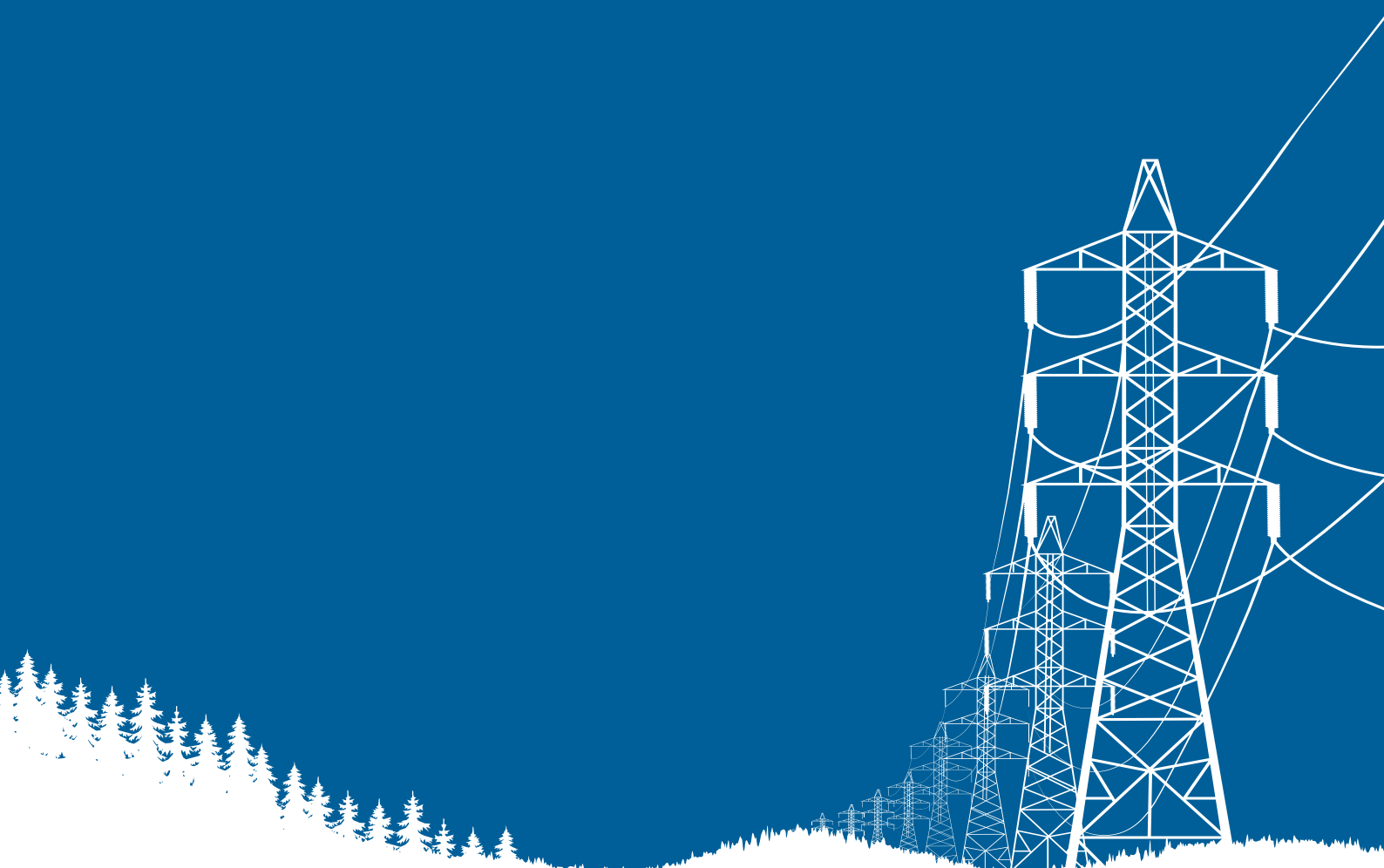




United Nations
Economic Commission for Africa



Regulatory Review of the Electricity Market in Kenya:

Towards Crowding-in Private
Sector Investment





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Economic Commission for Africa



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This analysis is based on policies, laws and regulations adopted until April 2022. Therefore, the results will not consider and/or reflect the impact of policy and regulatory changes adopted thereafter.

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Executive Summary

This report provides an analysis of Kenya's electricity sector policies, laws, and regulations in relation to crowding-in private sector participation in developing national electricity infrastructure. The report is part of the United Nations Economic Commission for Africa and RES4Africa Foundation joint program on *Regulatory Review of the Electricity Sector in Africa: Towards Crowding-in Private Sector Investment*.

Kenya is the second largest economy in East Africa in terms of GDP and the first in terms of GDP per capita. The yearly GDP growth has been in the 5-6 percent range for the last ten years, up to the COVID-19 pandemic outbreak. As a consequence, national electricity demand has grown steadily driven by economic and population growth, but also by the commitment of the government to increase electrification. As a result, electricity access increased from 22 percent in 2010 to about 75 percent in 2021. To support this growth, Kenya had to invest in the development of its electricity infrastructure. It pursued the engagement of the private sector to mobilize investments. This effort succeeded in attracting private capital, which is reflected today by the nearly 30 percent of electricity generation capacity undertaken by independent power producers. One of the reasons behind this success was the ability to implement a comprehensive reform of the electricity sector policy and regulatory environment through multiple waves of reforms. Following the enactment of the Electric Power Act of 1997, Kenya embarked on fundamental reforms that led to the unbundling of generation from transmission and distribution services in the electricity market. KenGen assumed power generation functions, while Kenya Power manages power transmission and distribution services. This was the beginning of Kenya's path towards liberalization of the electricity market and the introduction of competition in the generation segment.

Kenya has made major progress in reforming its electricity sector. The power sector governance framework evolved constantly starting from the 1990s to reflect the evolution of market fundamentals, support the development of new technologies, and ensure reliable electricity supply to its growing economy. Policy and regulatory reforms were adopted to attract new investment, improve competition, and progressively open the electricity supply industry to private companies. The climax of this process has been marked by the adoption of a new Energy Act in 2019 which liberalized the electricity supply industry. The Act legally opened all market segments (generation, transmission, distribution, and off-grid) to private sector participation. Another decisive step in crowding-in private sector investment is the recent Public Private Partnership Bill, which came into effect in 2021. It lays the foundation of public-private cooperation in the financing, construction, development, operation, and/or maintenance of infrastructure and services. As a result, Kenya can be considered one of the most advanced electricity markets in Africa in terms of policy and regulatory effectiveness.

Kenya is, however, confronted with structural challenges that are still preventing its electricity sector from thriving, and private entities from successfully participating in electricity infrastructure development. Major barriers are related to, among others, insufficient and under-performing distribution networks, delays in advancing

transmission assets development, and a perceived lack of clarity surrounding power purchase agreements from the perspective of independent power producers. The slower pace of solar and wind energy resource development is also indicative of some of the remaining policy and regulatory challenges. While universal electricity access remains a top national priority, success in reaching this target will partly depend on effectively crowding-in additional private sector investment.

The purpose of this regulatory review is to pinpoint the main strengths and gaps of the policy and regulatory framework currently in force related to private sector participation in the entire electricity market. It further aims to offer concrete recommendations for further regulatory improvement and reform toward attaining a competitive, resilient, and sustainable electricity market.

The regulatory analysis is undertaken following a comprehensive UNECA and RES4Africa regulatory review methodology, which was developed with the participation of African and international regulatory experts. The approach enables three broader assessments: the degree of *openness* of the electricity market, across the value chain, to the private sector based on an evaluation of the power sector policies, strategies, structure, and governance; the *attractiveness* of the market based on an assessment of sector economics, fair competition, and overall economic regulation; and the *readiness* of the market based on an assessment of technical regulations.

Main findings related to the Generation segment

Current legislation ensures a good degree of *openness* of the electricity generation market segment for private investors, underlining the ability of Kenya to adopt and implement sound legislation for the sector. Private generators can access the market through concessions, commercial models, or acquiring shares of publicly listed incumbents. However, further improvements of the regulatory environment towards greater openness are achievable by clarifying electricity *off-taking options*, notably with regards to corporate power purchase agreement business models, as well as improving access for private generators to a regional spot market. The generation market is also adequately attractive, as demonstrated by the participation of several independent power producers, partly facilitated by standardized contractual terms and provisions. The *attractiveness* of the generation market can further be enhanced through the launch of public auctions, particularly for renewables. Furthermore, market *attractiveness* will also be enhanced by addressing the current lack of credit enhancement instruments and public guarantees, such as concessional finance and sovereign risk guarantees, to private operators which impacts the cost of financing projects. The generation market is largely ready in terms of technical regulation. The Energy Act defines open access regime connection rules and allocation of connection costs, which are further codified and governed by the Grid Code.

Main findings related to the Transmission segment

The regulatory environment demonstrates outstanding development related to transmission market *openness* and *readiness*, while regulatory improvement is required to enhance market *attractiveness*. The Energy Act 2019 opens the transmission service to any entity under the condition of obtaining a license from the Energy and Petroleum Regulatory Authority, without differentiating between public and private operators. Procurement rules are well established, and supported by clear laws, including in a competitive environment for selecting projects for implementation through public-private partnership models. The national transmission grid code, which follows international best practices, offers further regulatory clarity and predictability. Furthermore, grid access is well defined by the Energy Act, which provides a mandatory connection by the transmission service operator to all licensed entities. The *attractiveness* of the transmission market to private investment will be improved by developing a contractual framework that defines the rights and obligations, as well as performance requirements and payment terms for potential private sector investors.

Main findings related to the Distribution segment

Kenya benefits from a dedicated distribution grid code, enhancing market *readiness*, though it does not currently define rules for evaluating distribution investments. The National Electrification Strategy completes the picture of planning for electrification expansion. Although private sector participation in the distribution segment has not occurred yet, the Energy Act 2019 permits entities to access distribution licenses. *Attractiveness* of the distribution market to private sector participation could further be enhanced by clearly outlining the rights and obligations of the distributor in distribution licenses, especially with regards to standards of performance, metering, billing and payments, complaints and dispute resolution, and setting electricity tariffs. Although credit enhancement instruments, notably multilateral guarantees, can be made available for distribution investors, government support through dedicated public guarantees and revenue escrow agreements are not available for private sector distribution investments.

Main findings related to the Off-grid segment

The Kenya National Electrification Strategy provides clear off-grid targets, aiming to electrify 1,105,000 households located further than 15 km from Kenya Power services by 2022, which amounts to around 2 million connections. However, the targets are yet to be translated into national law and integrated into a comprehensive system development plan. Private sector participation in the off-grid market segment is allowed through engineering, procurement and construction, and portfolio concession models as well as merchant models implemented through the KOSAP program. The governance of the off-grid market is also defined by the presence of the Rural Electrification and Renewable Energy Corporation, whose mandate has been expanded from a sole electrification agency to also spearheading green energy development in general by the Energy Act of 2019. Off-grid operators must report the quality and reliability of service, which are in line with main grid standards, to the

KEBS. The technical off-grid standards also need to adhere to the main grid standards as defined in the grid code. Currently, mini-grids can be integrated into the grid as small power distributors and small power producers, or sell their assets to the utility in the event of main grid arrival. *Attractiveness* of the market to private sector participation will be improved with the official adoption of the Draft Energy Mini-grid Regulations as well as by finalizing the rules, or guidelines, for contracts between off-grid operators and their clients which are currently under development. Although there are currently no government guarantees in place, the public funds from KOSAP will be used to provide incentives through results-based financing and debt facilities.

To enhance the *Openness* of the electricity market

- ⚡ To strengthen energy policy and strategy implementation capacity:
 - Back electricity sector targets with the adoption of relevant legislation to strengthen enforceability.
 - Define implementation roadmaps aligned with timelines and designated delivery agencies;
 - Set procedures and a reporting mechanism to continually monitor progress against policy targets.
- ⚡ To encourage private sector participation in the electricity distribution market:
 - Designate exclusive distribution areas/regions to be potentially run by private entities.
 - Define rules and procedures for awarding in a determined area the right to operate distribution services by a private entity.
- ⚡ To strengthen the public procurement framework relevant for electricity infrastructures development:
 - Implement public tenders for awarding the right to operate electricity transmission and distribution services in designated areas, or for designated assets, to allow private sector participation through a fair and transparent process.
 - Provide clarity and predictability to investors by publishing medium-term tender schedules.
- ⚡ Adopt regulation that defines the eligibility criteria for the “eligible consumers” category to facilitate a direct selling of electricity from generators to consumers, including through the development of regulation enabling corporate power purchase agreements.
- ⚡ Support the establishment and operationalization of the East Africa Power Pool spot market, and enable the participation of generation investors in the regional open market.

To enhance the *Attractiveness* of the electricity market

- ⚡ Standardize and adopt contract templates (power purchase agreements, transmission and distribution service agreements, off-grid power supply agreements, and others) to improve contract administration and reduce transaction costs to investors.
- ⚡ To achieve full cost-recovery for electricity services:
 - Adopt cost reflective electricity tariffs.
 - Disclose the tariff methodology including network charges.
 - Undertake periodic tariff review and revision, and mandate the regulator for its implementation.
- ⚡ Pursue the implementation of competitive auctions by:
 - Launching a pilot auctions program, including renewable energy.
 - Adopting and publishing plans for tender rounds.
- ⚡ Study the feasibility of introducing carbon pricing to support the development of sustainable energy in Kenya.
- ⚡ Review the utility of results-based financing to support electrification programs.
- ⚡ To de-risk private investments in electricity infrastructure development:
 - Pursue public risk mitigation facilities.

To enhance the *Readiness* of the electricity market

- ⚡ Streamline investment processes by establishing a one-stop-shop/single window for application and issuance of all permits for energy projects.
- ⚡ Improve national planning capacity to provide medium- and long-term pictures of the direction of the electricity market to market participants.
- ⚡ To enable private sector investment in off-grid electricity capacity :
 - Adopt the proposed Draft Energy (Mini-grid) Regulation to provide regulatory clarity to investors.
 - Adopt clear rules on commercial options for mini-grid businesses, related to business continuity or exit, in the event of main grid arrival to reduce risks and encourage long-term investment.

As Kenya takes further bold steps towards its energy sector regulatory reform, the UN Economic Commission for Africa and the RES4Africa Foundation remain committed to partnering with Kenya in addressing any of the identified regulatory and policy gaps. They also commit to supporting regulatory capacity development, as well as any area of particular reform interest of Kenya towards greater *openness*, *attractiveness*, and *readiness* of the electricity market.



Introduction





Nairobi City at Night, Kenya
Photo credit: Mwaru/www.click.co.ke

1. Introduction

Recognition that energy plays a key role in facilitating socio-economic development, and that its insufficient provision impedes it, has brought energy to the forefront of national, regional, and global agenda. National sector development strategies in most of Africa reflect the need to expand energy access rapidly, facilitated through the implementation of Sustainable Development Goals (SDGs), particularly SDG7. African states have pursued the energy access agenda, devoted public finance for energy infrastructure and capacity expansion, and instituted measures to strengthen the energy sector.

Latest global SDG7 tracking reports warn that progress made so far is not on track to achieving universal access by 2030 and that nearly 90 percent of the population without access at the end of the decade will be residing in Africa.

Sustainable Development Goal 7 aims to ensure access to affordable, reliable, sustainable and modern energy for all.

Despite appreciable progress as a result of these measures, structural challenges remain within the electricity markets of Africa. Over 500 million people on the continent today lack access to electricity. The global SDG7 tracking reports warn that progress made so far is not on track to achieving universal access by 2030 and that nearly 90 percent of the population without access at the end of the decade will be residing in Africa, partly due to rapid population growth (IEA et al., 2020).

Financing energy development remains a key challenge. The cost of achieving the SDGs at large in the continent is estimated at USD 1.3 trillion per year. Africa would require USD 32 billion per year through 2030 on universal electricity access-related investments (AfDB, 2019). According to the Infrastructure Consortium for Africa, 37 percent of infrastructure investments in the continent were undertaken by African governments in 2018, with the private sector accounting for 3 percent (ICA, 2018). Given the major infrastructure investment gap and the limited investment role of the private sector so far, addressing the crowding-in of private sector investment in the electricity market is crucial.

Towards the goal of crowding in the private sector, feasibility (bankability) of projects, country risks, profitability (viability), and the legal/regulatory environment are often identified as key barriers. Indeed, the regulatory framework is crucial for attracting private investments. The Regulatory Indicators for Sustainable Energy (ESMAP, 2020) indicate that more than half of the global population lacking access to electricity remained in countries with weak regulatory frameworks by 2019. These regulatory challenges remain to be addressed.

Kenya has made major progress in reforming its electricity sector. The power sector governance framework evolved constantly starting from the 1990s to reflect the evolution of market fundamentals, support the development of new technologies, and ensure reliable electricity supply to its growing economy. Policy and regulatory reforms were adopted to attract new investments, improve competition and progressively open the electricity supply industry to private companies. The climax of this process has been marked by the adoption of a new Energy Act in 2019 which liberalized the electricity supply industry and legally open all market segments (generation, transmission, distribution, and off-grid) to private sector participation. Another decisive step in crowding-in private sector investments has been the very recent Public-Private Partnership Bill (2021) which lays the foundation of public-private cooperation in the financing, construction, development, operation, and/or maintenance of infrastructure and services. As a result, Kenya can be considered one of the most advanced African electricity markets in terms of policy and regulatory effectiveness.

Kenya is, however, still confronted with structural challenges that are preventing its electricity market from thriving and private entities from successfully participating in electricity infrastructure development. Major barriers are related to under-performance of distribution networks, insufficient distribution assets, delays in advancing transmission assets development, lack of clarity surrounding power purchase agreements (PPAs), as well as a slower pace of development of solar and wind energy resources compared to the country's potential. While universal electricity access remains at the top of national priorities, succeeding to reach this target requires effective participation of private investment in the electricity market value chain.

