that there is need to go beyond the elimination of barriers to trade to achieve competitive trade. Therefore, it is necessary to consider the regulatory elements of open access to the monopolies that remain in the electricity chain to ensure effective trading at the national and regional levels, including foreign investors that enter the market. The inclusion of regulations dealing with open access for third parties therefore becomes key in ensuring that competitors have access to the network in a timely manner and upon request.

Hernandez (2008), suggested that having a TPA is a prerequisite for the creation of a competitive national electricity market and for the creation of a competitive cross-border electricity markets. A TPA is granted either based on sharing the whole available capacity or only the free capacity. Where TPA is not available, existing monopolies in the transmission and distribution network would operate as the gatekeepers for entry into the market in which case the advantages of competition and new suppliers would be accrued to the monopolistic operator instead of to the consumers and the larger economy.

Therefore, a TPA ensures that an electricity utility operator or service provider that owns a facility which is essential for the provision of services by its competitors in the sector is not allowed to refuse them access to the facility without valid reasons. Refusal to grant access by

the electricity utility operator would be considered an abuse of dominant position similar to those terms it provides services.

A TPA regulation should therefore take into account the issues related to capacity limitations; procedures and terms for effective allowance of third parties to the network and tariffs. However, it is important to note that the principle of open access to the electricity grid is not unconditional as there are some instances in which the electricity utility owner can deny access to the network such as technical issues related to lack of capacity. In this case, the regulatory options to be considered are access to only the available capacity or pro-rata sharing between the new entrants to the market and existing suppliers.

Tariffs imposed for access to the network should be reflective of cost without cross subsidization or discrimination between competing suppliers. Conditions set for access should not favour incumbents and be reasonable and non-discriminatory, while the procedures should not be less burdensome or involve high transaction costs. Since lack of transparency could constitute an anti-competitive practice, tariffs and conditions of access should be standardized and made publicly available when approved (Selivanova, 2014). Therefore, TPA is a prerequisite for ensuring competition in the electricity sector and a tool that guarantees effective liberalization of the sector.

2.6.2 Proposal for a Reference Paper for the Electricity Services Sector in Trade in Services Negotiations

Similarities do exist between the electricity and the telecommunication sector, as both rely on networks. The precedence presented in the WTO, under the GATS, with the development of disciplines contained in the Telecommunication Reference Paper to promote fair competition, *inter alia*, provides a basis for including pro-competitive regulations in the electricity sector negotiations both at the regional and multilateral levels. This would provide, among other benefits, the promotion of competition for the improvement of efficiency and lowering of prices for end consumers.

In this regard and according to WTO (2010), it is clear that like in the telecommunication sector, the elimination of market access barriers and the general obligations and specific commitments of governments are not enough for the removal of domestic regulation associated barriers to trade. Therefore, a Reference Paper in the electricity sector should be developed that includes, inter alia, the following fundamental elements:

a. Transparency disciplines in developing a regulatory framework for adopting and implementing technical standards, rules and regulations;
b. Open access for third parties to the transmission and distribution network that is not discriminatory;
c. Establishment of an independent regulator that is not answerable to any supplier in the market;
d. Prevention of anti-competitive practices in general for the electricity sector; and

e. Timely and non-discriminatory access to relevant information on transmission and distribution data, such as transmission load, price etcetera.

2.7 Kenya's electricity sector regulatory reform

The institutional arrangement of Kenya's electrical energy subsector is set out in the Energy Act of 2006, the Geothermal Resources Act of 1982, and the Kenya Energy National Policy as contained in Sessional Paper No. 4 of 2004. The institutional framework for the electricity sector in Kenya has been historically monopolistic both vertically and horizontally. This is because the sector was previously believed to be a natural monopoly by virtue of the characteristic of the electricity generation and transmission. However, with advancement in technology, it has been proved that electricity transmission and generation is not a natural monopoly as several electricity service providers can use the same network to provide the service.

2.7.1 Generation and transmission

Competition in electricity generation in Kenya became formally liberalized in 1997 on the enactment of the Electricity Power Act of 1997. The first step towards the liberalization process in the electricity subsector commenced in 1997 after the enactment of the 1997 Electricity Power Act which saw the unbundling of the vertically integrated utility into two entities.

First, the Kenya Power and Lighting Company (KPLC, whose name had been changed from East Africa Power and Lighting Company in 1983 and confined its operations to Kenya),

remained with the transmission and distribution function. Second, KenGen, previously under the management of the KPLC as the Kenya Power Company since 1954, was launched in 1998 and took over all publicly owned generation assets from KPLC. Initially KenGen was fully owned by the government of Kenya until the year 2006, when the government offloaded 30% of its stake in the company through an Initial Public Offering. As of December 2011, the government of Kenya's shareholding in KenGen was 70% whereas private shareholding was against 30%.

KenGen generates about 76% of the total country output. Currently, there are six IPPs which contribute total electricity supply of about 24%. The IPPs are however, not allowed to sell bulk power to any other consumer apart from KPLC. The six IPPs include:

(i) Tsavo Power Company Limited (Thermal Power Plant)

(ii) Orpower 4 Inc (Geothermal Power Plant)

(iii) Iberaafrica E.A Company Limited (Thermal Power Plant)

(iv) Rabai Power Company Limited (Thermal Power Plant)

(v) Mumias Sugar Company Limited (Co-generation)

(vi) Imenti Tea Factory Company Limited (Mini Hydro)

After the vertical unbundling, the distribution of electricity remained under the absolute monopoly of KPLC. KPLC which was rebranded and renamed Kenya Power in 2011, is still the only licensed supplier, distributor, and retailer of electrical energy in Kenya. Kenya Power purchases electricity in bulk from KenGen and other Independent Power Producers (IPPs) to transmit, distribute and retail to consumers. The purchase is under bilateral contracts or

Power Purchase Agreements approved by the Energy Regulation Commission. Currently, competitors in the supply of electricity can only access consumers under terms dictated by Kenya Power, with the only exception being during the Energy crisis, in which case, the government procures electricity through emergency power producers and sells to Kenya Power. The transmission network was historically developed by the government but is owned by Kenya Power.

Originally, the government was the sole shareholder in Kenya Power. Currently, the government shareholding is at 50.1% against a private shareholding of 49.1%. Generators have no access to consumers as the transmission lines are operated by KPLC. Kenya Electricity Transmission Company (KETRACO), which is fully owned by the government of Kenya, was incorporated on 2nd December 2008 under the Companies Act as a distributor pursuant to the provisions of the Energy Act 2006 and the recommendations of the National Energy Policy of 2004 to facilitate horizontal unbundling. To date, KETRACO has not carried out any distribution function as it has no transmission network of its own. The company has however started construction of transmission lines, especially in preparation for the expected imports from Ethiopia and Southern Africa power pool.

The Rural Electrification Authority (REA) was established in 2007 under section 66 of the Energy Act as a special purpose agency responsible for managing the Rural Electrification Programme (REP) for the acceleration of rural electrification. Under the policy, this was intended to facilitate market entry by Independent Power Distributors (IPDs), particularly in

areas remote from the national grid. Between 1973 and 2007, the REP was operated by KPLC on behalf of the Ministry of Energy.

The Rural Electrification Authority (REA) develops transmission and distribution networks to facilitate the supply of electricity services by Kenya Power in the rural areas using tax payers' money, donor funds and grants, and hands over the transmission lines to Kenya Power to transmit electricity. This mechanism only facilitates Kenya Power's monopoly in distribution of electricity by use of an infrastructure developed by tax payers through the rural electrification levy. The rationale for unbundling was to enhance overall operational efficiency of the power sector by separating the core business units of generation, transmission and distribution into legally and operational distinct and independent entities. It was also aimed at increasing transparency of Kenya Power on its charges. Currently, the generation and supply of electricity is competitive as electricity generators compete to supply to the national grid under long term contracts, but in high voltage transmission and regional distribution, competition is not accommodated.

The monopoly of Kenya Power as a transmitter and distributor of electricity is supported by the argument that since transmission and distribution are considered natural monopolies, as earlier discussed, because their functions entail large sunken capital investment, unbundling such institutions and exposing them to competition would lead to wasteful duplication of network resources. The logical solution is then to separate generation from quintessential monopoly and regulate the monopoly; probably it is based on this reasoning that the Energy

Regulatory Commission (ERC) and The Electricity transmitters were established under the provisions of the Energy Act 2006.

