

# Is Kenya Ready for Electricity Open Access? Institutional and Regulatory Insights from Developed Economies

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## ABSTRACT

Electricity Open Access refers to allowing access to electricity transmission and distribution infrastructure non-discriminatorily- to both consumers, distributors and generators. The intention is to open up competition in electricity sector's retail and generation alike. Developed economies like the European Union member states, United States, and some parts of Australia have implemented different Open Access models and they have both experienced mixed outcomes in the process. This paper interrogates the regulatory and institutional readiness of Kenya's framework. The underlying regulatory, legal, and institutional environments- with respect to Electricity Open Access readiness, are explored and correlated to the Open Access models in select developed economies. This includes appreciation of the historical evolutions that have seen Kenya's unbundling of the electricity sector over the past three decades. The conceptual framework utilized in the study establishes the outcomes of open access initiatives in the sector as the variable that is dependent on interactions between market infrastructure capacity, institutional arrangements, and legal provisions. External feedback into the relationships is derived from analysis of other jurisdictions- borrowing from the theoretical frameworks of regulatory governance, new institutional economics, and electricity markets design.

In the process, and through comparative policy analysis, enablers are identified, policy pathways, and bottlenecks alike.

**Keywords:** Energy and Petroleum Regulatory Authority (EPRA), KPLC, Electricity Open Access, bulk access Competition, distribution, transmission, electricity markets, institutional arrangements, unbundling, liberalization.

## THE BACKGROUND

Open access electricity market is an overall global strategy adapted by economies seeking to liberalize their electricity markets. This concept allows different providers of electricity to make use of the underlying distribution and transmission infrastructure – owned by incumbent utility companies. This technically positions the 'electricity infrastructure' as a service- separate from the electricity flowing within. Joskow (2008), hails open access as having the effect of fostering competition, and lowering the electricity prices. Whereas this model has been successfully operationalized in other regions, including Europe, Kenya still remains an outlier in the sub-Saharan Africa, where the sector is mostly monopolized and highly regulated (KPLC, 2021). Having transcended a rich energy transition history, with tariffs historically set below levels that reflected actual cost-recent trends have included shift from implicit and explicit subsidy mechanisms to market based approaches.

Like many African countries, Kenya has been at the crossroads of balancing between the dire need for achieving 100% electricity access, ensuring the electricity is reliably affordable, and realizing sustainable energy (Joskow, 2008). A couple of efforts have been realized in the recent past though. Most of which have seen the energy sector transitioning from the previous subsidy models to market sustained models. The most recent trajectory included alignment of the Energy Act (2019) - together with associated regulations aimed at enhancing competition in the electricity sector. This is evidenced by the most recent Energy (Electricity Market, Bulk Supply, and Open Access) Regulations, which were inaugurated in 2024. These regulatory refinements sit on decades of commendable progress which saw the traditional utility model evolve to unbundled generation,

transmission and distribution sectors. KenGen remained with the generation mandate – with the evolutions allowing for independent power producers (IPPs) to join in the market. Transmission was mandated to the transmission system operator (KETRACO) – fully government owned, with the transitioning of infrastructure still in progress to date. Rural Electrification And Renewable Energy Corporation (REREC)- a fully owned government entity, in turn was formed to promote rural electrification renewable energy promotion- an area which is mostly less attractive to private sector considering the returns prospects.

The distribution network however is still monopolized by KPLC who doubles up as the main electricity retailer, and as the main distribution system operator. The current regulatory landscape intends to open up the retail market to competition- a process which is yet to fully pick up. Whereas there have been institutional realignments and regulatory strategies – as efforts towards realizing the much desired liberalization of the sector by Kenya, there have also been a couple of impeding bottlenecks. According to World Bank (2020), some of these bottlenecks have included institutional resistances, regulatory limitations, pricing structures, and infrastructure access modalities.

Policy aspirations have already been drawn. But the question remains; when will these policy aspirations transcend to functional market realities? This paper critically evaluates the underlying scenario – borrowing insights from success stories- from which recommendations for Kenya’s trajectory are inferred.

### **Problem statement**

The structure for the power sector in Kenya remains vertically integrated. Kenya Power and Lighting Company (KPLC), still monopolizes the distribution network with the transmission mandate transitioned by the recent changes, to Kenya Transmission Company (KETRACO), though not wholly yet. Legal provisions promoting the much desired competition exist, albeit with ambiguities surrounding the practical readiness stalling the much desired competitive environment. This is assessed systematically; borrowing insights from select international experiences reviewed.