This regulatory review examines these and additional issues in-depth concerning the crowding-in of private sector investment in the electricity market of Kenya, from generation to networks and off-grid market segments. This analysis is based on policies, laws and regulations adopted until April 2022. Therefore, the results will not consider and/or reflect the impact of policy and regulatory changes adopted thereafter. The goal is, through regulatory improvement, to promote the achievement of SDG7 goals and the development of a resilient, competitive, diversified, and vibrant electricity market that will sustainably attract private capital to supplement public investment. This is particularly crucial in a post-COVID-19 environment where public resources are even more constrained due to priorities in public health and social protection, as well as economic recovery.



Country Overview





*Olkaria II geothermal power plant, Kenya
Photo credit: Byelikova_Oksana*

2. Country Overview

Kenya is located in East Africa, sharing borders with Somalia, Ethiopia, South Sudan, Uganda, and Tanzania. Since its independence in 1963, Kenya has made significant progress in terms of economic growth, social development, and political stability enabled by political and economic reforms (Ominde 2022; World Bank 2021). The population of Kenya stands at over 53,771,000 inhabitants, while the population growth rate dropped to its all-time low of 2.6 percent per year in 2020 (World Bank 2020).



Map of Kenya credit: Peter Hermes Furian
 Map of Africa credit: Geo Atlas Graphi Ogre



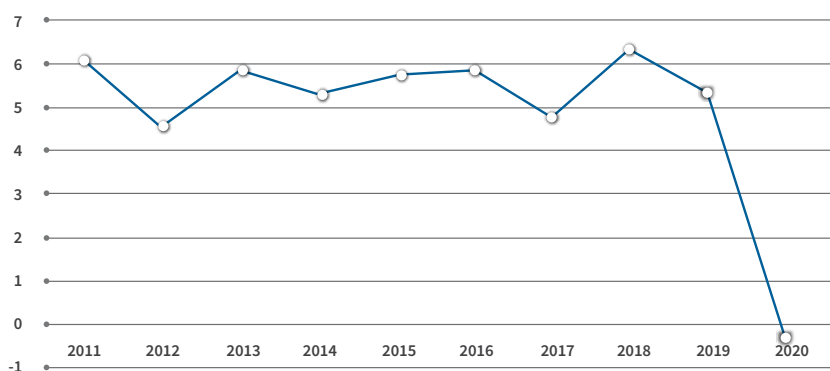
2.1 Macroeconomic overview

Kenya is classified as a lower-middle-income country. Its economy, the largest in East Africa, experienced significant growth after gaining independence in 1963, spurred by public investments that encouraged smallholder agricultural production and provided incentives for private industrial investments (The National Treasury of Kenya 2021).

Similar to other countries in the region, the demography of Kenya consists of a young and fast-growing population. Though the economy is still largely agrarian, and tourism plays a major role, there is robust growth in the technology and innovation sectors driving new economic growth. The manufacturing sector is also showing signs of growth. Coupled with the last mile project, these developments have increased the electricity demand.

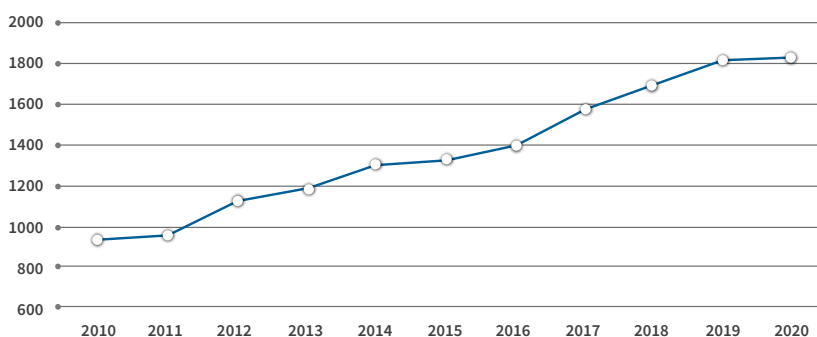
As shown in Figure 1, Kenya has consistently achieved yearly GDP growth in the 5-6 percent range in the last decade until COVID-19 severely hit the economy and resulted in negative GDP growth of -0.31 percent. This impact is also reflected in the GDP per capita which has grown at a slower pace compared to the fast growth in the last decade (see Figure 2).

Figure 1: GDP growth (% , 2011-2020)



Source: World Bank (2020)

Figure 2: GDP per capita (USD, 2010-2020)

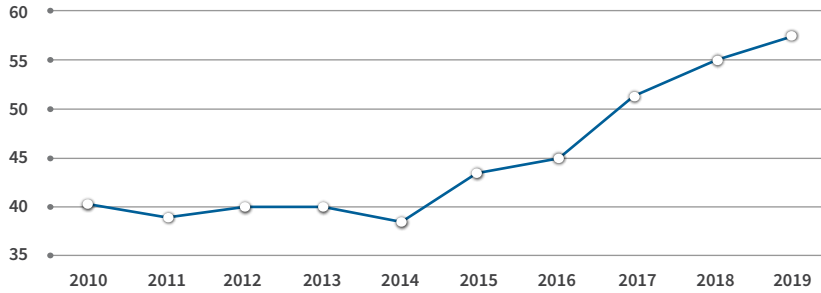


Source: World Bank (2020)

Debt-to-GDP

Debt-to-GDP had remained largely stable at around 40 percent between 2010 and 2014. Since 2015, there has been a rapid increase in debt levels, relative to GDP, reaching 57 percent in 2020. This has been done to spur economic growth although debt servicing costs have shot up simultaneously and forced Kenya to hold large reserves of USD.

Figure 3: Debt-to-GDP ratio (2010-2019)



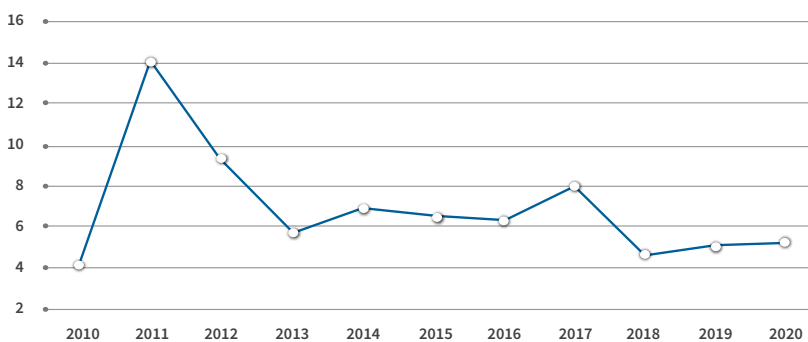
Source: IMF (2021)

Inflation and exchange rate stability

After a stark spike in the inflation rate in 2011, which was caused particularly by inflation of food and oil prices, rates came down to 5.3 percent in 2020. However, in August 2021, an 18-month peak in consumer prices was observed, mainly driven by food and energy prices. A third of the consumer basket is made up of the food and non-alcoholic beverage index, which rose 10.67 percent from the prior year (Herbling 2021).

Despite having depreciated against the USD in the past decades, the Kenyan shilling is still one of the most stable currencies in the region, often circulating also throughout neighboring countries (Hayes 2021).

Figure 4: Inflation rate (% , 2010-2020)



Source: Statista (2022)

Business climate

The World Bank’s 2020 Ease of Doing Business index ranked Kenya 56th, scoring particularly well in the areas of *protecting minority investors* (1st) and *getting credit* (4th) (World Bank 2020). The main areas of improvement are in *registering property* (134th), *starting a business* (129th), and *trading across borders* (117th) (World Bank 2020).

Foreign investors generally receive the same treatment as local investors, and regulations regarding foreign direct investments (FDIs) are provided in the Investment Promotion Act (2004). To encourage private investment, the government repealed a regulation in 2015 that limited foreign ownership of companies listed on the Nairobi Securities Exchange to 75 percent. Furthermore, a clause imposing 30 percent shareholding by Kenyan citizens by birth was repealed, further opening the market to foreign investors (U.S. Department of State 2020).

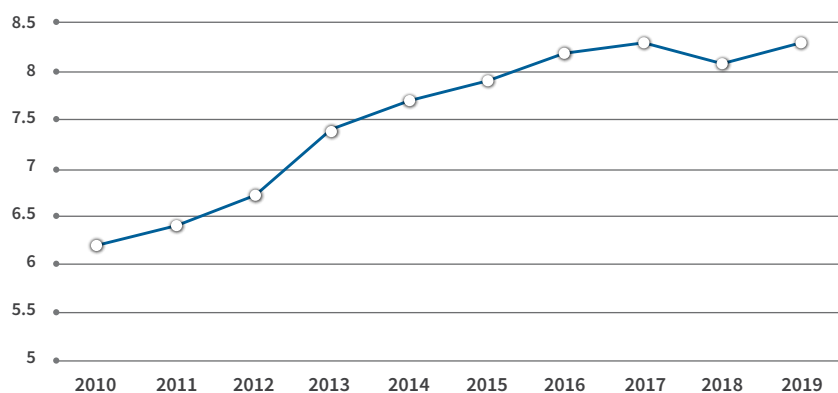
2.2 Electricity sector overview

The electricity mix has shifted over the past quarter decade from an over-reliance on hydro to more diversified sources. In the 1990s, electricity was generated almost exclusively from hydro, and a limited number of fossil fuel plants. There has been a progressive shift driven by extended droughts that led to electricity rationing which threatened the performance of vital industries. The international climate commitments of Kenya and the implementation of the Climate Change policy further encouraged diversification into sustainable energy sources. The energy sector has seen significant growth through both public and private initiatives. However, electricity supply remains at times unstable, and the distribution infrastructure has not kept up with growth in both demand and generation.

Electricity consumption

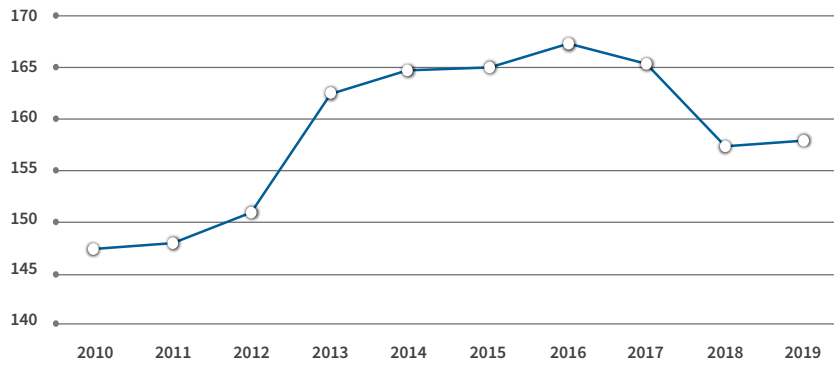
Power consumption in Kenya, from 2010 to 2019, was driven by a targeted government policy of increasing connectivity. This has helped grow power consumption by 34 percent from 6.2 TWh in 2010 to 8.3 TWh in 2019 (see Figure 5). The government set out to achieve universal access to electricity by 2022, which saw connectivity in the country grow from 22 percent in 2010 to just under 70 percent in 2019. This growth in access has also seen an evolution in how power is generated in Kenya, from a near monopoly of Kenya Power and Lighting Corporation (Kenya Power), today KenGen. While Kenya Power remains the unique electricity distributor, it has unbundled its generation activity and created KenGen which today operates in the electricity generation market along with a wide range of independent power producers (IPPs). Combined, the IPPs generate about 30 percent of electricity in Kenya (Eberhard 2018).

Figure 5: Electricity consumption, total (TWh, 2010-2019)



Source: IEA (2019)

Figure 6: Electricity consumption, per capita (kWh, 2010-2019)



Source: IEA (2019) World Bank (2020)

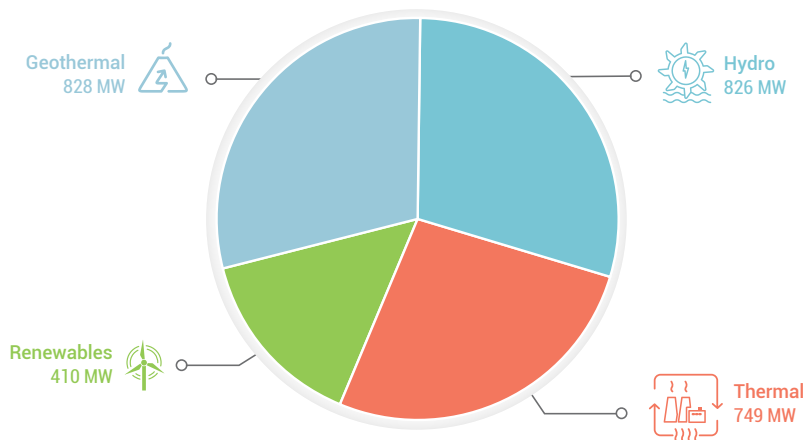
On-grid installed capacity and electricity production

The current generation mix consists of primarily hydro and geothermal sources, contributing around 29 percent each of the 2,813 MW total installed capacity. This is followed by 27 percent thermal and 15 percent renewable generation. About 70 percent of the installed capacity is owned by KenGen. The Kenyan State owns about 70 percent of KenGen, while IPPs own a 30 percent share.

The current generation mix consists of primarily hydro and geothermal sources, contributing around 29 percent each of the 2,813 MW total installed capacity. This is followed by 27 percent thermal and 15 percent renewable generation (see Figure 7). About 70 percent of the installed capacity is owned by KenGen. The Kenyan State owns about 70 percent of KenGen, while IPPs own a 30 percent share.

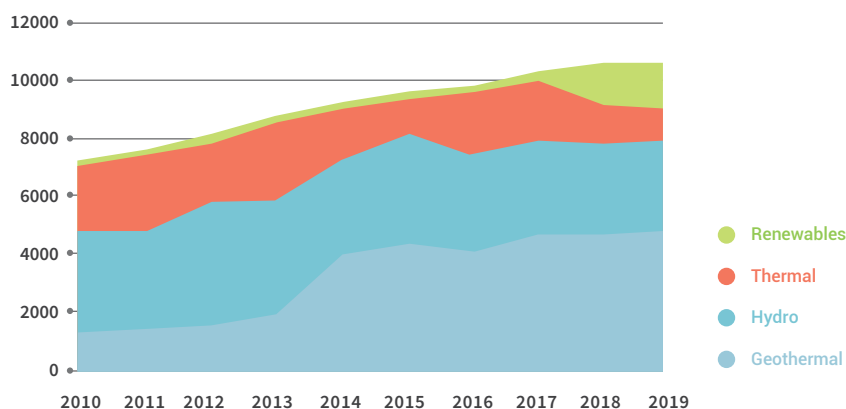
In terms of electricity generation, renewables and geothermal generation have gained significant importance in the last decade. The share of renewable energy in total electricity generation has grown from 3 percent in 2010 to 13 percent in 2019, while geothermal production has grown from 20 percent to 46 percent (see Figure 8). At the same time, thermal generation has dropped by 20 percent, while generation from hydro remained stable.

Figure 7: Installed generation capacity (MW, 2020)



Source: USAID (2022)

Figure 8: Electricity production (GWh, 2010-2019)

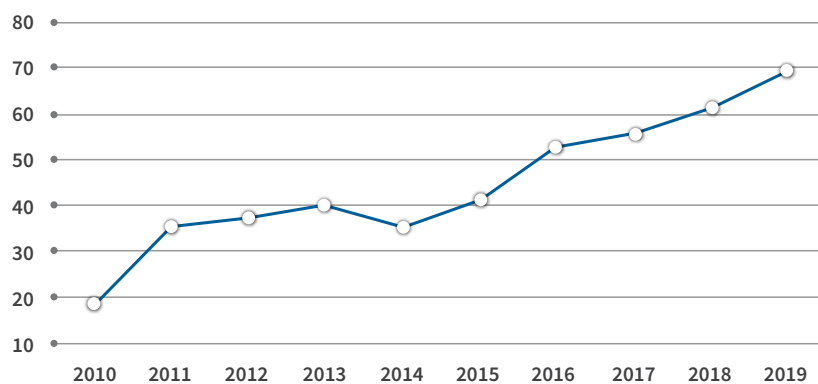


Source: IEA (2019)

Access to electricity

Access to electricity has increased significantly from just over 19 percent in 2010 to almost 70 percent by 2019. In a joint meeting of the Common Market for Eastern and Southern Africa (COMESA) Ministers responsible for Transport and Communication, Information Technology, and Energy in 2021, it was announced that by the end of April 2021, 8.2 million connections have been established, amounting to an electricity access rate of over 75 percent (COMESA 2021). This milestone has been achieved partly due to the *Last Mile Connectivity Project*, which was announced in 2015. The initiative aimed to connect 47 percent of the primarily low-income rural population to the grid. More specifically, the first phase aimed at benefitting 314,200 non-commercial customers, with a budget of KES 13.5 billion. Despite being unprofitable to Kenya Power, 45,000 distribution transformers are being used to ensure anyone within 600 meters can have access to electricity. With the help of the African Development Bank (AfDB), the program is on track to achieve 100 percent electrification by 2026 (AfDB 2021). The second phase aims at connecting a further 500,000 customers, which translates to roughly 2.5 million Kenyans (Kenya Power n.d.).

Figure 9: Electrification rate (% , 2010-2019)



Source: World Bank (2020)

Electricity service quality and reliability

The diversification of energy sources has led to improved electricity supply and reliability. This progress is further enhanced by the wide coverage of one of the world's largest off-grid and home solar networks. Furthermore, transmission and distribution services are unbundled in Kenya. Kenya Power is largely responsible for distribution and owns most of the distribution infrastructure. The Kenya National Electricity Transmission Company (KETRACO) has the mandate to develop new high voltage (HV) electricity transmission infrastructure. KETRACO has over 2,424 km of transmission lines, and a pipeline of 4,000 km (KETRACO, 2021). Serving 2,682,849 customers, in 2020 Kenya Power posted a System Average Interruption Frequency Index (SAIFI) of 4.5 and a System Average Interruption Duration Index (SAIDI) of 11.5 (Kenya Power 2020).

Off-grid electricity market

Even though Kenya Power had run a massive grid expansion program resulting in the growth of customer connections, Kenya has an increasing number of off-grid and mini-grid systems. These are led by solar home systems and solar-powered mini-grids. The International Renewable Energy Agency (IRENA) notes that in 2019 21.5 percent of Kenyans accessed electricity through off-grid connections, and 13 percent of households who access electricity through solar home systems represent the highest such penetration in Africa.