The ERC is charged with the responsibility of economic and technical regulation of electric power renewable energy and downstream petroleum subsectors including tariff setting and review, licensing enforcement, dispute settlement and approval of power purchase and network service contracts and therefore regulates all forms of energy in Kenya. The appointments of the commissioners are made by the minister.

The electricity transmitter, is primarily responsible for determining appeals from the decisions of ERC. The Tribunal has jurisdiction on all matters referred to it relating to the energy sector. The power of appointments to the tribunal just as it is in the ERC is largely by the Executive. Hence, these two important regulatory institutions are not largely free from the manipulations of the executive to accommodate fair play in the sector. Under the Energy Act, the Ministry of Energy and Petroleum (MOEP) retained the policy making initiative and is responsible for the formulation and articulation of energy policies throughout the country yet the government through its shareholding in KenGen KPLC and KETRACO is a competitor in generation transmission and distribution. The policies made by the ministry are likely to favor or be seen to favor these three institutions against other private IPPs.

The reforms introduced in Kenya 1997-2007 have had a great impact in the connectivity mostly to the rural areas and the improved efficiency. The most disadvantaged players are the new entrants who require to tap into the business potential of the sector and improving

its efficiency further. This study will focus on the policy bottlenecks faced by the potential investors and some of the successes that the reform agenda has managed to harness.

CHAPTER 3

METHODOLOGY

3.1 Introduction

This chapter introduces the research method which has been used as a guideline to data collection, analysis and interpretation. To achieve these objectives, the rationale of the study is presented and focuses mostly on the phenomenological (qualitative) and positivistic (quantitative) types of research. Phenomenological research focuses on identifying, analyzing and reporting patterns (themes) within data to facilitate a clear understanding of the electricity services sector in Kenya.

Furthermore, the chapter presents the research population, the sampling strategy, data collection, frame of analysis and a summary of the way data was analysed. Thematic analysis was used to analyse the questions. Ethical issues in the study are also dealt with towards the end of this chapter.

3.2 Rationale for Study

The purpose of this research is to establish the new services that have emerged in the Kenyan electricity sector due to the reforms undertaken in the sector. To achieve this, the study took cognisance of the past, where the electricity sector was believed to be purely a goods field and that it had to be managed by the public sector. However, with liberalization of the electricity sector, the private sector has become more involved and thus, the emergence of the electricity–related services. Further, a consideration of the main players and the role of

the regulator, that is, the Energy Regulatory Commission (ERC) was highlighted, while taking into consideration the legal instruments that have been established in the sector.

3.3 Research Design

Research design is the blueprint of the research work, which describes the methods used to collect, measure, and analyse data. Ay (1981), defines descriptive research as a process of collecting data in order to test hypothesis or answer research concerns. This study adopted both phenomenological and positivistic research approaches to collect data through a questionnaire in order to balance the weaknesses of one with the strengths of the other, and also to increase reliability and validity of the findings. The choice of the research design is based on its ability to obtain information at a time convenient for respondent, acquiring data as inexpensive as possible, and then make prediction about the subject under investigation (Koul, 1984).

3.4 Type of Research

This study mainly adopts both positivistic and phenomenological approaches. Interview schedules contained structured and semi-structured questions. Each respondent was approached by the researcher and then interviewed separately using a questionnaire. The use of structured and semi-structured questions was used to generate both qualitative and quantitative data, respectively, which will improve the quality of responses contained in the interview schedule.

3.4.1 Qualitative Approach

Juliet and Strauss (2003) stated that qualitative research is rich, exciting, and in many ways challenging. It captures the complexity, mess and contradiction that characterizes the real world, yet allows one to make sense of patterns and meaning. Qualitative research is dynamic and probably the most accurate way of collecting data. This approach was selected based on many reasons but perhaps the most important is the desire to step beyond the known and enter the world of the participants, obtain inner experience, see the world from their perspective, and discover rather than test variables.

Qualitative research is dependent on interpretation and requires several explanations. Additionally, there is no distinction between data collection and its analysis, this point is supported by Cohen, Manion and Morrison (2011), who said that data analysis in qualitative research is distinguished by, “merging of collected data, interpreting and analysis” (p.537).

According to Creswell (2003:184), qualitative approach is based on the study of cases and making very little use of numerical data. Leedy and Ormrod (2001:148), warn that the researcher using this approach should undertake considerable preparation and planning. Qualitative research enquires what kind of things people do, what kind of processes are at work, what kind of meanings are being construed, constraints and contingencies that are visible in the world. This implies that qualitative research probes deeply into the subject under study and uncovers complex issues. There are various methods used in the qualitative approach, which include grounded theory. With the research, there is an increased possibility of getting broad, rich descriptions and meanings of processes.

Amaratunga, et al., (2002:17), also argue that qualitative research concentrates on words and observations to express reality, and attempts to describe people in natural situations. Qualitative research allows the researcher an opportunity to meet the field or the life situation. First-hand knowledge of the subject under investigation could be obtained (Burrell & Morgan, 2002:321).

3.4.2 Quantitative Approach

In contrast, the quantitative approach grows out of a strong academic tradition that places considerable trust in numbers that represent opinions or concepts (Amaratunga et al., 2002:17). Quantitative approach uses scientific techniques to produce quantified results. This research relies mainly on numerical data and statistical analysis (White, 2002:42). Amaratunga et al., (2002:17), pointed out that quantitative investigation looks for distinguishing characteristics, elements, properties and empirical boundaries, and tends to measure “how much” or “how often”.

The descriptive method was used in this study to describe the collection of data in order to test questions about the current state of affairs under study.

3.5 Target Population

Hague (2002:97), defines population as the totality of persons, events, organisation units, case records, or other sampling units with which a research problem is concerned. This means that population refers to individuals in the “universe” who possess specific characteristics.

According to Gay and Airasian (2000:121), a population is a group of interest to the researcher and to which the researcher would like the results of the study to be generalised. The population that the researcher would ideally like to generalise to is referred to as the target population. The population that the researcher can realistically select from is referred to as the accessible or available population.

For this study the researcher targeted a small group of individuals that understand the area under review. As this is a complex issue, it was not possible to get information from the general public.

3.6 Sampling

Frazer and Lawley (2000:9), define sampling as taking any portion of a population or universe as representative of that population or universe. The portion taken from the population is assumed or will be "considered" to be representative. A sample is the chosen or selected group of the population. To obtain a representative sample that is good enough to enable research conclusion and generalisation of findings of the study from the target population, a sampling frame is vital.

The sampling technique used was homogeneous purposive, where respondents are selected based on their strategic positions, which helped the researcher to focus on characteristics of the target population that are of interest and that duly answer research questions. For this study, a total of eighteen high ranking strategic decision makers in the electricity sector were sampled and invited to participate. The sample was based on the number of strategic decision

makers available in the electricity services sector. As the data obtained from the eighteen respondents offer considerable depth and breadth of understanding about the phenomenon, and relationships to other categories was made clear, then the researcher considers sufficient sampling to have occurred (Corbin & Strauss, 2008).

3.6.1 Sample Size

The researcher anticipated a higher rate of return and to increase the sample representativeness, the data collected was adequate for inference to be made to the entire population. Due to efficiency considerations, the researcher included the total population from all stakeholders in the energy sector in Kenya, in the study as indicated in Table 3.1.

Table 3.1: Electricity Industry in Kenya

	Department	**Total Population**
National Policy and Regulation	1. Ministry of Energy and Petroleum	1
	2. Rural Electrification Authority	1
	3. Energy Regulatory Commission	1
	4. Independent Engineers (Consultants)	3
Regional and International Organizations on Policy	5. Common Market for East and Southern Africa (COMESA)	1
	6. East African Community (EAC)	1
Exploration and Generation	7. Geothermal Development Corporation	1
	8. Independent Power Producers	3
	9. Kenya Generating Company Limited	1
Transmission and Supply	10. Kenya Power Corporation Limited	1

	11. Kenya Electricity Transmission Company	1
	12. Traders	3
Total		**18**

3.7 Sampling procedure

Having obtained a research clearance before embarking on the study, the researcher obtained a list of all strategic decision makers, their designations, and telephone numbers. This enabled the researcher to compile respondents from the organizations and departments, contact them to schedule appointments telephonically or through email or request for the questionnaire to be filled. It turned out that most respondents preferred to fill the questionnaire at their own time as most were not conversant with issues related to services trade. Therefore, appointments and conversations were used to explain to respondents the requirements of the questionnaire. Respondents then filled the questionnaires and returned them in person or via email to the researcher.

