REPUBLIC OF KENYA

MINISTRY OF ENERGY & PETROLEUM

STATE DEPARTMENT FOR ENERGY

National Energy Policy 2025 – 2034

Draft One

Foreword

As Kenya progresses towards achieving sustainable and inclusive development, energy remains a key driver for economic growth. The National Energy Policy 2025–2034 is therefore a tool in spearheading our country's vision of equitable energy transition, focusing on innovation, resilience, and sustainability to meet the needs of all Kenyans.

This Policy seeks to address the challenges of energy access, affordability, and security whilst promoting clean energy solutions to reduce our dependence on fossil fuels and driving green industrialization. With over 25% of the population still lacking electricity access, particularly in rural areas, it is crucial that we expand our energy infrastructure and leverage renewable energy resources, including solar, wind, geothermal, and bioenergy, to provide reliable and affordable energy to all corners of the country.

This Policy sets forth bold strategies to ensure universal access to electricity by 2030, optimize the use of Kenya's vast renewable energy potential and accelerate the uptake of clean cooking technologies among other initiatives. Through strategic investments, partnerships, and innovation, we aim to transform our energy sector to power the economy, improve livelihoods, and ensure environmental sustainability.

The roadmap outlined in this document is also in line with Kenya's commitment to the global climate change agenda, particularly the Paris Agreement, and integrates climate-resilient energy systems that will foster economic growth and reduce emissions. We are committed to promoting a just energy transition, ensuring that no Kenyan is left behind, and that energy access contributes to improved quality of life, especially in marginalized communities.

I am proud to present the National Energy Policy 2025–2034, which I believe will guide Kenya's energy sector into a future of sustainable, equitable, and resilient energy solutions.

Hon. Opiyo Wandayi
Cabinet Secretary for Energy & Petroleum

Preface

The National Energy Policy 2025–2034 is a significant milestone in Kenya's ongoing transformation towards a sustainable, inclusive, and resilient energy future. Energy is at the heart of Kenya's socio-economic development, and as we embark on this new policy journey, we recognize that reliable, competitive, affordable, and clean energy access for all Kenyans is essential to realizing our national development aspirations.

Over the years, Kenya has made remarkable strides in expansion of electricity access, with majority of its population now connected to electricity. However, challenges remain, particularly in rural areas, where access remains limited, and in the clean cooking sector, where over 69% of households still rely on traditional biomass fuels. This Policy aims to address these gaps, laying the foundation for a comprehensive and inclusive energy transition that is centered on renewable resources, energy efficiency, and the promotion of innovative technologies.

The Policy is grounded in Kenya's commitment to achieving the Sustainable Development Goals (SDGs), particularly Goal 7: Affordable and Clean Energy, and aligns with our global climate commitments, including the Paris Agreement. It is designed to guide our energy sector towards a just and equitable transition that benefits all, particularly vulnerable and underserved communities. By prioritizing renewable energy resources, advancing the adoption of clean cooking solutions, and promoting energy efficiency, this policy sets a clear path toward ensuring that every Kenyan has access to reliable and sustainable energy.

The Government of Kenya is committed to supporting the implementation of this Policy through strategic partnerships, effective resource mobilization, and innovation. This document sets the framework to drive this transformation, ensuring that energy plays its rightful role as a catalyst for economic growth, social development, and environmental sustainability.

I am confident that this National Energy Policy will serve as a beacon of progress and transformation for Kenya's energy sector and economy in the coming decade.

Alex K. Wachira
Principal Secretary, State Department of Energy

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ACRONYMS

AI	Artificial Intelligence
AS	Ancillary Services
CCAK	Clean Cooking Association of Kenya
CEC	County Executive Committees
CEEC	Centre for Energy Efficiency and Conservation
CEF	Consolidated Energy Fund
CEM	Critical Energy Minerals
CEP	County Energy Plans
COG	Council of Governors
DFI	Development Finance Institutions
DHS	Demographic and Health Survey
EAPP	East African Power Pool
EMCA	Environmental Management and Coordination Act
EPRA	Energy and Petroleum Regulatory Authority
EPZ	Export Processing Zones
ESCO	Energy Supply Companies
ESS	Energy Storage Systems
EV	Electric Vehicles
FIT	Feed-in Tariff
GDC	Geothermal Development Company
GEDSI	Gender Equality, Diversity and Social Inclusion
GET	Grid-Enhancing Technologies
GHG	Greenhouse Gas
GIS	Geographic Information System
GoK	Government of Kenya
GSM	Government Support Measures
GTL	Gas to Liquids
ICT	Information and Communication Technology
IEA	International Energy Agency
IMC	International Medical Corps
INEP	Integrated national energy planning
IOT	Internet of Things
IP	Intellectual Property
IPP	Independent Power Producer
IT	Information Technology
KAM	Kenya Association of Manufacturers
KEBS	Kenya Bureau of Standards
KEFRI	Kenya Forestry Research Institute
KenGen	Kenya Electricity Generating Company

KETRACO	Kenya Electricity Transmission Company
KFS	Kenya Forest Service
KICD	Kenya Institute of Curriculum Development
KICT	Kenya Information and Communication Technology
KIRDI	Kenya Industrial Research and Development Institute
KNCTS	Kenya National Cooking Transition Strategy
KNeCS	Kenya National eCooking Strategy
KNEECS	Kenya National Energy Efficiency and Conservation Strategy
KNES	Kenya National Electrification Strategy
KNRA	Kenya Nuclear Regulatory Authority
KPLC	Kenya Power and Lighting Company
KRA	Kenya Revenue Authority
LCPDP	Least Cost Power Development Plan
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
LRMC	Long Run Marginal Cost
MDA	Ministries, Departments, and Agencies
MECCF	Ministry of Environment Climate Change and Forestry
MoE	Ministry of Education
MEPS	Minimum Energy Performance Standards
MoEP	Ministry of Energy and Petroleum
MoRT	Ministry of Roads and Transport
MSD	Medium Speed Diesel
MSME	Micro, Small, and Medium Enterprises
MVA	Mega Volt Amp
MW	Mega Watts
NCCAP	National Climate Change Action Plan
NDC	Nationally Determined Contribution
NEMA	National Environment Management Authority
NLC	National Land Commission
NLIMS	National Land Information Management System
NT	National Treasury
NuPEA	Nuclear Power and Energy Agency
O&M	Operation and Maintenance
OSH	Occupational Safety and Health
OSHA	Occupational Safety and Health Act
OTS	Open Tender System
PPA	Power Purchase Agreements
PPP	Public-Private Partnership
PPPD	Public-Private Partnership Directorate

PRG	Partial Risk Guarantees
PURE	Productive Use of Renewable Energy
RDI	Research, Development, and Innovation
RES	Renewable Energy Sources
REREC	Rural Electrification and Renewable Energy Corporation
RES	Renewable Energy Sources
RRR	Resource Recovery and Reuse
SACCO	Saving and Credit Cooperative Organization
SAF	Sustainable Aviation Fuel
SDE	State Department of Energy
SDG	Sustainable Development Goal
SEZ	Special Economic Zones
TCC	Technology Commercialization Center
TMP	Transmission Master Plan
VRE	Variable Renewable Energy
WTE	Waste to Energy

Executive Summary

The National Energy Policy 2025–2034 sets the strategic direction for Kenya's energy sector over the next decade. It aims to provide affordable, reliable, and sustainable energy that drives national development, economic growth, and climate resilience. As the backbone of Kenya's socio-economic transformation, energy plays a pivotal role in achieving the Government's economic development goals and the Sustainable Development Goals (SDGs), particularly SDG 7: Affordable and Clean Energy. The Policy outlines comprehensive strategies, frameworks, and initiatives that address the country's energy access, efficiency, and sustainability challenges, while positioning Kenya as a leader in the clean energy transition.

Key Highlights

Energy Access and Inclusivity

The National Energy Policy 2025–2034 aims to achieve universal electricity access by 2030, focusing particularly on marginalized communities in rural and remote areas. This goal will be achieved through grid expansion, off-grid solutions, and the integration of renewable energy technologies. The Policy also sets the ambitious target of providing universal access to clean cooking by 2030, reducing reliance on traditional biomass fuels and promoting cleaner, healthier alternatives.

Renewable Energy Development

The Policy seeks to harness Kenya's vast renewable energy resources, including geothermal, solar, wind, and bioenergy. It intends to expand Kenya's renewable energy capacity and ensure that renewable sources contribute substantially to the national energy mix. The Policy also positions Kenya as a leader in geothermal development, capitalizing on its geographical advantage and renewable potential to enhance energy security, spur green industrialization and contribute to global climate goals.

Energy Efficiency and Sustainability

Energy efficiency is a key focus of the policy, with an aim to double improvements by 2030. Efforts will include promoting energy-efficient appliances, supporting electric mobility, and enhancing energy conservation in various sectors such as industry and residential buildings. The policy also integrates energy storage systems (ESS) and ancillary services to support grid stability, particularly with the increased use of variable renewable energy sources like solar and wind.

Energy Financing and Innovation

The policy highlights the importance of securing sustainable financing to meet the energy sector's infrastructure needs. By fostering public-private partnerships, leveraging green financing mechanisms, and encouraging innovation, Kenya aims to attract both local and international investments. The integration of emerging technologies such as smart grids and artificial intelligence will further enhance energy system efficiency and service delivery.

Climate Change and Just Energy Transition

In alignment with Kenya's climate commitments under the Paris Agreement, the policy emphasizes decarbonizing the energy sector by 2050. It calls for a just energy transition, ensuring

support to vulnerable communities, access to sustainable energy, and resilience to climate change impacts. The policy promotes decentralized energy solutions like mini grids, micro-grids and to ensure equitable access to clean energy across the country.

Implementation and Governance

The policy outlines a robust implementation framework, with clear governance structures and monitoring mechanisms to ensure effective execution and accountability. Key institutions like the Energy and Petroleum Regulatory Authority (EPRA) and Kenya Electricity Transmission Company (KETRACO) will oversee policy enforcement, and the government will work closely with stakeholders to track progress and adjust strategies as needed to meet the policy's objectives.

Regional and International Cooperation

As part of the East African Power Pool (EAPP), Kenya aims to strengthen regional energy trade, ensuring a reliable and interconnected energy market across borders. The policy also encourages international collaboration, fostering partnerships for knowledge exchange, technical assistance, and financing to advance the development of Kenya's energy sector and align it with global best practices.

Strategic Objectives

i. Achieve universal electricity access by 2030.
ii. Diversify the energy mix, prioritizing renewable energy sources.
iii. Promote clean cooking technologies and reduce reliance on biomass fuels.
iv. Enhance energy efficiency and conservation in all sectors.
v. Foster innovation through emerging technologies and financing mechanisms.
vi. Support a just and equitable energy transition aligned with global climate goals.

Conclusion

The National Energy Policy 2025–2034 represents a comprehensive approach to addressing Kenya's energy needs and challenges while prompting a resilient and sustainable energy future. The Policy sets the base for Kenya's energy sector contribution to the country's economic, environmental, and social development goals by focusing on resource diversification, innovation, equity, sustainability and climate resilience. This Policy envisions a future where energy is a catalyst for economic growth, sustainability, and prosperity for all Kenyans.

CHAPTER ONE: INTRODUCTION

Overview

This Chapter highlights the basis for the National Energy Policy 2025-2034. It outlines the Policy structure, background information, and guiding principles. It sets out policy objectives, provides the scope, identifies key policy issues and justifies the need for Government intervention.

1 Introduction

1.1 Role of Energy in the National Development

Energy is the backbone of Kenya's socioeconomic development, driving industrialization, agricultural productivity, and economic resilience. Recognizing this pivotal role, the Government of Kenya has positioned energy as a critical enabler of its economic development, as entrenched in the Vision 2030 economic development blueprint. It prioritizes local and renewable resource development. This agenda prioritizes inclusive growth, job creation, and empowerment of underprivileged populations, ensuring no one is left behind.

However, despite significant progress in energy access, challenges persist. Approximately 25% of Kenyans lack access to electricity, with rural areas facing disproportionately low connectivity rates. Over 69% of households rely on traditional biomass for cooking, contributing to deforestation, health risks, and environmental degradation. The high cost of energy, coupled with reliance on imported fossil fuels, poses risks to energy security and economic stability. To address these challenges, this Policy aims to transition Kenya to a sustainable, resilient, and equitable energy future, aligning with national priorities, regional and international commitments like the Sustainable Development Goals (SDGs), African Union Agenda 2063, East Africa Community 2050 and the Paris Agreement.

1.2 Background

Kenya's energy sector has evolved over the years, guided by existing legal and policy frameworks designed to address the country's energy needs. Sessional Paper No. 4 of 2004 laid the groundwork by providing policy direction for electricity generation, distribution, and access, emphasizing rural electrification and renewable energy development. The Energy Act of 2006 introduced comprehensive regulatory reforms, which were subsequently enhanced under the Energy Act No. 1 of 2019 through inclusion of emerging technologies, green energy, and energy efficiency provisions. The National Energy Policy, 2018 provided a strategic blueprint to address energy access gaps, promote renewable energy solutions, and integrate climate change mitigation measures. These frameworks have fostered regulatory reforms, incentivized investment, and set the foundation for energy governance in the country and have collectively driven Kenya's transition towards a diversified, sustainable, and inclusive energy sector. Notable achievements include leading Africa and being the 6th geothermal producer globally with an installed capacity of 988MW, increasing electricity access to 75% of the population by 2024, and renewable energy sources contributing 82% of total installed capacity. Despite these accomplishments, challenges

such as climate change, population growth, and technological advancements necessitate a policy review to ensure sustainable energy development.

Kenya's installed electricity capacity was 3,299.8 MW as of December 2024, composed of 29% geothermal, 30% hydro, 13.4% wind, 6.5% solar, and 18.7% thermal. The country's energy potential is vast, with significant opportunities in geothermal, wind, solar, and bioenergy, as well as emerging areas such as green hydrogen and energy storage systems. Developments such as clean cooking solutions, electric vehicles (EVs), and other emerging technologies are transforming the energy sector, promoting sustainability and efficiency.

1.3 Rationale for Government Action

1.3.1 Justification for Government Action

The Government's commitment to address energy access gaps, accelerate harnessing of renewable energy sources, adopt emerging technologies and reduce dependence on imported fossil fuels has necessitated review of the National Energy Policy, 2018. This Policy seeks to foster a competitive and inclusive energy market that attracts investment, drives innovation, and supports sustainable socio-economic development.

1.3.2 Scope of the Policy

This Policy encompasses all aspects of Kenya's energy sector, including electricity generation, transmission, and distribution; energy access, renewable energy resources, bioenergy and clean cooking solutions; energy efficiency and environmental sustainability. It provides for decentralized energy systems, emerging energy technologies, innovation and climate change solutions.

1.4 Policy Objectives

The goal of this Policy is to provide reliable, competitive, affordable and sustainable energy to support national development and just energy transition. Specific objectives include to:

i. Promote renewable energy resource development and utilization;
ii. Achieve universal electricity and clean cooking access by 2030;
iii. Promote local and regional energy trade;
iv. Mobilize funding for energy projects;
v. Promote competitive energy procurement and pricing;
vi. Develop, modernize and optimize energy infrastructure;
vii. Promote energy efficiency and conservation;
viii. Enhance institutional capacity, governance and collaborative frameworks;
ix. Promote local content and optimize human capacity across the energy sector;
x. Support green industrialization, environmental and social sustainability.

1.5 Guiding Principles

The Policy is anchored on principles that aligns with national priorities and global sustainability goals:

i. Sustainability and Climate Action: Commitment to renewable energy development, reduced emissions, and climate resilience;
ii. Energy Equity and Inclusivity: Ensuring universal access to affordable energy while empowering marginalized communities;
iii. Economic Development and Innovation: Leveraging energy as a driver for industrialization, job creation, and poverty alleviation;
iv. Good Governance: Upholding transparency, accountability, and efficient resource management.

1.6 Political Alignment

This Policy aligns with the Government's development plan, as articulated in Vision 2030. It focuses on inclusive growth, job creation, and equitable access to energy. The Policy supports flagship programs aimed at improving the livelihoods of all Kenyans, particularly those in marginalized and underserved regions.

1.7 Structure of the Policy Document

The Policy document is structured into five chapters: Chapter 1 introduces the policy framework and context. Chapter 2 presents a situational analysis, detailing the present status, challenges, and opportunities within the energy sector. Chapter 3 outlines specific policy statements and interventions targeting multiple thematic areas. Chapter 4 focuses on the implementation framework, specifying the governance structure, roles, timelines, and resources for policy implementation. Chapter 5 provides the monitoring, evaluation, and reporting mechanisms for accountability towards achieving policy goals.

CHAPTER TWO: SITUATION ANALYSIS

2 Status of the Energy Sector

This Chapter provides an in-depth analysis of the status, challenges, and opportunities in Kenya's energy sector. It examines key aspects such as electricity access, generation, transmission, and distribution, as well as the role of renewable energy, clean cooking, energy efficiency, and emerging technologies. Additionally, it highlights critical areas that form the foundation for the policy interventions outlined in the other Chapters.

2.1 Electricity Access

Electricity access in Kenya has significantly improved over the past two decades. Government-led initiatives and private-sector participation, through innovative business models and adoption of renewable energy technologies have driven these improvements. In 2018, the Government formulated the Kenya National Electrification Strategy (KNES) which provided a roadmap to universal access to electricity.

By 2024, the national electricity access rate was approximately 75% with 90% and 68% access in urban and rural areas respectively. The lower connectivity rate in rural areas compared to urban ones is partly due to the high operational and maintenance costs in relation to the revenues generated in these areas. The Last Mile Connectivity Project (LMCP) undertaken by KPLC and other electrification programmes by REREC have extended the national grid. Off-grid power generation through mini-grids and standalone solar systems have increased electrification in rural areas.

Challenges

i. Kenya's diverse topography and dispersed rural population increase the cost and complexity of grid expansion;
ii. The high upfront costs for household connections limit access for low-income populations;
iii. High initial investment costs have limited the rapid scaling up of mini-grids and other off-grid solutions in rural areas;
iv. Ageing infrastructure that affects electricity stability, reliability and sustainability;
v. High grid expansion and densification costs and modernization.

Opportunities

i. Partnership with the international community places Kenya in a good position to access global climate and energy financing for electrification projects;
ii. Emerging technologies like smart metering, mobile money platforms for pay-as-you-go systems, and digital monitoring can improve energy efficiency and billing systems, affordability and service delivery;
iii. Adoption of hybrid renewable energy systems offers cost-effective and reliable alternatives for underserved rural areas;

iv. The rapidly growing off-grid solar market and innovations in battery storage technology present opportunities to provide clean energy to remote communities.

2.2 Electricity Generation, Transmission and Distribution

2.2.1 Electricity Generation

2.2.1.1 Hydro Power

The national hydropower potential is estimated to be 6,000 MW, half of which is from small hydros. This is mainly situated in five drainage basins: Lake Victoria, Rift Valley, Athi/Sabaki River, Tana River and Ewaso Ng'iro North River. Tana River Basin holds the highest potential with several large hydro power plants developed. Presently the total installed hydropower capacity is 838.5MW contributing approximately 30% of the total electricity capacity and average of 27.5% of total electricity generated in the last 5 years. Kenya also imports 200MW of hydropower from Ethiopia since 2023.

The hydropower plants provide a reliable electricity source and supplement the system by providing peaking capacity and ancillary services. Most of the existing power plants were developed over 50 years ago. The dams have degraded due to siltation occasioned by various economic activities upstream. Kenya has experienced severe drought over the past years following adverse climatic changes, thus reducing hydropower generation.

Challenges

i. Wavering environmental and social license and project support by the local communities leading to complexities in operation and delays in development of hydropower projects;
ii. Inadequate stakeholder coordination in project development leading to project delays and cost increase;
iii. Adverse climatic changes resulting in seasonal unreliability from hydro power sources;
iv. Multiple levies and taxes imposed on hydro power resources lead to increased electricity tariffs;
v. High capital investment required to construct large hydro-power plants leading to delayed project development and high tariff costs.

Opportunities

i. The country's hydrological landscape has potential sites for development of multi-purpose reservoirs capable of providing combined benefits of power generation, irrigation, and domestic water flood control and recreational activities;
ii. The country has potential sites for large and pumped hydro storage power plants suitable for peaking capacity and flexible generation for system stability;
iii. Potential sites for small hydropower plants ideal for enhancing energy access and local voltage support while mitigating the environmental impacts of large projects are available across the country;

iv. Increased hydro reservoir capacity would enhance energy storage;
v. Hydropower has the potential to attract funding from climate finance mechanisms.

2.2.1.2 Geothermal Power

Kenya's geothermal resource potential is estimated at 10,000 MW across 16 prospects. The installed geothermal capacity as at December 2024 was 940 MW equivalent to approximately 29% of the total electricity generation capacity. This includes 755 MW developed by KenGen and 185 MW by IPPs. This achievement has positioned Kenya 6th globally and 1st in Africa in geothermal development.

Geothermal development has primarily relied on concessional funding from development partners and direct investment from the Government of Kenya through state-owned agencies, KenGen and GDC. To accelerate geothermal development, the government established GDC to de-risk geothermal green fields, develop steam gathering network, contract investors to construct power plants and develop direct use applications for geothermal. Currently, several geothermal fields are licensed to IPPs, who are in the early stages of development.

Over the years, Kenya has established technical capacity in geothermal development, to provide technical and consultancy services across the region and world.

Challenges

i. Insufficient legal and regulatory framework to enforce geothermal resource licensing and compliance mechanisms to accelerate geothermal development;
ii. Lack of legal and regulatory framework to leverage expertise in government institutions to expand the ownership of geothermal power plants in the region;
iii. Lack of a framework to prioritise strategic national interests in geothermal resource development and leverage expertise and capacity in public energy institutions;
iv. Inadequate financing for geothermal resource development, slowing down its development;
v. Sub-optimal energy mix in the system that results in the underutilization of geothermal generation at certain times of the day, leading to steam venting.

Opportunities

i. The country's high geothermal potential can be harnessed to provide baseload supply, enhance power stability, and energy security;
ii. The availability of green financing that can be tapped to de-risk upstream development;
iii. Growing regional demand for technical expertise in geothermal development can generate additional revenue stream**.**

2.2.1.3 Variable Renewable Energy (Wind and Solar)

The vast variable renewable energy resource of solar and wind, in the country provides a strategic advantage for their integration.