Kenya is one of the largest off-grid markets in Africa, with initiatives such as the Kenya Off-grid Solar Access Project (KOSAP) paving the way for increased rural access to electricity. KOSAP allocates \$150 million in financing from the World Bank in the following manner (KOSAP 2022):

1. \$40 million towards mini-grids for community facilities, enterprises, and households;
2. \$48 million for stand-alone solar systems, and clean cooking solutions for households;
3. \$40 million for stand-alone solar systems and solar water pumps for community facilities; and
4. \$22 million for implementation support and capacity development.

2.3 Electricity sector governance and market structure

Overview of electricity sector reforms

Moving towards power sector liberalization: the first wave of electricity sector reforms (1997-2006)

Following the enactment of the Electric Power Act of 1997, Kenya embarked on fundamental reforms that led to the separation of generation from transmission and distribution services in the electricity market. As a result, KenGen assumed responsibility related to power generation while Kenya Power took responsibility for power transmission and distribution services. Furthermore, the Act established the Electricity Regulatory Board (ERB) as the market regulator having, among others, the responsibility to set, review, and adjust consumer tariffs, as well as promote competition (Trust Africa 2013). In continuing with the liberalization and diversification of generation, the Sessional Paper No. 4 of 2004 led to the creation of, amongst other companies, the Geothermal Development Company (GDC) as a special purpose vehicle to explore and exploit the geothermal potential of Kenya.

The climax of reforms in the energy sector was the enactment of the Energy Act of 2006, which consolidated all laws related to energy, and provided for the establishment of the Energy Regulatory Commission (ERC) as a single sector regulatory agency with responsibility for economic and technical regulation of the electric power, renewable energy, and petroleum sub-sectors (Trust Africa 2013).

The promulgation of the Kenya Constitution and the establishment of the new Energy Act (2006-2019)

Developments in the regulatory framework also led to the promulgation of the Constitution of Kenya whose Article 69(2) places a duty on every person to cooperate with State organs and other persons to protect and conserve the environment and ensure ecologically sustainable development and use of natural resources.

Following the promulgation of the Constitution in 2010, the Ministry of Energy, together with other market players, has taken steps to undertake a review of existing regulations to align them with the provisions of the new Constitution. Through the process, a National Climate Change Framework Policy and action plan were developed in 2016, along with a national Energy Policy which was supplemented by the National Electrification Strategy and the updated Power Generation and Transmission Master Plan.

Furthermore, a new Energy Act was developed and gazetted on 31st March 2019. The Energy Act 2019 amends the Energy Act 2006, consolidates the various laws relating to energy, provides for the establishment of energy sector entities, and regulates the production, supply, and use of energy. It establishes the Energy and Petroleum Regulatory Authority (EPRA) as the successor to the Energy Regulatory Commission (ERC).

The LCPDP enactment and the introduction of the 2021 REAP Policy and FiT Policy (2019-present)

Following the enactment of the Energy Act 2019, and the disruptions caused by the COVID-19 pandemic, the Government has released the 2020 Kenya National Energy Efficiency and Conservation Strategy and the 2021-2030 Least-Cost Development Plan (LCPDP). The LCPDP updates the previous 2017-2037 LCPDP and articulates the commitment of the Government to the recovery of the power sector (Bowmans Law 2021).

Keeping with these guiding principles and recommendations, the Ministry of Energy (MoE) has released the Renewable Energy Auction Policy (REAP) and the Feed-in-Tariffs Policy on Renewable Energy Resource Generated Electricity (FiT Policy 2021).

The FiT Policy 2021 is a revision of the FiT Policy 2012 with substantial changes introduced on the development of renewable energy projects in Kenya in a bid to align with the Energy Act and the other recent developments in the Kenyan energy sector.

2021 also saw the creation of the Presidential Taskforce on the Review of Power Purchase Agreements (PPA Taskforce), with the aim of assessing Kenya's current power procurement process in a bid to reduce end-user electricity tariffs by 30%. Upon the creation of the Taskforce in March, a moratorium was placed on all unconcluded PPAs. Among others, the report of the PPA Taskforce published in October, recommended the cancellation of PPAs under discussion and the renegotiation of existing PPAs. Both courses of action were followed by the Government, and PPA renegotiations are currently ongoing.

Following the enactment of the Energy Act 2019, and the disruptions caused by the COVID-19 pandemic, the Government has released the 2020 Kenya National Energy Efficiency and Conservation Strategy and the 2021-2030 Least-Cost Development Plan (LCPDP).

Institutions governing the electricity sector

The electricity market of Kenya is governed by the following institutions.

Table 1: Institutions governing the electricity sector

Ministry of Energy (MoE)	The Ministry is charged with developing and implementing policies that create an enabling environment for efficient operation and growth of the energy sector. It sets strategic directions to facilitate the growth of the sector while providing a long-term vision for all sector players. It also promotes the development of hydro, geothermal, and renewable energy, oversees the rural electrification program, and provides guidance on energy regulation, security, and conservation.
Energy and Petroleum Regulatory Authority (EPRA)	The Regulator is established under Section 9 of the Energy Act. Its functions include the regulation of generation, importation, exportation, transmission, distribution, supply, and use of electrical energy, except for licensing of nuclear facilities.
Rural Electrification and Renewable Energy Corporation (REREC)	Following the enactment of the Energy Act 2019, the Rural Electrification Authority was replaced by the Rural Electrification and Renewable Energy Corporation (REREC). REREC is a public entity mandated to implement the Rural Electrification Program, and spearhead green energy initiatives in Kenya.
Renewable Energy Resource Advisory Committee (RERAC)	RERAC is an inter-ministerial committee that advises the Cabinet Secretary on matters concerning the allocation of renewable energy resources, management of water catchment areas, and development of multi-purpose projects such as dams and reservoirs.
Energy and Petroleum Tribunal (EPT)	The Tribunal hears and determines disputes between the Energy and Petroleum Regulatory Authority and other stakeholders in the energy sector.
Public-Private Partnerships (PPP) Directorate	The PPP Directorate is one of the National Treasury Directorates and acts as the technical arm of the PPP Committee. It is mandated to facilitate the implementation of the PPP Program and projects in Kenya.
Public Procurement Regulatory Authority (PPRA)	The PPRA is a public body whose functions include the monitoring, assessment, and review of public procurements and asset disposals.
National Environmental Management Authority (NEMA)	NEMA is established under the Environmental Management and Coordination Act No. 8 of 1999 (EMCA) as a Governmental instrument for the implementation of all policies related to the environment.

Market players

The following are the main market players in the electricity market of Kenya.

Table 2: Market players

Kenya Electricity Generating Company (KenGen)	KenGen is a state-owned enterprise. It is the largest power producer, accounting for the majority of the generation in the country. It is 70 percent owned by the Government and 30 percent of its shareholding is in the hands of the public. KenGen was originally part of Kenya Power but was separated in 1998 after the Government commenced restructuring the energy sector to increase efficiency.
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Kenya Power and Lighting Company (Kenya Power)	Kenya Power and Lighting Company, which is also referred to as Kenya Power, owns and operates the majority of electricity transmission and distribution assets in Kenya. Although it is publicly listed on the Nairobi Securities Exchange, the government holds a controlling stake of just over 50 percent. The mandate of Kenya Power includes planning for sufficient electricity generation and transmission capacity, building and maintaining the power distribution and transmission network, and providing retail electricity services to its customers.
Kenya Electricity Transmission Company (KETRACO)	KETRACO is a public entity mandated to plan, design, construct, own, operate, and maintain the HV electricity transmission grid and regional power interconnectors. Of the 6,294 km of transmission lines, 2,364 km (37.5 percent) are currently owned by KETRACO. Following the Energy Act of 2019, KETRACO functions as a System Operator.
Geothermal Development Company (GDC)	GDC is a state-owned company responsible for geothermal resource assessments. It has the mandate to sell geothermal steam electricity to KenGen and private investors. GDC aims to develop 1,065 MW of geothermal resources by 2030.
Independent Power Producers (IPPs)	Several IPPs supply power to the grid. Currently, around 30 percent of national power generation comes from generation assets operated by IPPs.

Electricity market model

Since the early 1990s, Kenya has periodically carried out restructurings of the power sector, without substantially changing the underlying economic structure.

The generation segment is led by KenGen. With 1,818 MW of installed capacity, it represents 65 percent of the national installed capacity, operating primarily across hydro (826 MW), geothermal (713 MW), thermal (254 MW), and wind (26 MW) plants.

GDC is another state-owned actor in the generation market, tasked with developing steam fields and selling geothermal steam for electricity generation to KenGen and private investors. GDC does not sell energy directly to Kenya Power; instead, its generated energy is sold to KenGen which sells it to Kenya Power.

The Rural Electrification Program established under the Energy Act 2019 is overseen by RREC, which also sells generated energy to Kenya Power. Besides state-owned actors, almost a quarter of energy sold in 2019/20 to Kenya Power was from IPPs (AfDB 2021). In 2019, IPPs accounted for 30 percent of installed generation capacity, and 23 percent of production. Though initial IPP projects were primarily fossil fuels, this has largely evolved to more renewable resources, primarily solar and wind energy. Lake Turkana Wind Power, for example, is the largest wind power plant in Africa.

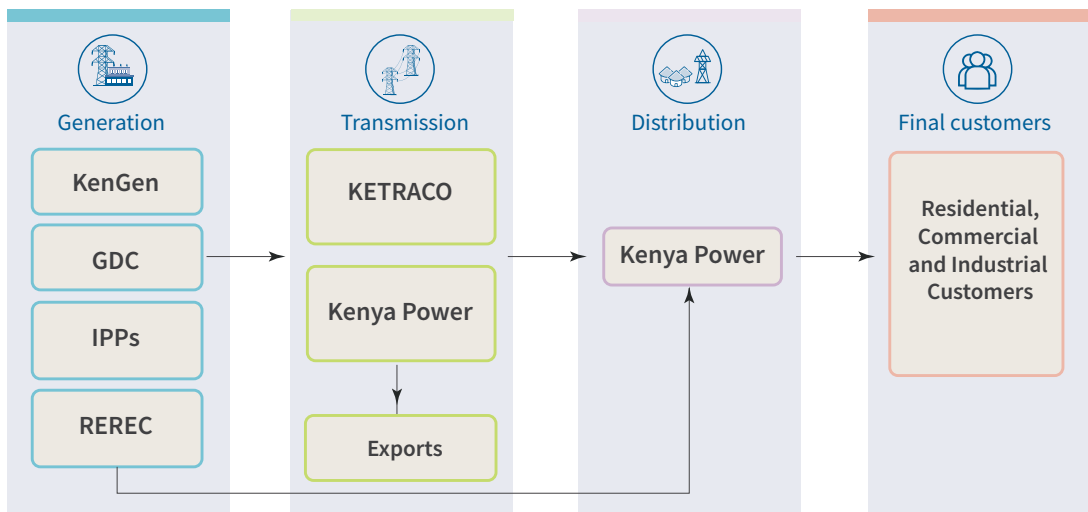
When it comes to transmission, there are two actors: KETRACO, a public corporation established in 2008 and responsible for planning, designing, constructing, owning, operating, and maintaining the HV electricity transmission grid, and regional power interconnectors; and Kenya Power, which has retained its transmission network built before the establishment of KETRACO.

The Rural Electrification Program established under the Energy Act 2019 is overseen by RREC, which also sells generated energy to Kenya Power. Besides state-owned actors, almost a quarter of energy sold in 2019/20 to Kenya Power was from IPPs (AfDB 2021). In 2019, IPPs accounted for 30 percent of installed generation capacity, and 23 percent of production.

In distribution networks, Kenya Power has a monopoly. Kenya Power, which is 50.1 percent government-owned and 49.9 percent publicly listed on the Nairobi Securities Exchange, is the single off-taker. It negotiates Power Purchase Agreements (PPAs) with generation providers and dispatches energy to over 8 million customers (Kenya Power n.d.).

The total length of the transmission and distribution networks was 243,207 km for all voltage levels in 2019/20, up from 59,322 km in 2014/15. This growth has been greatly influenced by KETRACO, which has accelerated the development of the transmission infrastructure (AfDB 2021).

Figure 10: Structure of the electricity supply industry



2.4 Policies and regulations governing the electricity supply industry

The electricity market of Kenya is governed through numerous position papers, strategies, policy documents, and laws summarized below (see Annex A for further information).

Table 3: Energy sector strategies, policies, and plans

<p>Power Generation and Transmission Master Plan (PGTMP), Kenya Medium Term Plan 2015 – 2020 (2016)</p>	<p>The PGTMP identifies the Kenyan power system expansion path, which encompasses:</p> <ul style="list-style-type: none"> • Analysis of past electricity demand and development of future demand scenarios; • Analysis of suitable expansion candidate fuels and technologies, their optimal sizing, siting, and scheduling; • Modeling of their expected contribution to the future power generation and the probable operation of the generation system; • Modeling of the transmission grid and analysis of its performance; and • Investment analysis summarizing financial implications.
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National Climate Change Framework Policy (NCCFP) (2016)	The NCCFP provides a basis to guide the development and implementation of specific, detailed, and costed climate change interventions through regular and periodic climate change action plans. By putting in place this policy architecture, Kenya aims to enhance adaptive capacity and build resilience to climate variability and change, while promoting a low carbon development pathway.
National Climate Change Action Plan (NCCAP) 2018 – 2022 (2018)	The NCCAP 2018-2022, is a five-year plan that supports Kenya in adapting to climate change and reducing greenhouse gas (GHG) emissions. The NCCAP builds on the first action plan (2013-2017), sets out the actions to implement the Climate Change Act (2016), and provides a framework to deliver on its Nationally Determined Contribution (NDC) to the Paris Agreement.
National Energy Policy (NEP) (2018)	The overall objective of the NEP is to ensure an affordable, competitive, sustainable, and reliable supply of energy at the least cost to meet national development needs while protecting the environment. The policy provides a comprehensive description of the current state of the energy sector and the policy framework as of 2018 and contains policy recommendations related to coal, renewable energy (including geothermal and hydro in particular), electricity, energy efficiency and conservation, land, environment, health and safety, energy services, energy financing, pricing, and socioeconomic issues.
Kenya National Electrification Strategy (KNES) (2018)	The KNES provides a roadmap to achieve electricity access for all households and businesses in Kenya over the shortest period and at an acceptable quality of service. In this regard, the strategy incorporates multiple options to expand access to rural areas and strengthen the existing power infrastructure.
Kenya National Energy Efficiency and Conservation Strategy (KNEECS) (2020)	The KNEECS provides a roadmap for setting and achieving energy efficiency goals, which include: <ul style="list-style-type: none"> • Reducing the national energy intensity by 2.8 percent per year; and • Enabling Kenya to achieve a 30 percent emission reduction by 2030 relative to the business-as-usual case, and meet Sustainable Development Goal 7 (SDG7) by 2030.
Least-Cost Power Development Plan (LCPDP) – 2021 -2030 (2021)	The plan presents a 10-years LCPDP for the period 2021-2030, which is derived from a longer-term LCPDP for 2020-2040. The plan addresses load forecast, generation planning, ancillary service requirements, and tariff evolution.
Renewable Energy Auctions Policy (REAP) (2021)	The REAP is developed to enable the Government to procure renewable energy on competitive terms. The REAP applies to all solar and wind power projects, as well as other renewable energy projects larger than 20 MW (except for geothermal power projects).
Feed in Tariff Policy (2021)	The 2021 Feed in Tariff (FiT) Policy is a revision of the 2012 FiT Policy with substantial changes introduced on the development of renewable energy projects in Kenya in a bid to align it with the Energy Act. It applies to renewable energy power plants not exceeding 20 MW in biomass, biogas, and mini-hydro technologies.

2.4.1 Key laws and regulations for the electricity supply industry

Foundational legislation

The Energy Act 2019, amending the Energy Act 2006 and consolidating the laws relating to energy, delineates the functions of the national and devolved levels of government concerning energy. It also redefines the mandate of energy-dedicated public authorities, regulates the exploitation of renewable energy sources, and defines rules and requirements for the supply and use of electricity.

A key aspect of the Energy Act is that it requires the Cabinet Secretary responsible for energy, in consultation with relevant stakeholders, to develop and publish a national energy policy to be reviewed every 5 years. The Energy Act sets the rules for electrical energy licensing, introducing:

- Generation License to operate a specific generation plant and connect it to the national network – plants of less than 1 MW for own use will no longer be required to obtain a license;
- Transmission License to operate a transmission network and, if allowed by the license, to connect to another transmission or distribution network;
- Distribution License to operate a system for distributing electricity from generation plants either directly or through the transmission network to consumers; and
- Retail Supply Licenses to supply electricity to consumers through a range of commercial activities including procuring energy from other licensees, metering, billing, and collecting the fees.

In this sense, the Energy Act 2019 opens to private sector participation in new segments of the electricity value chain, liberalizing the national electricity supply industry and potentially increasing competition.

Grid Codes and technical regulations

The Kenya National Transmission Grid Code (KNTGC) is the primary technical code of the electricity supply industry, collating the majority of the technical regulations for the connection to and use of a reliable, efficient, and safe electrical system.

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The KNTGC is divided into several provisions including, among others, governance, planning, connections, operations, scheduling, coordination, and balancing of power transfers across the Eastern Africa Power Pool (EAPP) Interconnected Transmission System. Its purpose is to establish the technical aspects of the planning, connection, operation, and use of the Kenya national transmission system and the relationships between the Kenya national transmission system operator (Kenya National TSO), transmission network service provider(s) (TNSPs), generation licensees, and other users of the transmission system.

Furthermore, the code has been developed taking into account the EAPP and East African Community Interconnection Code (EAPP IC). Kenya is a member of the EAPP and, as such, the requirements imposed on the EAPP member countries also apply to the users of the Kenya National Transmission System (KNTS).

In the distribution segment, the Kenya National Distribution Code (KNDC) defines the rules and regulations users must observe for accessing and using the distribution system. Its main objective is to improve the safety, reliability, efficiency, and economical operation of the power system.