3.7.1 Instruments and materials used

In this study, data was collected by means of a questionnaire, concisely designed to satisfy the objectives of the study. The questionnaire was used to obtain important information with each item in the questionnaire developed to address a specific objective, hypothesis or research questions of the study.

To make the level of enquiry dependable, the researcher ensured quality; correctly worded questions were framed by simplifying the questionnaire. The questionnaire mainly consisted of structured questions. However, a few semi-structured questions were included in the

questionnaire to allow respondents to make any suggestions, recommendations, or additional comments.

To reduce risk of misinterpretation, instructions were clearly given in all sections and there were no leading questions. The questionnaire was balanced, not lengthy, and bears double-barrelled questions (where two or more questions are joined together). Also, leading questions which would lead the respondent to choosing one response over another by its wording were avoided, as well as prestige bias that could arise when a statement, position, or response is associated with a prestigious person or group.

3.7.2 Data Management Procedures to be followed

Each questionnaire was assigned a serial number before being processed to prevent the chance of processing a questionnaire more than once. This also assisted in the data cleaning process, when there would be a need to refer back to the questionnaire.

3.8 Data Analysis

Once data was collected, questionnaires were cross-examined to ascertain validity, accuracy, consistency, objectivity, completeness and uniformity before commencing the analysis. However, different approaches are used for qualitative and quantitative research.

3.8.1 Qualitative Data Analysis Technique

The analysis of semi-structured questions was involved “breaking down” the data into manageable themes, patterns, trends and relationships with the aim of understanding various

constitutive elements such as patterns or trends that could be identified, isolated, or establish them in the data (Babbie, Mouton & Prozesky, 2001:108).

This was achieved using thematic analysis, which is a rarely acknowledged and yet widely used qualitative analytic method that searched for and identified both implicit and explicit ideas associated to the electricity value chain, analyzed themes or patterns that have emerged after the unbundling of the electricity sector, and reported patterns (themes) within data. This approach organized and described data set in (rich) detail, going beyond the semantic content of the data, and examined the underlying ideas, assumptions, and conceptualizations.

It precisely determined the relationships between concepts and compared them with the replicated data. Thematic analysis further assisted in interpreting various aspects of the research topic (Boyatzis, 1998), by following subsequent stages, namely transcription, familiarization with data, generating initial codes, theme searching, theme reviewing and refining of themes, defining and naming themes, and report writing.

The developed codes were then applied or linked to raw data as summary markers for later analysis, which included comparing the relative frequencies of themes or topics within a data set, looking for code co-occurrence, or graphically displaying code relationships", (Marks and Yardley, 2004). This was first supported by the classification identified in the literature review chapter. Second, with the developed classification as the base, the study then considered which of these activities have emerged from the dismantling of the vertically integrated state-owned utility in Kenya, and the liberalization of the sector. These were harnessed from the

annual reports of KPLC, KenGen and other government documents. Finally, the researcher identified key elements in the development of electricity-related services in the country, and ensured effective cross-border trade in the region is extracted and analyzed from the current available literature.

3.8.2 Quantitative Data Analysis Technique

Quantitative data analysis provides quantifiable and easy to understand results which can be analyzed in a variety of ways. The level of measurement that can influence the type of analysis is presented in four levels of measurement namely, nominal, ordinal, interval, and ratio or scale.

The first step in analyzing structured data was to discover the variations in each variable of interest and represent the information in form of graphs and frequency distributions tables using several data tabulation techniques, namely, frequency and percentage distributions, descriptive data, and data disaggregation. Advanced analytical methods, where percentages, means, standard deviations, and Analysis of Variance (ANOVA), Person's Chi-square and Cramer's V test analysis was used to analyze structured questions where made possible by data.

All quantitative data had some descriptive statistics, as well as frequency tables. For example, sample size and average values. This the first step prior to more complex inferential analysis.

3.9 Data Validity

Neuman (2000:301), states that validity is concerned with the soundness and effectiveness of the measurement. Therefore, to ensure that the study findings are valid, the researcher considered:

- **Credibility –** This refers to the way the study will be conducted to ensure accurate description of the subject. This study will be conducted per the pre-determined plan. Literature and the researcher will confirm the study methodology.
- **Transferability –** This implies the extent to which the results of a study could be generalised. The results will be finalised and generalised only after all the interviews have been conducted. Several responses will be used to identify patterns and thus, ensure transferability.
- **Dependability -** This is the extent to which the researcher will accommodate changes in the study setting and perception of the research study. The research will enhance dependability by using own observations in the field of research with regards to change.
- **Confirmability -** This refers to the extent to which data will confirm general findings and the implications that it leads to. This will be enhanced by comparing data with literature.
- **Data triangulation -** Will also be used as a method of validation by using various data sources, collection methods, and other researchers to examine the same variables. This will ensure that repeating patterns and themes are identified as recorded. Triangulation will enable the researcher to view the objective of the study

from different viewpoints. By using the triangulation method, the researcher observed all aspects of the research topic.

3.10 Limitation of the Study

Because the study is based on qualitative analysis, the perceptions of the respondents of the questionnaires are important, and having been specifically identified, they were cautious about being critical.

3.11 Elimination of Bias

Several ethical issues such as voluntary participation, no harm to the participants, ensuring anonymity and confidentiality, avoiding deception, and fair reporting has been emphasized as some important ethical considerations in social science research (Babbie, 2009). The study was guided by fundamental ethical considerations that relate to responsible research of human sciences. These concerns relate to:

- Scientific validity where the researcher maximised the objective by following accepted rules for data collection and data analysis to ensure academic integrity and scientific validity.
- Informed consent where respondents are consulted before the interviews are conducted. Consent was obtained and thereafter, the subjects were given the opportunity to carefully consider the risks and benefits, and to ask any pertinent questions.
- Recruitment, whereby none of the participants were coerced into participation;

- Participation, where participants are briefed on what the study involves and consent received;
- Sharing of results, where the researcher will share knowledge from the study through TRALAC; and
- Maintaining of the confidentiality of data provided, where the researcher will not disclose data provided by individuals or identifiable respondents and thus, protect their anonymity. The researcher enumerates how privacy and confidentiality concerns would be approached. The researcher will be sensitive not only on how information would be protected from unauthorised observation, but also if and how participants will be notified of any unforeseen findings from the research that they might or might not have anticipated.
- Analysis and reporting - Here the researcher assures that to the best of her knowledge, due care has been taken to collect and analyze data. The results reported are the outcome of the detailed analysis.

3.12 Conclusion

This chapter has provided that the research methods were determined by the nature of the study. The essence of the qualitative and quantitative approaches has been discussed. In addition, the population and sampling of this research was also been described.

Data collection techniques, including questionnaire were discussed. Various data analysis methods have been explained and discussed, which espoused the study findings. The findings will be presented in the following chapter.

CHAPTER FOUR

RESEARCH FINDINGS

4.0 Introduction

This chapter presents the findings of the study whose purpose was to review the reforms in the electricity services sector in Kenya, the pro-competitive regulations for an effectively liberalized electricity sector, and the resultant electricity-related services. Due to the complexity of the issues in the sector, interviewees preferred to be provided with the questionnaires instead of face-to-face or telephonic interviews. The questionnaire consisted of two sections, the respondent's demographics and reforms in the electricity sector in Kenya. The section on the regulatory reforms in Kenya set out to identify the main reforms that have taken place in the electricity sector, their success, challenges, restriction to access, impact, services that have emerged, and the regional cooperation in the electricity sector in which Kenya is engaged. The questionnaire targeted key stakeholders in the sector and was sent to eighteen potential respondents, as indicated in the methodology section, but only fourteen were responsive.

The analysis therefore, consists of data drawn from fourteen respondents in the Kenyan energy sector. Each respondent received a questionnaire, which they filled and returned either as a hard or soft copy. The response rate was high, about 78% (14 out of 18 respondents participated in the study). After several unfruitful follow-up attempts, the four respondents who did not reply in the allocated time were excluded from the study. Respondents were purposively drawn from strategic management levels in their organizations given that they were well acquainted with the policies in the energy sector. However, it is worth noting that

not all respondents were able to adequately answer all questions as some were irrelevant to their sector and the fact that trade in services issues were a new concept for most of them.