### **Objectives**

The main objective of this study is to analyze Kenya’s regulatory and Institutional readiness for Open Access- through comparisons from developed economies’ frameworks.

### **Conceptual Framework**

The conceptual framework guiding this study links the outcomes of electricity open access to the interactions between market infrastructure capacity, institutional arrangements, and legal provisions-upon which metric to assess open market readiness is premised. An assumption is made from the framework that an enabling legislation is not enough to support electricity open access, but it must be complemented by operational market mechanisms, and credible institutions. These three inter dependent pillars contribute to the performance of the open access as propositioned by the conceptual framework and this performance may be measured in terms of competitive market participation, consumer choice, investment response, and non-discriminatory network access.

The dependent variable in this study would thus be the outcomes of electricity open access- being, the number of new private sector entrants into the electricity market, and standardized wheeling framework. On the other hand, the independent variables include capacity of market infrastructure, institutional frameworks, and legal provisions.

The conceptual framework further recognizes the feedback effects- acknowledging the undermining and converse impacts of institutional capacity on electricity open access. As an external feedback, comparative international experience is incorporated.

### **Theoretical Framework**

This study is pivoted on integrated theoretical frameworks that draw from Regulatory Governance Theory, New Institutional Economics, and Electricity Market Design Theory. Where institutions lack credibility,

independence, and enforcement capacity, legislations may fail to realize competitive outcomes. These theories are elaborated below.

### **Regulatory governance theory**

This theory stresses on the importance of predictability, accountability, transparency, and regulatory independence in the network industries that are characterized by natural components of monopoly (Pollit, 2012). Successful open access markets are characterized by strong regulators who are capable of enforcing non-discriminatory access, setting cost reflective and predictable tariffs, and restraining incumbent behavior. It is from this theoretical lens that the causative impacts of partial unbundling, and discretionary tariffs, are inferred-creating basis for the study's emphasis on need for strengthening market monitoring mechanisms, and regulatory oversight within Kenya's electricity space.

### **New Institutional Economics**

This theory, as defined by North (1990), posits that formal laws alone do not shape economic outcomes; but also rules, quality of institutions, and enforcement mechanisms play a critical role as well. For instance, expecting a competitor to effectively implement the access-to-network policy to other competitors can in itself be a negating expectation. It is from this underlying where the inference for an independent distribution network operator emanates- borrowing from implemented models in developed jurisdictions.

### **Electricity Market Design Theory**

This theory maintains focus on the impacts of pricing mechanisms, system operation arrangements, and market rules on competition, reliability, and efficiency (Joskow, 2008). According to this theory, successful open access markets are characterized with standardized tariffs, independent system operators, balancing mechanisms, and congestion management. It is from this framework where the inference that Kenya's regulatory ambition has outpaced the underlying infrastructural capacity of the electricity market. Effective settlement and dispatch is limited by the absence of an independent distribution system operator.

## **METHODOLOGY**

### **Research Design**

A qualitative comparative policy analysis is explored in this research. This is considering that the expected outcomes are dependent on legal arrangements, market design, and governance structures other than on quantifiable metrics. It is on this backdrop that the research is purely premised on a qualitative approach- which initially seeks to understand the historical milestones gained by Kenya's electricity sector; appreciating the underlying policy vision; while borrowing on success stories to reveal the realistic expectations for the vision.

### **Data Sources**

The study exclusively relies on secondary data which includes; Kenyan statutes and regulations, international statutes and regulations, multilateral reports, and peer reviewed academic literature.

### **The Approach**

This study adopts a three pronged approach.

- a. Doctrinal legal analysis which entails a systematic evaluation of the underlying statutory provisions that govern electricity open access in Kenya which also gives basis of the historical pathway traversed and the underlying policy as envisioned by the regulatory frameworks.
- b. Comparative analysis where the structure of Kenya's electricity market is benchmarked against select models from developed economies with focus on tariff setting mechanism, regulatory oversight, system and market operation, and unbundling framework. Developed economies which include Australia, United States of America, and the European Union were considered for the case studies.