The KNDC, as the KNTGC, provides several provisions defining: i) the reciprocal obligations, responsibilities, and accountabilities users shall follow to ensure open and transparent access, use, and operation of the system; ii) the minimum technical requirements users must comply with once connected to the distribution system, and iii) the information exchange obligations among users.

Tariff regulation

As per the Energy Act 2019, EPRA is responsible for setting, reviewing, and adjusting tariffs and tariff structures in the electricity market. More specifically, when it comes to electricity tariffs administration, EPRA takes the following measures (EPRA 2019):

- forecasting demand for the bulk and retail markets;
- planning of both generation and transmission to meet demand forecasts;
- determination of the sector revenue requirements based on forecasts of costs likely to be incurred for generation, transmission, distribution, and supply of power;
- determination of marginal costs of generation, transmission, distribution, and retailing;
- allocation of total revenue requirement among the different customer categories;
- computation of initial retail tariff proposals;
- sensitivity analysis of the proposed retail tariffs which allows, where relevant, their revision;
- public disclosure of proposed tariffs, which may lead to public debate and hearing; and
- determination of the final retail tariffs.

Final electricity tariff decisions from EPRA are published publicly, detailing tariff levels by consumer categories.

2.4.2 Other regulations for private sector participation

Private sector participation models

The Public-Private Partnership Bill came into effect on December 23, 2021. It aims to streamline the regulatory framework for PPPs, enhance efficiency in the PPP process, and address the gaps existing in the previous PPP Act of 2013 (ESI-Africa 2019). The Bill provides for the participation of the private sector in the financing, construction, development, operation, or maintenance of infrastructure or development projects through PPPs.

To centralize PPP processes and functions, the Bill lays out the establishment of the PPP Committee whose functions include, among others, the formulation of policies on PPP, the supervision of the implementation of PPP contracts, and the approval of standardized PPP bid documents. Furthermore, under the current law, a Directorate of PPP has been established

to originate, guide, and coordinate the selection of PPPs, oversee project appraisal, provide technical expertise in the implementation of projects, and oversee PPP contract management frameworks.

When it comes to procurement methods, other than direct procurement, which is applicable only in exceptional circumstances, the Act provides for privately initiated proposals, competitive bidding, and restricted bidding which could be considered where, given the complexity or specialized nature of the works and services, the tender is limited to prequalified applicants. The PPP Bill also foresees the possibility for County governments to enter into PPP agreements. However, they would be required to liaise with the PPP Directorate and obtain written approval from the PPP Committee and the National Treasury.

An important aspect introduced by the new PPP Bill concerns the prioritization of local content which would enhance services and supplies provided and manufactured in Kenya.

Procurement processes

Public procurement in Kenya is governed by the Public Procurement and Asset Disposal Act 2015. This legislation came into effect on 7 January 2016, repealing the previous Public Procurement and Disposal Act of 2005. State organs and public entities within Kenya are required to comply with this law regarding planning and undertaking procurement, inventory management, asset disposal, and contract management.

The law provides for the National Treasury to be responsible for public procurement and asset disposal policy formulation while the Public Procurement Regulatory Authority (PPRA) monitors, assesses, and reviews the public procurement and asset disposal system to ensure compliance with article 227 of the Constitution on public procurement.

The Act prescribes various tender procedures which may be used for the procurement of goods, works, and services, in different circumstances. Notably, open tendering shall be the preferred procurement method, with alternative procurement procedures available when permitted under the Act and when prescribed conditions are met.

Procurement procedures are required to be conducted in a manner that is fair, equitable, transparent, competitive, and cost-effective. Accounting officers are required to make an invitation to tender to all eligible bidders and to set aside 30 percent of government procurement opportunities for the youth, women, and persons with disability.

Generally, tenders are evaluated based on the criteria set out in the tender documents. The Act requires such criteria to be, to the extent possible, objective and quantifiable.

Incentives

Renewable energy has the potential to generate income and employment opportunities, contribute to the electricity supply, and diversification of generation sources. In this regard, both the National Energy Policy and the Energy Act provide for a feed-in tariff system that promotes the generation of electricity from renewable energy sources. Furthermore, the Feed-in-Tariffs (FiT) Policy has practically allowed power producers to sell renewable energy-generated electricity to the off-taker at a pre-determined tariff for a given period.

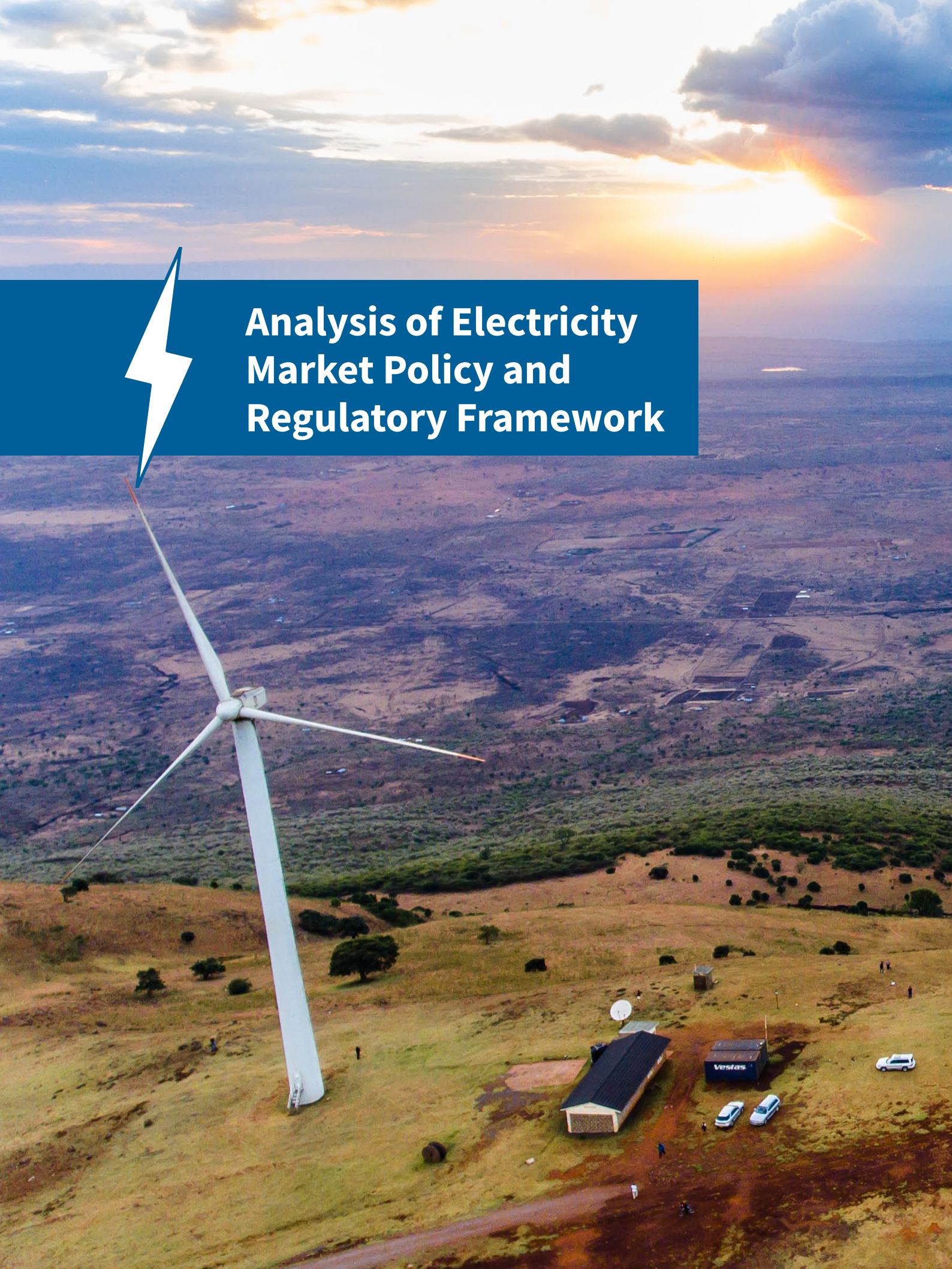
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The FiT Policy provides for review every three years from the date of publication. The last review has been recently undertaken in January 2021. The Policy applies to renewable energy power plants not exceeding 20 MW in biomass, biogas, and small hydro technologies, while geothermal energy is procured under the Policy on Licensing of Geothermal Greenfields.

Renewable energy power plants are contracted through standardized PPAs whose term shall not exceed 20 years, and whose tariffs shall be specified by the Policy itself. The FiT levels are technology specific and depend on several factors such as the investment cost for the plant, operation and maintenance, fuel cost (where applicable), financing cost, the lifetime of power plants, and the estimated generated electricity.

The Government has recently published the Renewable Energy Auctions Policy (REAP Policy 2021) to enable the procurement of renewable energy on competitive terms. The REAP applies to all solar and wind power projects, as well as other renewable energy projects larger than 20 MW. This means that no renewable energy projects larger than 20 MW shall be eligible under the FiT Policy. The REAP provides for review every five years from the date of publication.

The auction mechanism is based on a two-stage bidding process. The first stage is the prequalification stage during which preliminary evaluation is undertaken. The second stage entails the request for a proposal requiring technical and financial evaluation of the project. Successful bidders are invited for negotiation with the contracting authority and, upon negotiations, bidders are required to enter into a project agreement.

An aerial photograph of a large white wind turbine on a grassy hillside. The sun is setting in the background, creating a warm orange and yellow glow. The landscape is a mix of green grass and brown earth. In the foreground, there is a small building, a satellite dish, and a blue container with the 'Vestas' logo. Several cars are parked nearby. A dark blue banner with a white lightning bolt icon is overlaid on the left side of the image, containing the title text.

Analysis of Electricity Market Policy and Regulatory Framework



Wind power turbines, a KENGEN Project in Ngong hills, Kenya
Photo credit: Mwarv/ www.click.co.ke

3. Analysis of Electricity Market Policy and Regulatory Framework

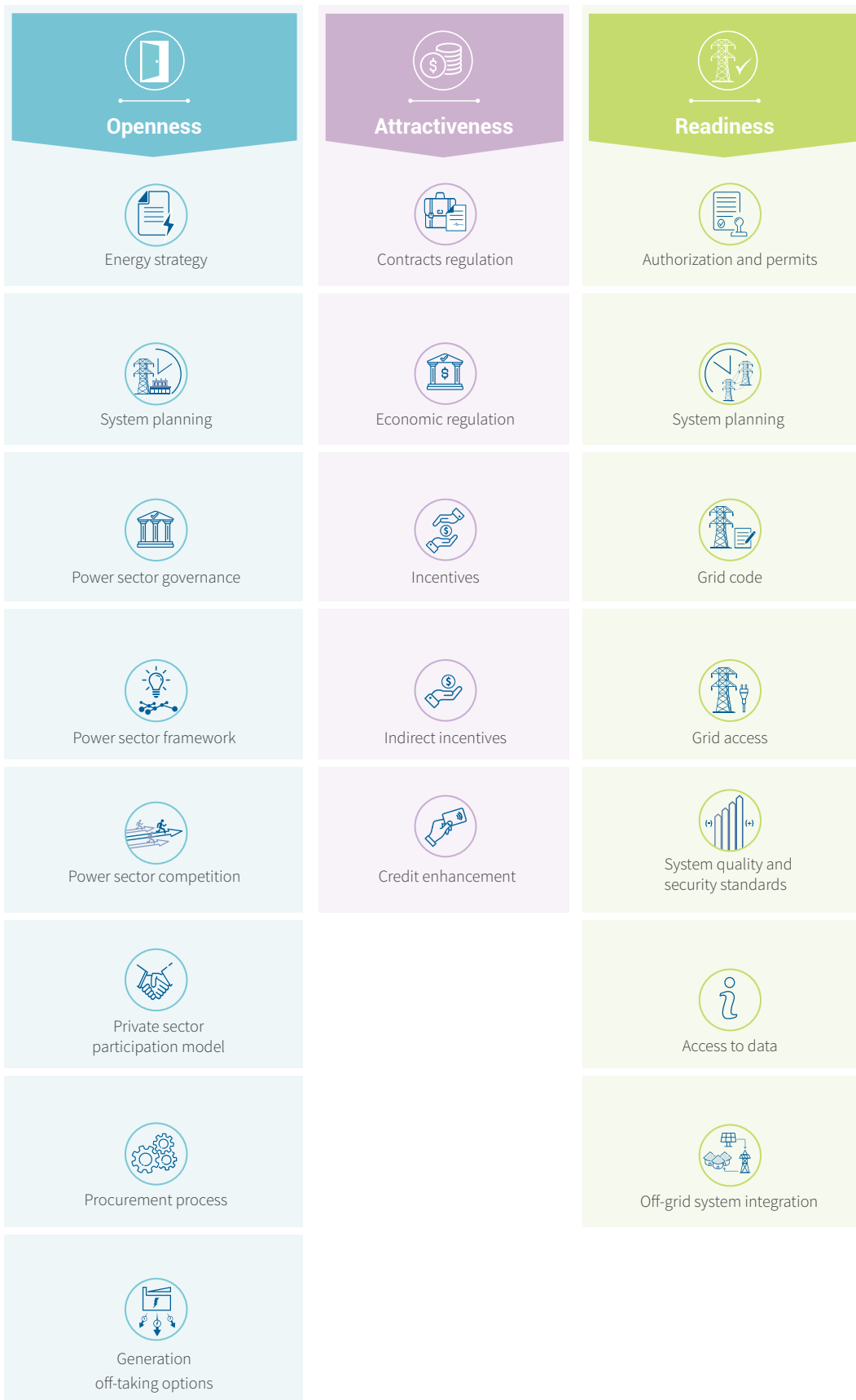
UNECA and RES4Africa Foundation have developed a custom methodology to assess countries' policy, legislative, and regulatory frameworks in their ability to encourage the participation of private sector investors. The approach encompasses the entire electricity supply industry value chain, covering the generation, transmission, distribution, and off-grid segments of the market.

3.1 UNECA and RES4Africa methodological approach

The methodology identifies three areas, referred to as Dimensions, under which policy, legislative, and regulatory elements are clustered. These Dimensions are as follows.

 <p>Openness</p>	<p>Openness – or power sector structure and governance. This Dimension covers policies, laws, and regulations meant to define energy policy and strategy priorities, market-entry, infrastructure planning, sector governance, market structures, and related considerations. These instruments combined provide an overall view of the <i>openness</i> of the electricity market to investors.</p>
 <p>Attractiveness</p>	<p>Attractiveness – or sector economics. This Dimension assesses policies, laws, and regulations that ensure the economic viability of electricity infrastructure investments, as well as fair competition among market operators. A review of these instruments provides an overall synthesis of the <i>attractiveness</i> of the electricity market to private sector investors.</p>
 <p>Readiness</p>	<p>Readiness – or sector maturity. This Dimension investigates technical regulations designed to ensure the implementation into, and efficient integration and management of electricity infrastructure within the energy system. A review of these elements of the Dimension provides an overall picture of the <i>readiness</i> of the electricity market to investors along the value chain.</p>

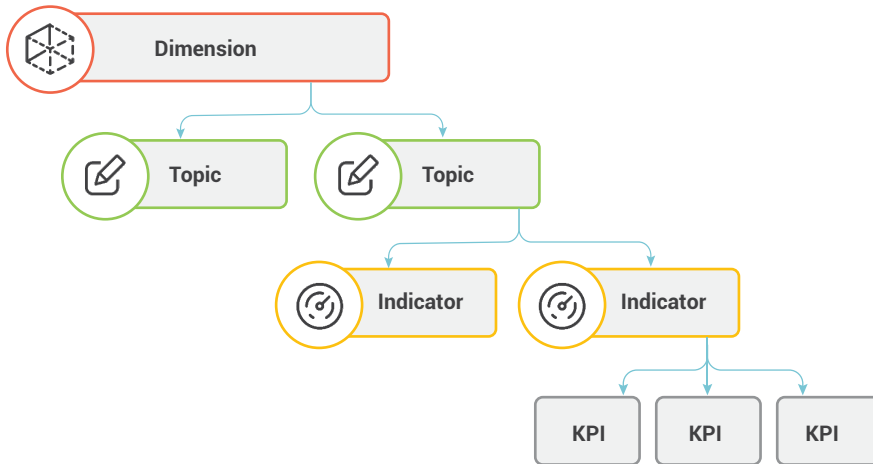
Figure 11: Overview of the Topics assessed within each Dimension



Each of these Dimensions is then disaggregated into three further levels, namely Topics, Indicators, and KPIs (key performance indicators).

- **Topics (1st Level)** define the main areas of policy and regulatory assessment (such as energy strategy, system planning, and grid code) specific to each of the dimensions. Topics are composed of Indicators. See Annex B for an overview of the Topics assessed.
- **Indicators (2nd Level)** cover single policy or regulatory elements (such as energy policy, Electricity Act, public PPAs, retail tariff structure, and grid connection). Each Indicator is composed of a series of KPIs.
- **KPIs (3rd Level)** are single elements, or specific questions, that provide a detailed understanding of Indicators, which in turn inform Topics.

Figure 12: Methodological building blocks



The methodology, cascading from the broader to the micro-level, enables proper assessment and understanding of the degree of *openness*, *attractiveness*, and *readiness* of electricity markets to private sector investors. This approach led to the formulation of a set of questionnaires – one for each segment of the electricity market, that is generation, transmission, distribution, and off-grid. Based on YES/NO questions, the approach enables the assessment of the policy, legal, and regulatory environment related to its fundamental attributes: clarity, predictability, transparency, and accountability.

The quantitative result from this methodological exercise is estimated by summing the positive (YES) answers to the detailed questions (KPIs). To reflect on the relative relevance of a particular KPI under a given Indicator, and to assess the impact that a particular Indicator has on its Topic, Indicators, and KPIs are subjected to relative weights on a scale system. The weights were reviewed and validated by a panel of African and international experts, and reflect the average input of the experts.