The findings of this study are presented per the research questions, which include investigating whether the reforms in the electricity sector in Kenya brought about new services in consideration of the key regulatory elements necessary to enhance competition in the sector. Also, can the electricity sector be better classified nationally and regionally, while maintaining pro-competitive regulations?

4.1 Respondents Demographics

The respondents included policy, private sector, generation, distribution, regulation, electrical engineer, geothermal development, public service development, transmission agency and Infrastructure. These fields were further clustered into exploration and generation, transmission and supply, regional and international organization dealing with policy, project implementation, installation, electrical licensing, finance and strategic planning.

4.2 Data Analysis

Question 1: The reforms in the electricity sector in Kenya and whether they have brought about new services and taken into account the key regulatory elements necessary to enhance competition in the sector

4.3 Nature of reforms in the electricity sector in Kenya and their impact in the sector

Respondents agreed that there were on-going reforms in the electricity sector in Kenya that were customer centric. The top three reforms that a majority of the respondents concurred

with included creation of new agencies established to facilitate the unbundling of the power or electricity sector into generation, transmission and distribution with 57.1%, the enactment of Electric Power Act 1997/2006 with 42.9%, and better regulation and service delivery in the electricity sub-sector with 35.7%. Other reforms are in the areas of policy, regulation and service delivery. The enactment of registration and adoption of customer friendly approaches increased activities in the exploration of renewable energy particularly geothermal, solar and wind, and also increased improvements in supply, reduction in connectivity tariffs, and the usage of power in households through the rural electrification process such that the use of traditional supply of power such as charcoal, paraffin and firewood was abandoned.

With these reforms, the electricity sector has attracted several partnerships in the industry which have led to enhanced stability, accelerated industrial reforms, growth, and simplified processes for small projects.

4.4 Reforms that have Successful taken place in terms in the Electricity Sector of Kenya

As indicated in Table 4.1, majority of respondents considered the reforms in the electricity sector to have been successful in all aspects. However, some respondents were neutral about the reforms, others had a contrary opinion about the reforms while a few did not respond.

Table 4.1 Success of the reforms in the electricity sector

	Totally Disagree	**Disagree**	**Neutral**	**Agree**	**Totally Agree**	**No response**	**Total**
Appropriateness of the chosen electricity reforms model as regards							
Generation	1 (7.1%)	1 (7.1%)	1 (7.1%)	5 (35.7%)	6(42.9%)	0	14 (100.0%)
Transmission	1 (7.1%)	1 (7.1%)	4 (28.6%)	5 (35.7%)	3 (21.4%)	0	14 (100.0%)
Distribution	2 (14.3%)	0	4 (28.6%)	6 (42.9%)	2 (14.3%)	0	14 (100.0%)
The success of implementation of the electricity reform process as							
Generation	2 (14.3%)	0	3 (21.4%)	7 (50.0%)	3 (21.4%)	0	14 (100.0%
Transmission	2 (14.3%)	0	5 (35.7%)	5 (35.7%)	1 (7.1%)	0	14 (100.0%)
Distribution	3 (21.4%)	1 (7.1%)	4 (28.6%)	6(42.9%)	0	0	14 (100.0%)
Flexibility of the electricity reform model as regards							
Generation	1 (7.1%)	1 (7.1%)	2 (14.3%)	9 (64.3%)	1 (7.1%)	0	14 (100.0%)
Transmission	1 (7.1%)	3 (21.4%)	3 (21.4%)	4 (28.6%)	1 (7.1%)	2 (14.3%)	14 (100.0%)
Distribution	2 (14.3%)	3 (21.4%)	2 (14.3%)	5 (35.7%)	0	2 (14.3%)	14 (100.0%)
	15(11.8%)	**10 (7.9%)**	**28(22.8%)**	**52(37.0%)**	**18(13.4%)**	**4 (28.6.%)**	**100.0%**

The number of respondents who held neutral opinions regarding the reforms were mainly from the transmission and distribution sectors and they were more than those whose ratings fell on the lower spectrum of the scale. Majority of the respondents (68.0%) felt that the reforms in the electricity generation sector stood out and termed it a success compared with reforms in the transmission (42.0%) and distribution (42.0%) sectors. They concurred with the appropriateness of the chosen reforms, success in implementation of the reforms, and flexibility of the electricity generation reform model. Further analysis revealed that majority

of those emanating from the exploration and generation sector concurred that there was success in the implementation of the electricity reform.

4.5 Future Structural Changes to the Adapted Electricity Reform Model

Figure 4.1 indicates that almost all respondents (85.7%) drawn mainly from generation and exploration, and transmission and distribution sectors, expressed the need for future structural changes to the adapted electricity reform model.

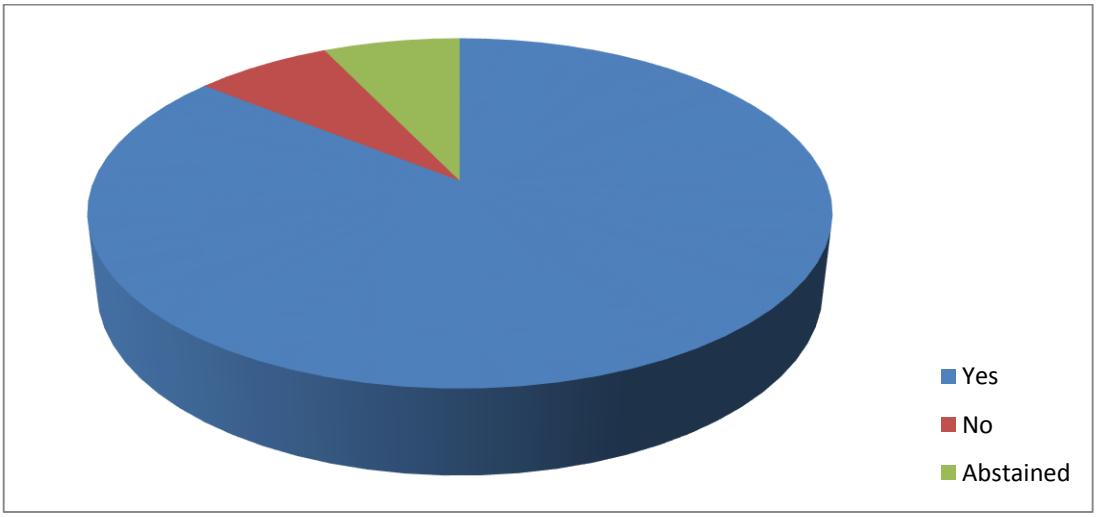

Figure 4.1: Need for structural changes to the adapted Electricity Reform Model

A minority however, either refrained from giving their opinion (7.1%) perhaps because they were not well versed with the finer details of the Kenya energy reforms or did not feel the need for any change.

The respondents that suggested future structural amendments to the adapted electricity reform model (85.7%) recommended benchmarking the model against international

standards harmonizing energy generation, transmission and distribution; and establishing an independent transmission system operator. Additionally, the changes pointed towards breaking KPLC quasi-monopoly over Kenya's electricity transmission and distribution in the electricity sector in order to accommodate more players; implementing future reforms that would facilitate better and full unbundling of the sector; and addressing escalating demands for power in both urban and rural areas.

4.6 Common Challenges and Constraints Experienced in the Electricity Supply Industry

Using a scale of 1 to 5 where 1 meant major challenges and 5 meant minor challenges, respondents were asked to rate the common challenges and constraints that they experienced in the Kenya electricity supply industry. As depicted in Table 4.2, most respondents (41.3%) concurred that there were major challenges and constraints faced in the electricity supply industry. The respondents who considered these aspects a major challenge exceeded all others who felt the aspects were less of a challenge and constraint. The top two major challenges on the list included third party access to the grid and wheeling (64.3%); and authorization process; acquisition of land for electricity infrastructure; and acquisition of land rights for electricity infrastructure (50.0%).