The potential for onshore wind resource above 6m/s in the country is estimated at approximately 1.073TW. The potential sites are located in Marsabit, Samburu, Laikipia, Meru, Nyeri, Nyandarua, and Kajiado Counties. Offshore wind remains untapped despite the strategic situation of the country along the seashore. The Country's total installed capacity for wind is 435.5MW, which is 13.4% of total installed capacity.

The country's potential for solar energy is estimated at approximately 15 GW. There exist approximately 200,000 photovoltaic solar home systems in Kenya, predominantly rated between 10We and 20We.The installed solar power capacity connected to the national grid is 210.3MW, which is 6.5% of the total installed capacity. There are several small-scale installations providing mini-grids and standalone systems.

Challenges

i. Variable Renewable Energy resources negatively affect grid stability and control due to their intermittent nature;
ii. Over-reliance on imported technology exposes the sector to supply chain risks;
iii. Lack of sufficient data for potential developers to fast track development of these technologies;
iv. Outdated procurement policy framework that does not enhance competition.

Opportunities

i. High VRE resource potential provides an opportunity for development;
ii. The expansion of VRE off-grid systems would enhance access to clean electricity;
iii. Integration of VREs with ESS would support grid stability.

2.2.1.4 Thermal Generation

Kenya's installed thermal capacity on the main grid and mini-grids is 605MW, which is 18.7% of total installed capacity. The capacity is located in Nairobi, Coast and Western regions. There is also significant capacity of back-up and captive generation installed in customer premises.

Challenges

i. High and fluctuating imported fuel prices, making electricity generation expensive and unpredictable;
ii. Negating environmental goals of minimizing environmental emissions;
iii. Plants have small generator units and thus less contribution to the system inertia.

Opportunities

i. Provide back-up and peaking capacity;
ii. Potential to switch fuel from HFO to LNG;
iii. Short implementation lead time.

2.2.1.5 Nuclear Energy

Nuclear energy has the potential to provide reliable baseload electricity to meet the country's growing energy demand. The country established the Nuclear Power Energy Agency (NuPEA) to promote the development of nuclear energy. Through NuPEA, Kenya is implementing the national

nuclear program following the International Atomic Energy Agency (IAEA) Milestone Approach. In preparation for the implementation, the country has embarked on feasibility studies and capacity building of nuclear energy expertise.

Challenges

i. High capital cost is required to develop and sustain nuclear power program;
ii. Stakeholder buy-in due to safety and environmental concerns;
iii. Lack of regulatory framework for implementation of nuclear power;
iv. Lack of a dedicated owner and operator to initiate the construction and operation of nuclear power plant;
v. Insufficient local expertise to develop nuclear power program.

Opportunities

i. Nuclear energy provides stable and reliable baseload power with potential of higher VRE integration;
ii. The global drive for climate action to cut down on carbon emissions;
iii. Nuclear technology is useful in other sectors of the economy, such as medical, food production and industrial applications;
iv. The generation will enhance Kenya's energy mix and the regional power pools' stability.

2.2.2 Transmission and Distribution

2.2.2.1 Electricity Transmission

Kenya's electricity transmission network covers 9,484 circuit km at 132 kV and above voltage levels as of December 2024. This comprises 1,282 km of 500kV, 2,683 km of 400kV lines, 2,152 km of 220 kV lines and 3,427 km of 132 kV lines. The transmission network consists of 111 transmission substations with a transformation capacity of 12,410 MVA.

In line with the Transmission Master Plan (TMP) 2024-2043, KETRACO is implementing transmission projects totaling about 2,500 km to be completed by 2027 and about 9,000km by 2041. Regionally, the Kenyan transmission network is interconnected with Ethiopia, Uganda and Tanzania. The existing transmission system is constrained due to voltage and frequency regulation challenges, adversely impacting on system stability. KPLC is in the process of transferring its transmission assets to KETRACO.

Challenges

i. Insufficient transmission and transformation capacity, which causes overloading of transmission lines and curtailment of generation;
ii. Inadequate funding for infrastructure development, operation and maintenance thus affecting reliability of power supply;
iii. Inadequate technical capacity for infrastructure development, operation and maintenance which impacts on projects implementation and infrastructure management;
iv. High technical losses due to long transmission lines from generation sources to load centres;

v. Vandalism of transmission infrastructure leads to disruption of power supply and high cost of repairs and maintenance;
vi. Land and wayleaves acquisition challenges which causes delays in infrastructure development and management resulting to high project costs.

Opportunities

i. Availability of alternative funding mechanisms such as PPP and monetization for transmission infrastructure development, O&M and modernization;
ii. Available market for development of transmission infrastructure due to increased power demand;
iii. Growing local and regional power trade;
iv. Decentralization of power generation systems;
v. Deployment of grid-enhancing technologies (GETs) to enhance reliability of supply and support the integration of renewable energy sources.

2.2.2.2 Electricity Distribution

The length of the distribution network has increased over time to meet the growing demand for electricity in Kenya. The country's power distribution network total length was 302,256 kilometers as at June 2024. The distribution network comprises high voltage (66kV), medium voltage (33kV and 11kV), and low voltage (415/240V) lines. KenGen and other IPPs generates electricity and then KETRACO steps up the voltage to 132 kV, 220 kV, and 400 kV. KPLC then steps down the voltage to 66/33 kV for distribution. Some sparsely populated areas not covered by the national grid are powered by mini and micro grids mostly situated in administrative and trading centers.
The reliability and quality of supply has a direct bearing on economic competitiveness of the country as these directly impact the cost of production.

Challenges

i. Technical and commercial losses caused by aging and inadequate distribution infrastructure;
ii. Vandalism of the distribution infrastructure leading to reduced reliability, high O&M costs, and loss of revenue;
iii. High operations and maintenance costs vis a vis the accrued revenues due to low demand in rural areas;
iv. Multiplicity of levies and charges on electricity infrastructure by various agencies and public entities thus increased end user tariffs;
v. Insufficient regulatory framework to govern the inter-connection and transition from mini and micro grids to the national grid;
vi. Lack of guidelines to facilitates public access and utilisation of customer-owned distribution assets.

Opportunities

i. Increased power demand due to customer growth and emerging drivers such as electric mobility, e-cooking and data centers;
ii. Availability of technologies such as smart grid technologies, energy storage, to improve reliability of electricity distribution and loss reduction;
iii. The Government's commitment to achieve universal access to reliable and stable electricity supply by 2030;
iv. PPP frameworks that can be leveraged in distribution infrastructure to realize universal access;
v. Private sector participation in distribution and retail services to improve reliability, enhance competitiveness and reduce commercial losses;
vi. Diversification of revenue sources using the distribution infrastructure.

2.2.2.3 Electricity Retail

The electricity supply frameworks in Kenya allow multiple generators, distributors and retailers across the value chain. KPLC is the main off-taker purchasing all power from public and IPPs, for distribution and retailing. There are small private generators and retailers who supply customers within their business areas, and also licensed micro-grid operators serving customers off the grid. The power supply model allows for bulk-purchase of power from the public single off-taker KPLC and onward retailing to downstream customers. KPLC is also pursuing further testing of this model targeting to partner with possible retailers in the informal settlements. This initiative has potential to reduce high electricity system losses. Development of the electrical energy retail market with diverse players promote efficiency through competition and improved services to customers. Establishment of multiple retailers would also enable optimal utilization of resources, particularly the distribution network. This shall ride on the enabling policies such as the open grid access, captive power, net-metering and the power market. Other key enablers include development of a wheeling tariff to enable transportation of electricity generated by other producers to their customers through the existing infrastructure.

Challenges

i. High cost of developing parallel distribution and supply networks;
ii. Long term contractual commitments such as the power take-or-pay power purchase agreements;
iii. Lack of wheeling tariffs;
iv. Current network layout and people settlement patterns;
v. Delayed unbundling of the public retail function;
vi. Lack of power market limiting consumer choices.

Opportunities

i. Substantial captive power developed;
ii. High potential due to increasing investor interest in power projects;
iii. Enabling legal and regulatory environment;
iv. Abundance of wind and solar and their decreasing technology costs;

v. Expansive power distribution network;
vi. Enhanced electricity access and operational efficiency.

2.2.3 System Operations

System Operations is a critical function in Kenya's electricity sector. It involves the management of electricity transmission, coordination of power generation and balancing supply with demand using economic merit order of dispatch. Its role is to ensure that the national power grid is stable, reliable and efficient.

KETRACO was designated as the System Operator in December 2021. KPLC is presently in the process of transferring the System Operation function to KETRACO. KETRACO is developing an ultra-modern National System Control Centre (NSCC) which is expected to be completed by 2027.

Challenges

i. Insufficient reliability and ancillary services to provide system regulation and address intermittency from variable renewable energy generation;
ii. Inadequate transmission, system operation and control infrastructure resulting in unreliable grid services;
iii. Reduced system inertia due to decommissioning of traditional synchronous sources;
iv. Inadequate islanding capability of the system;
v. High turnover of specialized technical human capacity.

Opportunities

i. Availability of modern technology such as smart grid, real-time monitoring systems, automated control, and predictive maintenance, that enhances reliability and of system operation efficiency;
ii. Incorporating energy storage solutions to improve system stability and address the intermittency caused by VRE technologies;
iii. Regional Power Trade: Strengthening interconnections with neighbouring countries and enhancing regional power trade can improve grid reliability and provide new markets for electricity exchange.

2.2.4 Power Trade

The Kenyan electricity market is critical to the country's energy sector, linking electricity generation with various end-users categories.

Kenya's electricity market is fully unbundled, with generation undertaken by KenGen and IPPs, transmission by KETRACO, distribution and retailing by KPLC. The market operates a single off-taker model, whereby KPLC solely purchases power from the generators under PPA arrangement. The Energy (Net Metering) Regulations, 2024, allow prosumers to connect to the grid and net off their excess energy through the electricity distribution system.

Kenya is a member of the Eastern Africa Power Pool (EAPP). The EAPP market design has been developed and market rules and guidelines are under formulation. Kenya is interconnected with

Uganda, Tanzania and Ethiopia facilitating cross-border power exchange and trade among the countries. Kenya and Tanzania have signed a wheeling agreement to enable regional power trade between Ethiopia and Tanzania. Kenya is reforming its electricity market from a single-off-taker model to a competitive wholesale market model. The Energy (Electricity Market, Bulk Supply and Open Access) Regulations, are under formulation to facilitate the transition.

Kenya is preparing to develop its power market into a competitive wholesale electricity market that will allow open access to transmission and distribution networks. A competitive wholesale electricity market will be adopted, starting with the day-ahead market. The electricity market will be segmented into wholesale market and retail market that will be for both capacity and energy.

Challenges

i. Inadequate technical capacity to undertake market operations thus impacting on the implementation of the power market;
ii. Lack of wheeling tariff/transmission pricing framework impeding the actualization of a competitive wholesale market;
iii. The offtaker's legacy contracts in form of PPAs which may delay the transition into the power market;
iv. Constrained transmission system limits capacity available for market operations;
v. The existing single buyer model limits competition and innovation;
vi. High technical and commercial losses increase the cost of electricity;
vii. Inadequate enabling regulatory framework to facilitate open power market.

Opportunities

i. Availability of technology and financial services markets to leverage on in the transition to a competitive electricity market;
ii. The unbundled electricity model in the country enables easier transition from a single off-taker model to a competitive wholesale electricity market;
iii. Participation in the EAPP to export/import electricity and stabilize the grid;
iv. Availability of market expertise in the region provides an opportunity for peer-to-peer learning on power market development;
v. Private sector interests in power sector investment.

2.2.5 Captive Power and Net Metering

Captive power and net metering arrangement enables consumers to generate electricity while reducing national grid dependency. There is over 530 MW captive power generation in Kenya. Under net metering consumers feed excess electricity from their renewable captive sources into the grid, offering a cost-effective and sustainable energy solution. This mechanism enhances energy security and sustainability while diversifying Kenya's energy mix. The Energy (Net Metering) Regulations, 2024 were published in June 2024. Presently, captive power generation is primarily undertaken by industrial and commercial entities to provide reliable energy for their

specific needs. Solar photovoltaic systems contribute about 43% of the captive generation installed capacity.

Challenges

i. Potential loss of revenue for the off taker expected from the commercial and industrial customers;
ii. Loss of revenues utilized for cross subsidies low end consumers thus increasing their tariffs
iii. Risks of stranded generation assets due to reduced demand from captive plants;
iv. Grid instability and safety risks due during integration and operation of captive plants;
v. Lack of compensation mechanism for grid support services from grid-tied captive power developers.

Opportunities

i. Promotion of economic development through investment in renewable energy contributing to climate change mitigation;
ii. Availability of additional generation capacity complementing the grid connected generation to meet the consumer demand;
iii. Potential to lower the consumer tariffs through reduction of transmission and distribution losses by supplying power near the load centres.

2.2.6 Energy Storage Systems (ESS)

Energy Storage Systems (ESS) provide energy arbitrage and ancillary services essential for grid stability and reliability. ESS are therefore important in integration of variable renewable energy (VRE). Presently there is no utility scale ESS installed in the country. A technical assessment in 2023, by MoEP identified BESS and pumped hydro storage systems as the most feasible for the Kenyan power system. BESS system technology such as lithium ion was proposed for implementation in the short term while pumped hydro storage was considered for long term energy storage. MoEP has designated KenGen to implement a 200MWh BESS pilot project to build capacity in the energy sector. The 2023 Technical Assessment Study recommended establishing a regulatory and institutional framework to facilitate the implementation of ESS in Kenya.

Challenges

i. High Capital costs for installing ESS;
ii. Lack of ESS regulatory framework and pricing mechanisms for integration of private sector ESS to the national grid;
iii. Limited local expertise to develop and maintain ESS.

Opportunities

i. ESS can support the integration of VRE into the grid, for system stability;
ii. ESS would mitigate CO2 emissions by reducing dispatch of thermal plants;
iii. Energy storage during low demand periods and shifting it to peak periods minimizing venting of geothermal steam;

iv. Reduction of unserved energy to consumers due to reduced load shedding.

2.2.7 Reliability and Ancillary Services

Ancillary Services (AS) support the transmission of electricity from generators to consumers. They are important for maintaining the quality, reliability, stability and efficiency of power systems. These services can be provided by grid users, such as conventional power plants, renewable energy sources (RES), storage units, or flexible loads, to support or ensure a secure and reliable power system operation. In Kenya, hydro power plants have been the main units providing AS. There is need therefore to quantify and provide for a remuneration framework for these AS to take care of increased integration of VREs.

Challenges

i. Lack of analysis to identify the type and size of Ancillary services requirement for the power system;
ii. Lack of a regulatory framework on development and compensation of Ancillary services;
iii. Inadequate skilled personnel with expertise on ancillary services sizing.

Opportunities

i. Modern technologies such as smart grid technologies and energy storage to improve provision of AS;
ii. The regional power connection cooperation in integration of AS in EAPP;
iii. Increased integration of variable renewable energy.

2.2.8 Demand Stimulation

Demand stimulation is key in enhancing electricity access, utilization and viability of energy infrastructure. It supports productive use of energy towards increased economic growth. National peak demand for electricity grew from 1,812 MW in July 2018 to 2,304 MW in January 2025 while KPLC's customer base grew from 6.7 million to 9.8 Million over the same period. The demand growth was 26% compared to 44% of customer growth. Demand stimulation therefore is critical as electricity consumption needs to be in tandem with customer growth for viability of the market. Time of Use Tariff, promotion of e-cooking technologies, cold ironing, green hydrogen, adoption of e-mobility and promotion of Special Economic Zones (SEZ) and data centres are some of the measures targeted to increase demand for electricity.

By 2023, only 3% of the 7.5 million grid-connected domestic customers in the country owned an electric cooking appliance and less than 1% use electricity as their primary cooking fuel. The immediate goal is to increase the uptake of electric cooking from 1% (90,000 customers) currently to 5% (about 500,000) in the short term and to 10% in the medium term. The E-mobility Policy envisages that a shift to EVs will resort in additional 415GW electricity demand in the next 5 years, part of which could be used to offset electricity venting at night with potential to balance load curve.

Challenges

i. Inadequate collaboration among key stakeholders within and outside the energy sector;
ii. Limited awareness of emerging technologies on e-appliances and e-cooking;
iii. Constrained public finance for electricity infrastructure upgrades and modernization;
iv. Inadequate incentives for off-peak electricity use to encourage power consumption to a wider consumer category;
v. Grid constraints in different parts of the country due to aged or limited capacity network leading to suppressed power demand.

Opportunities

i. Increased revenues for the utilities thus lowering the overall cost of power;
ii. Expanding the market beyond the national grid coverage;
iii. Optimal utilisation of energy resources by reducing curtailment of power generation;
iv. Promotion of private sector investment in new business models for household appliances, electric mobility, water pumping and cottage industries.

2.3 Clean Cooking and Bioenergy

2.3.1 Clean Cooking

The Government targets to achieve universal access to clean cooking by 2030. According to the Kenya National Cooking Transition Strategy (KNCTS) 2024, 69% of the population use biomass as the primary source of energy for cooking and heating, 31% rely on LPG, 1% on electricity and less than 1% on bioethanol. The Household Air Pollution Strategy, 2024 indicates that over 26,000 deaths occur annually, attributed to illnesses related to household air pollution. Over 80,000 social institutions rely on firewood as the primary cooking fuel.

The Kenya National Energy Efficiency and Conservation Strategy, 2020 (KNEECS), supports the development of Minimum Energy Performance Standards (MEPS) for clean cooking appliances and establishment of test labs. There are emerging clean cooking solutions that include solar cooking, green hydrogen, geothermal direct use, and bio-methane**.** The vast solar radiation coupled with innovative new technologies such as phase change materials for thermal storage and Direct Current eCooking appliances can be used for solar thermal and solar electric cooking in the country. Bio-methane technology is considered as an alternative to conventional LPG, since it reduces carbon emissions and reliance on fossil fuels.

Challenges

i. Limited access to clean cooking solutions with a low national access rate due high cost;
ii. There is inadequate funding for clean cooking solutions;
iii. Limited data availability has constrained the planning and resource mobilization for projects;
iv. Clean cooking technologies are still emerging and therefore subject to operational challenges;
v. The country relies on imports for all LPG for domestic and commercial demand.

Opportunities

i. Availability of climate finance funding option for clean cooking solutions;
ii. Inclusion and mainstreaming of clean cooking in national and county energy planning processes;
iii. Growing investment interests in clean cooking solutions both locally and globally;
iv. Collaborative stakeholder participation that include private sector, development partners Government agencies and public institutions that ease deployment of clean cooking solutions;
v. Introduction of viable cooking solutions and business models based on local fuels and technologies;
vi. The potential to generate biomethane from various feed stocks exists;
vii. Local production of biomethane is an alternative that could save the country foreign exchange.

2.3.2 Liquefied Petroleum Gas

LPG is used as a primary cooking solution by 31% households, with 9% usage by rural households and 63% in urban areas according to 2022 KNBS Demographic and Health Survey (DHS) 2022. The 2024 Economic Survey 2024 estimated the total consumption of LPG at 365 thousand tonnes in 2023. The per capita consumption of LPG stood at 7.5kg in 2021 and is forecasted to rise to 15 kg per year by 2030. The midstream segment of the LPG value chain has a combined storage capacity of 34kMT.

Challenges

i. Insufficient common user import facilities for handling bulk LPG;
ii. Price volatility occasioning supply uncertainties due to dynamic geopolitical factors;
iii. Inadequate legal and regulatory framework;
iv. Inadequate distribution infrastructure for the LPG limiting access.

Opportunities

i. Available investment opportunities in bulk LPG infrastructure development and market availability for public and social institutions;
ii. A subsidy scheme for LPG cylinders for low-income households that complements private sector involvement;
iii. Availability of the LPG Growth Strategy to enhance LPG penetration;
iv. The KNCTS has set a target to enable 50% of households use LPG by 2030;
v. Proposed initiatives to import LNG for household and industrial use;
vi. The Presidential Directive to transition all public institutions from firewood to LPG for cooking;
vii. On-going exploration of natural gas.

2.3.3 Electric Cooking

Presently, less than 1% of Kenyans use electricity as their primary fuel for cooking. According to the Kenya National eCooking Strategy 2024 (KNeCS) over 6% of Kenyans use electricity as their primary, secondary or tertiary solution for cooking and related processes. Approximately 25% own an electric appliance that can be used for cooking. The target is to build a sustainable eCooking market which can enable a net-zero transformation by electrifying the majority of cooking energy demand by 2050.

Challenges

i. The supply chain for energy-efficient eCooking appliances is inadequate;
ii. Reliability challenges and limited access to electricity in rural areas;
iii. The electricity tariff structure does not provide incentive for eCooking;
iv. Limited uptake of eCooking solutions occasioned by cultural norms and perceptions associated with food cooked using electricity
v. Limited awareness and knowledge gaps on the effective use of eCooking solutions leading to low usage;
vi. Weak guarantee on the durability, safety, energy-efficiency, performance, repair/maintenance and end of life disposal of eCooking appliances;
vii. Lack of regulatory framework for eCooking;
viii. Unfavorable fiscal policy for eCooking.

Opportunities

i. Majority of Kenyans have electricity connections that are suitable for eCooking and this an avenue for stimulating demand;
ii. The availability of a green grid provides viable option to fulfil national obligations on emission reductions;
iii. There is room to develop an eCooking tariff to improve demand;
iv. ECooking can attract funding through carbon financing.

2.4 Bioenergy Situational Analysis

Bioenergy resources in Kenya consist of solids (firewood, charcoal, briquettes, pellets), liquids (bioethanol and biodiesel) and gaseous (biogas). The harnessing of the resources is important for sustainable development including resource recovery and reuse (RRR). Bioenergy applications are in cooking and heating, road transport, aviation and power generation sectors and emerging uses (BioLPG).

2.4.1 Cooking and Heating

Bioenergy resources for cooking include (firewood, charcoal, briquettes, pellets, biogas, bioethanol and biodiesel). According to the 2022 KNBS Demographic and Health Survey, 69% of the population use firewood and charcoal as cooking fuels. The use of carbonized and non-carbonised briquettes and pellets for cooking offers sustainable solid biomass options. The KNCTS

targets to reduce the percentage of households relying on solid biomass fuels from 69% to 7% (sustainable biomass) by 2028. Gaseous biomass cooking solutions include biogas, syngas and hydrogen. There are an estimated 86,355 biogas digesters installed and 2019 studies indicate a potential to establish 2.3 million digesters in the country. The KNCTS targets to increase the number of households using biogas for cooking to 3% by 2028.