To compute the necessary quantitative results based on data input from countries, UNECA and RES4Africa developed the *ROAR* (Regulatory review of the *openness*, *attractiveness*, and *readiness*) tool. The ROAR tool computes results by country based on country data inputs and a defined weighting methodology.

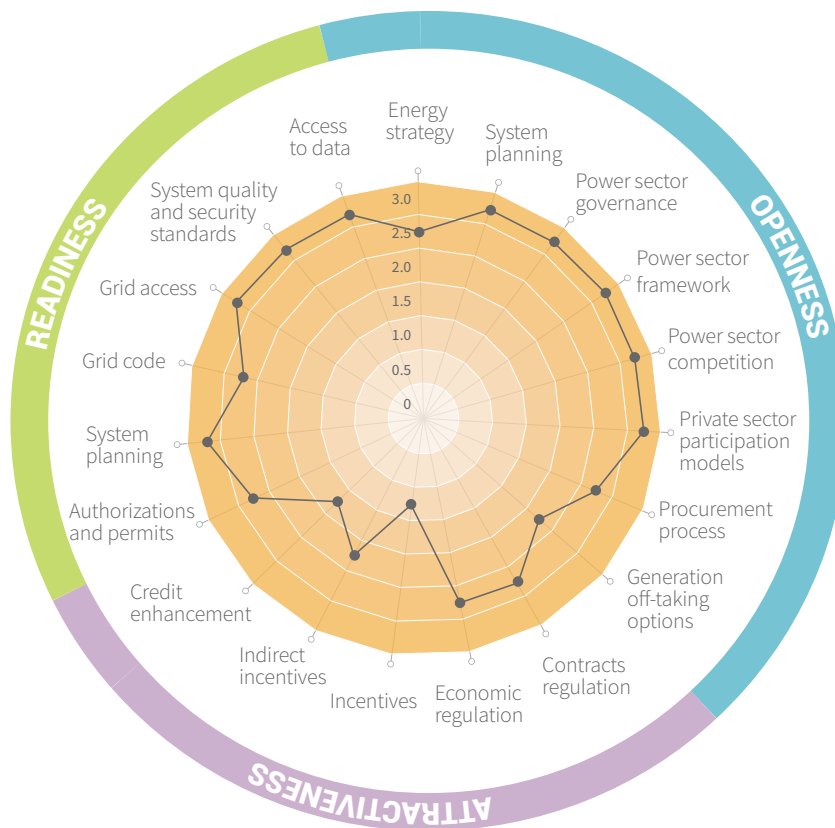
The quantitative results, therefore, are presented at the Topics level and use a scoring system based on a 0 to 3 point scale, where 0 is the lowest score – indicating a lack of regulatory preparedness on the assessed Topic related to private sector investment participation – and 3 is the highest – indicating a full regulatory preparedness on the assessed Topic.

3.2 Main findings

Assessment of the electricity policy and regulatory framework of Kenya related to the crowding-in of private investors into the electricity market is discussed below.

3.2.1 Generation segment

Figure 13: Overview of the generation segment

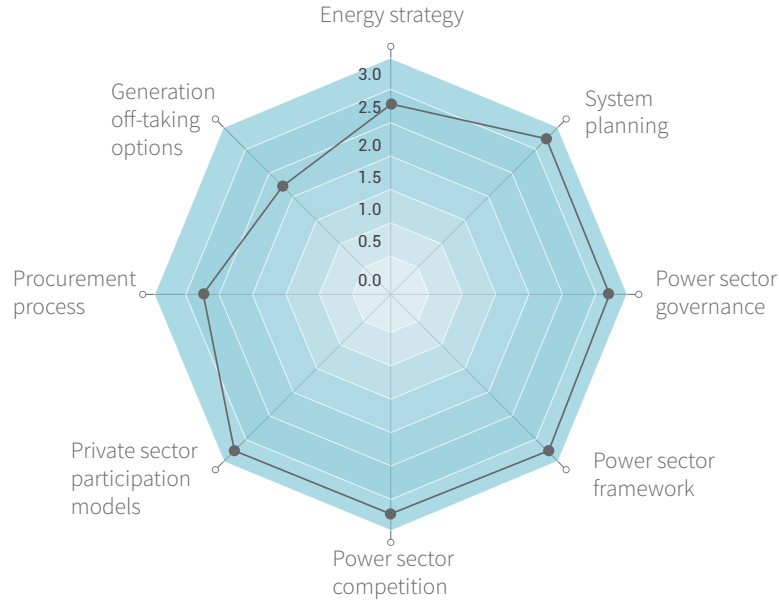


Overall, the regulatory performance of Kenya is satisfactory in most of the Topics assessed related to the *openness*, *attractiveness*, and *readiness* of the generation market to private sector participation. These results confirm the overall preparedness of the national policy and regulatory framework in enabling private investment in generation assets.



A deep dive into the Openness dimension

Figure 14: A deep dive into the Openness dimension for generation



Kenya achieves high regulatory performances in most of the Topics relevant to generation market *openness*, except for challenges related to the *power sector framework* and *generation off-taking options* where further improvement could increase generation market *openness* to private investment.

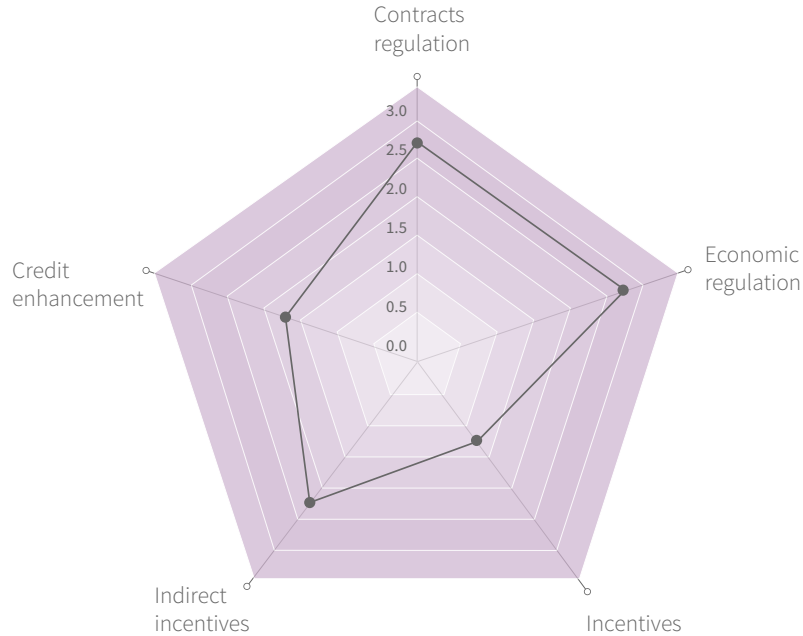
 <p>Energy strategy</p>	<p>Kenya demonstrates good regulatory performance related to <i>energy strategy</i> thanks to the presence of the Energy Policy, approved in 2018, which sets out the priorities and targets for the energy sector. It is also aligned with the national development strategy, Kenya Vision 2030. Furthermore, both the National Climate Change Framework Policy and the National Climate Change Action Plan 2018 – 2022 provide guidance on low carbon climate resilient development. However, the lack of a formal procedure to monitor existing targets is an area for further improvement.</p>
 <p>System planning</p>	<p>Kenya performs outstandingly in <i>system planning</i> due to its well-organized and implemented power sector planning process. The Ministry for Energy is responsible for issuing the Least-Cost Power Development Plan, which has been recently updated to cover the period 2020-2040. Moreover, electricity system planning further strengthened with the introduction of a 10 years plan, with the current plan covering the period 2021-2030, providing a picture of the long-term direction of the sector to investors. The LCPDP is also completed by a mid-term investment plan, detailing the investment pipeline and estimated capital requirements.</p>

 <p>Power sector governance</p>	<p>There is strong power sector governance in Kenya due to the Energy Act 2019, which is the foundational law establishing the general governance framework of the electricity sector. The Act establishes EPRA as the independent market regulator responsible for economic and technical regulation. The Act liberalizes extensively the Kenyan electricity market with its provision that EPRA licensed entities can operate generation, exportation, importation, transmission, distribution, and retail supply of electricity.</p>
 <p>Power sector framework</p>	<p>The ability of Kenya to restructure the electricity generation market is confirmed by excellent regulatory performance in the <i>power sector framework</i>. The electricity generation market is fairly advanced with a significant and growing presence of IPPs, the unbundling of the generation segment from both transmission and distribution services, and the presence of an independent system operator, KETRACO, with the coexistence of two transmission companies, KETRACO and Kenya Power.</p>
 <p>Power sector competition</p>	<p>The adoption of the Energy Act 2019 marks the liberalization of the electricity market, as reflected by the excellent regulatory performance on <i>power sector competition</i>. The Law introduces a licensing regime for traders/retailers, providing a new possible intermediary between generators and customers. Moreover, the law introduces the concept of an "eligible consumer" defined as a "consumer that is permitted to choose any licensee to be a supplier and with whom the consumer may contract for the purchase of electrical energy for the consumer's own use...". The consequence of this provision is the possible competition between generators and retailers to supply clients both at the wholesale and retail levels.</p>
 <p>Private sector participation model</p>	<p>Having liberalized the market, the Energy Act 2019 enables multiple models for private sector participation in the electricity generation market. Concession-type IPPs and merchant models are authorized, as well as participation as engineering, procurement, and construction (EPC) contractors. Moreover, private investors are authorized to buy shares of publicly listed companies including electric utility incumbents such as KenGen.</p>
 <p>Procurement process</p>	<p>The regulatory framework of Kenya is well developed in the area of the <i>public procurement process</i>, supported by the PPP Bill and the Public Procurement and Asset Disposal Act. The clear PPP process and the emergence of PPP models such as build, own, operate (BOO), build, own, operate, and transfer (BOOT), and build, transfer, and operate (BTO) demonstrate progress in this area. These models provide opportunities for private sector participation. Both competitive solicited and unsolicited proposals are permissible, and a PPP Directorate has been established to originate, guide, and coordinate the selection of PPPs, oversee project appraisal, provide technical expertise in the implementation of projects, and oversee PPP contract management frameworks.</p>
 <p>Generation off-taking options</p>	<p>Generators have access to several routes to market for selling their electricity output, both centralized (public PPAs with the off-taker) and decentralized (private PPAs, and self-consumption options). However, the regulatory performance of Kenya in <i>generation off-taking options</i> is moderate since a regional or domestic spot market has not yet been implemented.</p>








A deep dive into the Attractiveness dimension

Figure 15: A deep dive into the Attractiveness dimension for generation



Overall, the review indicates a moderate regulatory performance in the *attractiveness* of the generation market, with some areas such as *incentives* and *credit enhancement* requiring further regulatory improvements.

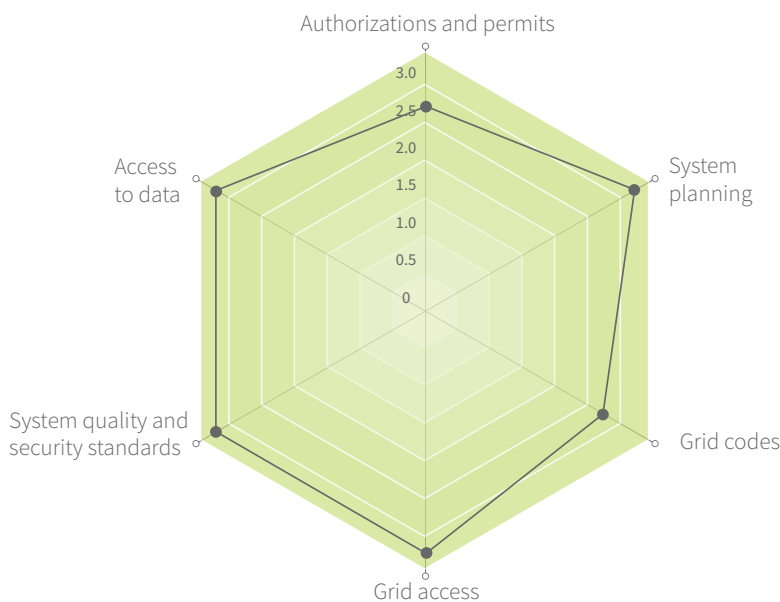
 <p>Contracts regulation</p>	<p>Kenya has been able to attract several private investors in the generation market where a number of IPPs are currently operational. Indeed, the country provided attractive contractual conditions for IPPs, through a good level of standardization of PPA terms and provisions offered to IPPs. PPAs with Kenya Power, the public off-taker, include provisions on foreign currency, force majeure, and dispute resolution mechanisms, in alignment with international best practices and the bankability requirements of private investors. There is good regulatory performance related to <i>contract regulation</i>.</p>
 <p>Economic regulation</p>	<p>The <i>attractiveness</i> of the generation market to private investment is also enhanced by the good regulatory performance in <i>economic regulation</i>. Indeed, as per the Energy Act, EPRA is responsible for the economic regulation of the electricity market, defining tariff formulae, and calculating and approving tariff levels. It has control of the tariff administration process, which includes public consultations with stakeholders before the final tariff decision. However, the periodicity of the tariff review mechanism is a remaining challenge to be addressed.</p>

 <p>Incentives</p>	<p>The low level of regulatory performance related to <i>incentives</i> has to be considered in light of the recent review of the dedicated supporting scheme for renewables. Kenya has updated its FiT Policy in 2021, specifying rules and feed-in tariff levels for renewable energy projects not exceeding 20 MW. The national FiT Policy is meant to be reviewed every 3 years with consequent tariffs adjustments, and offered PPAs are not meant to exceed 20 years. So far, the FiT scheme is the only available supporting mechanism for renewable generators. In fact, even if the Government has also published its Renewable Energy Auctions Policy in 2021 with the objective to enable the government to procure renewable energy (above 20 MW) on competitive terms, no renewable energy auction has been successfully launched so far.</p>
 <p>Indirect incentives</p>	<p>Kenya extends tax relief and VAT reductions to electricity generation investors as <i>indirect incentives</i> to support the development of investments in generation assets. However, other forms of incentives such as carbon pricing mechanisms or result-based financing are not yet available, therefore leading to a moderate regulatory performance in this area.</p>
 <p>Credit enhancement</p>	<p>The moderate performance in <i>credit enhancement</i> resulted from the lack of accessible public guarantees to private investors in the form of concessional financing and sovereign risk guarantees, that could decrease the cost of capital.</p>



A deep dive into the Readiness dimension

Figure 16: A deep dive into the Readiness dimension for generation

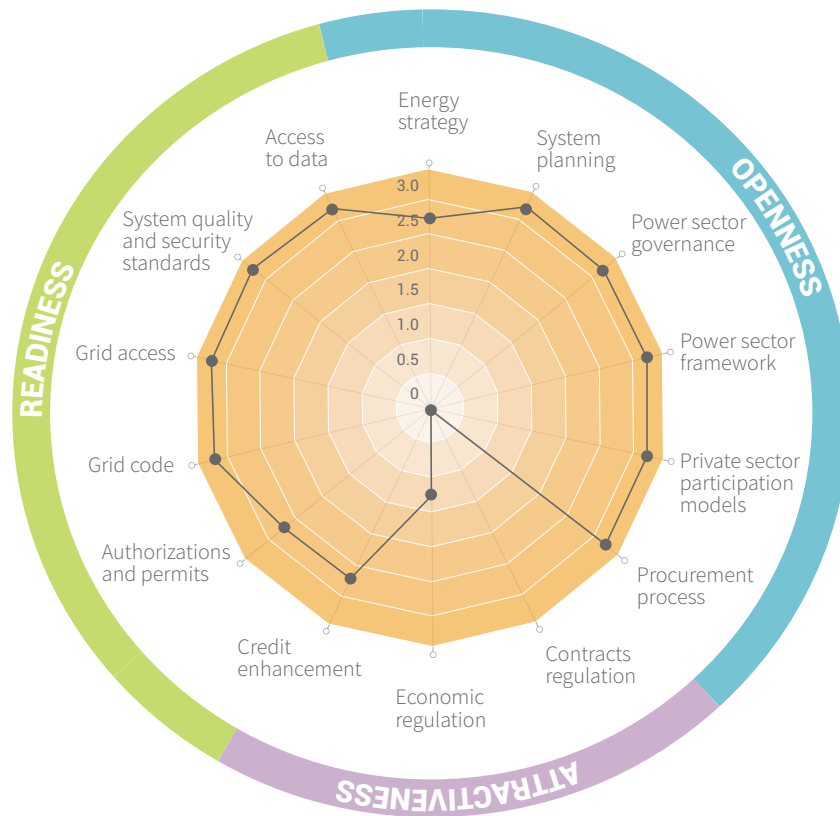


Overall, the review of the policies, laws, and regulations covering generation market regulatory readiness shows an excellent level of performance with some areas such as *system planning*, *grid access*, *access to data*, and *system quality* reaching peak performance. The current regulatory framework provides clarity on technical regulation essential for the effective participation of private investors in the generation market.