Table 4.2: Common challenges and constraints experienced in the electricity supply industry

	1	2	3	4	5	No Response	Total
1. Technical norms, standards and specifications a challenge?	21.4	7.1	28.6	21.4	21.4	0.0	100.0
2. Policy or lack of	14.3	14.3	14.3	35.7	14.3	7.1	100.0

3. Imports and exports (trading) in regional power pools	35.7	0.0	42.9	7.1	7.1	7.1	100.0
4. regulatory oversight (sector specific and competition)	21.4	14.3	14.3	35.7	7.1	7.1	100.0
5. Regulation of licensing and registrations	14.3	7.1	28.6	35.7	14.3	0.0	100.0
6. Regulating prices and tariffs	21.4	7.1	21.4	35.7	7.1	7.1	100.0
7. Third party access to the grid and wheeling	64.3	14.3	7.1	7.1	0.0	7.1	100.0
8. procurement of new generation capacity	28.6	14.3	21.4	21.4	7.1	7.1	100.0
9. Authorization process and land acquisition for electricity infrastructure in terms of environmental authorization, acquisition of land rights in land for electricity infrastructure	50.0	21.4	21.4	7.1	0.0	0.0	100.0
	271.4	100.0	200.0	207.1	78.6	42.9	
	30.2	11.1	22.2	23.0	8.7	4.8	0.0
		41.3	22.2		**31.7**	4.8	

While 31.7% of respondents perceived that the electricity sector experienced minor constraints, 22.2% did not know of any constraints in the sector. Regulation of licensing and registration was one of the variables that were perceived to have the least challenges and constraints. A few respondents did not attempt to respond to this question given that it was not within their line of duty.

4.7 Main Entry or Access Restrictions to the Electricity Supply Sector in Kenya.

Respondents generally concurred that there were numerous barriers related to policy, KPLC quasi-monopoly in the electricity transmission and distribution sub-sector, implementation and maintenance cost, and other prohibitive environmental assessment cost which hindered investors. They specifically named access and cost of capital (21.4%), bureaucracies in authorizing the generation of power below 40 MW (14.3%) and excessive tariffs controlled by the government (21.4%) as the main limitations. Others mentioned are those related to renewable energy technologies, unfavorable business environment terrain which include licensing cost; land policies, limited technology and implementation; inadequately connected grid as restrictive to the supply of energy in Kenya.

Question 2: How can the electricity-related services sector be better classified nationally and regionally in alignment with pro-competitive disciplines?

4.8 How electricity prices and tariffs are set and how one would evaluate the appropriateness of the relevant regulations

All respondents were aware that there was a regulator dealing with the electricity sector for the effective implementation of regulations. Most respondents felt that these tariffs were annually set in a competitive manner by the Energy Regulatory Commission based on usage (demand and consumption ratios), the current fuel price in the international market, and foreign exchange. Others felt that tariffs generally reflected the cost of production set after negotiations and consultations among various stakeholders such as electricity generating companies, MOEP, ERC and developers, while consumers played a minimal role. A respondent

stated that tariffs were set as cost effective as possible, while taking into account the revenue requirements of the whole supply chain, future expansions, losses, etc.

Recommendations were made to the effect that ERC should carry out medium-term forecasting and pricing of electricity. This would enable end users to plan and cost their goods and services appropriately. Albeit ERC being well structured, there is need for speed and aggressiveness enhancement in the whole system, and increasing the role of ERC from just determining the cost programme.

4. 9 How competition is regulated in the electricity supply market and how one would evaluate the effectiveness of the relevant regulation

Respondents acknowledged that competition existed in the supply of electricity in the industry and was regulated by ERC. However, in the case of distribution, KPLC still enjoyed a monopoly. When asked how they evaluated the effectiveness of the relevant regulation process, respondents were of the opinion that it was effective to a large extent, however the supply of electricity relied primarily on KPLC as it controlled the distribution network for enabling competitors to reach end-consumers. There was a suggestion that an evaluation should be conducted in the future.

4.10 What needs to be put in place to facilitate access to and usage of the grid for wheeling of electricity

When asked what structures should be put in place to facilitate access and usage of the electricity grid by third party to enable trade in electricity across border, respondents

suggested an array of measures which ranged from implementing appropriate legislation to govern wheeling and the charges to be considered and implemented. They further recommended that processes and procedures relating to TPA negotiations and agreements, standardization of grid codes and operating procedures, be duly implemented. Furthermore, respondents called for the following: the involvement of professional contractors in the electrical distribution sector, fairness or level playing field for new entrants in the distribution sector, opening up the transmission of power, and giving guidelines on wheeling.

Respondents further requested for the establishment of mini grids which are fueled by diesel renewables, such as solar, hydro, wind or biomass in more areas to eliminate dependency on the main grid, making public the wheeling charges and the wheeling template, and the use of more renewable power sources to encourage self-reliance by end-users.

4.11 Electricity Related Services that have Emerged as a Result of Reforms in the Electricity Sector in Kenya

The study established that most of the services existed even before the reforms but were all centralized and carried out by KPLC. The implementation of reforms resulted in unbundling of the electricity services sector such that the services were undertaken by different entities and hence improving the overall efficiency of the sector. Respondents indicated that there was significant developments in the construction services that were related to electricity facilities, energy audit and management, and the supply of metering, billing, enforced payment, etc. In addition, respondents also indicated that the reforms led to billing services,

engineering, technical testing and analysis, and the emergence of transport or transmission of electricity services.

Furthermore, respondents observed several other electricity-related services that emerged as a result of reforms, including enforcement service, maintenance and repairs of electricity equipment, provision of customer service in the supply of electricity, service incidental to electricity management, and scientific and technical consulting services.

4.12 Respondents' Perspective on the Impact of the Reforms in Kenya in line with the Emerging Electricity Related Services

With the implementation of reforms in the electricty sector, respondents acknowledged that their impact was most felt in the transport or transmission of electricity, followed by construction services that are related to putting up of electricity infrastructure, and the provision of customer service in the supply of electricity according to the services that emerged after unbundling of the vertically integrated electricity company. In addition, respondents also felt that reforms were instrumental in the following electricity services: maintenance, technical testing and analysis services, supply (metering, billing, enforcing payment and provision of customer service), repairs of electricity equipment and services incidental to electricity distribution. However, respondents were of the opinion that the least impact was felt in consulting services such as energy audit engineering, research and design in the electricity sector, and enforcement services of payment in the supply of electricity.

4.13 Regulatory Elements Necessary in Maintaining Competition in the Electricity Supply in Kenya

Most respondents, noted as important, the independence of regulator from policy maker (government) and external influences like vested interest groups in maintaining competition in the electricity supply services at the national level. Also there is need to have the necessary human and financial capacity, an efficient process for the regulator to initiate, develop and enforce regulation, ensure that there is political will to support regulator, and that the regulator is transparent and accountable to parliament, industry players, and consumers.

4.14 Regional Electricity Regulatory Cooperation Arrangement Awareness that Kenya is part of.

Most of the respondents were aware of regional electricity cooperation arrangement(s) and on implementation, regulation and information dissemination that Kenya is part of. The nature of the cooperation was stated as follows:

- As relates to the form of power pools and tariff setting, the East African Power Pool was considered successful and to seamlessly facilitate the distribution of electricity between neighbouring countries.
- Basic but functional framework. Besides having this, there was need to expedite regional co-operation on grid connectivity and use of resources to reduce the cost of power in the entire region
- The existence of the Independent Regulatory Board (IRB) of Eastern Africa Power Pool (EAPP) which is a relatively new body. ERC is a member of Regulators for Eastern and Southern Africa (RAERESA), Energy Regulatory of East Africa Association (EREA) and the

Association of African Regulators, where information is shared among member regulators. This has led to harmonizing of most of the regulations within the EAC Partner States.

4.15 Pro-Competitive Regulatory Elements Contained in the Regional Cooperation Arrangement

Respondents were asked which of these pro-competitive regulatory elements were contained in the regional cooperation agreement and most stated that technical standards were included in the agreements. The other elements that respondents felt were also contained in the regional cooperation agreement, include the role and rights of independent power producers, the right of national regulators to consider national policy objectives, non-discriminatory access to the grid, and fees for accessing and using the grid.

CHAPTER 5

DISCUSSION

This chapter presents the discussion based on the findings and will also provide interpretation in relation to the previous studies reviewed under literature. Unbundling the electricity sector has been the cornerstone of energy strategies in most developing countries. It is however, a source of controversy among development analysts. Advocates of the unbundling claim that it has major impacts on trade in service negotiations, which affect both agricultural and industrial productivity. They also argue that it reduces rural-urban migration, creates more jobs, and significantly raises the overall quality of life in an economy. Critics, on the other hand, claim that unbundling the sector may not have the anticipated effects on social and economic life, and could contribute to social tension.