- c. Readiness and gap assessment is also done to assess the underlying gaps on Kenya's readiness – borrowing leaf from the benchmarked scenarios. In the course of the comparative analysis, exploratory questions are asked to better extract impactful insights to country's that are yet to realize open access. These include “how did those who did it, approach it?” “What huddles did they face?” “how did they maneuver” “is electricity open access without any hiccup”

## LITERATURE REVIEW

### Kenya's Electricity Sector Reform Trajectory

Over the past three decades, the electricity sector in Kenya has undergone significant gradual transformation-triggered by both internal policy ambitions, external pressure for infrastructure liberalizations, and objectives for regional energy integration. The realized transformations have seen transitioning from the traditional vertically integrated framework where Kenya Power was the sole monopoly who handled both generation, transmission, and distribution roles. In this conventional utility model, the assumption was that the state –being the central planner, guaranteed universal access, affordability, and reliability.

In the early 1990's, the inefficiencies of monopoly provisions began manifesting with electricity demand outpacing the expansion of supply. Power outages became recurrent coupled with increasing commercial and technical losses. Network expansion- especially outside urban communities became limited and much needed. These manifestations triggered policy debates on the role of market oriented reforms in enhancing transparency, capital mobilization, and transparency- while also ensuring equity and balanced growth.

In the mid-1990s, as the first structured step, the Electric Power Act of 1997 initiated partial unbundling of the sector- leading to the formation of Kenya Electricity Generating Company (KenGen) whose mandate would solely be generation. For the first time, private entities were also allowed to participate in generation hence the entry of Independent Power Producers (IPPs). The Act also introduced an independent regulatory function – the Electricity Regulatory Board whose mandate was to oversee licensing, approve tariffs, and oversight the sector.

The 2004's sessional paper no. 4 and the Energy Act of 2006 expanded the ambitions for reforms beyond electricity but the larger energy scope. This led to strengthening of regulatory institutions, creation of rural electrification, boosted sharing of risks in the geothermal space through initiatives led by the state- significantly boosting renewable energy update and alternative sources of generation. The energy Act of 2006 led to the formation of Geothermal Development Authority (GDC), Kenya Transmission Company (KETRACO), and the Rural Electrification Authority. This Act further introduced the network service providers- creating an early enabling environment for competition in the distribution activities. The paper further defined the roadmap for future restructuring

Diversification and public investment in the generation space was significantly realized. Distribution and transmission functions however, still remained monopolized by KPLC signifying limited true competitive electricity markets. In 2008, KPLC was stripped of the transmission function which was mandated to KETRACO – a fully owned government agency. Over time, electrification rates have significantly increased- and so has the generation capacity. All these are attributed to the sectorial reforms experienced over the decades- including the unbundling efforts. Through it all, there are marks of 'approaching' liberalization. There are traceable efforts of unbundling. In form, unbundling was realized. In market structure, KPLC still remains the dominant off taker and KETRACO the main transmission wheeler.

### Global Experience

#### Chile

Among the most comprehensive and earliest pioneers of unbundling in the electricity sector is Chile (Pollitt, 2011). Their electricity structure was fundamentally restructured in the early 1980s (Pollitt, 2011). The generation, transmission and distribution, together with market based coordination mechanisms were introduced. Interestingly, Chile implemented these reforms within 'developing country' context. This offers a typical case review for Kenya – which is currently developing with the generation, distribution, and transmission having already been unbundled. Chile was then characterized by weak institutions, limited domestic capital markets,

and a rapidly growing electricity demand- just as Kenya is at the moment. In the course of Chile's journey, there were challenges associated with investment inefficiencies, fiscal strain, and supply shortages. State control traditionally characterized the vertically integrated infrastructure in Chile as was typical of Kenya's case.

Following the political transition that occurred in 1973 in Chile (Pollitt, 2011), a reform agenda emerged-incorporated within the general Chilean economy's neoliberal restructuring. These reforms were characterized with emphasis on competition, privatization, and regulatory rule making, as paradigm shifts from the traditional direct state provision (Munoz, 2023).

Primarily, the unbundling in the electricity sector was anchored in the General Electricity Law of 1982 which established basis for private ownership, structural unbundling, non-discriminatory access, and independent regulation across the electricity industry (Banfi 2022). The separation between transmission, generation, and distribution was formally realized through this law (OECD, 2009). Initially though, companies could still own assets within multiple segments but they were expected by law to account for separation under a strict regulatory oversight. Progressive enforcement of competitive neutrality was also done (Banfi 2022). Of importance to note, distribution and transmission were maintained as natural monopolies who operated in a regulated space. Generation however remained competitive.