Bioethanol for cooking is an emerging industry with 1% of households mostly in urban centres using it. Bioethanol cooking fuel imports between 2018 and 2022 were estimated at 33 million litres valued at 3 billion Kenya Shillings. The KNCTS targets to facilitate 30% of households to use bioethanol for cooking by 2028.

Challenges

i. The harvesting and use of biomass products leads to environmental degradation and indoor air pollution;
ii. There is limited awareness on the use of briquettes and pellets for cooking;
iii. The high initial investment costs of installing biogas digesters constrains the uptake;
iv. Limited technical expertise for installation and maintenance constrains growth;
v. The limited availability of data on biogas technology and bioethanol constrains planning efforts;
vi. The competition between production for food and fuel impedes bioethanol production;
vii. Limited regulatory framework, viable business models and low awareness constraining utilization of bioenergy resources.

Opportunities

i. There is potential for generating biomass, biogas and biofuels from agricultural residues, municipal solid waste and forest waste for industrial and domestic use;
ii. Potential for cultivation of energy crops for production biomass and biofuels;
iii. Locally produced biogas is an alternative to imported LPG and it would save the country foreign exchanges used for importation;
iv. The need to increase awareness, scale up the production, establish distribution infrastructure and enhance uptake of clean cooking solutions;
v. Available market for the biofuels which offers employment opportunities;
vi. Avoided cost of reforestation occasioned by use of trees for energy purposes.

2.4.2 Bioenergy and Road Transport

Bioenergy resources for road transport include bioethanol, biodiesel and biogas. The total installed ethanol processing capacity is 83 million litres annually, compared to annual production of 26.5 million litres. The country has an E -10 blending mandate which was developed in 2010, and has not been fully operationalized due to low production of bioethanol locally. There infrastructure for E-10 blending in Kisumu and Eldoret. There is potential to implement the E-10 blending to boost local bioethanol production especially targeting sugar and cassava feed stocks. The biodiesel sector in Kenya is at early stages of development in comparison with the more established bioethanol. Biodiesel initiatives focuses on non-edible oils and used edible oils. The Government

is presently developing the regulatory framework for biodiesel and bioethanol. Biogas for road transport is not established in the country.

Challenges

i. Kenya relies heavily on imported fossil fuels for the transport and industrial use contributing to emission of greenhouse gases;
ii. Local production of biofuels for the transport sector is constrained by competition between production for food and fuel;
iii. Inadequate legal and policy frameworks with limited fiscal incentives;
iv. Insufficient information due to limited research and development;
v. Public awareness and engagement is low;
vi. The distribution infrastructure is limited.

Opportunities

i. High saving in foreign exchange expenditure on imported fuels;
ii. Energy producing crops that do not compete with food production can be grown in the country;
iii. Potential to increase smallholder farmers' incomes through an expanded biofuels industry.

2.4.3 Sustainable Aviation and Marine Fuels

The total aviation fuel requirement for international operations is 88%, 7 % for domestic operations and 5 % for regional operations. Kenya's goal is to halve CO2 emissions from the aviation sector by 2050 in line with the international aviation industry's climate change targets. Kenya's aviation sector, aims to halve CO_2 emissions by 2050, aligning with global climate targets. Sustainable Aviation Fuel (SAF), derived from bioenergy, and green hydrogen offer transformative solutions to decarbonize the industry.

Marine shipping plays a pivotal role in global trade, handling approximately 80-90% of the total volume while contributing around 3% to annual global greenhouse gas (GHG) emissions. In Kenya, the maritime sector is equally critical, with 3,240 vessels docking at Kenya's ports in 2023, facilitating the importation of 50 different types of commodities from 76 countries. Biofuels and green hydrogen can significantly reduce emissions, with hydrogen also serving as a precursor for clean marine fuels like ammonia.

Challenges

i. There is low production of biofuel feed-stocks for SAF and marine fuels due to lack of awareness and markets;
ii. Lack of refining infrastructure, technical expertise and research in SAFs and marine fuels makes thus difficult to implementation of associated program;
iii. The lack for SAFs makes bulk production difficult, and advanced conversion technologies for converting biomass to jet fuel are locally unavailable;
iv. Inadequate legal and institutional framework to support sustainable development of SAFs and marine fuels;
v. Investment costs for achieving commercial viability are high.

Opportunities

i. There is a global requirement for decarbonization in the aviation and marine industry, including certification and standards for fuels;
ii. There is vast RE potential for the production of SAFs and marine fuels in the country.

2.4.4 Cogeneration, Gasification and Waste to Energy

Studies indicate there is high potential of biomass waste conversion to electricity through co-generation and gasification technologies. The Sugar Directorate indicates that about 2.4 million tons of bagasse generated by the sugar factories is unutilized (KEFRI, 2020). The estimated cogeneration potential from sugarcane bagasse in Kenya stands at 300 MW. The current generation is 193 MW, consumed by the sugar factories and is not supplied into the national grid. Mumias Sugar Company previously generated 38MW of which 26 MW was consumed within the factories and the balanced supplied to the national grid.

In Kenya, most tea factories source almost 99 % of their energy from firewood and other sources of biomass and 1 % from oil fuel. The tea industry consumes about 1 million tons of firewood annually (KEFRI 2020). The Government has identified potential for power generation through gasification using forestry and agro-industry residues. The country has potential to generate about 130 MW from municipal solid waste, sisal and coffee. The present generation from industrial bio-digesters is less than 3 MW. About 90% of municipal solid waste generated is reusable, but only 5% is recycled or composted. The collection rate is between 50% to 60%, representing 1500-1800 tons/day. The average per capita waste generation in the main Kenyan municipalities is estimated at 8 million tons annually. About 60 - 70% of waste is organic, 20% plastic, 10% paper, 1% medical and 2% metal (Ministry of Environment and Forestry, 2019). There is proposed MSW energy plants of a 45MW plant at Dandora dumpsite, and a 12 MW grid connected plant in Kibera.

Challenges

i. There is underutilization of available capacity for cogeneration and gasification;
ii. High investment and operational costs, and limited availability of feedstock slow the expansion of cogeneration and gasification;
iii. Inadequate regulatory framework on waste-to-energy conversion technologies;
iv. Inadequate research on waste-to-energy power generation;
v. Pollution from the combustion of waste is a health and environmental hazard.

Opportunities

i. Heat and power from cogeneration of waste can be put different industry usage;
ii. Standardized PPAs would support cogeneration due to reduced transactional costs;
iii. Heat recovery from incinerators in hospitals and industries, could be used to displace fuel oil in water boilers;
iv. Agricultural waste can complement municipal waste in biogas plants, for higher energy production.

2.5 Diverse and Productive Uses of Energy

Most energy sources provide alternative forms of energy that can be applied/used directly in other economic sectors. These sources include geothermal, solar, wind or small hydros. They provide thermal energy that is directly applied for heating, cooling, refrigeration and automotive applications. There is significant potential for direct-use applications for geothermal which can spur green industrialization but it is yet to be fully harnessed. Solar powered appliances are used in agricultural applications and cold chains. Wind power can be used for irrigation in off-grid areas. Small hydros can be used to power grinding mills among other applications.

In 2021, MoEP established the National Roadmap for Scaling up Productive Uses of Renewable Energy (PURE) in Kenya. The Inter-Governmental Committee on PURE was established in 2024 to facilitate the identification of barriers and opportunities for scaling PURE in Kenya. PURE will enable Kenya to expand energy access and for utilities to generate more revenue.

Challenges

i. Lack of a pricing mechanism and inadequate stakeholder engagement on PURE;
ii. Limited technical support on PURE technologies thus resource underutilization;
iii. Minimal expertise and technical know-how in non- electric energy applications;
iv. Low consumer awareness of PURE technologies reducing uptake;
v. High upfront costs coupled with limited access to financing for consumers;
vi. Inadequate innovation, research and development in PURE sub-sector;
vii. Inadequate business models that support adoption of diverse and productive uses of energy;
viii. Inadequate fiscal incentives to attract investors.

Opportunities

i. Availability of renewable energy resources;
ii. Availability of geothermal resources for direct use applications which has the potential to spur green industrialization;
iii. Availability of PURE for agricultural mechanization, electrification of public facilities, e-mobility transport, support for industrialization and manufacturing;
iv. Growing availability and demand for diverse and productive uses in the market.

2.5.1 Emerging Technologies

Emerging technologies in the energy sector, such as green hydrogen, oceanic energy, Internet of Things (IOT), carbon capture and advanced ESS, can enhance grid stability, and diversify the energy mix. Investment by Government and private sector in research and development, pilot projects, and capacity-building programs, can accelerate the adoption of these innovative energy solutions.

Challenges

i. High costs associated with developing and maintaining emerging technologies;
ii. Inadequate technical expertise and technology Infrastructure;
iii. Lack of research, development and awareness on emerging technologies;

iv. Cultural and societal factors slowing the adoption of emerging technologies;
v. Insufficient data due to limited research and development on emerging technologies.

Opportunities

i. The Government support for policies aligning with Kenya's green energy ambitions;
ii. Strategic partnership between the Government, multilateral lenders and investors in promoting sustainable economic growth and social development;
iii. High resource potential to support the emerging technologies.

2.6 Green Hydrogen

Kenya aims to produce green hydrogen by leveraging on its vast renewable energy resources. This will contribute to global decarbonization goals and enhance the country's energy security. The Government developed the Green Hydrogen Strategy and Roadmap, and Guidelines on Green Hydrogen and its Derivatives, to guide the development a green hydrogen economy. These frameworks set the criteria, regulatory standards, and monitoring mechanisms for Green Hydrogen projects. The applications will be in agriculture, industrial use, transport, power generation, and export markets.

Challenges

i. High capital costs;
ii. Limited infrastructure for Green Hydrogen development;
iii. Insufficient regulatory frameworks;
iv. Inadequate local technical capacity and technology for production.

Opportunities

i. Kenya's strategic geographical location and vast renewable energy resources can attract investments in green hydrogen;
ii. Domestic green hydrogen production can decrease reliance on imported fossil fuels, enhancing energy security;
iii. Green hydrogen useful in decarbonization of industries and clean transportation systems;
iv. Green hydrogen production will support production of green ammonia, e-methanol, synthetic fuels and in hydrogen-based steel and cement manufacturing industries;
v. Adoption of the green hydrogen create local capacity, foster innovation, and create jobs across;
vi. The growing global demand for cleaner fuels and decarbonized solutions creates a market for green hydrogen and its derivatives;
vii. Development partners and private investors interest in establishment of green hydrogen projects.

2.7 Energy Transition and Climate Change

Kenya has committed to champion and adopt measures to mitigate climate change. The energy sector ranks among the largest contributor to Green House Gas (GHG).

The country's target on Nationally Determined Contribution (NDC) to abate GHG emissions by 32% by 2030. The National Climate Change Action Plan (NCCAP) has identified priority areas that rely on dirty fuels. The NCCAP identifies policy and fiscal incentives to promote usage of climate-friendly technologies. MoEP's Kenya Energy Transition and Investment Plan provides the process for the energy sector to contribute for Net Zero emissions by 2050. The Government is committed to achieve a Just Energy Transition by reducing dependency on fossil fuel-based energy systems to renewable and sustainable energy resources fairly and equitably.

Challenges

i. High capital and maintenance costs for low carbon emitting technologies such as electric heat pumps, sustainable aviation fuels, green hydrogen and EVs;
ii. Limited infrastructure to support adoption of low carbon technologies such as EV charging stations, mass clean cooking stoves;
iii. High energy costs of modern and low carbon cooking solutions (LPG, sustainable biomass, electricity);
iv. High costs for grid support to integrate more capacities of VREs Technologies.

Opportunities

i. Availability of investment capital and donor support for low-carbon energy projects;
ii. There exists vast renewable energy potential to support the energy transition;
iii. Green growth opportunities that include carbon markets, green hydrogen, green manufacturing and localization of low carbon technologies;
iv. Creation of energy security as domestic demand grows, more local resources can be developed.

2.8 Carbon Market and Carbon Finance

Kenya has made significant steps toward developing sustainable energy and mitigating climate change. Carbon finance is a market-based mechanism that plays a vital role in achieving the goals of the energy sector in Kenya through the financing of projects that reduce emissions of greenhouse gases. Kenya enacted the Climate Change (Carbon Markets) Regulations 2024. This is bound to increase international investments into Kenya's green economy, while at the same time contributing to the country's national climate action plans. It provides incentives to businesses for the adoption of low-carbon technologies and encourages the adoption of sustainable practices.

Challenges

i. Lack of adequate capacity on project monitoring and verification;

ii. Global carbon prices are subject to fluctuations and this volatility affects the profitability of carbon credit projects;
iii. The carbon markets regulations in Kenya are underdeveloped compared to other international markets;
iv. Small projects and organizations face challenges in meeting and aligning with international standards.

Opportunities

i. Vast renewable energy resources in Kenya, offering high potential for generation of carbon credits;
ii. Engagement in carbon markets can help Kenya emerge as a regional leader in climate action and sustainable energy;
iii. Access to funds such as the GCF and GEF, gives Kenya the opportunity to enhance the country's carbon market.

2.9 Critical Energy Minerals

Critical minerals are vital to modern industries, including battery storage, wind and solar energy, semiconductors, and defence applications. Recent geological surveys and exploration activities indicate that Kenya possesses a diverse range of critical minerals, with significant deposits identified in various regions. They include copper, manganese, Rare Earth Elements (REE), graphite, nickel and cobalt. Through the Vision 2030 and Green Industrialization Policies, the Kenyan government focuses on harnessing critical minerals to support Kenya's transition to a low-carbon, high-tech economy.

Challenges

i. Limited exploration and data hinder investor confidence in investing in the exploitation of critical minerals;
ii. The lack of adequate infrastructure, including inefficient transportation, insufficient energy supply, and limited processing facilities, hampers the development of full-scale mining operations;
iii. Inadequate regulatory framework to spur investor confidence in exploiting critical minerals;
iv. The integration of critical minerals with the renewable energy sector remains limited due to the absence of established renewable energy industries.

Opportunities

i. The untapped and unexplored critical mineral potential presents an opportunity to exploit these minerals;

ii. The increasing demand for lithium, cobalt, nickel, copper, and rare earth elements (REEs) due to the global shift toward renewable energy, electric vehicles (EVs), and battery storage presents a huge export opportunity for Kenya;
iii. The potential for developing local value-addition processes;
iv. The high renewable energy potential and targeted capacity growth provide an opportunity for synergies between critical mineral mining, processing, and renewable energy industries to create a self-sustaining value chain.

2.10 Development of Other Geo-energy Resources

2.10.1 Coal Resources for Energy Production

Kenya has delineated 31 blocks for coal exploration. Prefeasibility studies undertaken in one of the blocks in Mui Basin of Kitui County indicate coal reserves estimated at 400 million tons. The Government extended coal exploration to cover the Karoo system in Kwale and Kilifi Counties.

The country is a net importer of coal which is used in high-heat industrial processes in steel making, cement manufacturing, ceramic industries and for captive power generation. In 2022, the annual imports for coal was 1,000,000 tons valued at KES. 26 billion (KRA). The imported coal and coke feedstock in 2022 and 2023 were 4,888.06 TJ and 6,077.59 TJ respectively (KNBS 2023 & 2024). According to International Energy Agency (IEA), Kenya imported coal valued at about US $120 million in 2023. The Energy and Petroleum Statistics Report (EPRA, 2024) indicate that coal and coke contributed 3.7% of Kenya's energy supply for the year 2023.

Challenges

i. Reduced funding and investment financing in coal development;
ii. Adverse effects in coal utilization which include land degradation, water pollutions and mass displacement of population;
iii. Lack of socialize license to operate in coal resources development;
iv. Opposition from anti-coal lobby groups leading to negative publicity of coal projects.

Opportunities

i. Growing demand for use of coal in high heat industrial processes that currently with no viable alternatives;
ii. Local coal production will reduce imports and improve the country's balance of trade;
iii. Utilization of clean coal technologies for power generation to enhance the country's energy security, provide contingency base load and mitigating the effects of intermittent sources;
iv. Diverse multi- resource industry for coal resource associated minerals and bye-products production of coke for manufacture of iron and steel products, as a source of process heat for industrial and commercial boilers, for conversion to liquid fuels, as source of industrial filler, in construction and gasification;

v. Improved livelihoods of communities such as job creation, local industries, improved infrastructure and other social amenities.

2.11 Natural Gas

Natural Gas plays a critical role in the clean energy transition. It has various uses including thermal applications in industries, transportation, institutional, and households use; electric power generation and gas to liquids (GTL) conversions. It is used as raw material for other products including fertilizer, methanol and ethanol.

The Kenya Exploration Potential Play based Resource Assessment Report indicate that the country has a huge potential for natural gas, especially in the Lamu Basin. As the world transitions to clean energy, there is need to explore and exploit natural gas for utilization in the domestic market and for exportation.

Challenges

i. Lack of handling and distribution infrastructure for natural gas;
ii. Price volatility occasioned by dynamic geopolitical factors;
iii. Slowed local exploration of the resources;
iv. Intensive capital requirement in the exploration and development of gas infrastructure.

Opportunities

i. There are local natural gas prospects in the country that remain unexploited;
ii. Feasibility studies have been carried out to determine the quantity requirements of natural gas to develop power plant and other industrial use;
iii. Availability of natural gas in the region reducing import costs.

2.11.1 Crude Oil and Liquid Petroleum Products

Domestic crude oil deposits have been discovered in Turkana and the initial plan is to transport the oil via a pipeline to Lamu for export. The commercial viability of exploitation and export or domestic refining of the crude is still being established. Petroleum products account for 22% of the national primary energy consumption with approximately 8% sourced from fossil fuels such as heavy fuel oil (HFO) and gasoil. Demand for petroleum products has grown over time, increasing by approximately 10% annually. Kenya relies entirely on imports for its petroleum products, with refined products sourced mainly from Murban crude and Arabian Medium. Kenya's electricity sector previously relied heavily on imported crude oil and petroleum products fueling nearly 40% of the installed power generating capacity. With the commissioning of geothermal, wind and solar power plants, this dependency has decreased in recent years and fossil plants provide less than 10% of the annual electricity generated. Heavy fuel oil (HFO) has less preference for power generation expansion due to its adverse environmental impacts. As part of expansion planning, efforts are directed towards converting existing thermal power plants to liquefied natural gas (LNG).

Challenges

i. Long lead time and uncertainties in resource development;
ii. Fluctuations in world crude oil prices leading to high cost energy;
iii. Reduced preference due to adverse environmental impacts including air pollution and climate change.

Opportunities

i. Potential to save the country's foreign currency used for oil importation and improve the country's balance of trade;
ii. Local coal production would boost national energy security;
iii. Thermal plants easy deployment and ability to provide back-up power, peaking capacity and electricity production for mini-grids and home systems.

2.12 Energy Efficiency and Conservation

Energy efficiency and conservation is key towards; sustainable development, cost reduction, mitigating environmental impacts, and in enhancing energy security. It supports economic growth, job creation, improved health, and reduced inequalities while addressing global challenges like greenhouse gas emissions. The country targets to double improvements in energy efficiency by 2030 in order to achieve Sustainable Development Goal (SDG) 7, which requires access to affordable, reliable, sustainable and modern energy for all.

Energy efficiency in Kenya crosscuts various sectors, including buildings, households, industries, agriculture, transport, and utilities. Existing policy interventions in energy efficiency include Energy Management Regulations and the Standards and Labeling Program, implemented by EPRA.

The Government through the Centre for Energy Efficiency and Conservation (CEEC) has facilitated energy audits, capacity building and public awareness campaigns. Other initiatives by stakeholders include promoting electric mobility in transport, efficient design in buildings enhancing agricultural cold chains, and clean cooking. Additionally, Kenya is part of the regional efforts in the development of the East Africa Community Regional MEPS for lighting appliances.

Challenges

i. Limited access to financing mechanisms for implementation of energy efficiency measures;
ii. Inefficient and inadequate data management systems on energy efficiency for target setting and monitoring;
iii. Inadequate human capacity to carry out energy efficiency measures, develop standards and enforce compliance;

iv. Lack of awareness on energy efficiency and conservation among consumers and other key stakeholders resulting to low adoption of energy efficient appliances;
v. Limited supply-side energy efficiency programs, which limits the potential for comprehensive improvements in energy use and sustainability in the country.

Opportunities

i. There exists a growing market for energy efficient appliances driven by regulatory compliance and consumer awareness;
ii. Existing local and regional frameworks for energy efficiency and conservation;
iii. Existence of energy efficiency solutions such as energy management systems;
iv. Availability of financing options and business models providing a solution to the high capital costs of energy efficiency projects.

2.13 Energy Financing, Pricing and Procurement

2.13.1 Energy Financing

The financing and pricing mechanism of energy projects in the country is crucial in determining end user tariffs. The sector requires sustainable financing to modernize the country's energy infrastructure, adopt new technologies and enhance energy access. The Government is committed to supporting investment in all segments of the energy sector ranging from generation, transmission, distribution and retailing. Presently, the energy sector is financed through Government budgetary allocations, development partners and private sector initiatives. The investment requirements supersede the available financial resources in the sector. The Government is in the process of establishing the Consolidated Energy Fund as provided under the Energy Act. The National Green Fiscal Incentives Policy Frameworks promotes green energy investments.

The funding gap is expected to continue as growth in energy demand necessitates addition and modernization of energy infrastructure. The Government will continue to partner with financial and other development partners for fiscal and technical assistance. The Public-Private Partnerships (PPP) arrangement will attract investment and foster innovation and technological advancements. In the energy sector, financing is primarily foreign currency and most tariffs are priced in USD. The Government applies appropriate risk management mechanism in infrastructure projects through guarantees and other Government Support Measures (GSMs). These strategies are intended to de-risk projects and improve bankability of the projects. The project developers assume certain risks and are required to mitigate them at reasonable costs ensure the project's viability.

Kenya offers several fiscal incentives to encourage business investment in the country. Some of these incentives include Tax Holidays, Export Processing Zones (EPZs), Duty-Free Imports, Investment Allowances, Infrastructure Support, Export Promotion Schemes, Customs and Trade Facilitation.

2.13.2 Energy Pricing

The current energy pricing and tax incentives for renewable projects are designed to encourage sustainable practices and attract investments. Policies such as feed-in tariffs aim to promote investment in renewable projects. Electricity pricing follows the principles of Long Run Marginal Cost (LRMC) of supply, with both bulk and retail tariffs regulated. Electricity tariffs are structured to generate adequate revenue for utilities while ensuring competitive end user tariffs.