The study adopted a descriptive research design with positivistic and phenomenological approaches; it encompassed both quantitative and qualitative data approaches. The target population was experts in the areas of electricity policy who were sampled using a purposive sampling procedure. Out of this sample, a sample of eighteen respondents was obtained from various sub sectors. Close-ended questionnaires were used to collect the data which was later analysed using both thematic analysis for qualitative data, and descriptive and inferential techniques for quantitative data.

1. The reforms in the electricity sector in Kenya and whether they have brought about new services taking into account the key regulatory elements necessary to enhance competition in the sector

- The study established that there were indeed some on-going reforms in the electricity sector in Kenya that were customer centric. These include the creation of new agencies solely established to facilitate the unbundling of the power or electricity sector into generation, transmission and distribution, the enactment of Electric Power Act 1997/2006, and better regulation and service delivery in the electricity sub-sector.
- The study also established that the two major challenges faced in electricity unbundling was third party access to the grid and wheeling. The other significant challenge was the authorization process and acquisition of land rights for electricity infrastructure.
- As far as the barriers of entry to electricity supply in Kenya were concerned, the study found out that the main hindrances for investors were the KPLC quasi-monopoly in the electricity transmission and distribution network, implementation and maintenance costs, and other prohibitive environmental assessment costs.
- The study established that most of the services existed even before the reforms, however these services all centralized and carried out by KPLC. The implementation of reforms resulted in unbundling of the electricity services sector such that the services are now being undertaken by different entities and hence, improving the overall efficiency of the sector.
- Respondents indicated that there was significant developments in the construction services that were related to electricity facilities, energy audit and management and the supply of metering, billing, enforced payment, etc. In

addition, respondents also indicated that the reforms led to billing services, engineering, technical testing and analysis, and the emergence of transport or transmission of electricity services.

- Furthermore, respondents observed several other electricity-related services that emerged as a result of reforms, namely enforcement service, maintenance and repairs of electricity equipment, provision of customer service in the supply of electricity, service incidental to electricity management, and scientific and technical consulting services.

2. How can the electricity-related services sector be better classified nationally and regionally in alignment with pro-competitive disciplines?
    - As far as the setting of tariffs was concerned, the study established that respondents knew that they were set annually by the Energy Regulatory Commission (ERC) in a competitive manner. However, the price of fuel in the international market played a major role in their decision-making.
    - Some respondents stated that KPLC enjoyed a monopoly in the distribution network and that competition existed in the supply of electricity and was regulated by ERC.
    - On respondent's perceptions on the impact of the reforms, most accorded the highest impact to the transmission of electricity, followed by construction services that are related to putting up of electricity infrastructure, and the provision of customer service in the supply of electricity according to the services that emerged after unbundling of the vertically integrated electricity

company. The least impact was in the enforcement services of payment in the supply of electricity.

- The majority of respondents emphasized the importance of an independent regulator from government (policy maker) and external influences like vested interest groups, for the maintenance of competition in the electricity supply in Kenya.
- Most of the respondents were aware of the regional electricity cooperation arrangement(s) on implementation, regulation and information dissemination, which Kenya is part of, and vividly pointing out the nature of the cooperation.
- About 50% of respondents seemed not to be aware of the pro-competitive elements in the regional cooperation agreements that Kenya was participating in, by their indication that they were not included. This might insinuate that some of the experts in the area were not be well informed, however this could be considered fallacious.

The introduction of KenGen and Geothermal Development Company as policy reforms has had a positive impact and is largely considered a success because it has assisted in the elimination of power rationing due to its backup capacity and also injected more than 1000 MW in the national grid. However, policy reforms in the distribution network resulted in a KPLC monopoly due to the large amount of capital required for the introduction of competing firms. The emergence of contractors to aid in the distribution of the available electricity has had little impact, as indicated by the players in both the transmission and distribution sectors.

Nevertheless, there has been a suggestion to introduce professional contractors to ensure efficiency in the provision of services in the electricity sector.

One of the suggestions was to consider the introduction of competition in the distribution network in Kenya, however this would be technical and resource intensive. Devolution in Kenya can play a role in ensuring this by allocating county governments the necessary resources to establish county managed electricity distribution centers and possibly in the generation of electricity. An example is demonstrated in the case of a Kenyan in Murang'a County who generates electricity from a local water fall and distributes it to the local community (https://www.youtube.com/watch?v=eK762rIvXkc).

The electricity supply industry experiences a lot of challenges, one being third party access to the grid and wheeling with the process of access being negotiated between the KPLC as the operator of the network, government agencies such as National Environmental Management Authority (NEMA) and the Ministry of Lands, and competing suppliers of electricity to end-consumers. The silos in the Kenyan government also play a crucial role in fueling the challenge as one wing of the government, for instance, the NEMA and the Ministry of Lands pose rigorous processes which are next to impossible in obtaining environmental authorization and rendering the acquisition of land, respectively.

Power pools were developed solely to aid the importation and exportation of electricity cheaply. Due to the insufficiency of power within the power pool, sometimes a country is forced to source for electricity from other power pools. Kenya, for instance, is forced to source

for power from the Southern African power pool (SAPP), specifically from Kabwe in Zambia. This lack of sufficient power within the pools has been a challenge but the introduction of sourcing of electricity from renewable energy such as geothermal, has boosted supply significantly. Even though there is insufficient supply of power in Kenya, new entrants or interested parties are faced by a number of challenges when they attempt to enter the market. One of the challenge, which can also be a prudential measure by the regulator, is that the new entrant must show proof of the required capital. This is a challenge for small and medium enterprises. Another challenge is that the tariffs, which are set by the ERC, might not be viable when compared with the required capital to encourage new entrants to the market, and thus discouraging new investments.

Small scale generation enterprises are constrained by the capital intensity and technological requirements in the generation of electricity, which constitutes an entry barrier for plants of over 40 MW. This also, is not an easy road because they face a vast number of challenges, including high licensing costs, stringent land policies posed by the Ministry of Lands, limited technology for the implementation, and the inadequately connected grid (this is the main bottle neck as a supplier is only allowed to connect electricity to the available grid and thus, one cannot establish their own grid).

The aspect of pricing and cost recovery is also crucial as this is what will ensure that any distributor remains in the market. The ERC, as the regulator mandated to set electricity tariffs in Kenya, provides technical advice on tariffs in the retail of electricity through the consultative tariff review meetings, which involve consumers. The tariffs are set in the most

cost-effective way taking into account the regional cost of the fuel (crude oil), while calculating the past, current and anticipated losses, along with the economic nature of the end user based on the units (KWh) consumed. This generally reflects the cost of production set after negotiations and consultations. However, as noted in Onyango et al., (2011), the electricity prices in Kenya are still high even after the partial unbundling of the state-owned KPLC due to the dominance of the majority owned government service provider (Kenya Power) in the transmission and distribution network.

Abrupt increase in the tariffs has been witnessed on several occasions in Kenya, a move that has been greatly opposed by the Kenya Association of Manufacturers (KAM), who are the largest consumers of electricity. This shift in tariffs has influenced the economy at large, as the producers are forced to increase the cost of commodities to cushion them against the losses, which finally falls on to the end-consumer.

The supply chain of electricity has seen the introduction of competition in both the generation and some aspects of distribution. The competition, however, is not posed directly to Kenya power hence the company still enjoys a monopoly. This is because even though the power is generated by Geothermal and KenGen, the generated power is still supplied by Kenya Power, which is also in charge of collection of revenue generated. Kenya Power has also outsourced the distribution repair and maintenance to contractors, hence playing the sole role of administration and policy implementation. This tactically renders Kenya Power the monopolistic nature that the policy endeavoured to eliminate.

There have been stumbling blocks in the access to and usage of the grid for transportation (wheeling) of electricity by third parties to enable cross-border electricity trade. The predicaments are attributed to a non-level playing ground for all the contractors, unclear methodology for calculating the wheeling charges and hence lack of a standard template for wheeling agreements, unstandardized grid codes and operating procedures, and the lack of mini grids and consequently, the sole reliance on the main grid managed by KETRACO.

Services such as engineering, technical testing and analysis, transport and transmission of electricity, billing services, supply of electricity, consulting and construction of electricity facilities existed and were done by KPLC, which was a monopoly in the electricity sector. The policy reforms of 1997-2006 have ensured that these services have been unbundled from KPLC, with some services outsourced by KPLC, while others such as generation and transmission have been separated from KPLC completely. This is an important development for the trade in services agenda because liberalization in the electricity sector brings about foreign services players to compete in the market, and can therefore be an issue for negotiations at the regional and multilateral levels.