Institutionally, the National Energy Commission (CNE) was formed with mandates related to tariff setting, policy formulation, and market oversight. Safety, technical regulation, and compliance enforcement was mandated to the Superintendence of Electricity and Fuels (SEC) (Pollitt, 2011).

In its reform journey, transmission was earmarked as a possible bottleneck that had the capability of undermining competition in the generation space (Serra, 2022). An open access regime that mandated nondiscriminatory access to the transmission network for all the large consumers and generators was adopted (Pollitt, 2011).

This was triggered by the inefficiencies of the traditional setup where there were weak access rules despite the fact that the transmission networks were initially privately owned- leading to disputes emanating from connection rights and pricing formulas (Serra, 2022). This scenario was further aggravated by the entry of independent power producers into the market within the 1990s. As a result, amendments to the general electricity law of 1982 were proposed in the 1999, 2004, and 2016 and these refinements sought to: strengthen regulated transmission tariffs, centralize transmission planning, mandate open access obligations and introduce mechanisms for cost sharing during network expansion (Banfi 2022).

Towards the mid of 2000s, (Pollitt, 2011), Chile had effectively realized both economic and functional unbundling-especially for the transmission network. This included even for the transmission network owners. Restriction was enforced against transmission system operators and all transmission owners were barred from discriminatory behaviors (Serra, 2022).

Notably and contrary to Kenya's case, during the early reform stages, Chile shunned from centralized power pool but relied on decentralized models. Independent System Operators (ISOs) (Banfi 2022). Later on though, the ISOs were merged into one national system operator who still maintained independence from the commercial interests- an action that reinforced open access. Large customers were given the leverage to negotiate contracts while regulated consumers' pricing were derived from marginal cost calculations. This approach sustained competitive pressure within the wholesale market while maintaining stable revenue incomes for the generators (Banfi 2022).

## **The United States**

Restructuring of electricity markets for competition promotion in the United States began in the 1990s with Federal Energy Regulatory Commission (FERC) leading the transformational journey. The FERC Order 888 (1996) mandated all the vertically integrated utility companies to give access non-discriminatorily to their transmission systems through standardized tariffs dubbed Open Access Transmission Tariffs. The utility companies were further expected to unbundle functionally by separating their generation, transmission and marketing activities (FERC, 1996).

The subsequent FERC Order 2000 (1999) required the utilities to transfer to the Regional Transmission Organizations (RTOs), control of their transmission networks. RTOs are operationally non-profit making entities who have the responsibility for ensuring fair access to the regional transmission infrastructure hence facilitate wholesale electricity markets through competitive and well-coordinated dispatch (FERC, 1999). According to Joscow (2008), these reforms removed the bottlenecks- allowing for new generators into the American electricity market. The states that fully embraced the competitive retail and wholesale markets experienced high levels of innovation and market participation compared to those states that maintained the status quo of vertically aligned models (Joscow, 2008).

These comparisons according to Joscow (2008), reveal the essence for the need for institutional independence as well as robust market monitoring in order to realize the much desired effectiveness of open access reforms.

### **The European Union**

In the early 1990s, the electricity sector in the European Union as still vertically integrated. Then, European Union's case presented complexity associated with harmonizing of the electricity markets within member states that were sovereign- and had divergent institutional and ownership structures (European Commission, 2019). As is with Kenya's case, the respective transmission, generation, distribution, and retail monopolies operated with: no third party access grants, tariffs that were regulated, and limited cross-border electricity trading. According to (Filon and Glachant, 2003) this tradition was limiting as it constrained competition, affected efficiency, and exposed fragmented electricity boundaries across Europe.

The reforms in the European Union's electricity sector were largely motivated by the desire to create integrate internal energy market among the EU member states. Competitive retail markets, unbundling requirements, and third party access were gradually introduced towards the end of 1990s through a series of EU directives. In 1996 for instance, negotiated third party access was introduced into the sector. Functional and legal unbundling were achieved in 2003. Regulatory and independence and ownership unbundling were the last steps of the EU's win which was achieved in 2009. Directives 2009/72/EC and (EU) 2019//944 later strengthened the initiated reforms by mandating legal and functional unbundling among utility companies. These directives further mandated independent regulatory oversight among member states, and enhanced consumer rights of choice from electricity suppliers (European Parliament and Council, 2019). The regulations and the respective directives collectively cemented EU's unbundling as a regulatory obligation established under the EU' legal framework.