 <p>Authorizations and permits</p>	<p>The rules for access to land, water rights, and construction and permits are clearly defined by the Energy Act. Related to environmental approval, the relevant rules have been established by the Environmental Management and Co-ordination Act. However, the absence of a one-stop shop to facilitate access to all these permits has slightly reduced the regulatory performance of Kenya in this area.</p>
 <p>System planning</p>	<p>The electricity sector is guided by effective system planning which, as already assessed in the <i>openness</i> dimension, benefits from the presence of a network infrastructure development plan inside the current Power Generation and Transmission Master Plan and Least Cost Power Development Plan (LCPDP).</p>
 <p>Grid code</p>	<p>A national transmission grid code (KNTGC), issued by the national regulatory authority, is in place to provide technical guidance to market regulation. The market benefits from technical regulation indispensable to ensuring the stable and safe operation of electricity networks, electricity dispatching, network expansion, and quality of supply. In compliance with international best practices, the national grid code is composed of several provisions including governance, planning, connections, operations, scheduling, coordination, and balancing of power transfers across the Eastern Africa Power Pool Interconnected Transmission System.</p>
 <p>Grid access</p>	<p>The Energy Act provides for mandatory connection by the Transmission Service Operator (TSO) to all licensed entities, and clearly states that access to the national grid has to be ensured in a fair, transparent, and non-discriminatory manner. Connection rules and allocation of connection costs are aspects governed by the Grid Code, providing clarity on <i>grid access</i>.</p>
 <p>System quality and standards</p>	<p>System quality and security standards are applied in the planning and operation of the transmission network, as detailed by the KNTGC; thus, explaining the excellent regulatory performance in this area.</p>
 <p>Access to data</p>	<p>Kenya avails socioeconomic and electricity market data publicly. The Kenya National Bureau of Statistics (KNBS) collects, analyzes, and disseminates socioeconomic data on behalf of the Government. Both KenGen and Kenya Power publicly avail their balance sheets. These efforts ensure transparency and enable the accessibility of relevant data to investors.</p>

3.2.2 Transmission segment

Figure 17: Overview of the transmission segment

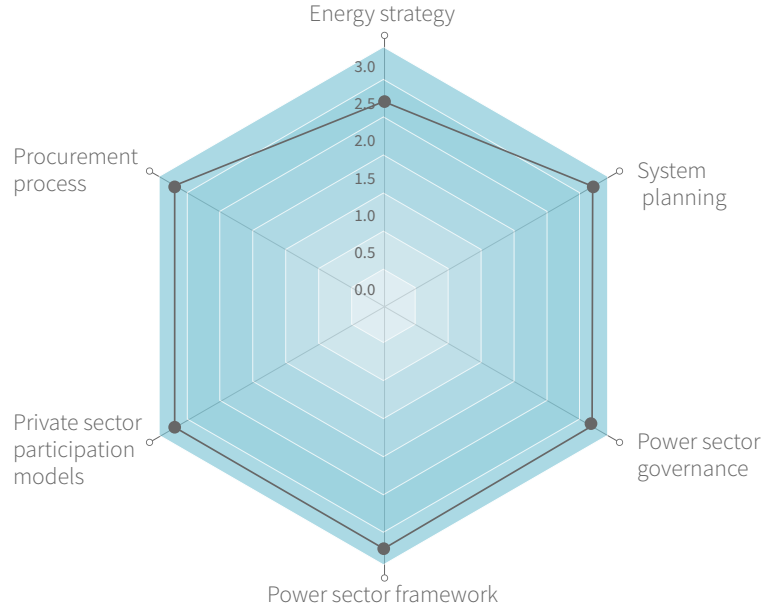


As in the case of the generation market, the regulatory review of the electricity transmission services market confirms good regulatory performance. However, regulatory improvements are required notably in *contracts* and *economic regulation*.





A deep dive into the Openness dimension

Figure 18: A deep dive into the Openness dimension for transmission



The transmission services market is overall *open*, supported by an *energy strategy* and a functional *power sector framework*. For detailed analysis, refer to Generation – openness.

 <p>System planning</p>	<p>There is strong <i>system planning</i> due to a comprehensive regulation dedicated to network development plans over the long, medium, and short periods. There is a detailed Least-Cost Power Development Plan which has been derived from a longer-term LCPDP for 2020-2040 with a ten-year plan covering the period 2021-2030. It is noteworthy that a TSO investment assessment methodology exists, as well as a transmission investment plan.</p>
 <p>Power sector governance</p>	<p>The Energy Act 2019 opens the transmission service to any entity under the condition of obtaining a license from EPRA, without differentiating between public and private operators. More specifically, Article 117 provides that “a person who wishes to carry out the generation, exportation, importation, transmission, distribution, and retail supply of electricity must apply for a license as the case may be to the Authority in accordance with the provisions of this Act”. Clear and transparent rules and requirements are defined by the current laws to apply for and access licenses by interested operators; thus, explaining the excellent regulatory performance related to power sector governance.</p>
 <p>Private sector participation model</p>	<p>With the adoption of the Energy Act 2019, Kenya has legally opened the electricity transmission segment to private participation. As a result, multiple <i>private sector participation models</i> are permissible. Indeed, following the enactment of the Energy Act, interested private investors are legally allowed to access several models to operate within the transmission segment: from concession agreements and Independent Power Transmission (IPT) models to buying shares of the listed incumbents including the transmission utility or participating in investments as EPC contractors.</p>



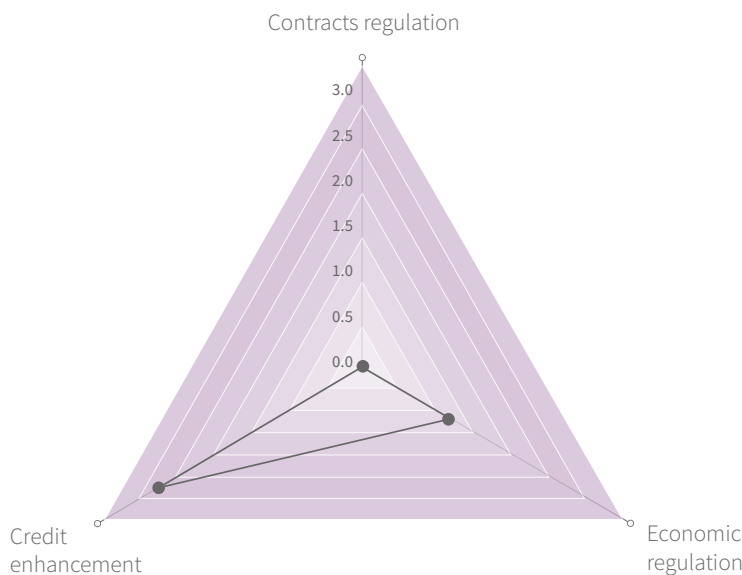
Procurement process

Procurement rules are well established, as there are clear laws for selecting PPPs. Investment in transmission assets is allowed under PPP-type arrangements, administrated under the current legislation on PPPs and public procurement - the PPP Bill and the Public Procurement and Asset Disposal Act.



A deep dive into the Attractiveness dimension

Figure 19: A deep dive into the Attractiveness dimension for transmission



The mitigated regulatory performance related to the *attractiveness* of the transmission market, especially in the areas of *contracts* and *economic regulation*, reflects the recent opening of this market segment to private operators. Regulatory improvements are required to ensure an adequate level of *attractiveness* of the transmission services market to crowd-in private investment.




Contracts regulation

Kenya has yet to develop a contractual framework and its related regulatory administration to define rights and obligations, as well as performance requirements and payment terms, to be applied to private transmission operators.



Economic regulation

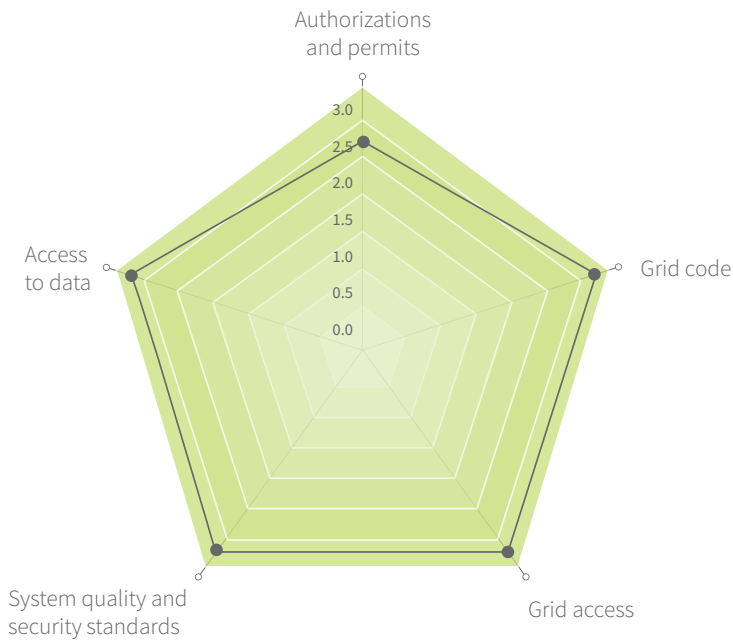
The Energy Act 2019 clearly defines the principles of tariff determination and responsibilities for their definition and administration, which falls under EPRA. However, so far tariff formulas used by the regulator are not made public and the periodicity of tariffs revision is not defined by law. As a result, there is moderate regulatory performance in transmission *economic regulation*.

 <p>Credit enhancement</p>	<p>Credit enhancement is extended to transmission asset investors through government and multilateral guarantees.</p>
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A deep dive into the Readiness dimension

Figure 20: A deep dive into the Readiness dimension for transmission



Overall, the regulatory performance related to the *readiness* of the transmission market segment is very satisfactory. For more information, see *Generation – readiness*.

 <p>Authorizations and permits</p>	<p>In addition to the regulatory aspects evaluated in the generation segment of the regulatory review, rules concerning the right-of-way, which are crucial for the construction of transmission infrastructure, are defined by the Energy Act. As a consequence, Kenya performs very well related to <i>authorization and permits</i> administration.</p>
 <p>Grid code</p>	<p>The excellent performance related to regulatory clarity through a <i>grid code</i> is due to the availability of the national transmission grid code. The code follows international best practices and covers among others system governance, planning, connection rules, operations, scheduling, coordination, and balancing of power transfers across the Eastern Africa Power Pool Interconnected Transmission System.</p>



Grid access

The Energy Act provides a mandatory connection by the Transmission Service Operator to all licensed entities. The national transmission grid code states the right for third-party access to the transmission network and defines the technical conditions for connection, leading to high regulatory performance related to grid access.

3.2.3 Distribution segment

Figure 21: Overview of the distribution segment

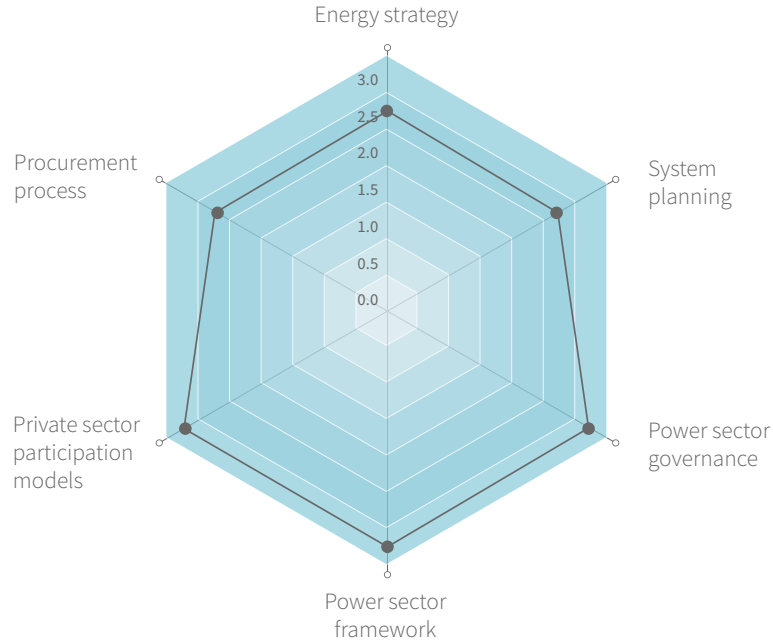


The electricity distribution services market demonstrates overall regulatory preparedness, especially related to market *openness* and *readiness*. However, there is overall regulatory underperformance on market *attractiveness*. Although private participation in the distribution segment has been made legally possible by the recent reforms, Kenya Power retains a de facto monopoly on distribution. Regulation to support the economic viability of business models such as *contracts regulation*, *economic regulation*, and regulation for accessing *credit enhancement* instruments has yet to be defined.






A deep dive into the Openness dimension

Figure 22: A deep dive into the Openness dimension for distribution



Overall, there is appreciable regulatory performance under distribution services market *openness*, except for the *power sector framework* where further improvements would enhance private sector participation. For detailed analysis, refer to the discussions under *Generation-openness*, and *Transmission-openness*.

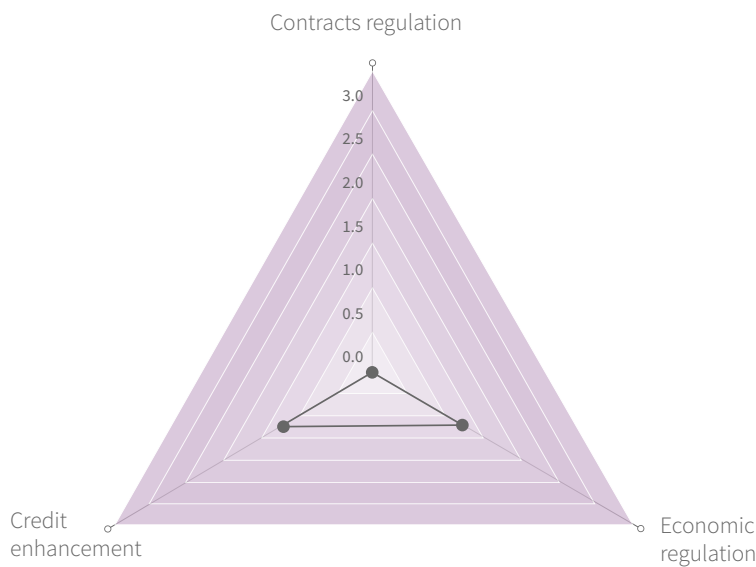
 <p>System planning</p>	<p>The distribution services market is guided by robust <i>system planning</i> due to a comprehensive regulation dedicated to network development planning over the long, medium, and short periods. There is a dedicated distribution grid code (KNDGC), which however does not define rules for evaluating distribution investments. The National Electrification Strategy further strengthens planning for electrification expansion.</p>
 <p>Private sector participation model</p>	<p>Although private sector operators have not participated in the distribution services market yet, the Energy Act 2019 permits any entity to access distribution licenses. Furthermore, private companies can participate in the market through the acquisition of shares of Kenya Power, which is publicly listed on the Nairobi Stock Exchange platform. Private sector investors could also participate in distribution asset development through EPC contracts.</p>
 <p>Power sector governance</p>	<p>The Energy Act provides regulatory guidance to distribution and retail service providers. The licensing portal of EPRA gives guidance on acquiring distribution licenses, which offers opportunities for private distribution companies to invest in areas presently unserved by Kenya Power. These developments demonstrate the excellent regulatory performance related to <i>power sector governance</i>.</p>

	<p>PPP agreements are potentially available for investors in distribution infrastructure. The PPP Law regulates such agreements and defines public procurement procedures. Public tendering has not been used so far for procuring new distribution assets.</p>
<p>Procurement process</p>	




A deep dive into the Attractiveness dimension

Figure 23: A deep dive into the Attractiveness dimension for distribution



Significant regulatory improvements are needed to improve the economic viability of distribution business models to investors. Although private sector participation in the distribution market is enabled through regulatory reform, *contracts regulation* has yet to be defined and approved. *Economic regulation* and regulation for accessing *credit enhancement* instruments also require regulatory improvements.

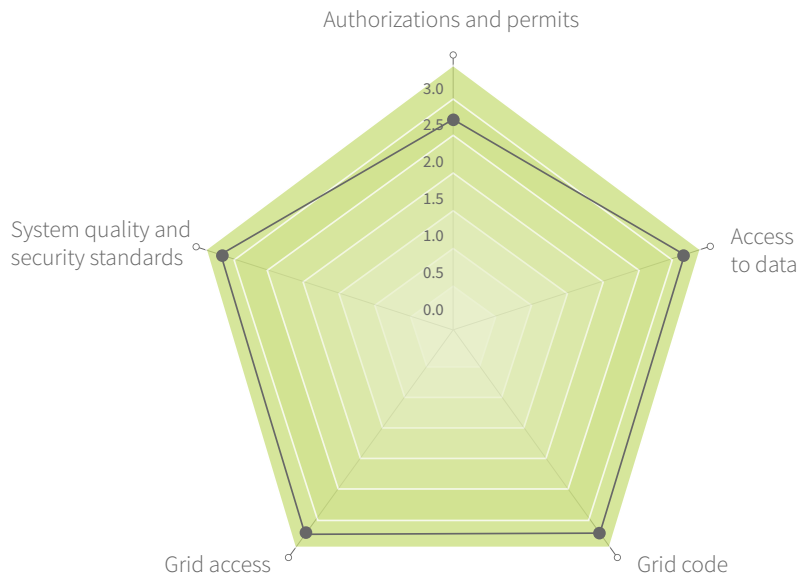
	<p>There is a general lack of detailed provisions in the Energy Act to support <i>contracts regulation</i> to determine the rights and obligations of the distribution service provider. There are also gaps in standardization of performance, metering, billing, payments, complaints, dispute resolution, and electricity tariff setting within contractual arrangements.</p>
<p>Contracts regulation</p>	
	<p>EPRA has a clear tariff setting methodology based on studies on the capital expenditure and operating costs of electricity supply services. However, the tariff formula used by the regulator is not yet public and the periodicity of tariffs revision is not defined by law. These areas constitute opportunities for further enhancement of national capacity in <i>economic regulation</i>.</p>
<p>Economic regulation</p>	

 <p>Credit enhancement</p>	<p><i>Credit enhancement</i> instruments, made available notably by multilateral entities, could potentially be available to distribution investors, with the exception of revenue escrow agreements. Government support through dedicated public guarantees is not available for private-led distribution investments. <i>Credit enhancement</i> remains an area of further improvement to enhance the participation of private capital in distribution asset investment.</p>
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A deep dive into the Readiness dimension

Figure 24: A deep dive into the Readiness dimension for distribution



Overall, the regulatory performance of distribution services market *readiness* is excellent, with the potential to improve on *authorizations and permits*. For a more extended review, refer to *Generation – readiness*, and *Transmission – readiness* discussions.

 <p>Grid code</p>	<p>The presence of the distribution grid code (KNDGC) explains the excellent performance related to regulatory guidance through a <i>grid code</i>. The code defines the obligations, responsibilities, and accountabilities of all of the grid users to ensure open, transparent, non-discriminatory, and economic access and use of the system while maintaining its safe, secure, reliable, and efficient operation. It furthermore defines minimum technical requirements for users and sets out the information exchange obligations by the users.</p>
 <p>Grid Access</p>	<p>In alignment with the provisions of the Energy Act 2019, the KNDGC provides for the open access regime to the distribution grid and sets the rules for connecting to the grid, as well as the rules for connection charges. These developments constitute good regulatory practices related to <i>grid access</i>.</p>



System quality and standards

The KNDGC also establishes the quality of supply and security standards to be ensured on the distribution grid infrastructure, providing regulatory clarity for grid operators.