The reforms have been largely felt in transmission of electricity, followed by construction services that are related to putting up of electricity infrastructure, and the provision of customer service in the supply of electricity. The impact has however, not yet been greatly felt in the maintenance and repair of electricity equipment according to the sector's impact or growth as a little preference is accorded to Research and Development (R&D) in the electricity sector.

The electricity sector plays an important role in the overall performance of the economy as it is a main price determinant of commodities. This is in line with the sentiments of Melly (2003), who suggested that the electricity industry directly determines international competitiveness as the prices for electricity influence the prices for exports of both goods and services. Further, this study suggested that this could diminish the competitiveness of a country's industries internationally, especially when the price of electricity is high.

Our study established that tariffs setting is an important role and hence needs strategic intervention, taking into account pertinent views from key stakeholders. This correlates with a study conducted by Cameron (2007), who ascertained that the electricity industry necessitates tougher regulations and tariffs settings focusing on fluctuations in demand due to weather patterns, and fluctuations at different times during the day. The study concluded that this creates a 'peak-demand problem', which means that for the supply of the whole load to be taken care of, capacity should be equal to or be more than the load at all times. Pricing strategies such as for peak load pricing, can be taken account by tactical teams drawn from different sectors to set the usage regulation by either pricing or increasing the capacity to cater for burnouts and blackouts.

This study also ascertained that government was a stumbling block to the reform agenda as it owns and controls the grid access through KETRACO. This is in tandem with the study conducted by WTO (2010), which established that the need for supply through fixed networks for transportation and delivery of electricity to end users makes transmission a natural

monopoly. Furthermore, this is complicated by the fact that it is costly to develop electricity infrastructure, which requires large amounts of capital, that is, sunk costs for its construction and maintenance. This locks out most interested investors as the cost is not recoverable through the tariffs as set by the regulator. As indicated by Power Africa (2016), this has led to the introduction of off-grid solutions that provide effective cost-saving measures and rapid means of connecting rural areas and those that are costly, to the grid. The off-grid market comprises of actors in renewable energy mini-grids, solar lanterns, and single-home solar systems.

Private small entrants in the renewable energy generation sector face another challenge as the power produced cannot be stored and thereby, forcing them to ensure that all the electricity produced is consumed concurrently. This poses a major challenge as they must supply it to the under capacity power grid and thus, making it difficult for them to penetrate. This confirms the views of Cronje (2013), who remarks that where the generation of electricity is by a secondary source such as combustion of fuels, renewable energy or nuclear energy, then it is not easy to store the electricity, this means that it must be distributed simultaneously to users through transmission and distribution grids. Therefore, there is need to put in place net metering provisions that ensure new entrants are connected to the grid.

A combination of lack of political goodwill and insufficient technical capacities has been established as the main barriers of the reform agenda in the electricity sector. This is echoed by Cameron (2007) and Selivanova (2014), who indicated that due to the exhaustible nature of hydrocarbons, which are considered to have irregular distribution, issues of security arise

thus making it a strategic political matter. This builds barriers to entry and requires technical coordination as the regulators argue that there is need for flexibility in the generation of electricity to ensure rapid response to demand changes.

The study also found that the introduction of competition in the value chain has been instrumental in pushing the reform agenda forward. It however, noted that the main bottleneck is in ensuring that there is no abuse of dominant power in the transmission and distribution network. This is confirmed by Cali et al., (2008), OECD (2005), and Melly (2003), who suggested that reforms have made most governments conclude that a sole provider is no longer a prerequisite for efficiency and that there is need to introduce competition in some segments of the value chain, such as generation and retail supply. The study however, indicates that transmission and distribution segments are considered natural monopolies since it would not be necessary to have competing grids and thus, the grid remains under the control of government. Nevertheless, there will be need to ensure that the transmitters and distributors of electricity provide third party access to the network in a fair manner.

The study established that one of the challenges that the reform agenda faces is in the discriminatory third-party access of power. Melly (2003), emphasized that regulatory supervision is needed in the transmission and distribution segments to ensure equal system access for producers and consumers to the network systems. This calls for the regulations to guarantee non-discriminatory third-party access to electricity transmission and distribution networks. The main achievement of the electricity reforms as ascertained by the study was improved physical access by almost 70% but the cost of the electricity is somewhat high to

some rural households. This contradicts the universal access benchmark as set out by Evans (2006), who suggested that having universal access to electricity services has two main components, namely. affordability and physical connection.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

The study was motivated by the limited literature on the reforms undertaken in the electricity sector in Kenya and the emergence of an electricity services sector. According to Power Africa (a US government-led partnership, 2016), the reforms in the electricity sector in Kenya and an increase in connections has led to good governance and participation by the private sector in generation, coupled with a doubling of electricity penetration from 20% to 46% of households in four years. Moreover, it projected that power demand in Kenya will reach 2,600-3,600 MW by 2020, up to double the demand in 2015. Therefore, this suggests that there is still need for further development of the electricity infrastructure and insufficient generation to cater for the remaining section of households.

Having a sound regulatory framework that promotes domestic and regional trade will be key in ensuring that investors and new entrants are encouraged to enter the electricity market. The study concludes that reforms in the electricity sector in Kenya have brought about new services and considered the key regulatory elements necessary to enhance competition in the sector. The new services that have emerged include geothermal exploration, grid connectivity through KENTRACO, generating electricity from crude oil, and ensuring that more households are connected to the national grid through the rural electrification project.

Institutional reforms in electricity unbundling aid in facilitating the implementation of electricity to the poor and streamlining the sector such that the implementation of the

program benefits exactly those who are targeted. These reforms have ensured the continuity of expansion of electricity services and protection of all intended stakeholders. The reforms in the electricity sector are driven by the need to improve technical and financial performance, promote investment in system development, and to reduce political interference in tariff setting and utility management.

The success of unbundling of the electricity sector depends on the ability of the consumers to pay for the connectivity costs. The ability to pay is largely dependent on the level of income among the residents among other factors. However, the government of Kenya through its rural electrification programme, has subsidized connectivity costs so as to reach remote areas with the development of regulations to encourage mini-grids. Therefore, the choice is between connecting to the national grid through the rural electrification projects or using alternative power sources such as solar.

With the unbundling of the electricity sector in Kenya, core electricity services of production, transmission and distribution are now increasingly being supplied by independent operators, in the public and private sectors. Aspects of competition conditions have been introduced in the production and distribution of electricity. Non-core electricity-related services have also emerged such as consulting, including in electricity efficiency, conservation and renewable sources of energy; maintenance of electricity network; construction works in the electricity sector; and distribution in terms of billing and metering.

It is also worth noting that there has been substantial progress in unbundling the electricity sector in Kenya, in terms of provision of funding by government and having adequate policies to guide the process of sourcing more funds for infrastructural development. However, there is a lot more to be done in terms of identifying additional sources of funding, increasing community participation, and end to end monitoring of projects, including an additional grid other than the one managed by KETRACO.

Electricity unbundling also brought about the need for management support to clarify all the strategic objectives of the project so as to ensure the project is executed and delivered in line with the strategic objectives and serve the overall business purpose. The silos that exist between the policy developers and the different implementation arms should be eliminated to ensure that all the stakeholders sit together and work on the set objectives. It can also be concluded that a clear scope of work influences the unbundling of electricity to a very great extent. A clear scope is maintained through effective stakeholder communication and participation, and proper documentation of project work.

Electricity unbundling projects need to be monitored and lessons learnt need to be properly documented and used to inform future projects. The government of Kenya needs to support and provide incentives for investments in alternative power sources such as mini-grids. This needs to complement electrification efforts to improve and increase accessibility to the national grid, while at the same time promoting the use of renewable energy as opposed to fossil generated electricity.

6.2 Recommendations

The study recommends the following:

- Financing of projects in the electricity sector: the government should revise the electrification policy to ensure that the cost of electricity is affordable for all and not only those in the rural areas. This will encourage investments in other sectors because electricity is an infrastructural sector that is an enabler of other sectors such as manufacturing, agriculture and services. Also, there is need to continue monitoring and evaluating progress within the sector in order to inform future projects.
- Private sector participation: the government of Kenya needs to ensure that the legal and regulatory framework in the electricity sector encourages competition, especially in allowing small and medium enterprises to participate in the electricity services sector.
- Open access: ERC should work with Kenya Power, as the dominant player in the electricity sector, to develop TPA regulations that are transparent and non-discriminatory, and that encourage national and regional trade for new entrants in the electricity market. Having a TPA regulation is a prerequisite for the creation of a competitive national and cross-border electricity market, and is a tool that guarantees effective liberalization of the sector.
- Regional cooperation in the electricity sector: Kenya should encourage regional trade in electricity, by developing the trade in services activities to promote trade in the sector. This may require active participation in regional negotiations and a clear classification of the sector that is geared towards the current situation to ensure that the sector is well structured and defined.