Bulk tariffs are negotiated between producers and the off taker, then approved by EPRA. Retail tariffs, regulated by the Authority, are reviewed at least every three years. Fuel costs and forex adjustments are pass-through costs in electricity pricing. These adjustments account for variations in power costs due to fluctuations in international crude oil prices and the volatility for the Kenya shilling against foreign currencies, primarily the US dollar.

Challenges

a) Energy Financing and Investment

i. Inadequate Government funding for energy projects has delayed projects implementation, compromising reliable energy, energy security and sustainability goals;
ii. The Government entities in the generation, transmission and distribution segment are unable to generate adequate revenue to meet their financial obligations;
iii. Over-reliance on external financing from developmental partners affects sustainability of energy projects;
iv. The high capital requirements for energy projects and the limited financing for certain technologies results to underutilization of certain energy resources;
v. The complexity, volatility and regulatory inadequacy of emerging financing alternatives poses financial risks to investors in assessing project viability;
vi. Inadequate pipeline of bankable energy projects to draw alternative financing sources especially during upstream development;
vii. Higher transactional costs due to complex and lengthy financing processes resulting to project delays and high end user tariff.

b) Electricity Pricing and Social Economic Issues

i. The pricing mechanism is not dynamic to ensure short term pricing to meet changing requirements for consumers and market participants;
ii. Lack of optional competition in the electricity value chain and lack of a power market;
iii. There is risk of regulatory capture in tariff setting and political interventions;
iv. The subsidization lifeline tariffs, through compensation by other consumer categories;
v. Lack of flexible pricing mechanisms, such as spot electricity markets, to improve market responsiveness.

c) Foreign Exchange, Taxation, Levies and Fiscal Regime

i. Multiple and uncoordinated levies and charges applied to energy operations leading to high cost of energy services;
ii. The unpredictable fiscal regime and long-term, inflexible energy infrastructure contracts;
iii. The global economic shocks due to geopolitics and other factors disrupts supply chains and reduce demand for energy;
iv. The inadequate fiscal incentives, tax breaks, and unpredictable policies create a challenging environment for attracting long-term investments;
v. Investors and developers unable to compute project costs and returns accurately, due to fluctuating interest rates and unpredictable levies discouraging long-term investment and development of energy infrastructure;
vi. Overreliance on foreign currency financing, exposing the sector to exchange rate volatility.

d) Financial Risk Management

i. Insufficient use of de-risking mechanisms to protect the sector from macroeconomic shocks;
ii. High reliance on GSMs over structuring viable, bankable projects;
iii. Inadequate capacity in the public sector to manage and implement PPP projects, asset monetization and structure complex energy projects.

Opportunities

a) Energy Financing and Investments

i. Availability of alternative financing sources such as pension funds, green funds, bonds, SACCOs, climate funds, and strategic partnerships which have not been adequately utilized;
ii. There is investment potential in renewable energy, due to global emphasis on green growth and sustainable energy projects;
iii. There is a stable legal and policy framework enabling adoption of various financing initiatives and private sector investments;
iv. The country is a member of several regional economic bodies which fosters trade and investment;
v. The availability of energy infrastructure and associated assets can monetized as a source of capital;
vi. Successful implementation of PPP projects in other countries with similar social, economic and political background and such projects can be replicated locally;
vii. The Carbon Credit Market for energy project provides a platform to offset tax liabilities while contributing to environmental sustainability;
viii. The PPP and asset monetization provides a mechanism of sharing risks in energy project development and implementation.

2.13.3 Power Procurement

Power procurement in Kenya involves least cost planning, acquisition and management of electricity supply to meet the country's energy demand. The MoEP has the primary obligation of power planning. Procurement is primarily guided by the LCPDP. LCPDP considers affordability, sustainable energy generation and evacuation among other elements. Sources of electricity in the country are from a diverse mix of renewable energy including geothermal, hydro, wind, solar, biomass, complemented by thermal plants. KenGen and IPPs generate power which is purchased by KPLC through PPAs for distribution and retailing. Regionally, power procurement is through bilateral trading arrangements. Plans to develop a competitive regional market are underway with a day ahead market set to be launched in 2025.

The Public Procurement and Asset Disposal Act, 2015 and the Public Private Partnerships Act, 2021 apply in procurement of goods and services by public bodies. The FiT Policy, 2012 was adopted to promote generation of electricity from renewable energy sources providing pre-determined tariff for different technologies. Technological advancement over the years has resulted to competitive market tariff rates for renewable technologies. Government has directed that new capacity of variable renewable energy to be procured through the Renewable Energy Auctions process except for small capacity projects of less than 20MW from small hydro, biomass, and biogas sources that are to be retained under the FIT Policy. A coordinated approach in the procurement process supports the growth of the renewable energy sector and balances the investor and consumer interests.

Challenges

i. The off-taker's PPAs are denominated in foreign currencies despite off-taker's revenue being in local currency which exposes the off-taker to foreign exchange risk;
ii. Lack of clear guidelines on procurement of power projects resulting to delayed procurement processes discouraging investments in the sector;
iii. Local and geopolitical factors impacting on the country's economic growth exposes the Government to demand risk;
iv. Lack of clear guidelines for collaboration both among energy sector agencies and between the sector and external stakeholders.

Opportunities

i. Growing energy demand as a result of economic growth;
ii. Access to the evolving modern technology increasing efficiency in power generation;
iii. Existing legal framework on local content that will enhance local capacity and expertise and provide opportunities for job creation;
iv. Utilization of Kenya's vast renewable energy resources to enhance energy security;
v. Resource mobilisation by giving investor confidence;
vi. Availability of Partial Risk Guarantees (PRGs) and insurance facilities from multilateral and financial institutions to de-risk project and promote investor confidence.

2.14 Energy Planning and Devolution

2.14.1 Integrated Energy Planning

The Sessional Paper No. 4 of 2004 provided for integration of energy planning with the national economic development plan, land use, social and environmental policies. Energy is an enabler for all sectors of the economy and decisions on energy impact on other areas of the economy. Energy planning in Kenya previously focused on electricity generation, transmission, and distribution under the LCPDP. MoEP and its agencies have developed internal capacities in electricity planning. The existing planning tools and models are inclined to electricity planning and not integrated energy planning.

Due to concentration on electricity planning, other energy subsectors such as petroleum, renewable energy, clean cooking, bio-energy and energy efficiency not adequately incorporated into the energy sector planning. Integrated National Energy Planning require collaboration between the National and County Governments among other stakeholders. The Constitution, provides for County Government to undertake energy planning. All the County Governments energy plans are to be incorporated into INEP. Access to complete and accurate energy data and information is essential in development of INEP. An effective integrated energy planning requires adequate financial resources and modern energy planning and modelling tools.

Challenges

i. Lack of whole sector planning with individual subsectors (electricity, petroleum, bioenergy, etc.) separate planning thus inefficiencies and no synergies;
ii. Inadequate stakeholder collaboration among Government entities and private sector actors, impacting on integrated energy planning;
iii. Lack of adequate financial resources, technical expertise, modelling and planning tools to facilitate comprehensive integrated energy planning at all levels;
iv. Slow implementation of existing energy plans and strategies;
v. Lack of a centralized repository for data and information which can be used by all players during energy planning.

Opportunities

i. Development partners and private sector are interested in supporting Kenya's integrated energy planning;
ii. Availability of energy planning technologies, tools and models such as geospatial mapping and AI useful in energy planning;
iii. Local institutions and academia are involvement in energy research, providing a resource base for innovation in energy planning.

2.14.2 Devolution of Energy Functions

The Constitution of Kenya provides for the National and County governments. The Fourth Schedule of the Constitution, assigns functions between the National and County Governments.

Some functions are concurrent, while others are exclusive to either level of Government. The Fifth Schedule of the Energy Act, specifies the functions of National and County Governments.

Challenges

i. Inadequate financing of the energy sector functions due to constrained budgetary allocations;
ii. Lack of specific energy departments in most counties;
iii. Inadequate human resources and expertise needed to undertake the devolved energy functions;
iv. Inadequate consultation among stakeholders planning, implementation, monitoring and reporting of concurrent energy functions, leading to overlaps and inefficiencies;
v. Lack of legal and regulatory frameworks to guide their devolved energy functions.

Opportunities

i. Development partners and private sector interested to provide technical and financial support to strengthen the capacity of counties to implement their devolved energy functions;
ii. Counties are strategically structured to implement specific energy projects;
iii. The legal and regulatory framework provide for specific function, County and National Government can collaborate with other stakeholders.

2.15 Land, Environment, Gender, Health and Safety

2.15.1 Land and Energy

The Energy Act provides for use of land for energy infrastructure, wayleave acquisition, compensation, and decommissioning. The Constitution, and Land Act, 2012, categorize land as private, public, or community-owned. Private land is individually owned, public land is managed by the National Land Commission (NLC), and community land is under County Governments. The NLC administers public land, manages land acquisitions for energy projects, and administers compensation process. The Ministry of Lands develops policies, manages the National Land Information Management System (NLIMS), and oversees land registration. County Governments regulate land use and allocate land for public infrastructure.

Challenges

i. Large-scale energy projects cause economic and physical displacement;
ii. Inadequate legal frameworks, unclear procedures, stakeholder disputes, and insufficient funding and inconsistent compensation delays project implementation;
iii. Infrastructure vandalism affects grid stability and consumer safety;
iv. Lack of digitized land process slows land acquisition process.

Opportunities

i. The country has vast land resources, for energy expansion;
ii. Advances in technologies such as GIS and drone surveillance eases land transactions;

iii. Stakeholder collaboration creates synergies for land acquisition for energy projects.

2.15.2 Environment and Energy

Environmental management is important for sustainability in the energy sector. The Environmental Management and Coordination Act (EMCA) 1999 provides the legal framework for environmental management. Kenya's climate change policies, based on the Climate Change Act of 2016, aim to achieve Vision 2030 goals through low-carbon development. The National Climate Change Action Plans (NCCAPs) targets clean, safe, and affordable cooking fuels.

The energy sector impacts the environment in several ways: fossil fuel-based electricity generation contributes to greenhouse gas emissions and climate change; biomass fuels causes deforestation, biodiversity loss, and ecosystem degradation; large-scale projects such as hydropower dams and geothermal drilling disrupt habitats and ecosystems; and renewable energy technologies generate e-waste. Climatic changes causes droughts reducing hydropower generation, while floods and storms damage infrastructure.

Challenges

i. Biodiversity and cultural requirements, stakeholder conflicts, and mitigation measures associated with protected areas delays project implementation increasing costs;
ii. Inadequate environmental and social impact assessment causes disputes leading to delayed energy projects;
iii. Inadequate stakeholder engagement for energy projects;
iv. Climate change adversely impacts on energy resources, programmes and projects;
v. Greenhouse gas emissions from energy activities contribute to global warming and climate change;
vi. Improper e-waste disposal from energy equipment and materials lead to environmental degradation.

Opportunities

i. Available regulatory and compliance framework to guide the sustainable utilization renewable energy resources;
ii. Global interest in energy transition with provision for funding of renewable energy;
iii. Advances in technology provide mechanism to manage and monitor energy projects adherence to sustainable environmental practices;
iv. Establishment recycling facilities of e-waste from renewable energy technologies creates business opportunities.

2.15.3 Gender Equality, Diversity and Social Inclusion on Energy (GEDSI)

Gender Equality, Diversity and Social Inclusion (GEDSI) is key in achieving sustainable development and social justice since it ensures that all individuals, regardless of gender, ethnicity, age, disability, or other social-economic factors, have equal access to opportunities, resource and rights. The GEDSI approach aims to address systemic inequalities and promote inclusive

development by removing barriers of discrimination towards marginalized and vulnerable populations.

The energy sector has made progress in mainstreaming GEDSI into policies and programmes towards the government goal of achieving universal access to electricity and clean cooking solutions by the year 2030. A Gender Policy in energy was developed in 2019 to among others strengthen institutional frameworks for gender equality in energy sector at both national and county levels. Another key programme implemented was the Global Partnership for Results-Based Approaches (GPOBA) under Kenya Electricity Expansion Project that targeted the expansion of Kenya's electricity grid into slum areas through an output-based aid approach at a subsidized cost. The Government has been extending electricity connectivity in under severed areas through construction of mini-grids. Life-line electricity tariff is intended to make electricity affordable to the low-income earners.

Challenges

i. Inadequate involvement of the marginalized and vulnerable in policy and programme conceptualization, design, implementation and monitoring;
ii. Limited human capacity and technical expertise at National and County Governments to mainstream GEDSI in energy sector;
iii. Inadequate financing and budget allocation for implementation of dedicated GEDSI programmes;
iv. Lack of GEDSI disaggregated data to inform policy and decision making;
v. Inadequate monitoring and evaluation framework on GEDSI.

Opportunities

i. Development partners and non-state have considerable knowledge and expertise in GEDSI that the government can tap into;
ii. There exist compressive frameworks for mainstreaming and conducting audits on GEDSI.

2.15.4 Occupational Health and Safety

The Constitution guarantees fair labor practices and provides for the right to a safe and healthy working environment and protection from hazardous conditions. The energy sector involves high-risk activities in electricity generation, transmission, distribution, retailing and all renewable energy projects, necessitating adequate safety measures. The Occupational Safety and Health Act (OSHA) 2007 provides a framework on handling proactive safety measures, risk assessments, and compliance mechanisms in the work place. The Energy Act 2019 mandates EPRA to ensure safety and environmental compliance within the energy sector.

Challenges

i. Occupational safety and health awareness is low among employers, workers, and other stakeholders;
ii. Inadequate systems for occupational injury data management and digitization of safety and health processes;

iii. Inadequate work-life balance programs to address prevention, care and support with syndemic diseases and psychosocial issues;
iv. Inadequate research on emerging and traditional occupational risks arising from fast technological advancement;
v. Insufficient finance and budgetary allocation to facilitate compliance and enforcement OSH requirements in the energy sector;
vi. The inadequacy of resources ranges from limited technical assistance and training needs to support OSH development.

Opportunities

i. The availability of legal framework provides a framework on safety, risk assessments, and compliance mechanisms;
ii. Allocation of additional resources towards addressing OSH challenges;
iii. Developing energy sector-specific disaster risk frameworks enhances resilience to hazards and protects infrastructure.

2.16 Research, Development and Innovation

Research, Development, and Innovation (RDI) are essential for advancing Kenya's energy sector. Kenya can reduce electricity costs, foster local manufacturing, and become a global hub for cutting-edge energy technologies in sustainable and innovative energy solutions by streamlining RDI. Despite notable progress, RDI activities remain fragmented, resulting in sub-optimal outcomes and missed opportunities. By streamlining RDI efforts, Kenya can reduce electricity costs, foster local manufacturing, and become a global hub for cutting-edge energy technologies.
Integrating RDI into Kenya's energy policy is a strategic pathway to unlocking significant opportunities, including driving job creation, reducing electricity costs, and accelerating green industrialization. Key to this strategy is fostering collaboration between academia and industry, underpinned by supportive government policies that align with Kenya's green energy ambitions. Strengthening intellectual property (IP) protection will be critical to safeguarding innovations, incentivizing inventors, and attracting investors to the sector. Establishing dedicated RDI budgets at institutional levels will enable consistent experimentation, pilot projects, and scaling of new technologies.

Challenges

i. Lack of coordination among energy sector stakeholders in RDI activities leading to duplication;
ii. Inadequate research and dissemination due to limited financial resources and facilities for RDI;
iii. Inadequate local content t in the energy sector has resulted to reliance in foreign expertise for RDI.

Opportunities

i. Available research institutions, universities, and think tanks that provide technical expertise and conduct specialized studies on energy resource availability, technological innovations, and energy system modeling;
ii. Collaboration with stakeholders to research on new technologies and innovative projects;
iii. The sector's strong culture of creativity and innovation enhances its capacity for transformative advancements and adoption of emerging technologies;
iv. Strengthening intellectual property (IP) protection to safeguarding innovations, incentivizing inventors, and attracting investors to the sector;
v. Establishing dedicated RDI budgets at institutional levels will enable consistent experimentation, pilot projects, and scaling of new technologies.

2.17 Human Resource Development & Retention

Human resource development is important in the energy sector. The development and retention of a skilled workforce will enable efficient execution of their mandates towards realizing sustainable energy goals. Institution-specific programs such as Kenya Power's Institute of Energy Studies and Research, KenGen's Centre of Excellence, and GDC's Geothermal Centre of Excellence are important in training and retaining high-caliber professionals in energy sector. By leveraging on Kenya's youthful, tech-savvy population and nurturing a culture of innovation, the energy can develop dynamic workforce to advance the emerging technologies in the energy sector.

Challenges

i. Lack of a centralized process and inter-institutional collaboration in research and training personnel in the energy sector;
ii. Insufficient budgetary allocation for human resources function within the various agencies in the sector;
iii. Limited institutions and specialized curricula in bridging knowledge and skills, and sector demands;
iv. Weak linkages and collaboration among sector entities, academia, and research institutions, limiting knowledge transfer and innovation;
v. The absence of a centralized system for identifying and tracking human resource capacities in the energy sector.

Opportunities

i. There is exists collaboration mechanism with the development partners for training energy sector staff;
ii. Kenya has a youthful, well-educated workforce with strong potential for skills development;
iii. Digitalization and E-Learning platforms to provide cost-effective training for energy sector professionals.

2.18 Cyber Security and ICT

Cybersecurity and data protection in the energy sector aim to safeguard the confidentiality, and integrity of digital assets. The energy sector entities are committed to ensure compliance with data protection laws and policies. Energy sector entities have developed cybersecurity and data protection policies tailored to secure critical infrastructure and sensitive data. These policies align with the Computer Misuse and Cybercrimes Act of 2018, Access to Information Act, No. 31 of 2016, the Kenya Information and Communication Technology (KICT) Act of 2011 and IT Governance Standards established by the ICT Authority. These frameworks ensure that ICT systems within the sector comply with the prevailing laws and national standards. As the sector adopts digital solutions, compliance with these laws require future investments in ICT infrastructure, data backups, and systems to mitigate risks.

Challenges

i. Existing ICT systems lack modern cybersecurity features and there is inadequate integration of cybersecurity within energy infrastructure, with limited awareness and adoption of best practices;
ii. Inadequate safeguards from cyber threats such ransomware, phishing, and malware targeting critical infrastructure;
iii. Inadequate compliance to laws and regulations on data protection;
iv. Weak linkage and collaboration mechanism among sector institutions on ICT and cyber security;
v. The integration of smart grids, IoT devices, and digital tools without matching cyber security safeguards.

Opportunities

i. Availability of data protection laws which supports secure data sharing and management;
ii. Co-ordination with Office of the Data Protection Commissioner towards compliance with data protection regulations;
iii. Establishment of the energy sector Computer Emergency Response Team (CERT) that monitor and mitigate cybersecurity incidents on critical energy infrastructure;
iv. Regular security audits and vulnerability assessments to identify and address potential cyber threats;
v. The availability of AI and machine learning for threat detection and response;
vi. The availability of block-chain technology to secure energy transactions and grid management.

CHAPTER THREE: ENERGY POLICY STATEMENTS

3 Overview

This chapter outlines Kenya's energy policy statements, which provide strategic direction and actionable measures to address the challenges identified in the situation analysis. The policy interventions focus on key thematic areas, including electricity access, renewable energy development, clean cooking, energy efficiency, emerging technologies, and climate change mitigation. These policy statements aim to enhance energy security, promote sustainability, and ensure equitable energy access for all Kenyans.

3.1 Electricity Access

The country faces significant challenges towards achieving universal access to electricity. These are high grid expansion costs and modernization of ageing infrastructure that affects electricity stability, reliability and sustainability. Limited investment has slowed the development of mini-grids and off-grid solutions in remote rural areas. The Government is committed to provision of equitable, reliable, and sustainable energy for all Kenyans.

To achieve the above objective, the Government will:

i. Develop and implement the Least Cost Electrification Strategy for universal access to electricity;
ii. Finalize the regulatory framework for development and operation of mini grids and off-grid solutions that support innovative business models;
iii. Develop innovative pricing models to make connections and electricity tariffs more affordable for low income earners;
iv. Collaborate and partner with development partners and other financial institutions for electrification funding;
v. Modernize energy infrastructure, invest in renewable energy and implement smart technologies to improve reliability.

3.2 Development of Renewable Sources and Non-renewable Sources

3.2.1 Generation

The installed generation capacity as at December 2024 was 3,236 MW, with a net effective interconnected capacity of 3,082 MW, inclusive of wind and solar. The installed capacity is composed of 940 MW of geothermal, 838MW hydro, 605.8 MW fossil fuels, 435wind, 212.5MW solar, 200 MW import and 2MW co-generation.

3.2.1.1 Hydro Power

Hydropower development requires balancing the benefits of renewable energy generation with the need for environmental and social safeguards. There is need to achieve sustainable energy development goals while protecting and conserving the ecosystem.

To achieve this, the Government will:

i. Streamline and strengthen inter-agency collaboration for hydro project development;
ii. Develop and implement mechanisms to mitigate the adverse effects of climate change and enhance restoration of catchment areas;
iii. Provide adequate resources and mechanisms for the acceleration of hydropower development, mitigate environmental and social impacts;
iv. Leverage automation and emerging hydro technologies and invest in RDI to enable the harnessing of the varied hydro resources in the country.

3.2.1.2 Geothermal Power

Geothermal resources are important for the country's energy strategy and security, providing sustainable and reliable power generation with the potential for tremendous growth in direct-use applications and green industrialization. However, managing and developing these resources face many challenges and including long project lead times, substantial upfront capital investments and resource risk among others. The uncertainties and delays in geothermal resource development pose significant risks to the country's energy security.

As Kenya transitions to a liberalised power market, the Government intends to leverage on local capacity and expertise to accelerate the development of the geothermal resources while strengthening its regional leadership position. This is aimed at enhancing energy security and competitive electricity prices that will spur economic growth.

To achieve this objective, the Government will:

i. Strengthen the legal and regulatory framework to:
    a. Enforce the geothermal resource licensing and compliance mechanisms;
    b. Leverage local capacity and expertise to accelerate geothermal development, green industrialization and ensure energy security;
    c. Incentivize local innovation in geothermal technologies and solutions.
ii. Develop and operationalise the National Geothermal Development Strategy;
iii. Establish a legal and regulatory framework to enable the geothermal public institutions to develop, invest and own geothermal plants in the region.