3.2.4 Off-grid segment

Figure 25: Overview of the off-grid segment

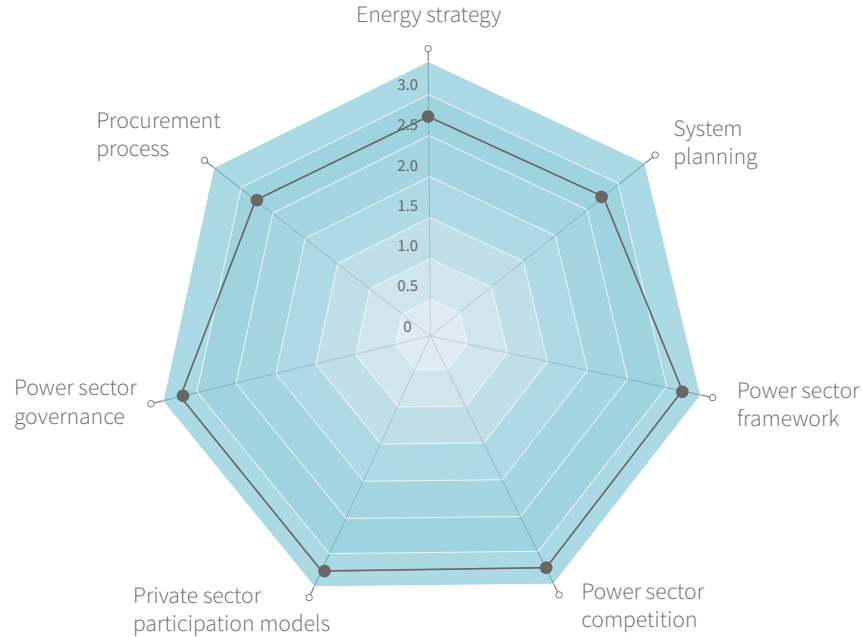


A regulatory review of the off-grid market segment reveals mixed results. There is an overall good regulatory performance related to off-grid market *openness* and *readiness*, explained by the presence of a Rural Electrification Authority and a concrete roadmap to achieve full electricity access, as well as regulatory clarity emanating from the Energy Mini-Grid Regulations of 2021. However, there is room for improvement related to *contracts regulation*, *economic regulation*, and *credit enhancement* mechanisms impacting off-grid market *attractiveness*.








A deep dive into the Openness dimension

Figure 26: A deep dive into the Openness dimension for off-grid



The off-grid market is generally *open* to private sector investors. For a more extended review, refer to *Generation – openness*, *Transmission – openness*, and *Distribution – openness*.

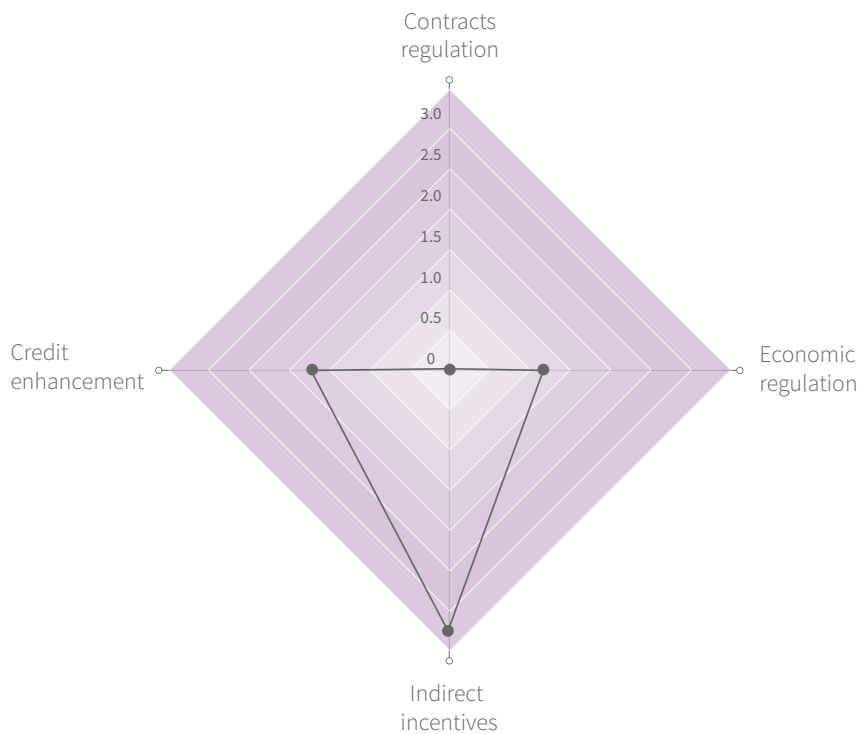
 <p>Energy strategy</p>	<p>The strategic priorities of Kenya target the development of the electricity off-grid segment articulated in the Kenya National Electrification Strategy (KNES) of 2018. The KNES provides clear off-grid targets, aiming to electrify 1,105,000 households located further than 15 km from Kenya Power services by 2022. This criteria amounts to around 2 million connections. However, KNES targets are not legal mandates and they are yet to be integrated into a comprehensive system development plan.</p>
 <p>System planning</p>	<p>KNES also serves as a planning exercise for off-grid infrastructure development. In 2018, the Government launched the Electricity Sector Investment Prospectus, which presents the investment opportunities in the energy sector over the next 5 years (2018 to 2022). It serves as an indicative investment plan covering mini-grids and off-grid systems. However, KNES focuses on electrification expansion as a stand-alone issue and has yet to be integrated into the overall electricity system planning process.</p>
 <p>Private sector participation model</p>	<p>Private sector participation in the off-grid market segment is permitted through an EPC and portfolio concession models as well as merchant models, implemented through the KOSAP program.</p>

 <p>Power sector governance</p>	<p>The recent publication of the Energy Mini-grid Regulations 2021, yet to be officially approved at the time of this regulatory review, clarifies fundamental aspects of <i>sector governance</i> for off-grid operators, including license applications and performance and quality standards for all mini-grids up to 1 MW. The governance of the off-grid sector is also defined by the presence of the Rural Electrification and Renewable Energy Corporation whose mandate has been expanded from a sole electrification agency to also spearhead green energy development by the Energy Act of 2019.</p>
 <p>Procurement process</p>	<p>A variety of PPP models, such as BOO, BOOT, and BTO as well as a split asset investment approach are accessible for mini-grids operators. Competitive tenders are used to procure mini-grid assets, although also open to government-owned companies. However, the lack of visibility on the planning and scheduling of tenders reduces regulatory performance in this area.</p>



A deep dive into the Attractiveness dimension

Figure 27: A deep dive into the Attractiveness dimension for off-grid



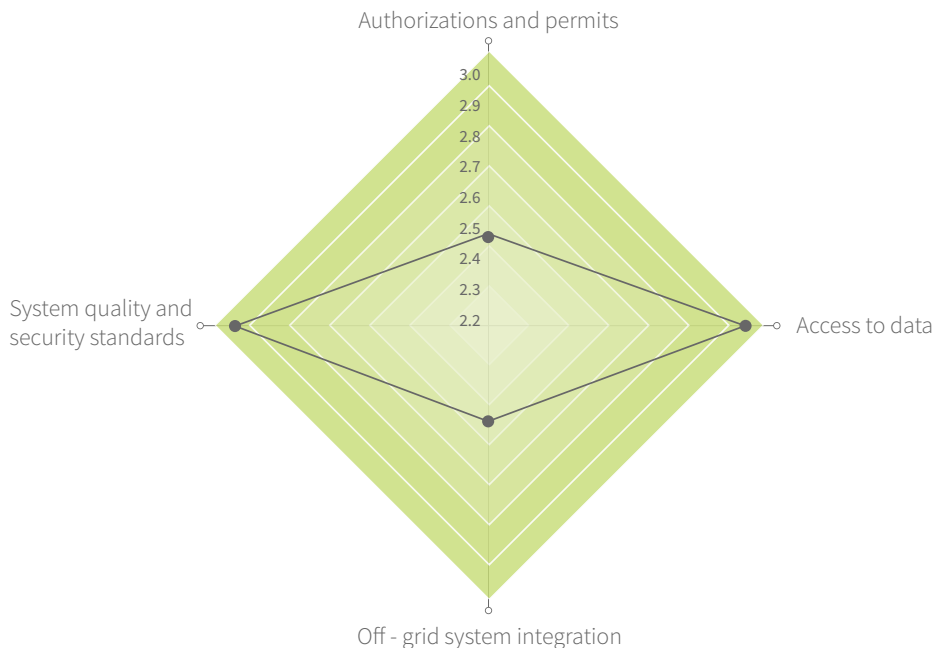
To enhance off-grid market *attractiveness* to private investment, *contracts regulation*, *economic regulation*, and *credit enhancement* are to be carefully considered to implement reforms that will improve the participation of private investors.

 <p>Contracts regulation</p>	<p>The current regulatory framework does not define rules, or guidelines, for contracts between off-grid operators and their clients, reducing the transparency about service quality, metering rules, and payments. Rules are currently under development.</p>
 <p>Economic regulation</p>	<p>The reduced regulatory performance on <i>economic regulation</i> stems from a lack of standardization of the tariff regulation to be applied by off-grid operators. This challenge is expected to be resolved by the adoption of the Draft Energy Mini-grid Regulations of 2021. So far, every operator uses different tariff systems. Tariff models have to be submitted to the Regulator for approval to obtain a license. A maximum internal rate of return (IRR) level for mini-grid assets is also defined by the regulatory authority to provide a fair balance between returns on investment and end user tariffs.</p>
 <p>Indirect incentives</p>	<p>The full score in this topic is explained by the presence of VAT and import duty relief for generation assets that also benefit off-grid operators by reducing fixed costs.</p>
 <p>Credit enhancement</p>	<p>Both concessional lending and multilateral guarantees are available for off-grid operators. The Kenya Off-Grid Solar Access Project (KOSAP) supports the use of solar and clean cooking technology to drive the electrification of households, enterprises, community facilities, and water pumps and has received USD 150 million in financing from the World Bank. Although there are currently no government guarantees in place, the public funds from KOSAP will be used to provide incentives through results-based financing and debt facilities.</p>





A deep dive into the Readiness dimension

Figure 28: A deep dive into the Readiness dimension for off-grid



The regulatory review of the *readiness* of the off-grid market confirms good performance as a result of regulatory provisions ensuring good integration and safe operation of off-grid assets within the whole electricity system. For a more extended review of all the Topics, refer to *Generation – readiness*, *Transmission – readiness*, and *Distribution – readiness*.

 <p>System quality and standards</p>	<p>The Kenya Bureau of Standards (KEBS) is the government agency responsible for the development of standards and certifications. It ensures the compliance of off-grid operators with international off-grid product standards. Off-grid operators must report the quality and reliability of service, in line with main grid standards, to the KEBS. The technical off-grid standards also need to adhere to the main grid standards as defined in the grid code.</p>
 <p>Off-grid system integration</p>	<p>Currently, mini-grids can be integrated into the main grid as small power distributors and small power producers, or sell their assets to the utility, once the main grid arrives. This is further detailed in the Draft Energy Mini-grid Regulations, which are expected to be adopted soon. However, there are no guarantees or compensation mechanisms for stranded assets in place. In the absence of adoption of the draft regulation, there is increased risk and uncertainty for off-grid investors in the event of main grid arrival without clear regulatory provisions for the treatment of such risks.</p>



Conclusions and Recommendations





*Aerial view over Garissa solar project, Garissa Northern Kenya.
Photo credit: George Alusa*

4. Conclusions and Recommendations

Kenya is the second largest economy in East Africa in terms of GDP and the first in terms of GDP per capita. The GDP growth ranged in the 5-6 percent in the last decade, though more recently COVID-19 has dampened economic growth. As a consequence, national electricity demand has grown steadily over the last decade driven by economic and population growth, and the commitment of the Government to increase electrification. Such commitment enabled the improvement of electricity access from 22 percent in 2010 to about 75 percent in 2021. To support this growth, Kenya had to invest in the development of its electricity infrastructure and opted to engage the private sector to support the effort. Kenya succeeded in attracting private capital demonstrated by the 30 percent national electricity generation capacity contributed by IPPs.

One of the reasons behind this success was the ability of the authorities to undertake a comprehensive reform of the electricity market through policy and regulatory reforms. Following the enactment of the Electric Power Act of 1997, Kenya embarked on fundamental reforms that led to the unbundling of generation from transmission and distribution services. This was the beginning of Kenya's path towards liberalization of the electricity market and the introduction of competition in the generation market segment.

Reforms continued in 2006 when the Energy Act consolidated all laws relating to energy and provided for the establishment of an independent national regulatory authority. Following the promulgation of a new Constitution in 2010, the necessity emerged to review the existing regulations and align them with the provisions of the new Constitution. The second half of the 2010s have testified a third wave of reforms with the adoption of a National Climate Change Policy along with a National Energy Policy, a National Electrification Strategy, and an updated version of the Power Generation and Transmission Master Plan. A new Energy Act, amending the Energy Act 2006, was adopted in 2019, reforming the governance of the whole electricity supply industry and fully liberalizing it, enabling private entities to operate at all service levels.

However, whilst the energy sector has seen significant growth through both public and private initiatives, electricity supply is still unstable at times, and the network infrastructure, most notably at the distribution level, has not kept up with the growth in both demand and generation.

A thriving electricity sector development involves government, industry, and customers as the key players. In this respect, defining and implementing regulatory improvement to enhance the *openness*, *attractiveness*, and *readiness* of the electricity market is essential to stimulate and crowd-in private investments. Indeed, the policy and regulatory environment play a fundamental role in ensuring a safe, reliable, and competitive electricity supply industry, and its weaker points, if not addressed, risk affecting the performance of the whole industry.

The policy and regulatory review performed under this study confirm the good performances of Kenya in many areas of policies and regulations relevant to effective private sector participation, acknowledging also the recent efforts made in terms of strategy and governance reforms. The review considered positively such improvements. The assessment, however, also shows some areas that still require attention from the national electricity sector decision-makers and the market regulator.

The policy and regulatory review performed under this study confirm the good performances of Kenya in many areas of policies and regulations relevant to effective private sector participation, acknowledging also the recent efforts made in terms of strategy and governance reforms.

4.1 Takeaways from the regulatory review

Related to the *Openness* of the electricity market

- ⚡ Current legislation ensures a good degree of *openness* of the electricity generation market for private investors. The outstanding regulatory performance of fundamental aspects such as *system planning*, *power sector governance*, *private sector participation models*, and *power sector competition* confirm the ability of Kenya to adopt and implement regulatory reforms. Generation has been unbundled from both transmission and distribution services. The Energy Act of 2019 has further liberalized the electricity sector, opening potentially vast opportunities for private generators to enter the market and sell electricity to public and/or private distributors, as well as to final customers. Private generators can access the market through concession, commercial models, or acquiring shares of publicly listed incumbents. However, further improvements are still possible in clarifying *off-taking options*, notably with regards to corporate PPA business models as well as access for private generators to a regional spot market.
- ⚡ Recent reforms have secured a good degree of *openness* of the transmission segment to interested private entities. The Energy Act 2019 allows the private sector to operate in the transmission segment, subject to the issuing of a license. This is reflected in the outstanding performance in *power sector governance*. A detailed *system planning* process, enriched by the availability of a transmission investment plan and a methodology to assess transmission investments, provides good visibility to potential private investors. Several *private sector participation models* also contribute to the high degree of *openness*, as the Energy Act allows private entities to enter the transmission segment through concession agreements, divestiture, merchant, and Independent Power Transmission models. The regulatory framework of Kenya is also well developed in the area of *public procurement process*, with the PPP Bill and the Public Procurement and Asset Disposal Act governing the usage of competitive tenders for transmission investments. However, improvements are still needed to advance private sector participation in transmission asset investments by clarifying the *power sector framework* in case of the arrival of multiple transmission companies.
- ⚡ The policy and regulatory environment is also *open* to distribution market investors. The Energy Act 2019 allows entities to access distribution licenses, including private companies, and to build, maintain, and operate electricity distribution networks to enable supply in the area specified in the license. Private companies can buy shares of publicly listed utilities and PPP agreements are potentially available for investors in distribution infrastructure. There is, therefore, regulatory preparedness related to *power sector governance*, *private sector participation models*, and the *public procurement process*, although private sector participation in the distribution segment has not occurred yet. The market is also supported by strong *system planning* due to the extended network development plan and the presence of a national electrification strategy. There is, however, room for improvement in clarifying available areas for distribution licenses outside Kenya Power's exclusive zones, as well as the governance and administration process for granting those licenses to interested investors. The lack of a dedicated methodology to evaluate distribution investments also reduce the ability to prioritize investments in grid expansion and enhancement and remains an area of regulatory improvement.

- ⚡ The off-grid market segment similarly demonstrates a good degree of *openness* to private sector investments. Strategic priorities and targets for the development of the electricity off-grid segment are well defined in the Kenya National Electrification Strategy of 2018, which also serves as a planning exercise for off-grid infrastructure development. The recent publication of the Energy Mini-grid Regulations 2021, though yet to be officially approved, clarifies fundamental aspects of *sector governance* for off-grid operators, including license applications for all mini-grids up to 1 MW. The governance framework is complemented by the presence of the Rural Electrification and Renewable Energy Corporation. Private sector participation in the off-grid market is allowed through concession as well as merchant models. Competitive tenders are used to procure mini-grid assets, although also open to government-owned companies. However, the lack of integration between system planning and off-grid planning risks jeopardizing the cost-effective development of infrastructure for electricity service expansion. The limited visibility of procurement plans for mini-grid assets also risks diverting the interest of investors to participate in this market segment.