- Regional and multilateral negotiations in electricity services sector: the inclusion of electricity services sector, as a sub-sector of the wider energy-related services sector, in regional and multilateral negotiations would be beneficial to Kenya in terms of opening the sector for cross-border trade. This would bring about opportunities for both exports and imports in the electricity sector. The inclusion of a reference paper dealing with the imperative regulatory issues in the sector would complement the market access liberalization in the electricity sector, for enhancing trade in electricity services both nationally and cross-border.

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APPENDICES

Appendix 1: Letter to Respondents

Emily N Mburu
P.O. Box 3018
Gaborone
Botswana

8 July 2015

To Whom It May Concern

REF: REQUEST FOR RESEARCH DATA

My name is Emily Mburu, a post graduate student at University of Cape Town Graduate School of Business, pursuing a Master of Commerce in Management Practice specializing in Trade Law & Policy at the Faculty of Commerce.

As part of the requirement of the course, I have been mandated to conduct a research paper on a subject of my choice; which is Energy-related services in Kenya: Implications of unbundling of the electricity sector on trade in services negotiations.

This research is purely for study purposes and all information will be handled confidentially and expressed in an aggregate manner according to the study objectives. To make this a success, you have been identified as a potential participant in the survey and I kindly request you to participate in the study by giving your honest opinion on the subject of enquiry.

Please note that your input is invaluable and there are no right or wrong answers.

I thank you for your time and participation.

Kind regards

Emily Mburu

Appendix 2: Questionnaire

Instructions

Kindly circle the appropriate answers in the boxes provided and write down the appropriate answers in the spaces provided.

SECTION 1: RESPONDENTS' DEMOGRAPHICS

Question 1: What is your area of work?	
1. Policy	
2. Regulation	
3. Private sector (Independent Power Producers, traders etc),	
4. **Others [Please specify]. . . . .**	

Question 2: In which of the following electricity sectors do you work?	
1. Finance and Strategic Planning	
2. Regional and International Organizations on Policy	
3. Exploration and Generation	
4. Transmission and Supply	
5. Others [Please specify].	

SECTION 2: REFORMS IN THE ELECTRICITY SECTOR IN KENYA

Question 3: Kindly list the main reforms, in your opinion, that have taken place in the electricity sector in Kenya over the past 10 years.

_____

_____

_____

_____

_____

Question 4: In your opinion and on a scale of 1 to 5, **where 1 means Totally Disagree and 5 means Totally Agree,** do you think the reforms have been successful in terms of. . .?

Question 4A: Appropriateness of the chosen electricity reform model as regards					
4.1a Generation	1	2	3	4	5
4.2a Transmission	1	2	3	4	5
4.3a Distribution	1	2	3	4	5
Question 4B.: The success of implementation of the electricity reform process as regards					
4.1a Generation	1	2	3	4	5
4.2b Transmission	1	2	3	4	5
4.3b Distribution	1	2	3	4	5
Question 4C: Flexibility of the electricity reform model as regards					
4.1c Generation	1	2	3	4	5

4.2 c Transmission	1	2	3	4	5
4.3c Distribution	1	2	3	4	5

Question 5: Is there need for future changes to the adopted electricity reform model?	
Yes	1
No	2

Please explain your answer in Question6 above:

Question 6: The following are common challenges and constraints experienced in an electricity supply industry. On a scale of 1 to 5 indicate the level at which you consider the following to be a challenge or constraint in Kenya.
[Number 1 being a major challenge/constraint and Number 5 being a minor challenge/constraint]

6.1 Technical norms and standards and specifications	1	2	3	4	5
6.2 Policy (or lack thereof)	1	2	3	4	5
6.3 Imports and exports (trading) in regional power pools	1	2	3	4	5
6.4 Regulatory oversight (sector specific and competition)	1	2	3	4	5
6.5 Regulation of licensing and registration	1	2	3	4	5
6.6 Regulating prices and tariffs	1	2	3	4	5
6.7 3rd party access to the grid and wheeling	1	2	3	4	5
6.8 Procurement of new generation capacity	1	2	3	4	5
6.9 Authorization process and land acquisition for electricity infrastructure in terms of environmental authorizations, water use, acquisition of land or rights in land for electricity infrastructure	1	2	3	4	5

Question 7: What would you say are the main entry or access restrictions to the electricity (generation, transmission or distribution) supply sector in Kenya?

Question 8: How are the regulations relating to electricity prices and tariffs set and how would you evaluate the appropriateness of the relevant regulation, process and body?

Question 9: How is competition regulated in the electricity supply market and how would you evaluate the effectiveness of the relevant regulation, process and body?

Question 10: What should be put in place to facilitate access to and usage of the grid for transportation (wheeling) of electricity by third parties to enable trade in electricity across-borders?

Question 11: Please indicate in the table below which of the following electricity related services that are part of the electricity sector have been subject to reforms in Kenya?

11.1 Transport or transmission of electricity	
11.2 Supply which includes metering, billing, enforcing payment and providing customer services	
11.3 Billing services in the supply of electricity	
11.4 Enforcement services of payment in the supply of electricity	
11.5 Provision of customer services in the supply of electricity	
11.6 Construction services related to putting up of electricity infrastructure	
11.7 Consulting services such as energy audit, management, scientific and technical services etc	
11.8 Engineering services provided in the electricity sector	
11.9 Technical testing and analysis services provided in the electricity sector	
11.10 Services incidental to electricity distribution	
11.11 Research and Development (R&D) in the electricity sector	
11.12 Maintenance and repair of electricity equipment	

Question 12: Please indicate in the table below your assessment of the impact of the reforms in Kenya in line with the electricity related services mentioned above. **[Kindly number 1 to 5 your assessment according to the sector's impact or growth: Number 1 being the highest impact while Number 5 being the smallest impact from your point of view]**

12.1 Transport or transmission of electricity	
12.2 Supply which includes metering, billing, enforcing payment and providing customer services	
12.3 Billing services in the supply of electricity	
12.4 Enforcement services of payment in the supply of electricity	
12.5 Provision of customer services in the supply of electricity	
12.6 Construction services related to putting up of electricity infrastructure	
12.7 Consulting services such as energy audit, management, scientific and technical services etc	
12.8 Engineering services provided in the electricity sector	
12.9 Technical testing and analysis services provided in the electricity sector	
12.10 Services incidental to electricity distribution	
12.11 Research and Development (R&D) in the electricity sector	
12.12 Maintenance and repair of electricity equipment	

Question 13: The following are key regulatory elements necessary in maintaining competition in the electricity supply services at the national level. In your opinion which regulatory elements are **not** present in Kenya? **[Kindly number as many as appropriate according to importance starting with number 1 being the most important while number 5 being the smallest impact from your point of view]**

13.1 Legislation that provides a clear mandate for the regulator	
13.2 Human and financial capacity	
13.3 Process of regulator to initiate, develop and enforce regulation	
13.4 Is the regulator viewed or perceived as iindependent from the policy maker (government)	
13.5 Independence of regulator from possible external influences like vested interest groups	
13.6 Political will to support regulator	
13.7 Transparency and accountability of regulator to parliament, industry players, consumers.	

Question14: Are you aware of any regional electricity regulatory cooperation arrangement/s that Kenya is part of? (**Please tick one**)

1. Yes	
2. No	

Question15: If Yes, what is the nature of the cooperation and how would you evaluate its success? _____
_____
_____
_____
_____

Question16: Which of the following pro-competitive regulatory elements are contained in the regional cooperation arrangement mentioned in Question 16 above? **[Kindly number as many as appropriate according to importance starting with number 1 being the most important]**

16.1 Non-discriminatory access to the grid	
16.2 Fees for accessing and using the grid	
16.3 Technical standards	
16.4 Role and rights of independent power producers	
16.5 The right of national regulators to consider national policy objectives	

Thank you for your participation in this study.