3.2.1.3 Variable Renewable Energy (Wind and Solar)

VREs such as solar and wind power, are important in the global transition to sustainable energy systems. However, the intermittency of these resources necessitates optimal energy planning and integration measures for grid's reliability and stability. In Kenya, leveraging VREs aligns with national goals to diversify the energy mix, reduce carbon emissions, and foster energy access.

Kenya can unlock the full potential of VREs to support its sustainable development agenda by addressing challenges such as intermittency, waste management of VRES technologies, and over-dependence on imported technologies and storage solutions.

To achieve the above objective, the Government will:

i. Develop and implement mechanisms to support solar & wind integration;
ii. Establish an enabling environment to spur local manufacturing hubs to reduce import reliance;

iii. Establish and centralize a data management repository for VREs resources to ease stakeholders' and investors' access;
iv. Operationalize the Renewable Energy Auction Policy to improve VREs' competitiveness.

3.2.1.4 Thermal power

Power generation from fossil thermal plants in Kenya has been declining following development of more capacity from geothermal, wind and solar energy resources. Contracting of 200MW from Ethiopia has reduced thermal generation in line with the power sector goal of keeping the thermal generation at below 10% of the annual energy mix in order to minimize the cost of energy and also meet environmental goals on clean energy. However, the plants play a critical role in meeting the peak power demand and backing up other sources including the variable solar and wind. Further, thermal plants play a critical role in off-grid stations which serve commercial centers located far from the national grids. These centers are being hybridized with solar PV sources to minimise generation costs and emissions in line with national objectives.

To achieve the above objectives, the Government will:

i. Prioritise development of renewable energy sources over thermals but retain the current thermal plants until expiry of their contracts;
ii. Minimise dispatch from thermal plants to reduce the cost of energy;
iii. Continue to hybridize off-grid stations with solar and wind;
iv. Shift from heavy fuel oil to LNG for existing thermal plants and development of LNG plants for system flexibility in the event that flexible renewable energy options are not available.

3.2.1.5 Nuclear Energy

Introduction of nuclear power into Kenya's energy mix requires the development of the necessary framework and infrastructure. This relates to the safety aspects in development, construction, operation, maintenance, decommissioning, and waste management of the nuclear power program and related amenities. Developing a nuclear power programme in Kenya has notable challenges, due to the high capital investment for the infrastructure, technical expertise, public concerns about safety and environmental impacts. These obstacles necessitate strategic planning, robust stakeholder engagement, and clear policy frameworks to ensure the programme's feasibility, sustainability, and public acceptance while contributing to the nation's long-term energy security and low-carbon goals.

To achieve the above objectives, the Government will:

i. Establish and sustain governmental strategy, legal and regulatory frameworks towards the development, implementation and maintenance of a safe, secure and sustainable nuclear power programme;
ii. Establish a nuclear power plant owner and operator to initiate construction of a nuclear power plant and later operate the plant;

iii. Undertake capacity development and resourcing for sustainable nuclear infrastructure development and management of intricacies of atomic technology;
iv. Enhance public awareness campaigns on the safety and benefits of nuclear energy, which is a prerequisite for public buy-in and acceptance of nuclear programs;
v. Leverage the latest nuclear power technologies, such as small modular reactors scalable to Kenya's current grid size.

3.2.2 Transmission and Distribution

3.2.2.1 Transmission

A reliable and stable transmission network is necessary for efficient and adequate power supply. A stable transmission network enhances electricity access and power evacuation from generation plants to load centres. It also interconnects with neighbouring countries for power trade and system stability. The transmission network require continued upgrading and strengthening to reduce losses and improve the reliability and security of the power supply. Appropriate operation and maintenance guarantee the availability of the network for an uninterrupted power supply.

Therefore, to effectively and efficiently transmit power in the country, the Government will:

i. Expand, strengthen and modernise the transmission network to foster grid stability, resilience and reliability;
ii. Mobilize adequate funding for transmission infrastructure development, modernization, operation and maintenance;
iii. Enhance local expertise in transmission infrastructure operation and maintenance;
iv. Facilitate timely and cost-effective acquisition and management of land and wayleaves for transmission infrastructure and control encroachment of wayleaves;
v. Categorize transmission infrastructure as critical national assets to enhance safety and security of the infrastructure;
vi. Transfer the transmission assets from KPLC to KETRACO;
vii. Fast-track the formulation of Open Access and Bulk Supply Regulations.

3.2.2.2 Electricity Distribution

Kenya's electricity distribution system has expanded over the years, to meet the Government's objective of universal electricity access by 2030. The expansion of the distribution system with inadequate reinforcement has constrained supply reliable and quality electricity to customers. Rural electrification programmes by KPLC and REREC has expanded electricity access in rural areas. However, the tariff framework does not provide sufficient funds to meet the operation and maintenance requirements.

Therefore, to ensure a reliable and efficient distribution system, the Government will:

i. Prioritise investments in modernising and expanding the electricity distribution infrastructure to minimise power losses, improve system reliability, and support the growing electricity demand;

ii. Adopt innovative grid technologies and advanced metering infrastructure to improve operational efficiency and facilitate demand-side management;
iii. Enhance the resilience of the electricity distribution network against natural disasters, climate change impacts, and other disruptions;
iv. Promote decentralised systems such as mini-grids and solar home systems to complement the national grid in remote rural areas;
v. Facilitate open access to the distribution network to optimise network utilisation as the sector transitions to a competitive electricity market;
vi. Develop sustainable ownership and operational and maintenance modalities for rural electrification assets.

3.2.2.3 Electricity Retail

The country shall facilitate further development of electricity retail function to enhance the efficiency of energy distribution and supply and promote optimal utilization of resources. This shall ride on the enabling policies such as the open grid access, captive power, net-metering and the power market. In this regard, the government will:

i. Implement policies frameworks to facilitate competitive retail of electricity models with enhanced participation of private players;
ii. Encourage structuring of PPAs that allow generators to retail power to retail customers;
iii. Facilitate development of greenfield projects that support direct retailing and energy trade in local and regional power markets;
iv. Pursue public-private partnerships for energy bulk sale agreements with the national off-taker and downstream retailing by private energy supply companies;
v. Facilitate development and operationalization of a local energy market.

3.2.2.4 System Operations

System operations in Kenya face critical challenges that undermine grid reliability, resilience, and efficiency. These include; insufficient ancillary services to manage renewable energy intermittency, inadequate transmission infrastructure, reduced system inertia from decommissioned synchronous sources, and limited islanding capabilities. Additionally, there gaps in operational controls and a shortage of skilled personnel. There is need for a stable, efficient, and future-ready energy system capable of supporting Kenya's growing energy demands and renewable energy technologies.

Therefore, to meet the above objectives, the Government will:

i. Establish reliability/ancillary services to regulate the system and control intermittency from VRE generation;
ii. Facilitate investment in strengthening the transmission grid infrastructure to minimise system losses, improve the dispatch of competitive generation sources, and enhance the quality and reliability of services;

iii. Establish human capital incentives including specialized training programmes to improve technical skills and ensure a sustainable workforce for system operations.

3.2.2.5 Power Trade

Electricity markets are designed to provide reliable electricity at the least cost to consumers. A standard market design for wholesale electric markets aims to establish a common market framework that promotes economic efficiency and lowers delivered energy costs, maintains power system reliability, mitigates significant market power and increases the options for wholesale market participants. Planning and focus on basic market principles are key to achieve market objectives.

Therefore, to effectively and efficiently develop and operationalise power trade in the Country, the Government will:

i. Develop and gradually implement power market design and structure to guide market operations;
ii. Establish programmes to build and enhance market operations technical capacity in terms of skills and human resources;
iii. Prioritise and develop power infrastructure to promote power market operations and regional integration.

3.2.3 Captive Power and Net Metering

In Kenya, captive power plants and net metering mechanism have the potential to enhance energy security while supporting the integration of renewable energy in the grid. However, a connection framework for managing the integration process, operation, and monitoring of captive plants, as well as a compensation mechanism for ancillary services provided by the grid to the grid-tied captive power developers to guide the implementation, is required.

To achieve this, the Government will:

i. Establish guidelines for the integration, operation, and monitoring of captive power plants to ensure safe and efficient grid interactions;
ii. Develop compensation mechanisms for ancillary services provided to grid-tied captive power developers;
iii. Develop and implement technical standards and operational protocols to mitigate risks to grid stability and safety from captive plant operations.

3.2.4 Energy Storage Systems (ESS)

Energy Storage Systems (ESS) are essential for grid stability and reliability, as the country integrates more VREs into the power system. The Government has committed to achieving 100% clean energy by 2030, and ESS will contribute to these targets.

To achieve this, the Government will:

i. Develop innovative funding models with for finanancing ESS capital cost;
ii. Establish a regulatory and institutional frameworks and guidelines for energy storage development;
iii. Facilitate building local expertise through international collaboration on ESS;

iv. Establish a framework for the participation of the private sector in development and implementation of the ESS.

3.2.5 Reliability and Ancillary Services

Kenya has vast renewable energy resources. Due to increased VRE in the system and the grid extension, ancillary services are necessary to maintain system stability and integration of VREs. To achieve this, the Government will:

i. Establish regulatory framework and guidelines for reliability/ancillary services development, integration and compensation in the Kenyan power system;
ii. Collaborate with regional countries to harmonise ancillary service provision standards and regulations;
iii. Invest in training and capacity building to equip the sector's manpower with technical skills to manage RS effectively;
iv. Establish financing, collaboration and incentive frameworks to enhance AS in the Kenyan power system.

3.2.6 Power Market

The Kenya power system plays a central role in economic growth and improving the quality of life by providing electricity to households, social institutions, industries and businesses. The system is a single buyer model where KPLC procures power in bulk from generators through PPAs then distribute and retail it to consumers. There has been increased electrification in the country, but challenges in financial sustainability, infrastructure modernization, and regulatory adequacy exist. The Government is committed to reform the power market from a single-off-taker model to a competitive wholesale electricity market in order to improve the efficiency and sustainability of the sector.

To achieve the above objective, the Government will:

i. Develop a regulatory framework and roadmap to transition the power sector to a competitive power market;
ii. Develop a framework for wholesale and retail electricity market to enable bulk energy trading and provide consumers options for electricity suppliers;
iii. Strengthen the institutional framework to manage competition in the electricity market and provide equal opportunities to all market participants;
iv. Collaborate with the EAPP in regional power market design.

3.3 Clean Cooking and Bioenergy

3.3.1 Clean Cooking

Clean cooking reduces pollution and related respiratory diseases. Various underlying barriers limit the optimization of the clean cooking sub-sector's contribution to national climate obligations, and the achievement of access to clean cooking for all Kenyans by 2030. These barriers include: limited public financing; slow pace of integrating clean cooking measures in national and county planning

frameworks; and delays in operationalization of relevant legislative measures such as the energy funds. The supply and affordability gaps need to be resolved.

To address the challenges and leverage opportunities, the Government will:

i. Enable affirmative action towards the achievement of universal access to clean cooking by 2030 through implementation of the KNCTS and other supporting strategies while observing the principle of GESI;
ii. Establish a financing mechanism to fast track the implementation of the clean cooking access goal by 2030;
iii. Provide legislative and fiscal support to all social institutions and MSMEs to switch to clean cooking solutions by 2030;
iv. Support counties to mainstream clean cooking as part of integrated energy planning;
v. Mainstream cooking within broader energy sector initiatives, specifically electricity access, energy efficiency and grid strengthening projects;
vi. Review building guidelines and codes to enable construction and retrofitting of buildings to create clean cooking environments and reduce indoor air pollution;
vii. Establish programmes to enhance technical capacity of relevant agencies to develop and enforce regulations related to minimum energy performance standards for clean cooking appliances, including the establishment of testing laboratories;
viii. Adopt fiscal policies that support local manufacturing of clean cooking technologies;
ix. Enhance public awareness and capacity to accelerate the uptake of clean cooking solutions through behavior change;
x. Promote research and knowledge management for the clean cooking sector.

3.3.2 Liquefied Petroleum Gas and Natural Gas

The consumption of LPG is bound to grow with increasing population. The importation and distribution network are inadequate. Opportunities to increase the use of LPG in households and institutions are available and can be leveraged to help the country meet the set targets. The exploitation of natural gas resources needs to be enhanced to complement the importation of LPG. To enhance the uptake of LPG in households, institutions and SMEs, the Government will:

i. Develop adequate LPG infrastructure for importation, storage and filling including construction of a common user storage facilities for imported LPG to enhance reliability of supply;
ii. Promote competitive importation and pricing of LPG through Open Tender System (OTS) to enhance reliability of supply and address the pricing issues;
iii. Mobilize funding and build technical capacity to enforce compliance with the existing regulations;
iv. Review the existing building codes to include LPG reticulation for enhanced access;

v. Ensure compliance of LPG and related facilities to statutory requirements on safety, quality and standards;
vi. Promote diversified use of LPG for domestic, automotive and commercial purposes;
vii. Strengthen the legal and regulatory framework for the natural gas industry;
viii. Facilitate development and utilization of natural gas and the associated infrastructure.

3.3.3 Electric Cooking Solutions

There are good prospects for enhancing the uptake of electric cooking, based on the electricity access level and the number of households that have not yet adopted eCooking. The country has a green energy grid that can support increased demand for electric cooking. However, challenges of inadequate supply chain and tariff, unreliability of electricity supply and limited awareness are a constraint.

To address the challenges relating to the uptake of e-Cooking, the Government will:

i. Incentivize local manufacturers of energy efficient eCooking solutions;
ii. Initiate innovative financing programmes to develop supply chains for energy-efficient eCooking solutions;
iii. Facilitate the evolution of electrical supply and use infrastructure, and eCooking loads in parallel;
iv. Develop fiscal incentives to promote affordability of energy efficient eCooking solutions;
v. Strengthen eCooking appliance quality assurance ecosystem;
vi. Enhance awareness and develop skills and knowledge on energy efficient e-Cooking solutions.

3.3.4 Bioenergy

The present bioenergy subsector is unsustainable due to inefficient technologies, to harness the full potential of the industry as it remains in its nascent form. To address the challenges of the bioenergy value chains for cooking and heating, transport, SAFs, cogeneration, gasification and waste to energy through the following:

3.3.4.1 Bioenergy for Cooking and Heating

The exploitation of bioenergy for cooking and heating using biomass, biofuels and biogas has been low due to slow adoption in the country. To address this challenge the Government will:

i. Review the existing fiscal, legal, regulatory and institutional frameworks to promote diversified and sustainable application of biomass, biofuels and biogas solutions;
ii. Undertake data collection, comprehensive mapping and planning for biomass, biofuels and biogas;
iii. Promote measures to enhance local production of biomass, biofuels and biogas value chains development.

3.3.4.2 Bioenergy for Transport

The use of biofuels to decarbonize the transport sector is still not fully exploited in the country despite the country having a high potential to produce bioethanol and biodiesel for use in fuel

blending in the sector. To address this challenge and leverage on the opportunities the Government will:

i. Formulate and implement blending mandates for bioethanol and biodiesel;
ii. Promote local production of bioethanol and biodiesel for use in transport sector.

3.3.5 Cogeneration, Gasification and Waste to Energy

To address the challenges and leverage existing opportunities for power generation using cogeneration, gasification and waste to energy the Government will formulate and implement a measures to promote cogeneration, gasification and waste to energy initiatives.

3.3.6 Sustainable Aviation and Marine Fuels

SAFs is revolutionizing the aviation industry by offering a greener alternative to traditional jet fuels. Marine fuels also offer a decarbonization pathway in marine sector.

To enhance the use of SAFs in the aviation and marine industry the Government will:

i. Develop a framework for oversight and coordination of SAF and clean marine fuel production;
ii. Facilitate research and development to scale up the use of biofuels and green hydrogen;
iii. Strengthen international partnerships to align with global climate goals and technology advancements;
iv. Establish policies to integrate sustainable fuels into national energy strategies.

3.4 Demand Stimulation

Stimulating electricity demand, investments in energy generation and infrastructure will translate into tangible economic, social and environmental benefits.

To stimulate demand, the Government will;

i. Enhance collaboration within Government MDAs and the private sector to encourage demand stimulation like promotion of SEZ electricity;
ii. Invest in grid infrastructure modernization to increase stability and reliability to support economic activities;
iii. emerging technologies on e-appliances and e-cooking;
iv. Review the Time of Use tariff to reach more consumer categories;
v. Formulate electricity market, bulk supply and open access regulations and finalize the market design to enable energy exchange and competition.

3.5 Diverse and Productive Uses of Energy

The country has not fully exploited diverse and productive use of energy. There has been inadequate collaborative mechanism among stakeholders both public and private sector on DPUE.

To facilitate alignment, coordination and growth for DPUE, the Government will:

i. Develop and implement policies, strategies and regulations to promote DPUE including geothermal resources in collaboration with other sectors;
ii. Establish an intergovernmental multisectoral working group to coordinate implementation of DPUE;

iii. Develop appropriate incentives and fiscal measures to enhance promotion and adoption of DPUE technologies;
iv. Design and implement capacity building, awareness initiatives programs targeted at relevant stakeholders.

3.6 Emerging Technologies

Emerging technologies in the energy sector, such as green hydrogen, oceanic energy, IOT, carbon capture and advanced energy storage systems can address specific energy challenges such as enhanced grid stability, and diversified energy mix.

In this regard, the Government will:

i. Ensure funding of research and development of emerging technologies;
ii. Establish partnerships with the private sector, and international organizations to support emerging technologies development, knowledge transfer and capacity development;
iii. Invest in training programs to improve technical skills of workforce in emerging technologies.

3.7 Green Hydrogen

Green Hydrogen offers Kenya a transformative path to decarbonize key sectors, leveraging its renewable energy potential to achieve net-zero emissions. To promote the development of a green hydrogen economy, encompassing regulatory standards, and financial mechanisms to drive innovation, infrastructure development, and market growth while ensuring environmental sustainability and global competitiveness, the Government will;

i. Establish a centralized coordination framework to support the nascent green hydrogen industry by facilitating private and public sector green hydrogen investments, regulations, finance and investments;
ii. Establish contracts for difference to support offtake of green hydrogen and its derivatives by making it cost competitive by leveraging on global climate funds to bridge the cost gap between green hydrogen production and its fossil-fuel-based alternatives;
iii. Facilitate common infrastructure development by funding the development of hydrogen transport, storage, and export infrastructure to reduce logistical bottlenecks;
iv. Create opportunities for local value creation in the green hydrogen industry through strategic collaboration and capacity building.

3.8 Energy Transition and Climate Change

Kenya is experiencing the impacts of climate change as it's a global occurrence. The energy sector has been impacted directly by climate change effects. The generation of hydro power and other renewables sources has been reduced becoming unreliable and unavailable and there is the risk on energy security. By mitigating climate change, Kenya can reduce the intensity of its future risks and ensure energy security for the country. By reducing greenhouse gas emissions from energy uses, Kenya can slow down or even prevent further temperature rises and extreme weather events.

The government recognizes the important role that energy transition plays towards climate change mitigation and has developed the Kenya Energy Transition and Investment Plan. A just energy transition for Kenya will secure Kenya's energy independence and optimize the socio-economic benefits.

Towards a just energy transition, the Government will:

i. Develop a regulatory framework for the adoption of clean energy technologies;
ii. Promote the deployment of flexible technologies in industrial and power sectors to reduce carbon emissions;
iii. Mainstream energy transition in energy planning with a development framework around new value chains;
iv. Enhance knowledge and technical capacity development adoption of emerging low-carbon technologies.

3.8.1.1 Carbon Markets and Carbon Financing

In Kenya, carbon credits arise mainly from projects involving renewable energy, forestry, waste management, and agriculture. The country recognizes the importance of reducing emissions, mitigating climate change, and improving the quality of its environmental standards.

The Government will develop and implement a standardized framework for carbon markets in Kenya.

3.9 Critical Energy Minerals

Critical minerals could be central to Kenya's economy, offering significant potential for industrial growth, job creation, and increased export earnings. These minerals are essential for key sectors, such as renewable energy, electric vehicle manufacturing, and advanced technology. Despite their potential, critical minerals in Kenya remain under-exploited due to limited exploration, insufficient legal and regulatory framework, inadequate mining infrastructure, and insufficient investment in value addition. However, the Government recognises the strategic importance of these resources and is committed to harnessing them to boost economic growth and transform local renewable energy-related industrialization.

To achieve this objective, the Government will:

i. Develop a regulatory framework to integrate critical mineral exploitation with renewable energy development;
ii. Develop and implement regulations to spur investment in local processing;
iii. Strengthen government institutions to explore critical minerals and provide data to boost investor confidence;
iv. Develop and implement a critical mineral strategic plan to guide targeted and deliberate exploitation of these minerals.

3.10 Development of Critical Geo-energy Resources

3.10.1 Coal Resources for Energy Production

The country has coal reserves which have not been harnessed. The coal demand for use in high heat industrial processes will continue to increase. Reliance on imports may not be a sustainable due to the changing dynamics in energy supply systems globally. The country will benefit from sustainably exploiting the resource through clean coal technologies, to support its energy security. To achieve this objective, the Government will:

i. Promote sustainable development of coal resources to meet the country's energy requirements;
ii. Develop and implement measures to promote clean coal technologies to mitigate environmental impacts;
iii. Promote exploration and development of coal resources.

3.10.2 Natural Gas

The Government will:

i. Strengthen the legal and regulatory framework for the oil and gas sector to include the natural gas industry;
ii. Facilitate development and utilization of natural gas and associated infrastructure.

3.11 Energy Efficiency and Conservation

The Government has set a target of reducing the national energy intensity by 2.8% per year and enabling the country achieve a 32 % emission reduction by 2030 in line with its Sustainable Development Goal targets. However, the following issues still persist; the market remains dominated by low-efficiency appliances that are not covered in the existing MEPS; limited access to financing; lack of awareness and aging infrastructure.

To address these issues, the Government will:

i. Enhance coordination and resource mobilization of energy efficiency and conservation programs;
ii. Enhance implementation of energy efficiency and conservation programs in key economic sectors;
iii. Enhance knowledge and awareness on energy efficiency and conservation;
iv. Promote adoption of electric vehicles;
v. Mainstream energy efficiency and conservation in learning institutions.