Related to the *Attractiveness of the electricity market*

- ⚡ Kenya ensures a fairly *attractive* business environment for private investors in the generation market. It was able to attract several IPPs thanks to attractive contractual conditions, through a good level of standardization of PPA terms and provisions. Good regulatory performance has also highlighted best practices in *economic regulation*. EPRA is responsible for defining tariff formulae and calculating and approving tariff levels, and it has control of the tariff administration process. However, the periodicity of the review and revision of tariffs remain unclear. The generation market does not benefit from a wide range of *incentives*; however, this has to be considered in light of the recent review of renewables supporting schemes with the update of the FiT Policy in 2021 and the establishment of the REAP, which is still to be implemented. *Indirect incentives* only exist in the form of tax relief and VAT reduction while other forms such as carbon pricing mechanisms or result-based financing are not yet available. The lack of accessibility for private generators to *credit enhancement* instruments and public guarantees, such as concessional finance and sovereign risk guarantees, has an impact on the cost of financing projects.
- ⚡ The analysis spotted more gaps in the *attractiveness* of the transmission services market. The contractual framework defining rights and obligations to be applied to private transmission operators still needs to be developed. The Energy Act 2019 clearly defines the principles of tariff determination and responsibilities for their definition and administration. However, the tariff formula employed by the regulator is not yet public, and the periodicity of tariff revision is not defined by the law. *Credit enhancement* such as government and multilateral guarantees for transmission investors, and concessional lending are potentially available.
- ⚡ The *attractiveness* of the distribution services market is affected by the lack of detailed provisions in the Energy Act, or other affiliated regulation, on how the rights and obligations of the distributor will be defined in the distribution license, especially with regard to standards of performance, metering, billing, and payments. The tariff formula used by the regulator for calculating distribution charges is not yet public and the

periodicity of tariff revision is not defined by the law. *Credit enhancement* instruments are available notably from multilateral entities; however, government support through dedicated public guarantees is not available for private-led distribution investments.

- ⚡ The current regulatory framework does not define rules, or guidelines, for contracts between off-grid operators and their clients. A lack of standardization of the tariff regulation to be applied by off-grid operators, which is expected to be addressed by the Draft Energy Mini-grid Regulations 2021, results in challenges with *economic regulation*. However, both concessional lending and multilateral guarantees are available for off-grid operators, enhancing the *attractiveness* of the market to private investment.

Related to the *Readiness* of the electricity market

- ⚡ Overall, the generation market demonstrates regulatory *readiness*. The national transmission grid code (KNTGC) regulates the governance, planning, connections, operations, scheduling, coordination, and balancing of power transfers across the Eastern Africa Power Pool Interconnected Transmission System. The Energy Act defines the open access regime connection rules and allocation of connection costs, which are aspects governed by the Grid Code. *System quality and security standards* are used for the planning and operation of the transmission network and are detailed by the KNTGC. Kenya makes its socioeconomic and basic electricity market data available. This ensures the transparency and accessibility of relevant data. These measures demonstrate outstanding regulatory *readiness*.
- ⚡ The transmission market segment is also governed by rules concerning the right-of-way, which are crucial for the construction of transmission infrastructure. The rules are defined by the Energy Act. The excellent regulatory performances in the *grid code* and *grid access* are linked to the availability of the national transmission grid code and its coverage.
- ⚡ The distribution market segment is similarly *ready*. The distribution grid code defines the obligations, responsibilities, and accountabilities of all of the users to ensure open, transparent, non-discriminatory, and economic access. It furthermore defines minimum technical requirements for the users. The KNDGC provides for the open access regime to the distribution grid and sets the rules for connecting to the grid and establishes the quality of supply and security standards to be ensured on the distribution grid infrastructure.
- ⚡ Private investors can also expect a high degree of *readiness* in the off-grid segment. Once the main grid arrives in the operational area of the mini-grid, the mini-grid assets can be integrated as small power distributors or producers or sold directly to the utility. This is expected to be further regulated by the proposed Draft Energy Mini-grid Regulations. Standards and certifications ensuring the compliance of off-grid operators with international off-grid product standards is the responsibility of the Kenya Bureau of Standards. Off-grid operators must report the quality and reliability of service to the Bureau.

While acknowledging the efforts put in place by national institutions to strengthen electricity sector policies and regulatory frameworks, the analysis demonstrated that further regulatory action and reforms (or improvements) are needed to ensure enhanced *openness*, *attractiveness*, and *readiness* of the national electricity market through policies and regulations to effectively crowd-in private investment.

Recommendations on how to address the regulatory challenges highlighted by the regulatory review are targeted to the relevant energy sector institutions and the sector regulator. If implemented, these reforms would constitute positive steps toward strengthening the role of the private sector in supporting the electricity industry development in Kenya towards providing reliable, competitive, and sustainable electricity for all.

4.2 Recommendations



To enhance the *Openness* of the electricity market



Energy strategy

The electricity sector benefits from policy and strategy guidance provided by the Energy Policy and the National Climate Change Framework Policy, as well as action plans, sector plans, and implementation guidelines. However, regular monitoring and evaluation of policy and strategy targets remains a challenge. Therefore:

- ⚡ Back electricity sector targets by the adoption of specific legislation to strengthen the enforceability of targets implementation.
- ⚡ Establish implementation timelines along with designated delivery agencies.
- ⚡ Set procedures to monitor progress against policy targets and design dedicated reporting from a designated authority.



System planning

The electricity *system planning* process is well defined and established. However, to strengthen the electricity planning process:

- ⚡ Align long and medium-term planning exercises.
- ⚡ Ensure the inclusion of distribution and off-grid infrastructure development in system planning;
- ⚡ Adopt cost-benefit-based analytical approaches to evaluate and prioritize investments in distributions network expansion.



Private sector participation model

The Energy Act 2019 has opened both the electricity transmission and distribution segments to possible private sector participation. In the transmission space, this results in an opportunity for KETRACO to explore PPP arrangements, as in the case of IPTs, to enhance investment. In the distribution market, authorities need to clarify important elements to enable effective private sector participation. Therefore:

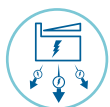
- ⚡ Define exclusive distribution areas/regions to be potentially awarded to private entities.
- ⚡ Define rules and procedures for awarding the right to operate distribution services in a determined area to a private entity.



Procurement process

The presence of the PPP Bill and the Public Procurement and Asset Disposal Act has enabled the implementation of a well-defined and administrated PPP framework and public *procurement process*. Their application to the development of electricity network infrastructure could be further improved through the following actions:

- ⚡ Implement public tenders for awarding the right to operate electricity transmission and distribution services in designated areas, or for designated assets, to allow for fair and transparent private sector participation.
- ⚡ Provide clarity and improve predictability about procurement plans to potentially interested stakeholders by publishing medium-term tender schedules.



Generation off-taking options

Due to the adoption of the Energy Act 2019, and as a consequence of the introduction of the “eligible consumer” category, generators have potential access to several *off-taking options*. However, regulatory improvements are further required to enable their full implementation. Therefore:

- ⚡ Adopt regulations to define the eligibility criteria for the “eligible consumer” category to facilitate the direct selling of electricity from generators.
- ⚡ Support and encourage the establishment of the East Africa Power Pool spot market and open market participation to private generation investors in Kenya.



To enhance the *Attractiveness* of the electricity market



Contracts regulation

The Energy Act 2019 has opened the operation of generation, transmission, and distribution services to any licensed entities; thus, opening these markets to interested private entities. However, to enable effective private sector participation in the operation and maintenance of generation and network infrastructure, further regulatory actions are required. This includes the adoption of standard contract templates to define economic payment models, and the roles and responsibilities for the new infrastructure and service provision, including ownership, construction, maintenance, and financing responsibilities. Therefore:

- ⚡ Adopt a standardized PPA template, or blueprint, for specific generation asset technologies to reduce transaction costs.
- ⚡ Adopt standardized Transmission and Distribution Service Agreements to establish roles and responsibilities, as well as clarify the financial terms during a project period.
- ⚡ Design key clauses for risk allocation (i.e., dispute resolution, termination provision, force majeure, change of law, etc.) based on best practices.
- ⚡ Adopt a standard model for power supply agreements with customers of off-grid and mini-grid operators.



Economic regulation

The Energy Act 2019 defines the principles of tariffs determination and responsibilities for their definition and administration. EPRA is responsible for regulating and approving tariffs. However, related to cost recovery and reflectiveness of tariffs, further steps are required. Therefore:

- ⚡ Increase transparency by publicly availing the methodology and underlying costs used for tariff calculation.
- ⚡ Introduce legal provision for the frequency of tariff review, and possibly revision, by the regulator.



Incentives

Kenya has recently reviewed its set of policies to support renewable energy capacities development. The update of its FiT and REAP policies in 2021 clarifies its plans and the framework for financial incentives. Building on these positive steps, implementation of the new framework could be strengthened through:

- ⚡ Implementation of the REAP by launching a pilot program for auctions, particularly for renewable energy.
- ⚡ Adopt plans for tender rounds, including renewables.
- ⚡ Monitor incentives disbursements, and ensure the periodical update and review of targets and incentives.



Indirect incentives

Current legislation foresees the support of investments in electricity infrastructure through the provision of several *indirect incentives* such as tax exemptions and import duty relief to generation and off-grid components. To further strengthen the system of *indirect incentives*:

- ⚡ Study the feasibility of introducing a carbon pricing mechanism to support sustainable energy development.
- ⚡ Evaluate the effectiveness of results-based financing to support electrification.



Credit enhancement

Credit enhancement mechanisms play a fundamental role in de-risking electricity infrastructure projects and enhancing their bankability. Improvements are still required to optimize public and multilateral resources to de-risk private investments. In this regard:

- ⚡ Establish a national mechanism to de-risk investments in electricity infrastructure, covering generation, networks, and off-grid assets.
- ⚡ Assess the feasibility of creating a risk mitigation facility dedicated to de-risking investments in energy infrastructure.



To enhance the Readiness of the electricity market



Authorization and permits

Kenya benefits from a comprehensive set of rules covering electricity infrastructure permitting requirements, land access, environmental authorization, right-of-way, construction rights, and others. Guidelines about the procedures to obtain permits from competent authorities are well defined by the law. However, the division of competencies for processing and issuing *authorizations and permits* results in potentially high transaction costs. Therefore:

- ⚡ Streamline investment processes by establishing a one-stop-shop/single window for application and issuance of all permits for energy projects.



Off-grid system integration

Kenya is one of the leading markets in terms of off-grid technology development based on solar home systems and pay-as-you-go models. The development of mini-grid assets, able to provide better service quality, will support the progress towards universal electrification. However, a dedicated regulatory framework is needed. Therefore:

- ⚡ Adopt the proposed Draft Energy (Mini-grid) Regulation to set rules about license applications, as well as performance and quality standards for all mini-grids.
- ⚡ Adopt clear rules on commercial options for mini-grid business continuity, or exit options, in the event of main grid arrival to reduce risks and provide investors with clarity about long-term operations.

4.3 Way forward

The review of Kenya's policies, laws, and regulations relevant to the electricity supply industry confirms the good results achieved by national authorities in reforming the regulatory environment towards greater private sector participation. Kenya has made major progress in reforming its electricity sector. The power sector governance framework evolved constantly starting from the 1990s to reflect the evolution of market fundamentals, support new technologies development, and ensure reliable electricity supply to its growing economy. Policy and regulatory reforms were adopted to attract new investments, improve competition, and progressively open the electricity supply industry to private sector investors. The climax of this process has been marked by the adoption of the new Energy Act in 2019 which liberalized the electricity supply industry and legally opened all market segments to private sector participation. Another decisive step in crowding-in private sector investments has been the very recent Public-Private Partnership Bill which laid the foundation for public-private cooperation in the financing, construction, development, operation, or maintenance of infrastructure and services. As a result, Kenya can be considered one of the most advanced African electricity markets in terms of policy and regulatory effectiveness.

Kenya, however, is still confronted with structural challenges that are preventing its electricity sector from thriving and private entities from successfully participating in electricity infrastructure development at a much higher scale. These challenges are elaborately highlighted in this regulatory review relevant to the generation, transmission, distribution, and off-grid market segments.

As Kenya strives to further develop its power sector through private investment, policies and regulations play a pivotal role in enabling effective private sector contribution to the expansion and development of the national energy supply industry. Towards this end, this regulatory review evaluated the *openness, attractiveness, and readiness* of the current national policy and regulatory framework across the value chain. Areas of strength, as well as areas of further improvement, have been identified, and key recommendations are offered to support Kenya in achieving its goals. Towards this end, this regulatory review offers constructive identification of areas of reform and policy and regulatory enhancement for a competitive, resilient, and sustainable electricity sector. Economic recovery and long-term sustainable growth will continue to require a reliable electricity supply to thrive.

The UN Economic Commission for Africa and the RES4Africa Foundation remain committed to supporting Kenya in addressing any of the identified regulatory and policy gaps, investing in necessary regulatory capacity development, as well as any area of particular reform interest of Kenya towards greater *openness, attractiveness, and readiness* of the electricity market. They also call on the development community, NGOs, ISOs, national organizations, and the private sector to play their constructive role in supporting the efforts of the Government of Kenya in this reform process, guided by its public institutions, aimed at economic transformation and the achievement of SDG7 goals.

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Acronyms

AfDB	African Development Bank
BOO	Build, own, and operate
BOOT	Build, own, operate, and transfer
BTO	Build, transfer, and operate
COMESA	Common Market for Eastern and Southern Africa
CS	Cabinet Secretary
EAPP	Eastern Africa Power Pool
EAPP IC	East African Community Interconnection Code
EMCA	Environmental Management and Co-ordination Act
EPRA	Energy and Petroleum Regulatory Authority
ERC	Energy Regulatory Commission
ESMAP	Energy Sector Management Assistance Program
FiT	Feed-in tariff
GDC	Geothermal Development Company
GDP	Gross domestic product
GoK	Government of Kenya
ICA	Infrastructure Consortium for Africa
IPP	Independent power producer
IPT	Independent power transmission
IRENA	International Renewable Energy Agency
KEBS	Kenya Bureau of Standards
KenGen	Kenya Electricity Generating Company
KETRACO	Kenya Electricity Transmission Company
KNBS	Kenya National Bureau of Statistics
KNDGC	Kenya National Distribution Grid Code
KNEECS	Kenya National Energy Efficiency and Conservation Strategy
KNES	Kenya National Electrification Strategy
KNTGC	Kenya National Transmission Grid Code
KNTS	Kenya National Transmission System
KOSAP	Kenya Off-Grid Solar Access Project
KPLC	Kenya Power and Lighting Company
LCPDP	Least-cost power generation expansion plan
MoE	Ministry of Energy
MW	Mega-watt
NCCAP	National Climate Change Action Plan
NDC	Nationally determined contribution
NEMA	National Environmental Management Authority
NEP	National Energy Policy

NES	National Electrification Strategy
PGTMP	Power Generation and Transmission Master Plan
PPA	Power purchase agreement
PPP	Public-private partnership
PPRA	Public Procurement Regulatory Authority
REA	Rural Electrification Authority
REAP	Renewable Energy Auctions Policy
REC	Renewable Energy Corporation
REP	Rural Electrification Program
RERAC	Renewable Energy Resource Advisory Committee
REREC	Rural Electrification and Renewable Energy Corporation
RES4Africa	Renewable Energy Solutions for Africa Foundation
ROAR	Regulatory review of <i>openness, attractiveness, and readiness</i>
SAIDI	System average interruption duration index
SAIFI	System average interruption frequency index
SDGs	Sustainable development goals
TWh	Terawatt hour
TNSP	Transmission network service provider
TSO	Transmission service operator
UNECA	United Nations Economic Commission for Africa
VAT	Value-added tax



Annex A

Policies, Plans, and Regulations

Power Generation and Transmission Master Plan, Kenya Medium Term Plan 2015 – 2020 (2016)	https://www.epra.go.ke/download/power-generation-and-transmission-master-plan-kenya-medium-term-plan-2015-2020-2/
National Climate Change Framework Policy (2016)	http://www.environment.go.ke/wp-content/uploads/2018/08/Climate-Change-Framework-PolicyMay2017.pdf
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Annex B

An overview of the *Topics* assessed

 <p>Openness</p>	Energy Strategy	The existence and characteristics of energy and climate policies.
	System Planning (also <i>Readiness</i>)	The existence and characteristics of plans for generation expansion, network development and electrification.
	Power Sector Governance	The existence of an Energy Act or Law defining the operational regime of market agents, and the existence and role of an energy regulatory authority.
	Power Sector Framework	The degree of unbundling of generation, transmission, and distribution services.
	Power Sector Competition	The Openness of the electricity market to competition.
	Private Sector Participation Model	The number of available models for private parties to participate in the power sector.
	Procurement Process	The characteristics of PPP procurement policy, competitive tenders, and solicited/ unsolicited proposals.
	Off-taking Options (for <i>Generation</i>)	The existence of a spot market or single-buyer as well as the regulatory characteristics of private PPAs and captive generation.
 <p>Attractiveness</p>	Contract Regulation	The structure and characteristics of public PPAs, TSAs, DSAs, and standard retail contracts for off-grid operators.
	Economic Regulation	The structure and definition of the retail and network tariff.
	Incentives	The existence of instruments incentivizing private investors to operate in the power sector (e.g., FIT, capacity payments, green certificates, RES quotas)
	Indirect Incentives	The existence of policies or instruments indirectly incentivizing private investors to operate in the power sector (e.g., carbon pricing, result-based financing, tax relief)
	Credit Enhancement	The existence of lending agreements or guarantees that reduce risk or costs for private investors entering the power sector.



Readiness

Authorizations and Permits	The existence and characteristics of permits needed for the construction of assets in the power sector (e.g., land & water rights, construction, and environmental permits)
System Planning	The existence and characteristics of the network development plan.
Grid Code	The characteristics of the grid code (e.g., the existence of rules for system operation and connection).
Grid Access	The existence of third-party access and the characteristics of grid connection and operation agreements.
System Quality and Security Standards	The existence of quality and security standards for transmission network planning and operation.
Access to Data	The public availability of data related to electricity sector performance.
System Integration (for Off-Grid)	The existence and characteristics of regulation for grid arrival.



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