To facilitate cross border trade, Transmission System Operators (TSOs) and Independent System Operators (ISOs) were also promoted by the EU allowing way for most member states to develop competitive wholesale and retail markets. Among the successes realized in the process include improved efficiency, improved regional energy security, as well as increased renewable energy integration (European Commission, 2020).

### **Australia**

Just like Kenya, around early 1990s, the electricity sector was initially monopolized by utilities that were state owned. This controlled both generation, transmission, and retailing within individual states. The monopolies had the characteristics of having limited transparency in tariff structures with administrative setting of electricity prices. The unbundling approach employed by Australia was multi-layered where both the operational, legal, and structural elements were considered (Hilmer, Rayner & Taperell, 1993).

Australia's National Electricity Market (NEM) was founded in the year 1998 with the sole intention of integrating transmission systems across Southern and Eastern Australian states including Victoria, New South Wales, Tasmania, Queensland, and South Australia. The unbundling of the transmission sector in Australia was implemented as a natural monopoly which is state owned and strictly regulated under the Australian Energy Regulator (AER). The regulatory framework gives mandatory transmission network access to all eligible third parties. The Transmission Network providers are not allowed to engage in generation and retail activities.

Generation entities were separated from network entities and this gave leverage to the private players to enter the electricity generation market and compete on equal grounds. Wholesale electricity market was thus borne

where pricing is mostly determined through competitive bidding which rides on the laid regulations. The operation model of NEM is a wholesale spot market with five minutes trading interval. Prices are determined by the forces of demand and supply.

There is constant competition among the generators to sell power to the retailers who then sell to the retailers (Australian Energy Market Commission, 2022).

The unbundling and strict regulation also affected the distribution sector. Distribution Network Service Providers were established with their sole focus being on network services. The retail end was also separated from the network services with the electricity retailers competing for customers based on their pricing, value added services, and contract terms. There was deregulation of the retail prices- which was done progressively within the National Electricity Market. In Australia, consumers have the right to choose on their favourite supply which is a critical sign for a successful unbundling.

Several institutions co-share the regulatory oversight mandate. Competition issues, compliance, and regulation of network revenue are overseen by the Australian Energy Regulator (AER). Market Settlements, dispatch, and system operation are in turn managed by the Australian Energy Market Operator (AEMO), and Australian Energy market Commission (AEMC) develops policy guidelines and market rules. The wholesale electricity market is operated by the Australian Energy Market Operator (AEMO).

NEM ensures Open Access through principles that allow eligible players to utilize distribution and transmission infrastructure under regulated conditions. According to AER (2023), this model has boosted efficiency and renewable energy generation; and has improved private sector participation thus offering a success story of how separating regulation, policy making, market participation, and system operation can contribute to effective unbundling.

### **Critical Evaluation Of Kenya's Current Policy Landscape On Electricity Open Market Access**

The Energy Act 2019, introduced a new era. Kenya's legal framework was modernized to align with evolving best practices in the global electricity markets. The mandate of the regulator (EPRA) was expanded, introduced competitive licensing, and introduced provisions that allow entries into the different segments of the electricity value chain. Qualified market players who seek to utilize the existing transmission and distribution networks are allowed to do so in a regulated way. Deliberate policy alignment efforts are visible with the intention to diversify investments, open competition, and enhance consumer choice. Nonetheless, the trajectory exposes mixture of progress- including implementation constraints, and conceptual ambiguity.

### **Lessons for Developing Economies.**

Chile made it within the developing context- a proof sufficient that open access can actually be realized by immature economies. This discredits myths associated with the need for mature economies for open access success (World Bank, 2013). Chile's case further sustains the argument of infrastructure independence in spite of the ownership framework. The case with Chile- a developing economy then was relatively more complicated than Kenya's current scenario where the transmission infrastructure is fully government owned and operated hence easier to enforce non-discriminatory access compliance. Despite this complexity of many private players, the non-discriminatory access requirement was successfully enforced. This further cements the essence and power of reforms associated with transparent tariff approaches, functional unbundling, coupled with centralized planning. These are equally evidenced in the insights derived from the UK, USA, and Australia case studies.

Chile's journey to successful unbundling in the sector has spanned over four decades. A clear support that unbundling is actually an iterative process rather than a one-time reform event. Chile's framework for instance underwent various amendments in the bid to closing the realized loopholes and addressing market power clearly vindicating Kenya's current partial unbundling as not a terminal state- but a progress towards the desired direction.