3.12 Energy Financing, Pricing and Procurement

3.12.1 Energy Financing and Pricing

Kenya's energy sector requires a strategic and sustainable financing and pricing mechanism to ensure economic feasibility, financial viability, project bankability and investment security. To sustainably mobilize requisite financial resources, improve the investment climate, foster investor confidence, maintain viability of energy projects and improve financial status of energy utilities

and at the same time ensure cost-reflective tariffs, the Government will implement the following measures;

i. Explore and adopt viable and sustainable financing options from local and international sources to ensure cost effective utilization of locally available energy resources;
ii. Develop frameworks for sustainable innovative financing mechanisms such as PPPs, assets monetization, climate financing and local equity funds;
iii. Operationalize Consolidated Energy Fund and allocate adequate resources for both national and county levels;
iv. Adopt diversified internal revenue generation frameworks to increase revenue generation within the sector;
v. Provide targeted fiscal incentives, such as tax exemptions, subsidies, or grants, to support low-income households to ensure equitable access to energy;
vi. Provide adequate fiscal incentives and harmonize various charges levied on energy operations to create an attractive and predictable investment environment in the energy sector;
vii. Operationalize the draft Renewable Energy Auctions Policy for competitive pricing and improved risk management of renewable projects;
viii. Review of electricity tariffs every three years to ensure predictability, timely recovery and cost-reflective tariffs.

3.12.2 Power Procurement

Power procurement methods and mechanisms that enable price discovery, ensure cost efficiency and transparency in project selection are preferred for power procurement. This approach supports the growth of the renewable energy sector while balancing affordability, investor confidence and consumer protection.

To facilitate effective procurement of power projects, the Government will:

i. Develop and implement power procurement guidelines, standardized processes, and practices to enhance transparency and attract investments in the energy sector;
ii. Enhance collaboration between sectors and agencies to fast-track developments that increase electricity capacity expansion.

3.13 Integrated Energy Planning, Security and Devolution

3.13.1 Integrated Energy Planning

INEP will help the Government and other stakeholders to make investment decisions as well as using it as a tool for resource mobilization. INEP will define the country's energy development goals as well as the role of various stakeholders in the energy sector.

To enhance the integrated energy planning in the sector, the Government will:

i. Establish an institutional framework for integrated energy planning at the National and County level;

ii. Enhance knowledge and technical capacity of counties, ministries and other Government agencies in integrated energy planning;
iii. Mobilize financial resources for integrated national energy planning;
iv. Develop mechanism for implementation, monitoring and evaluation of energy plans;
v. Establish data management and governance structure in the energy sector;
vi. Establish mechanisms for regular stakeholder engagement to foster a shared understanding;
vii. Collaborate with research institutions, academia to undertake research, capacity building, technical assistance and innovation in to energy planning;
viii. Support use of geospatial tools and harmonize energy planning tools used for integrated energy planning at National and County level.

3.13.2 Energy Security

Enhancing energy security is a priority for the country. To achieve this, the Government will

i. Ensure the power development plan (LCPDP) factors various sources of energy in the long term to maintain a diverse energy mix;
ii. Facilitate public and private investment across the power supply value chain;
iii. Minimize dispatch of thermal plants and avoid development of non-renewable energy resources;
iv. Undertake feasibility studies for pumped hydro projects including identification of suitable sites;
v. Ensure development of adequate firm capacity in order to maintain at least 15% firm power generation capacity reserve above the peak demand annually, with national energy sources at no less than 10% of the annual peak or projected peak demand;
vi. Put in place adequate strategies for national energy independence to ensure firm power import contracts do not exceed 20% of the annual peak or projected demand in each year;
vii. Mobilize adequate investments towards development of strong national grid infrastructure and regional grid interconnections with neighboring countries for resilience, cross-border exchanges and flexibility.

3.13.3 Devolution

The primary objective of devolution is to re-align the two-tier governance system to ensure effective and efficient public service delivery. The National and County Governments continue to collaborate in implementation of energy programs. However, the Counties are yet to fully undertake their respective devolved energy functions due to inadequate financial resources, lack of dedicated energy units at the Counties, and inadequate coordination between the National and County Governments.

In order to achieve the objective of devolution of energy functions, the Government will support the Counties to;

i. Mobilize adequate financial resources for implementation of devolved energy functions;

ii. Establish their respective, dedicated energy directorates;
iii. Support Counties in building capacity to discharge their devolved energy functions;
iv. Promote development county specific energy policies and regulations;
v. Establish collaborative mechanism among strategic local and international partners and stakeholder to support counties undertake their energy mandate.

3.14 Enabling Frameworks

3.14.1 Land Acquisition

Kenya's energy sector faces significant challenges in land acquisition and management. These include inadequate legal frameworks, stakeholder disputes, and insufficient funding, compensation grievances, leading to delays in project implementation.

The Government will:

i. Develop and implement a standardized framework for land and wayleave acquisition for energy projects;
ii. Implement public sensitization and participation programs for energy projects and programmes.

3.14.2 Environmental Issues in Energy

Kenya's energy sector impacts the environment through greenhouse gas emissions, deforestation, biodiversity loss, and e-waste generation, while large-scale projects disrupt ecosystems and water resources. Conversely, droughts due climate change reduce hydropower generation and floods damage infrastructure. Lack of proper e-waste management infrastructure affects sustainability and compliance with global standards. Kenya's renewable energy potential supports sustainable development, aligned with the global energy transition.

To mitigate the environmental challenges and leverage on available opportunities, the Government will:

i. Develop and implement environmental sustainability framework for energy sector projects;
ii. Establish programmes to enhance energy sector technical capacity to comply with environmental management regulations.

3.14.3 Gender Equality, Diversity and Social Inclusion in Energy

GEDSI principles advocate for equal access and opportunities and removing the barriers of discrimination towards marginalized and vulnerable populations. There is insufficient GEDSI responsive institutional frameworks across the sector and gender mainstreaming into energy sector activities remains low and inadequate.

To address GEDSI challenges and leverage on available opportunities, the Government will:

i. Develop GEDSI Strategy and Action Plan;
ii. Collaborate with relevant stakeholders in promoting GEDSI in the energy sector;

iii. Build the capacity of the Ministries and its Agencies as well as Counties in GEDSI;
iv. Mobilize adequate financial resources for implementing specific GEDSI programmes/projects;
v. Create awareness on GEDSI in energy sector;
vi. Mainstream GEDSI in the Energy monitoring and evaluation framework.

3.14.4 Occupational Safety and Health (OSH)

The laws provide for fair labor practices and the right to a safe and healthy working environment and protection from hazardous conditions for workers in any industry. The energy sector in particular the electricity value chain from generation to retailing involves high-risk activities which require adequate mitigation measures.

To facilitate compliance with OHS requirements, the Government will:

i. Develop energy sector-specific OHS framework to address the unique challenges;
ii. Develop and implement work-life balance programs across the energy sector.

3.15 Research, Development and Innovation

3.15.1 Research Development & Innovation

Research and development in the energy sector is critical in order to optimally harness the vast resources and advance in the emerging technologies. By promoting technology development and manufacturing through RDI, the energy sector fosters a collaborative, innovative, and self-sufficient sector by integrating local technology manufacturing with coordinated research, knowledge sharing, and robust IP protection frameworks. This aims to lower the cost of electricity through targeted RDI initiatives that drive local industrialization, enhance the efficiency of energy production and distribution, and reduce dependency on imported energy technologies.

To address the RDI policy gaps, Government will:

i. Support the development of locally produced energy technologies such as solar panels, wind turbine parts, geothermal equipment, transmission & distribution equipment clean cooking equipment, and energy efficiency technologies to drive industrial growth and job creation;
ii. Prioritize research and innovation to develop cost-effective, locally made energy solutions and reduce reliance on imports;
iii. Establish platforms to link research with industrial applications and strengthen collaboration between academia, industry, and research institutions;
iv. Facilitate partnerships to commercialize energy innovations and lower production costs;
v. Provide intellectual property protection and commercialization support to bring local energy technologies to market.

3.15.2 Human Resource Development and Retention

Availability of a skilled and capable workforce is important to enhance the energy sector growth in view of new innovations in the sector. There is need to continually improve personnel skills and

institutional capacities through targeted training, skill development, and knowledge enhancement. Aligning training and development programs will ensure the workforce is equipped to handle emerging energy technologies and challenges, reduce skills gap by creating strategic workforce. Planning accordingly minimizes talent shortages, improve talent retention and enhance knowledge management systems, employee satisfaction and institutional memory.

To establish and retain a skilled workforce for the long-term growth of the energy sector, the Government will;

i. Establish a centralized framework to promote inter-institutional collaboration for skill and knowledge development in the energy sector;
ii. Establishment of a knowledge management framework and human resource retention plan in the energy sector;
iii. Promote recognition and accreditation of novel and innovative courses by professional bodies to support the adoption of new technologies and approaches;
iv. Foster linkages and partnerships between energy sector entities, academia, and research institutions to promote knowledge sharing for capacity building.

3.15.3 Cyber Security, ICT and Artificial Intelligence

3.15.3.1 Cybersecurity and Data Protection

The energy sector is reliant on digital systems and interconnected technologies to drive operational efficiency, reliability, and innovation. However, this digital transformation also exposes the sector to evolving cybersecurity threats that could compromise critical infrastructure, disrupt energy services, and expose sensitive data.

3.15.3.2 Artificial Intelligence

AI would be applied in energy systems to optimize energy production, consumption, and grid management by analyzing vast amounts of data to predict demand, forecast renewable energy generation, identify potential issues, and improve overall efficiency, particularly in areas like smart grids, demand response, and predictive maintenance, ultimately contributing to a more sustainable energy future. AI will be applied in prioritizing the optimization of energy production, distribution, and consumption while ensuring grid stability, sustainability, and consumer protection through robust regulatory frameworks and collaborative stakeholder engagement.

Recognizing these risks, the Government will;

i. Establish a comprehensive framework for coordinating cybersecurity and data protection measures, ensuring seamless integration across the energy sector;
ii. Enhance capacity-building initiatives and allocate adequate resources to effectively implement and maintain cybersecurity measures across all institutions in the sector;
iii. Strengthen collaboration among energy sector institutions to develop and implement robust business continuity and crisis management frameworks;
iv. Strengthen collaboration with regional and international entities to address cross-border cyber threats targeting energy infrastructure;
v. Adopt AI technologies in management of energy sector systems.

CHAPTER FOUR: FRAMEWORK FOR IMPLEMENTING ENERGY POLICY

4 Overview

This section provides coordination and administration mechanisms that specifies all institutions and their respective functions in this Policy implementation. It highlights institution, legal and regulatory reforms that will be undertaken for successful implementation of the Policy. The section will also describe the sources of funds to cater for the Policy activities and actions.

4.1 Coordination Framework and Administrative Mechanisms

The implementation of the NEP will adopt a coordinated, multi-sectoral approach, integrating efforts across government agencies, private sector stakeholders, energy sector associations, development partners, civil society organizations and other key sector actors. MoEP will provide leadership in coordinating sector operations and ensuring the effective implementation of the Policy objectives.

Table 1. presents an overview of the various institutions involved in the energy sector, detailing their roles and contributions toward achieving the Policy's goals.

Table 1. Functions of Institutions in Implementation of the Policy

No.	INSTITUTIONS	FUCTIONS OF INSTITUTIONS
1.	Ministry of Energy and Petroleum	i. Coordinate the following in the energy sector: • Policy and regulation development and management. • Sector resource mobilization and capacity building. • Establishment of national, regional and international partnerships. • Research, innovation and knowledge dissemination. • Coordinate and oversee integrated energy planning. ii. Oversight all energy sector entities and programmes. iii. Undertake oversight and implementation of the following functions in the sector: • National energy policy development and management; • Thermal power development; • Rural electrification programme; • Energy regulation, security and conservation; • Hydropower development; • Geothermal exploration and development; and • Promotion of renewable energy.

No.	INSTITUTIONS	FUCTIONS OF INSTITUTIONS
2.	Rural Electrification and Renewable Energy Corporation (REREC)	i. Oversee the implementation of the Rural Electrification Programme. ii. Manage the Rural Electrification Programme Fund. iii. Develop and update the rural electrification master plans in consultation with County Governments. iv. Support the establishment of Energy Centres in the counties. v. Undertake feasibility studies and maintain data for renewable energy resources. vi. Develop, promote and manage, the research and development and use of renewable energy and technologies (excluding geothermal). vii. Promote the development of appropriate local capacity for the manufacture, installation, maintenance and operation of renewable technologies.
3.	Geothermal Development Company (GDC)	i. Undertake geothermal resource development and management of steam fields. ii. Promote and develop direct uses of geothermal resources. iii. Develop human capacity for geothermal development. iv. Support Government in resource mobilization for geothermal development. v. Facilitate private sector entry by contracting geothermal resources and services to power producers and other users. vi. Early power generation through installation of well head generating units.
4.	Kenya Electricity Transmission Company Limited (KETRACO)	i. To plan, design, construct, operate and maintain the national high voltage electricity transmission grid and regional power interconnectors. ii. Facilitating national and regional power trading. iii. To be the System Operator.
5.	Kenya Electricity Generating Company (KenGen)	To generate electricity by developing, managing, and operating power plants.
6.	Kenya Power and Lighting Company (KPLC)	i. Plan for sufficient electricity generation and transmission capacity to meet demand. ii. Build and maintain the power distribution and transmission network. iii. Retail electricity to its customers. iv. Purchase of retail, bulk electricity from licensed generators.

No.	INSTITUTIONS	FUCTIONS OF INSTITUTIONS
7.	Energy Petroleum and Regulatory Authority (EPRA)	i. Regulate the generation, importation, exportation, transmission, distribution, supply, and use of electrical energy except for licensing of nuclear facilities. ii. Regulate importation, refining, exportation, transportation, storage and sale of petroleum and petroleum products. iii. Set, review and approve electricity and petroleum tariffs. iv. Monitor the conditions of contractors' operations and their trade practices in consultation with the relevant agencies. v. Protect consumer, investor and other stakeholder interests. vi. Work with the relevant statutory authorities to formulate, enforce and review environmental, health, safety and quality standards. vii. Collect and maintain energy and petroleum data. viii. Ensure that only energy efficient and cost-effective appliances and equipment are imported into the country in collaboration with relevant agencies.
8.	Nuclear Power and Energy Agency (NuPEA)	i. Lead Kenya's nuclear energy programme implementation. ii. Promote nuclear electricity generation development. iii. Undertake research, development and dissemination activities in the energy and nuclear power sector. iv. Strengthen human and institutional capacity in the sector.
9.	Energy and Petroleum Tribunal	Adjudicate and arbitrate disputes referred to it in the energy and petroleum sector.
10.	NEMA	i. To exercise general supervision and co-ordination over all matters relating to the environment. ii. Monitor and enforce compliance of environmental regulations. iii. Facilitate carbon trading and financing.
11.	County Governments	i. County energy planning. ii. Develop County energy policies and regulations. iii. Undertaking county energy functions in accordance with the laws and constitution.
12.	Parliament	i. Legislative oversight, representation and enactment of laws and regulations for the sector. ii. Approval and appropriation of the national energy sector budget.
13.	Judiciary	Resolution of disputes.

No.	INSTITUTIONS	FUCTIONS OF INSTITUTIONS
14.	Office of Attorney General and Department of Justice	The principal legal adviser to the Government on all legal matters.
15.	National Treasury and Economic Planning	i. Resource mobilization and budgetary allocation. ii. National planning and project monitoring and evaluation iii. Approval of programmes and projects. iv. Policy formulation and management of Government financial, accounting and public procurement and asset disposal standards.
16.	Other Government Institutions and Agencies	i. Collaboration in policy formulation and implementation. ii. Implementation of crosscutting projects and programmes according to their mandates.
17.	Research and academic institutions	i. Research, development, innovation and strategic collaborations and partnerships. ii. Training and capacity building.
18.	Media	Dissemination of information.
19.	Development Partners	i. Provide financial resources through technical assistance, grants, guarantees, facilities, loans, and innovative financing mechanisms. ii. Enhance technical and institutional capacities. iii. Facilitation of regional and international partnerships.
20.	Private Sector	i. Mobilize capital for energy infrastructure development. ii. Develop and apply innovative technologies to improve energy sector services. iii. Collaborate with the Government to implement energy projects and programmes. iv. Participate in the development and growth of various aspects of the energy sector value chain; generation, transmission, distribution and consumption.
21.	Civil Society Organizations	i. Influence the development and implementation of energy policies through advocacy to ensure inclusivity, sustainability, local content and responsiveness to community needs. ii. Facilitate community participation in energy sector matters, projects and programmes. iii. Monitor energy sector activities to promote transparency and good governance.
22.	Other players/Community	Participation in policy formulation and implementation. iv. Support sector initiatives.

4.2 Legal and Regulatory Framework

The Energy Act, 2019 and its attendant regulations provides a legal and regulatory framework that guides the energy Sector. The State Department for Energy will review the Energy Act, 2019 to align with the Reviewed Energy Policy.

4.3 Funding Arrangements

The financial resources required to implement the policy activities and actions will be sourced from the Government, development partners, private sector, civil society and other funding agencies. Resource mobilization will also entail leveraging on PPPs.

MoEP together with National Treasury will operationalize the CEF in order to mobilize additional resources for the sector.

CHAPTER FIVE: MONITORING, EVALUATION, LEARNING AND REPORTING

5 Overview

This section explains how the policy strategies and actions will be monitored and evaluated highlighting the data sources, timeframe for implementation of the identified strategies and actions and who is responsible for tracking the implementation of the Policy actions. It will also define the reporting channels within the organizations, dissemination of M&E results as well as the feedback mechanism from the public on the Policy implementation.

Effective implementation of this Policy requires establishment of a strong M&E Framework. The framework will ensure that the implementation of this Policy is undertaken according to the set budget/cost, time, and scope. It will also specify the indicators and their definition, baseline, target, data source, frequency and responsibility for data collection. M&E will provide a core set of tools that stakeholders will use to verify and improve the relevance, quality, efficiency, effectiveness impact and sustainability of this Policy. M&E will help in improving Policy design and implementation, as well as in promoting accountability and dialogue among the Policy makers and stakeholders.

5.1 Monitoring

Monitoring will be a continuous function entailing systematic collection and analysis of data on the specified indicators to establish the progress on achievement of the set goals and objectives outlined in this Policy. Monitoring reports will be prepared quarterly and annually to highlight the extent of progress with the set Policy goals and objectives as well as document the challenges, recommendations and lessons learnt. MoEP will coordinate the monitoring of implementation of this Policy.

5.2 Evaluation

Evaluation will involve collection of data and evidence on Policy to determine whether the Policy goals have been achieved and to inform the review or relevance of continual implementation of the Policy. Mid-term and End term evaluation will be done in a systematic and objective process to assess the level and extent of achievement of the set goals and objectives. This will provide an opportunity to ascertain if the interventions are coherent with the set goals and objectives and are implemented in an efficient manner. It will also assist in drawing conclusions, interrogating lessons learnt and building a knowledge base to inform future policy and decision making.

5.3 Risk Management

The process will involve categorization and prioritization of the risks based on the likelihood of occurrence and expected impact with suggested actions for mitigation. The risk matrix is highlighted in table 2.

Table 2. Risk Management Matrix

Risk	Impact	Likelihood	Mitigation
Change in global market dynamics that change supply and demand dynamics.	High	High	Enhance supply chain resilience frameworks for all players in the Country's energy sector.
Geo-political tensions that affect regional integration of power market and infrastructure.	High	High	Develop strategic reserves for key infrastructure.
Change of government priorities that invalidate previous resource allocations.	High	Medium	Seeking alternative funding sources from development partners.
Conflicting inter-sectoral policy goals.	High	Medium	Proactive engagement of other sectoral players to minimize the effect of conflicting goals.
Inadequate succession planning that ensures the availability of a robust and vibrant workforce.	High	Medium	Development and adoption of a human capital succession plan.
Stakeholder resistance that affects the implementation of the policy.	High	Medium	Enhance continuous monitoring and evaluation of stakeholders' concerns.
Resource variability due to sudden changes in weather patterns and events.	High	Low	Development of reliability/ancillary services to enable the grid to withstand the resulting shocks.

5.4 Reporting

Quarterly and annual progress reports will be prepared based on the National M&E reporting system. The State Department for Energy will coordinate the reporting and dissemination of the reports. Dissemination of the reports to stakeholders will be undertaken quarterly on several platforms including websites and in stakeholder engagement forums at both National and County levels.

5.5 Learning

Learning will be integrated into every aspect of the Policy design and implementation in order to create a culture of learning. The information generated from M&E will be analyzed and applied towards the achievement of the set Policy goals and objectives. Learning will provide information on what worked and what needs adjustment during the implementation process to improve on the subsequent processes to enhance effectiveness. This will involve identification, documentation and dissemination of best practices for replication and scaling up.

5.6 Policy Review

This Policy will be reviewed after every five years or any such other period as may be determined by MoEP. Policy review will be prompted by clear indication that the Policy is not meeting its intended objectives, is misaligned with current realities, or needs to adapt to new circumstances.

ANNEXES

IMPLEMENTATION PLAN

1. Electricity Access

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
Policy Goal/Objective: Achieve universal electricity and clean cooking access by 2030.								
Statement 1: To ensure all Kenyans have access to reliable, quality and sustainable electricity.								
i.	Develop and implement the Least Cost Electrification Strategy for universal access to electricity.	National Electrification Strategy.	Number of connections made every year.	2025 - 2034	50	• GoK • Development Partners	• SDE	• All SAGAs in MoEP • Private Sector
ii.	Finalize the regulatory framework for development and operation of mini grids and offgrid solutions that support innovative business models.	Mini grid Regulations.	Licensed mini grids plants developed.	1 year	20	• GoK • Development Partners	• EPRA • SDE	• AG Office • Kenya Power • REREC • Private Sector
iii.	Develop innovative pricing models to make connections and electricity tariffs more	Innovative pricing models.	Number of connections made from low income earners.	2 years	10	• GoK • Development Partners	• SDE	• National Treasury • EPRA • KPLC • REREC

	affordable for low income earners.							• Private Sector
iv.	Collaborate and partner with development partners and other financial institutions for electrification funding.	Collaboration /partnership frameworks partners.	Amount of funding available for electrification.	2025 - 2034	5	• GoK • Development Partners	• SDE • National Treasury	• EPRA • Kenya Power • REREC • Private Sector
v.	Modernize energy infrastructure invest in renewable energy and implement smart technologies to improve reliability.	Modern infrastructure.	Number of new power plants, mini grids, substations and length of transmission and distribution lines constructed.	2025 - 2034	1000	• GoK • Development Partners	• SDE • National Treasury	• EPRA • KPLC • REREC • KETRACO • Private Sector

2. Hydro Power

Policy Statement	**Expected Output**	**Key Performance Indicators**	**Time Frame**	**Estimated Cost (Ksh. Million)**	**Funding Sources**	**Responsibility**	
						Lead	**Support**
Policy Goal/Objective: Promote renewable energy resource development and utilization.							

Statement 1: To promote and harness the hydro resources towards enhancing the generation mix.								
i.	Streamline & strengthen inter-agency collaboration for hydro project development.	An interagency working framework.	Time taken to process, approval and develop the hydro projects.	2025-2034		• GOK • Development Partners	• SDE	• KenGen • KPLC • EPRA • SDW • SDECC
ii.	Develop and implement mechanisms to mitigate the adverse effects of climate change and enhance restoration of catchment areas.	Climate change mitigation and catchment restoration framework.	Number of restored catchment and increased water flow to the reservoirs.	1 year		• GOK • Development Partners	• SDE	• KenGen • KPLC • EPRA • SDW • SDECC
iii.	Provide adequate resources and mechanisms for the acceleration of hydropower development, mitigate environmental and social impacts.	Resources available for development of hydropower plants.	Number of hydropower plants developed.	2025-2034		• GoK • Development Partners • Private sector	• SDE • National Treasury	• KenGen • Private Sector
iv.	Work with other Government agencies to streamline levies imposed on hydropower.	Levies/charges imposed following consultations.	Number of levies harmonized.	1 Year		• GoK • Development Partners • Private sector	• SDE • National Treasury	• KenGen • KPLC • EPRA • SDW • SDECC

3. Geothermal Power

	Policy Statement	**Expected Output**	**Key Performance Indicators**	**Time Frame**	**Estimated Cost(Ksh. Million)**	**Funding Sources**	**Responsibility**

							Lead	Support
	Policy Goal/Objective: Promote renewable energy resource development and utilization.							
	Statement 1 : To accelerate the development of geothermal resources.							
i.	Enhance the legal and regulatory framework for enforcement of the geothermal resource licensing and compliance.	New geothermal regulations.	Number of geothermal regulations developed. Number of new concessions allocated.	3 years	100	• GoK • Development partners	• SDE	• GDC • EPRA • KenGen • Development partners
ii.	Leverage on the local expertise and capacity to accelerate geothermal resources development and ensure energy security.	Institutional capacity engagement & utilization framework.	Published institutional capacity engagement & utilization framework. Number of experts from geothermal institutions actively engaged in exploitation of green geothermal fields.	2 years	30	• GoK • Development partners	• SDE	• GDC • EPRA • KenGen • Development partners
iii.	Incentivize local innovation in geothermal technologies and solutions.	National geothermal industrialization & innovation strategy.	Published national geothermal industrialization & innovation strategy. Increase in % of geothermal research funding into geothermal training centres. Number of tax breaks/ grants/subsidies provided for local geothermal manufacturing.	2025	100	• GoK • Development partners	• SDE	• GDC • EPRA • KenGen

iv.	Develop and operationalise the national geothermal development strategy.	Geothermal development strategy.	Publishing of the national geothermal development strategy. Number of months taken to operationalize the geothermal development strategy. Number regulations developed to operationalise the geothermal development strategy.	2 years	50	• GoK • Development partners	• SDE	• GDC, • EPRA • KenGen
v.	Establish a legal and regulatory framework to enable the geothermal public institutions to develop, invest and own geothermal plants in the region.	Regional geothermal institutional investment & governance regulations.	Number of geothermal bilateral agreements in the region. Number of geothermal projects undertaken in the region.	3 years	50	• GoK • Development partners	• SDE	• GDC • EPRA • KenGen

4. Variable Renewable Energy (Wind and Solar)

Policy Statement		**Expected Output**	**Key Performance Indicators**	**Time Frame**	**Estimated Cost(Ksh. Million)**	**Funding Sources**	**Responsibility**	
							Lead	Support
Policy Goal/Objective: Promote renewable energy resource development and utilization. **Statement 1: To accelerate the development of variable renewable energy.**								
i.	Develop and implement mechanisms to support solar & wind integration.	Investment in wind and solar plants.	Number of wind and solar regulations and guidelines established.	2025-2024	50	• GOK • Development Patners • Private Sector	• SDE • KETRACO • KPLC • EPRA	• Kengen

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost(Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
ii	Require all new VRE power plants to have an embedded ESS to improve dispatch-ability of their electricity output.	Solar/wind projects with embedded ESS.	Number of wind and solar power plants with embedded ESS.	5 years	5000	• GOK • Development Patners • Private Sector	• SDE	• KPLC • KenGen
iii	Establish an enabling environment to spur local manufacturing hubs to reduce import reliance.	Improved environment for local manufacturers.	Number of local manufacturing hubs for solar/wind equipment established.	5 years	500	• GoK • Development Partners	• SDE	• KPLC • KETRACO • KenGen • KAM
Iv	Establish and centralise a data management repository for VRE resources to ease stakeholders' and investors' access.	A central data management repository.	A centralised data management repository established.	2 years	100	• GoK • Development Partners	• SDE	• SAGAs in MoEP • Private sector • Development partners
iv.	Revise the FiT Policy and operationalise the Renewable Energy Auction Policy to improve VRE's competitiveness.	Revised FiT Policy and Renewable Energy Auction Policy.	Number of solar and wind projects procured under the Renewable Energy Auction Policy.	1 Year	100		• SDE • Private Sector	• The National Treasury • EPRA • KPLC • KETRACO

5. Nuclear Energy

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
	Policy Goal/Objective: Achieve universal electricity and clean cooking access by 2030.							
	Statement 1: Promote development and maintenance of nuclear energy programme.							
i.	Establish governmental strategy, legal and regulatory frameworks for a safe and sustainable nuclear power programme.	Nuclear strategy. Nuclear regulations. Financing and resourcing strategy.	Nuclear development & financing strategy established. Regulations developed.	2025 - 2035	400	• GoK • Development partners	• SDE • KNRA	• NuPEA
ii.	Establish a nuclear power plant owner and operator to initiate construction of a nuclear power plant.	Nuclear own operating company.	Nuclear operator established.	2 years	100	• GoK	• SDE	• NuPEA
iii.	Capacity development and resourcing for sustainable nuclear infrastructure development.	Financing strategy trained nuclear professionals. Optimal placement of nuclear experts.	Human resource allocation & optimization. Number of local nuclear experts.	2025 - 2034	800	• GoK • Development partners	• SDE • NuPEA	• SAGAs in MoEP • KNRA • MoE
iv.	Enhance public awareness campaigns on the safety and benefits of nuclear energy.	Stakeholder engagement. Public awareness.	Public campaigns and sensitization forums undertaken. Stakeholder engagement strategy developed.	2025 – 2035	800	• GoK • Development partners • Private Sector • Non-State actors	• NUPEA • SDE	• SAGAs in MoEP • CoG • Development Partners

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
								• Private Sector • Non-State actors • Local Communities
v.	Leverage the latest nuclear power technologies, such as small modular reactors scalable to Kenya's current grid size.	Feasibility studies.	Feasibility evaluation undertaken. Modular reactors developed.	2025 – 2035	800	• GoK • Development partners • Private Sector • Non-State actors	• NuPEA • SDE • County Governments	• SAGAs in MoEP • CoG • Development Partners • Private sector

6. Electricity Transmission

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
	Policy Goal/Objective: Develop and modernize energy infrastructure.							
	Statement 1: Facilitate development and extension of the electricity transmission system in the country.							

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
i.	Expand, strengthen and modernise the transmission network to foster grid stability, resilience and reliability.	Electricity transmission infrastructure developed & strengthened	Length of transmission lines developed. Transformation capacity (MVA) developed.	2025-2034	700,000	• GoK • Development partners • Private sector	• KETRACO	• MOEP • SAGAs in MoEP • National Treasury • CoG • MLPP • MINGC
ii.	Mobilize adequate funding for transmission infrastructure development, modernization, operation and maintenance**.**	Financial resources mobilized.	Amount mobilized through exchequer, private sector and internal revenue.	2025-2034	750,000	• GoK • Development partners • Private sector	• KETRACO	• MOEP • SAGAs in MoEP • National Treasury • CoG • MLPP • MINGC
iii.	Enhance local expertise in transmission infrastructure operation and maintenance.	Transmission network effectively and efficiently operated and maintained.	Availability (%) of transmission infrastructure.	2025-2034	100,000	• GoK • Development partners • Private sector	• KETRACO	• MOEP • SAGAs in MoEP • National Treasury • CoG • MLPP • MINGC
iv.	Facilitate timely and cost-effective acquisition and management of land and wayleaves for transmission	Land and wayleaves timely acquired prior to project implementation.	Land and wayleaves timely acquired.	2025-2034	50,000	• GoK • Development partners • Private sector	• KETRACO	• MOEP • SAGAs in MoEP • National Treasury

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
	infrastructure and control encroachment of wayleaves.	Land and wayleaves effectively and efficiently managed Land and wayleave acquisition legal framework developed.	Land and wayleave acquisition legal framework.					• CoG • MLPP • MINGC
v.	Categorize transmission infrastructure as critical national assets to enhance safety and security of the infrastructure.	Security and safety of the transmission infrastructure enhanced. Partnerships with national security agencies established Public sensitization programmes implemented.	Percentage reduction in vandalism incidents.	3 years	50	• GoK • Development partners • Private sector	• KETRACO	• MOEP • SAGAs in MoEP • National Treasury • CoG • MLPP • MINGC
vi.	Transfer the transmission assets from KPLC to KETRACO.	KPLC transmission assets transferred to KETRACO.	The transmission assets transferred.	1 year	10	• GoK • Development partners • Private sector	• KETRACO	• MOEP • SAGAs in MoEP • National Treasury • CoG • MLPP • MINGC
vii.	Fast-track the formulation of Open Access and Bulk Supply Regulations.	Published regulations.	Open Access and Bulk Supply Regulations gazettement.	1 year	5	• GoK • Development partners • Private sector	• KETRACO	• MOEP • SAGAs in MoEP • National Treasury

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
								• CoG • MLPP • MINGC

7. Electricity Distribution

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (KSh. Million)	Funding Sources	Responsibility	
							Lead	**Support**
	Policy Goal/Objective: Develop and modernize energy infrastructure.							
	Statement 1: Facilitate development of the electricity distribution system in the country.							
i.	Prioritise investments in modernising and expanding the electricity distribution infrastructure.	Facilitate development of a modern electricity distribution network.	Universal access to electricity. Increased system efficiency-reduced system losses. Increased electricity demand. Facilitate private sector investments in the distribution system.	3 years	1000	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• National Treasury • SAGAs in MoEP • COG
ii.	Adopt innovative grid technologies and	Increased system efficiency.	Reduced power losses.	3 years	500	• GoK	• MoEP	• National Treasury

	advanced metering infrastructure to improve operational efficiency.	Increased customer satisfaction.	Growth in electricity demand Competitive electricity tariffs.			• Development partners • Private Sector • Non-State Actors		• SAGAs in MoEP • COG
iii.	Enhance the resilience of the electricity distribution network.	Increased power supply reliability	Reduced outages. Increased electricity demand.	5 years	500	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• National Treasury • SAGAs in MoEP • COG
iv.	Promote decentralised systems such as mini-grids and solar home systems.	Electricity access.	Increased access to electricity. Reduced fossil fuel usage and pass through charges.	2030	500	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• National Treasury • SAGAs in MoEP • COG
v.	Facilitate open access to the distribution network to optimise network utilization.	Enhanced system efficiency in power generation, distribution and retail.	Electricity retail market. Competitive electricity tariffs. Increased distribution efficiency. Increased private sector investment.	2029	100	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• National Treasury • SAGAs in MoEP • COG

8. Electricity Retail

Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost	Funding Sources	Responsibility

					(Ksh. Million)	Lead	Support
Policy Goal/Objective 3: Achieve universal electricity and clean cooking access by 2030.							
Statement 1: Facilitate establishment of downstream ESCOs and a competitive electricity retail market in Kenya.							
i.	Implement policies frameworks to facilitate competitive retail of electricity models with enhanced participation of private sector players.	Enabling environment for establishment of a competitive electricity retail market.	Number of regulations and policies established.	3 years	100	• GoK • Development partners • Private Sector • Non-State actors	• SDE • County Governments	• SAGAs in MoEP • CoG
ii.	Encourage structuring of PPAs that allow generators to retail power to customers.	Flexible power purchase contracts with direct retail and power wheeling.	PPAs templates developed.	2	10	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • CoG
iii.	Facilitate development of greenfield projects that support direct retailing and energy trade in local and regional power markets.	New investment in renewable energy generation for direct retail and energy market.	New generation projects developed for direct energy retail to customers.	2025-2034	100	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • COG
iv.	Pursue public-private partnerships for energy bulk sale agreements with the national off-taker and downstream retailing by	Establishment of ESCOs at the bottom of the power supply business.	Number of bulk supply contracts.	3 years	100	• GoK • Development partners • Private Sector	• SDE	• SAGAs in MoEP • COG

	private energy supply companies (ESCOs).					• Non-State Actors		
v.	Facilitate development and operationalization of a local energy market.	Establishment of a competitive electricity retail market.	Local electricity retail market.	2027	200	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • CoG

9. System Operations

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
	Policy Goal/Objective: Encourage local and regional energy trade. **Statement 1: Maintain a stable and reliable power grid by controlling the flow of electricity across the transmission system.**							
i.	Develop and modernize System Operation infrastructure.	National System Control Centre (NSCC) developed.	NSCC	4 years	11,500	• National Treasury • Development partners	• KETRACO	• National Treasury • MoEP • KPLC
ii.	Establish reliability/ancillary services to regulate the system and control intermittency from VRE generation.	Reliability & ancillary services established.	Regulations established.	2 years	100	• GoK • Development partners	• EPRA	• SAGAs in MoEP • MoEP

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
iii.	Facilitate investment in the transmission grid infrastructure to minimise system losses and enhance the quality and reliability of services.	Modern reliable transmission grid.	Reduced system losses.	2025-2034	50000	• GoK • Development partners • Private sector	• MoEP	• SAGAs in MoEP • KETRACO
iv.	Establish human capital incentives including specialized training programmes to improve technical skills and ensure a sustainable workforce for system operations.	Skilled workforce in system operations.	Number of experts skilled in system operations.	2025-2034	100	• GoK • Development partners • Private sector	• KETRACO	• MoEP • National Treasury

10. Power Trade

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost	Funding Sources	Responsibility	
							Lead	Support
	Policy Goal/Objective: Encourage local and regional energy trade. **Statement 1: To promote regional sale of electricity towards optimizing costs and integration of variable renewable energy.**							

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost	Funding Sources	Responsibility	
							Lead	Support
i.	Develop and gradually implement power market design and structure to guide market operations.	Trading rules, regulations and guidelines developed. Power market institutional framework formulated. Open Access Market Structure developed and adopted.	Trading rules, regulations and guidelines. Power market institutional framework. Open access market structure.	2 years	200	• GoK • EPRA • Development partners • Private sector	• EPRA	• MOEP • SAGAs in MoEP
ii.	Establish programmes to build and enhance market operations technical capacity in terms of skills and human resources.	Power market expertise trained.	% Power market staff trained.	2 years	50	• GoK • Development partners • Private sector	• MoEP	• EPRA • KPLC • KETRACO
iii.	Prioritise and develop power infrastructure to promote power market operations and regional integration.	Power interconnectors developed and modernized. Power interconnectors operated and maintained.	Length in KMs of Power interconnectors developed.	2025-2034	5000	• GoK • Development partners • Private sector	• MoEP	• MOEP • KETRACO • EPRA • KPLC

11. Captive Power and Net Metering

Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Millions)	Funding Sources	Responsibility	
						Lead	Support

Policy Goal/Objective: Promote renewable energy resource development and utilization. **Statement 1: To enable prosumers earn credits for excess energy they contribute to the grid and reduce costs on battery storage.**								
i.	Establish guidelines for the integration, operation, and monitoring of captive power plants to ensure safe and efficient grid interactions.	Guidelines for integration, operation, and monitoring of captive power plants.	Guidelines on captive power established.	1 year	20	• GoK • Development Partners	• EPRA • SDE	• KPLC • KETRACO
ii.	Develop compensation mechanisms for ancillary services and other grid services provided to grid-tied captive power developers.	Compensation mechanisms for ancillary services.	Number of power plants compensating the offtaker for ancillary services and other grid services provided.	1 year	30	• GoK • Development Partners	• EPRA • SDE	• KPLC • KETRACO
iii.	Develop and implement technical standards and operational protocols to mitigate risks to grid stability and safety from captive plant operations.	Technical standards and operational protocols developed and implemented.	Technical report on grid stability and safety operations of captive plant.	3 years	50	• GoK • Development Partners	• EPRA • SDE	• KPLC • KETRACO

12. Energy Storage Systems

Policy Statement	Expected Output	Responsibility

			Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Lead	Support
Policy Goal/Objective: Promote renewable energy resource development and utilization. **Statement 1: To effectively balance the supply and demand improving power quality and reliability.**								
i.	Develop innovative funding models with for financing ESS capital cost.	Financing Models.	Number of ESS developed.	5 years	10	• GoK • Development Partners	• SDE	• EPRA • KPLC • KETRACO • KenGen
ii.	Establish a regulatory and institutional frameworks and guidelines for energy storage development.	Regulations/ guidelines for energy storage.	Regulations/ guidelines for energy storage developed.	2 years	50	• GoK • Development Partners	• SDE	• EPRA • KPLC • KETRACO • KenGen • Private sector
iii.	Facilitate building local expertise through international collaboration on ESS.	Capacity building and training of local experts.	Number of Local Experts trained.	2 years	100	• GoK • Development Partners	• State Department	• EPRA • Kenya Power • KETRACO • KenGen • Private sector
iv.	Establish a framework for the participation of the private sector in development and implementation of the ESS.	A framework for participation on development & implementation of ESS.	Number of ESS developed and implemented.	2 years	50	• GoK • Development Partners	• SDE • EPRA	• KPLC • KETRACO • KenGen • Private sector

13. Reliability and Ancillary Services

Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
						Lead	Support
Policy Goal/Objective: Develop, modernize and optimize energy infrastructure. **Statement 1: Maintain voltage levels within acceptable limits across the grid.**							
i. Establish regulatory framework and guidelines for reliability/ancillary services development, integration and compensation in the Kenyan power system.	Regulatory and guideline framework for ESS.	Regulations and guideline developed.	2 years	50	• GoK • Development Partners	• EPRA • SDE	• KPLC • KETRACO • KenGen • Private sector
ii. Collaborate with regional countries to harmonise ancillary service provision standards and regulations.	EAPP electricity market framework for ancillary services.	Amount of ancillary services traded between Kenya and interconnected countries,	3 years	50	• GoK • Development Partners	• State Department	• EPRA • KPLC • KETRACO • KenGen • Private sector
iii. Invest in training and capacity building to equip the sector's manpower with technical skills to manage AS effectively.	Training and capacity building forums.	Number of experts trained.	3 years	100	• GoK • Development Partners	• SDE	• EPRA • KPLC • KETRACO • KenGen • Private sector
iv. Establish financing, collaboration and incentive frameworks to enhance AS in the Kenyan power system.	Financing, collaboration and incentive framework.	Financing, collaboration and incentive framework established.	3 years	50	• GoK • Development Partners	• EPRA • SDE	• KPLC • KETRACO • KenGen • Private sector

14. Clean Cooking

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (KSh. Million)	Funding Sources	Responsibility	
							Lead	**Support**
	Policy Goal/Objective: Achieve universal electricity and clean cooking access by 2030.							
	Policy Statement: Increased access to clean cooking solutions.							
i	Enable affirmative action towards the achievement of universal access to clean cooking by 2030 through implementation of the KNCTS and other supporting strategies while observing the principle of GESI.	Enhanced coordination in implementing the universal access to clean cooking goal. Supply & demand side incentives.	A Clean Cooking Implementation Unit. Supply & demand side incentives. Use of carbon credits to finance clean cooking. Use of revenues from carbon credits to finance clean cooking solutions.	2025-2030	5000	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• IMC • Development Partners • Private Sector • National Treasury • MSMEs • Communities • MECCF • NEMA
ii	Establish a financing mechanism to fast track the implementation of the clean cooking access goal by 2030.	Budgetary allocation for clean cooking.	Budget-line for clean cooking established. Clean cooking financing mechanism established.	5 years	500	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• National Treasury • KFS • MoE • MoH • KPS
iii	Provide legislative and fiscal support to all social institutions and MSMEs to switch to clean cooking solutions by 2030.	A regulation to promote the use of clean cooking. solutions in all social institutions. A sustainable clean cooking fuels and technologies market.	Institutional transition to clean cooking solutions. Regulation and guidelines for cleaning cooking. Institutions established as hubs for the supply of clean cooking solutions.	3 years	1000	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• National Treasury • KFS • MoH • MoE • KPS • MECCF • EPRA

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (KSh. Million)	Funding Sources	Responsibility	
							Lead	Support
			Studies and reports published on taxation of clean cooking solutions.					• KPLC
iv	Support counties to mainstream clean cooking as part of integrated energy planning.	CEPs that incorporate clean cooking. Coordinated planning for clean cooking initiatives in the energy.	Investment plans for clean cooking developed. Clean cooking factored in INEP. LCPDP and CEP Committee engagements.	5 years.	340	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• COG • LCPDP Committee • CoG • Development Partners • Private Sector
v	Mainstream cooking within broader energy sector initiatives, specifically electricity access, energy efficiency and grid strengthening projects.	Cooking embedded within electricity access, energy efficiency. Clean cooking aligned to public health, deforestation reduction, and climate change objectives. Increased share of LPG, ecooking, biogas, sustainable solid biomass, bioethanol, clean cooking and heating technologies in the cooking energy mix.	Electricity sector projects with cooking components. Demand stimulation through eCooking. The contribution of clean cooking to the targets for health, environment and climate change under the national obligations. % of LPG, bioethanol ecooking biogas sustainable solid biomass and merging clean cooking and heating technologies in the cooking fuel mix.	5 years	2000	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• SAGAs in MoEP • COG • SDP • KFS • MECCF • MoH • MECCF • IMC • SDP
vi	Support the review building guidelines and codes to enable	Reviewed building guidelines and codes promoting clean	Enforcement and conformity to the building guidelines.	5 years	200	• GOK • Development partners	• SDE	• IMC • NCA • NEMA