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## **Strong Legal Intention yet cautious Liberalization**

The Energy Act 2019's sections 136 and 140 introduced critical elements aimed at opening up electricity market in Kenya. These include provisions allowing; direct supply; wheeling arrangements; competitive licensing; and participation of third parties across the value chain. To further operationalize the intentions in the Act, the Energy and petroleum Regulatory Authority further developed regulations- The Energy (Electricity Market, Bulk Supply, and Open Access) Regulations, in 2024.

Courtesy of these reforms, Kenya recently successfully piloted 50MW wheeling from Ethiopia to Tanzania through its HVDC transmission infrastructure- signifying the potentiality of the open access reforms (Mutua, 2025). However, since the inauguration of the Act and the subsequent regulations, this is the only implemented wheeling case. The hybrid structure is still dominant. Despite competition being encouraged by the legal reforms, KPLC still dominates the sector signifying a cautious pace of reforms uptake. Evidently so, market restructuring has been outpaced by the legislative reforms.

Kenya has demonstrated commendable legal alignment milestones compared to the international electricity market access norms albeit with limited structural separation of the distribution end.

## **Wheeling and Open Access- Market Reality limits Policy Innovation**

In the case economies reviewed, the market adapts standardized tariff schedules, and cost allocation methodologies that are transparent to boost investor confidence and minimize uncertainty. In Kenya, the wheeling tariffs are supposed to be independently done and reviewed by EPRA creating uncertainty and room for ambiguity (Nyambane & Gitonga, 2021).

The Regulations (Electricity Market, Bulk Supply, and Open Access Regulations, 2024) have elaborated multiple application procedures and steps to open access – including drafting of wheeling agreements, and obtaining regulatory approval. Whereas these are essential to realize technical security and due process, the negotiation layers may be a deterrent to potential investors (World Bank, 2019).

Additionally, the open access regulations reveal system management constraints and deeper grid operations with additional obligations for loss compensation, day-ahead scheduling, and adherence to the grid code. These call for sophisticated system operator functions and market infrastructure (International Energy Agency, 2024; Samuel & Karekezi, 2020). The regulations have referenced issues like congestion management, reactive energy pricing, and energy accounting which call for digital platforms and rulebooks for their effectiveness (Pollitt, 2012). In the EU, US and Australia, open access lies on advanced market platforms for imbalance reconciliation, settlement, and dispatch- with transparent real time systems (Vasconcelos, 2018; Pollitt, 2012). Kenya's infrastructure is yet to mature to this scale. There is therefore a gap between practical capacity, and the policy ambition- which can only be filled by institutional and infrastructural enhancements.

## **Unbundling with Partial Structural Separation**

Going by the global success stories, unbundling remains essential to the design of competitive markets (Pollitt, 2012). Whereas generation was conceptually separated, distribution and transmission largely remain centralized with KPLC still retaining the simultaneous roles of being the dominant retailer, distributor, and network owner. This concentration poses risks emanating from conflicts of interest. KPLC is essentially a vertically aligned utility that is still influential.

The incentive to facilitate third party network access, even where there may be regulatory compulsion- May in reality, be limited. From the global success stories reviewed, to achieve credible open access, full functional independence and structural separation of the operators is essential (Pollitt, 2012).

The partial unbundling that is the case with Kenya's scenario may be limiting to market neutrality with the danger of eroding investor confidence and their assurance of non-discriminatory treatment.

## Policy Recommendations For Operationalizing Electricity Open Access In Kenya

This study picks from the comparative experiences in Australia, United States, and the European Union- anchored on Kenya's prevailing regulatory and institutional realities- to propose policy interventions required to bridge the gap between effective electricity open access and the legislative intent. Lessons from the liberalized electricity markets reveal the insufficiency of legal reforms alone and stresses on the need for complementary of market infrastructure development and complementary institutional restructuring. This is a view that is shared by both Pollitt (2012) and Joskow (2008).

### Deepen structural and functional unbundling

From the reviewed international experiences, credible open access is dependent on the effective unbundling of monopoly functions from the competitive market activities (Vasconcelos, 2018; Pollit, 2012). Otherwise, the incentives justifying non-discriminatory access remain weakened. Whereas generation is partially unbundled in Kenya, retail supply and distribution still remain vertically aligned necessitating impeding conflict of interest. Market neutrality is thus imperative which can be achieved through a myriad of approaches.

- a. Implement functional unbundling within the Kenya Power and Lighting Company, including independent structures of governance, ring-fenced accounting, and network access protocols that are transparent (European Commission, 2020).
- b. Borrowing from the EU's functional and legal unbundling vide Directive (EU) 2019/944, separate progressively the retail supply operation and distribution system operations.
- c. Transitionally, consider establishment of a distribution system operator who is independent. Despite Kenya's commendable efforts towards introducing competition in the electricity sector, it is evident that such reforms become successful where effectiveness in infrastructure access management and grid operations is. An independent operator ensures grid access management without biasness and conflict of interest situations. Whereas this is envisioned in Kenya's Energy Act of 2019, real independence and accountability still requires institutional, legal, and regulatory oversight strengthening.

### Publish and standardize Use-of- System and Wheeling Tariffs

Pollit (2012) stresses the essence of transparent electricity pricing as a critical component to competitive electricity markets. Kenya's current scenario relies on case by case negotiated wheeling tariffs. This, according to Nyambane & Gitonga (2021), introduces regulatory risks, and uncertainty. This can be addressed by having ex-ante approved wheeling tariffs and uniform application procedures that have consistence with the international regulatory practices (AER, 2023). Discretionary tariff negotiations are limiting and have a way of discouraging new market players (World Bank, 2019). The adoption of standard tariff framework may be borrowed from The Open Access Transmission Tariff (OATT) established under the FERC Order 888, (FERC, 1996).

### Invest in Digital Systems and Market Infrastructure

Karekezi and Samuel (2020) argue that in the absence of digitized infrastructure, open access will mostly remain aspirational and far from operational. The reviewed jurisdictions have advanced metering infrastructure with digitized grid networks. Additionally, adequate capacity building needs to be done on the regulator to build on the ability to manage complex market functions as is evidenced in Australia's case.

### Adopt Targeted and Phased Market Opening Strategies

Institutions need to adapt as the liberalization change can be disruptive. From the reviewed international reforms, a gradual approach is essential when it comes to minimizing the transitional risks; a view that is shared with Joskow (2008). This may be realized by initially limiting the eligibility criteria to select players – say for instance, cross-border transactions, and large industrial consumers. This approach is already proposed in the Energy (Electricity Market, Bulk Supply, and Open Access) Regulations, in 2024 where for one to be eligible,

their generation must be above 1 MW. The eligibility may then be expanded progressively based on the underlying regulatory capacity and system readiness. The outcomes may then be continuously evaluated to influence market wide roll-out (World Bank, 2019). This implementation trajectory is evidenced in the strategies that were employed by both the European Union and Australia in the course of their liberalization journeys (AEMC, 2022; European Commission, 2020).

### **Sustain the efforts**

As evidenced from the journey traversed by the predecessors, unbundling is a journey. A journey of learning and unlearning. Whereas legal reforms alone cannot get the sector there, iterative legal reviews still play a critical adaptation role- just as was evidenced in Chile's study. Institutions need to be strengthened on the parallel and regulatory processes tested through initiatives like pilots which enhance institutional recalibrations to the betterment of the sector. Model scenarios need to be practically implemented as proof of concepts at the local scale- as is already done at the transmission level through the piloted wheeling arrangement to Tanzania from Ethiopia through Kenya's infrastructure. More pilots at the transmission scale need to be tested. Policies need to be influenced and steps made.

## **CONCLUSION**

This study evaluated the readiness of Kenya in implementing the much desired open market access for the electricity sector. Comparative and regulatory comparisons of developed electricity markets was reviewed in the process. It is evident from the findings that Kenya has made commendable progress thus far- more so, in her articulation of the policy and legal visions for market liberalization. This is through the Energy Act 2019, and the Energy (Electricity Market, Bulk Supply, and Open Access) Regulations, in 2024.

There however, also are persistent gaps between the operational realities and the established legal frameworks. Unlike the Australia, The United States, and The European Union, where deep unbundling, standardized pricing, independent distribution system operation, and digitized market infrastructure, have supported their open access realization, the electricity sector in Kenya displays limited digital readiness, partial structural separation, and dominant incumbency (IEA, 2024; Pollit, 2012; Joscow, 2008).

Despite the early cross border 'wheeling to Tanzania' achievement, this shows latent potential- an isolated achievement rather than a show of systemic readiness. Evidently, open access is not only a mere legislative exercise, but an institutional transformation. Kenya therefore, needs to ensure coherence and alignment between its regulatory ambitions with credible institutional reforms.

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