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (KSh. Million)	Funding Sources	Responsibility	
							Lead	Support
	construction and retrofitting of buildings to create clean cooking environments and reduce indoor air pollution.	cooking environments and minimizing HAP.	Number of counties adhering to the guidelines and codes.			• Climate Finance • Private Sector		• COG
vii	Establish programmes to enhance technical capacity of relevant agencies to develop and enforce regulations related to minimum energy performance standards for clean cooking appliances, including the establishment of testing laboratories.	Harmonised regulations to support sustainable biomass value chains. MEPS Standards developed. MEPS testing labs established.	Number of regulations harmonized. Number of trained experts on regulatory aspects. MEPS standards developed. MEPS testing lab established.	1 year	2000	• GOK • Development partners • Climate Finance • Private Sector	SDE	• MECCF • IMC • KFS • KEFRI • NEMA • EPRA • KEBS • Research Institutions & Universities • KIRDI • KWS
viii	Develop fiscal policies that support local manufacturing of clean cooking technologies.	Increased volumes and brands of locally produced clean cooking technologies.	Quotas designated in SEZs for local manufacturing of clean cooking technologies. % Share of cooking technologies produced in Kenya.	5 years	50	• GOK • Development partners • Climate Finance • Private Sector	SDE	• MoE • IMC • Research Institutions
ix.	Enhance public awareness and capacity to accelerate the uptake of clean cooking solutions through behavior change.	A reviewed BCC Strategy. Percentage of Kenyans aware of sustainable	Percentage of Kenyans aware of clean cooking.	5 years	2500	• GOK • Development partners • Climate Finance	SDE	• Media • MoI • MSMEs • MoH • COG

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (KSh. Million)	Funding Sources	Responsibility	
							Lead	Support
		firewood and charcoal production and processing. Percentage conversion to sustainable biomass solutions.	Percentage of Kenyans using clean cooking solutions. Number of operational clean cooking hubs. Number of national and grassroots awareness raising programmes on clean cooking. Communities trained on sustainable tree management for firewood and charcoal production, circular bio-economy and recovery practices.			• Private Sector		• Social Institutions • Communities • MECCF • SDI • MoA • Research & academic Institutions • CoG • Local Communities
x.	Promote research and knowledge management for the clean cooking sector.	A knowledge management platform for clean cooking. Clean cooking reports mainstreamed into national planning. Processes and reporting.	A knowledge management hub for the cooking sector developed. KPIs for the cooking sector. A cooking sub-sector Knowledge Management Committee. NDC carbon registry for clean cooking.	5 years	4000	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• COG • Development Partners • Research & academic institutions • Private sector • Local communities • IMC

15. Demand Stimulation

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Kshs. Millions)	Funding Sources	Responsibility	
							Lead	Support
Policy Goal/Objective: Promote energy efficiency and conservation.								
Statement 1: To promote demand of electricity by households and industries particularly during off peak.								
i	Enhance collaboration within Government MDAs and the private sector to encourage demand stimulation like promotion of SEZ.	A collaboration framework for promotion of demand stimulation activities.	Percentage increase of demand in the national grid.	2 years	50	• GoK • Development Partners	• SDE • National Treasury	• EPRA • KPLC • KETRACO • KenGen • MITI
ii	Invest in grid infrastructure modernization to increase stability and reliability to support economic activities.	Modern transmission and distribution infrastructure.	Improved SAIDI & CAIDI indicators.	2025-2034	1000	• GoK • Development Partners • Private Sector	• SDE	• EPRA • KPLC • KETRACO • KenGen
iii	Review the Time of Use Tariff to reach more consumer categories.	Reviewed Time of Use Tariff.	Percentage increase in the number of customers in the Time of Use Tariff.	2 years	50	• GoK • Development Partners • Private Sector	• EPRA • SDE	• KPLC • KETRACO • KenGen • KAM

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Kshs. Millions)	Funding Sources	Responsibility	
							Lead	Support
iv	Conclude electricity market, bulk supply and open access regulations and finalize the market design to enable energy exchange and competition.	Electricity market, bulk supply and open access regulations.	Number of players participating in the electricity market, bulk supply and open access.	1 year	20	• GoK • Development Partners • Private Sector	• EPRA • SDE	• KPLC • KETRACO • KenGen • KAM

16. Bioenergy for Cooking and Heating

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
Policy Goal/Objective: Achieve universal electricity and clean cooking access by 2030.								
Statement 1: To promote the use of bioenergy for cooking and heating.								
i.	Review the existing fiscal, legal, regulatory and institutional frameworks to promote application of biomass, biofuels and biogas.	Legal, fiscal, regulatory and institutional framework for bioenergy developed. Legislation for commercial and out-grower schemes for energy. Crop cultivation.	Regulations formulated.	5 years	5	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• MTI • MECCF • SDI • MoA • Civil Society • SAGAs in MoeP • COG

ii.	Undertake data collection, comprehensive mapping and planning for biomass, biofuels and biogas.	State of biomass, biofuels and biogas resources established. Sustainable production for bioenergy framework.	Biomas, biofuels and biogas resource studies. Reports on viability of SAF's established. Reports on Sustainability framework for biomass, biofuels and biogas.	5 years	90	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• MTI • MECCF • SDI • MoALD • Research Institutions • COG
iii.	Promote measures to enhance promotion of biomass, biofuels and biogas value chains development.	Knowledge management system for biomass, biofuels and biogas resources and programs developed. Research and Development that facilitates the exploitation of biomass, biofuels undertaken. Local production of biomass, biofuels and biogas enhanced. Consumer and enterprise financing including carbon finance developed.	Knowledge management platform for biomass, biofuels and biogas. Number of incentives established. Reports of R&D initiatives. Number of plants established. Number of capacity development programs. Amount of finances assessed by enterprises. Number of carbon projects developed and implemented.	5 years	2000	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• MTI • MECCF • SDI • MoALD • COG

17. Bioenergy for Transport

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
Policy Goal/Objective: Promote renewable energy resource development and utilization. **Statement 1: To promote the use of bioenergy for transport.**								
i.	Formulate and implement blending mandates for bioethanol and biodiesel.	Blending mandate for bioethanol and biodiesel developed. Multi-agency team for blending established.	Number of blending mandates formulated. Volumes of bioethanol and biodiesel used for blending. Reports of multi-agency.	2 years	50	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• MTI • MECCF • SDI • MoA • COG
ii.	Promote local production of bioethanol and biodiesel for use in transport sector.	Number of enterprises and industries established.	Volumes of biofuels produced locally.	5 years	1000	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• MTI • MECCF • SDI • MoA • COG

18. Cogeneration, Gasification and Waste to Energy

Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
						Lead	Support
Policy Goal/Objective: Promote renewable energy resource development and utilization.							

Statement 1: Promote cogeneration, gasification and waste to energy technologies.

i.	Formulate and Implement National measures for promoting Cogeneration, Gasification and WTE technologies.	National Strategy for Coordinating Cogeneration. Gasification and WTE Technologies. Infrastructure for cogeneration, gasification and WTE developed. A Standardized PPA for cogeneration, gasification and WTE.	Formulation of National Strategy for Coordinating Cogeneration. Number of gasification and WTE technologies developed. Number of Plants on cogeneration, gasification and WTE developed. A standardized PPA for cogeneration, gasification and WTE in developed.	2025-2034	40000	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • CoG • NEMA • Non-State Actors
ii.	Capacity building on Cogeneration, Gasification and WTE.	Capacity Building Program and Implementation Strategy on Cogeneration, gasification and WTE technologies.	Capacity building strategy developed. Number of trainings contacted. Number of workforce trained.	2025-2034	150	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • CoG

19. Sustainable Aviation and Marine Fuels

Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
						Lead	Support
Policy Goal/Objective: Promote renewable energy resource development and utilization.							

Statement 1: To promote the use of sustainable aviation and marine fuels.								
i.	Develop a framework for oversight and coordination of SAF and clean marine fuel production.	Framework and coordination mechanism for SAF and marine fuels established.	Number of frameworks established. Reports of marine fuels.	5 years	5	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• MTI • MECCF • SDI • MoA • KCA • KPC • MA • COG
ii.	Facilitate research and development to scale up the local production and use of biofuels and green hydrogen.	SAF and marine feedstock production system established. Number of refinery and blending facilities for SAFs and marine fuels.	Volumes of SAFs and Marine fuels produced.	5 years	100	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• MTI • MECCF • SDI • MoA • KCA • KPC • MA • COG
iii.	Strengthen international partnerships to align with global climate goals and technology advancements.	Collaboration framework developed.	Number of frameworks. Number of programs and projects. Amount of resource mobilized.	2030	10	• GOK • Development partners • Climate Finance • Private Sector	• SDE	• MTI • MECCF • SDI • MoA • KCA • KPC • MA • COG

20. Diverse and Productive Uses of Energy

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost	Funding Sources	Responsibility	
							Lead	Support
	Policy Goal/Objective: Promote renewable energy resource development and utilization.							
	Statement 1: Promote diverse and productive uses of energy.							
i.	Develop and implement intergovernmental and inter-sectoral collaborations to promote alternative and productive uses of energy.	PURE strategy Inter-governmental Working Group.	Strategies developed. Intergovernmental Working Group Established. Fiscal policy to support demand supply side standards & quality frameworks for PURE products developed.	2 years	22	• GOK • Development Partners • Private Sector • Non-State actors	• SDE	• National Treasury • KRA • KEBS • SAGAs in MoEP
ii.	Develop a legal and regulatory framework to promote the development and investment in geothermal direct use applications to optimize geothermal resources.	Geothermal direct applications policy & regulations.	Legal & regulatory frameworks developed.	2 years	10	• GOK • MDAs • Development Partners	• SDE	• KenGen • GDC
iii.	Design and implement capacity building, awareness initiatives programs targeted at relevant stakeholders.	Building of technical experts.	Number of professionals trained.	2025 – 2034	30	• GoK • Development partners • Private Sector	• SDE	• SAGAs in MoEP • National • CoG

21. Green Hydrogen

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	**Support**
	Policy Goal: Support green industrialization, environmental & social sustainability.							
	Statement 1: Establish a competitive green hydrogen industry.							
i.	Establish a centralized coordination framework to support the nascent green hydrogen industry by facilitating private & public sector green hydrogen investments, regulations, finance and investments.	Centralized coordination framework.	Centralized Coordination Framework established. Allocated resources, including funding and personnel. Green Hydrogen Committee established. Stakeholder Engagement Strategy. Stakeholder engagement forums.	2025	100	• GoK • Development partners • Private Sector	• SDE	• SAGAs in MoEP • Non-State Actors
i.	Establish Contracts for Difference to support offtake of green hydrogen and its derivatives by making it cost competitive.	Financial mechanisms established.	Contracts for Difference Frameworks established. Financial mechanisms established to support research, innovation, and project green hydrogen. Creation of a market for green hydrogen and its derivatives.	2025 – 2034	50000	• GoK • Development partners • Private Sector	• SDE	• SAGAs in MoEP
i.	Facilitate common infrastructure development by funding the development of	Green hydrogen infrastructure developed.	Number of Projects completed. Funding allocated for hydrogen infrastructure projects.	2025 – 2034	10,000	• GoK • Development partners • Private Sector	• SDE	• SAGAs in MoEP

	hydrogen transport, storage, and export infrastructure to reduce logistical bottlenecks.							
v.	Create opportunities for local value creation in the green hydrogen industry through strategic collaboration and capacity building.	Skilled personnel for green hydrogen development.	Trainings on green hydrogen. Peer to peer learning forums. Secondment of officers for skills development. Public awareness campaigns.	2025 – 2034	5000	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • CoG • Academia

22. Energy Transition and Climate Change

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Kshs Million)	Funding Sources	Responsibility	
							Lead	Support
Policy Goal/Objective: Promote renewable energy resource development and utilization.								
Statement 1: To promote and streamline adoption of energy transition technologies in Kenya.								
i.	Develop a regulatory framework for the adoption of clean energy technologies.	Regulatory framework governing adoption of clean energy technologies adoption.	Approved Standards & Regulations for clean energy technologies. Coordination and collaboration framework between Government ministries and other stakeholders.	2 years	50	• GoK • Development • partners	• MOEP	• EPRA

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Kshs Million)	Funding Sources	Responsibility	
							Lead	Support
			Approved incentives for consumers to shift to clean energy technologies.					
ii.	Promote the deployment of flexible technologies in industrial and power sectors to reduce carbon emissions.	Increased deployment of the flexible technologies in industrial and power sector.	Pilot Incentives for use of flexible technologies in Industrial sector. Framework the adoption and integration of energy storage. Innovative service delivery models to catalyze investment in flexible energy solutions.	2 years	50	• GoK • Development partners	• MOEP • EPRA	• MDAs
iii.	Mainstream energy transition in energy planning with a development framework around new value chains.	Integrated energy plan that includes all transition value chains.	An approved Integrated Energy Plan with transition value chains. Technical capacity development for adoption of emerging low-carbon technologies.	2 years	50	• GoK • Development partners • Private Sector	• MOEP	• EPRA • SAGAs • MDCAs • Private Sector

23. Critical Energy Minerals

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost	Funding Sources	Responsibility	
							Lead	Support
	Policy Goal/Objective: Support green industrialization, environmental and social sustainability.							
	Statement 1: Accelerate the exploitation of critical minerals to foster industrial growth and accelerate adoption of renewable energy emerging technologies.							
i.	Develop a regulatory framework to integrate critical mineral exploitation with renewable energy development.	Regulatory framework integrating critical mineral exploitation with renewable energy development.	Complete critical minerals integration with renewable energy regulations developed. Rate of operationalization of the developed regulations.	2026	50	• GoK • Development partners	• MoEP	• MMBEMA • SAGAs in MoEP • KCM • NEMA
ii.	Develop and implement regulations to spur investment in local processing.	Regulations to spur investment in local processing.	Number of incentives put in place to spur local processing. Number of local processing setups.	2 years	50	• GoK • Development Partners	• MoEP	• MMBEMA • SAGAs in MoEP • KCM • NEMA
iii.	Strengthen government institutions to explore critical minerals and provide data to boost investor confidence.	A framework for strengthening government institutions.	The number of local institutions involved in exploration activities. A centralised mineral resource data management system setup. Availability of data on critical minerals.	2027	100	• GoK • Development Partners	• MoEP	• MMBEMA • SAGAs in MoEP • KCM • NEMA
iv.	Develop and implement a critical mineral exploitation strategy to	Critical mineral exploitation strategy to guiding targeted and	Critical minerals strategy developed.	2026	30	• GoK • Development Partners	• MoEP	• MMBEMA • SAGAs in MoEP

	guide targeted and deliberate exploitation of these minerals.	deliberate exploitation of critical minerals.	Regulations on critical minerals.					• KCM • NEMA

24. Natural Gas

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost	Funding Sources	Responsibility	
							Lead	Support
Policy Goal/Objective: Develop and modernize energy infrastructure. **Statement 1: Develop and implement natural gas infrastructure.**								
i.	Strengthen the legal and regulatory framework for the oil and gas sector to include the natural gas industry.	Revised oil and gas legal & regulatory framework.	Natural gas legal framework developed.	2 years	100	• GoK • Development partners	• MoEP	• EPRA • NOCK • KPLC
ii.	Facilitate development and utilization of natural gas and associated infrastructure.	Natural gas facility. Locally produced gas. LNG power plants.	Gas handling facility Developed Local exploration and development. New gas powered plants developed. Thermal power plants converted to LNG.	5 years	10,000	• GoK • Development partners • Private sector	• MoEP	• SAGAs in MoEP

25. Energy Efficiency and Conservation

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Millions)	Funding Sources	Responsibility	
							Lead	Support
Policy Goal/Objective: To promote energy efficiency and conservation. **Statement 1: Promote practices and technologies that use less energy to perform the similar roles.**								
i.	To enhance coordination and resource mobilization of energy efficiency and conservation programs.	Establishment of Energy efficiency and conservation coordination and resource mobilization framework.	National energy efficiency coordination committee established. Resource mobilization framework developed. Energy efficiency and conservation investment prospectus developed.	2025-2034	20	• GoK • Development partners • Private Sector	• MoEP	• National Treasury • SAGAs in MoEP
ii.	To enhance implementation of energy efficiency and conservation programs in key economic sectors.	Enhanced implementation of EE&C programs in economic sectors.	MEPs for household, buildings, vehicles electrical appliances developed and gazette. Testing labs for appliances built. Number of energy audits conducted in designated facilities and public buildings. Number of trained energy efficiency professionals Number of ESCOS created.	2025-2034	500	• GoK • Development partners • Private sector	• MoEP • EPRA	• SAGAs in MoEP • CoG
iii.	Enhance knowledge and awareness on energy efficiency and conservation.	Improved dissemination of technical and general knowledge on EE&C.	Number of EE&C seminars. Number of energy auditing guide books. Number of discussion/working papers published Local curriculum for energy efficiency.	2025-2034	500	• GoK • Development partners • Private sector	• MoEP	• SAGAs in MoEP • CoG

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Millions)	Funding Sources	Responsibility	
							Lead	Support
iv.	Promote adoption of electric vehicles.	Increased electric/ hybrid vehicles imported to Kenya. Charging stations constructed.	Share of electric/ hybrid vehicles in total vehicles imported into Kenya. Number of charging stations in the country.	2025-2034	900	• GoK • Development partners	• MoEP	• Treasury • MTI • SAGAs in MoEP
v.	Mainstream EE&C in learning institutions.	EE&C incorporated in the basic education and higher learning curriculum.	Curriculum on EE&C developed.	5 years	50	• GoK • Development partners • Private sector	• MoEP	• KICD • Academia

26. Energy Financing and Pricing

Policy Statement		Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Millions)	Funding Sources	Responsibility	
							Lead	Support
Policy Goal/Objective: Mobilize funding for energy projects.								
Statement: Adopt viable and sustainable financing options to modernize energy infrastructure, adopt new technologies and enhance energy access.								
i.	Explore and adopt viable and sustainable financing options from local and international sources to ensure cost	Development partners funding. Adoption of financing options Cost-effective energy projects.	Amount of funding secured. Percentage increase in development partners funding.	2025 – 2034	50	• GoK • Development partners • Private sector	• MoEP	• National Treasury • DFIs • UTLs

	effective utilization of locally available energy resources.	Sustainable financing model. Increased local energy production.	Number of projects implemented using local resources. Sustainability of financing model. Energy generation capacity increase.					
ii.	Develop frameworks for sustainable innovative financing mechanisms such as PPPs, assets monetization, climate financing and local equity funds.	Alternative financing models developed. Stakeholder engagement and consultation. Pilot programs or projects launched. Policy recommendations capacity-building programs. Sustainable funding strategies.	Number of financing frameworks developed. Stakeholder engagement Pilot projects launched: Amount of capital mobilized. Training and capacity-building completion.	2025 - 2034	50	• GoK • Development partners • Private sector	• MoEP	• EPRA
iii.	Operationalize Consolidated Energy Fund and allocate adequate resources for both national and county levels.	Consolidated Energy Fund established. Resource allocation framework. Monitoring and evaluation systems. Awareness and capacity-building. Strategic partnerships for fund management. Legal framework for the CEF developed.	Consolidated Energy Fund. Amount allocated to national and county levels. Number of projects funded. Capacity-building initiatives completed Monitoring and evaluation framework established.	2	50	• GoK • Development partners Private sector	• MoEP	• EPRA
iv.	Adopt diversified internal revenue generation	Diversified internal revenue generation	Number of new revenue generation frameworks developed.	3 years	30	• GoK • Development partners	• MoEP	• EPRA

	frameworks to increase revenue generation within the sector.	framework and guidelines developed. Revenue targets set. Stakeholder engagement. Public communication and awareness. Sustainability of revenue generation models.	Amount of revenue generated from new frameworks. Revenue growth rate. Stakeholder engagement success. Sustainability of new revenue streams. Revenue generation guidelines.			• Private sector		
v.	Provide targeted fiscal incentives, such as tax exemptions, subsidies, or grants, to support low-income households to ensure equitable access to energy.	Fiscal incentive programs designed. Awareness campaigns. Increased energy affordability. Integration with energy policies. Monitoring and evaluation systems.	Number of fiscal incentive programs developed. Number of low-income households benefiting. Amount of funding disbursed. Equity in distribution of incentives. Integration with energy access goals. Monitoring and reporting compliance.	3 years	50	• GoK • Development partners • Private sector	• MoEP	• EPRA
vi.	Provide adequate fiscal incentives and harmonize various charges levied on energy operations to create an attractive and predictable investment environment in the energy sector.	Fiscal incentive schemes developed. Harmonized regulatory framework. Review of existing laws, levies and charges. Investor-friendly policy environment. Increased energy sector investment.	Number of fiscal incentive schemes implemented. Reduction in the number of regulatory charges. Increase in energy sector investment. Number of new energy projects initiated. Private sector participation in PPPs.	3 years	30	• GoK • Development partners • Private sector	• MoEP	• EPRA

		Energy infrastructure development.	Stability and predictability of energy sector regulations. Reduction in energy project approval times. Harmonized energy tariffs and charges.					
vii.	Operationalize the draft Renewable Energy Auctions Policy for competitive pricing and improved risk management of renewable projects.	Renewable Energy Auctions Policy operationalized. Competitive bidding environment Capacity building for stakeholders. Successful renewable energy projects awarded.	Renewable Energy Auction Policy published. Number of energy auctions conducted. Reduction in end user tariffs. Number of projects awarded contracts.	3	30	• GoK • Development partners • Private sector	• MoEP	• SAGAs in MoEP
viii.	Review of electricity tariffs every three years to ensure predictability, timely recovery and cost-reflective tariffs.	Regular tariff review mechanism established. Cost-reflective electricity tariffs. Predictability in tariff changes. Fair and affordable tariffs. Stakeholder consultation process. Strengthened regulatory framework.	Timeliness of tariff reviews. Cost-reflective tariffs published. Tariff adjustment predictability. Public consultation during tariff review. Consumer affordability. Financial stability of the energy sector utilities.	3	50	• GoK • Development partners • Private sector	• EPRA	• SAGAs in MoEP • KAM • KEPSA

27. Power Procurement

Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Millions)	Funding Sources	Responsibility	
						Lead	Support
	Policy Goal/Objective: Promote competitive energy procurement and pricing.						
	Policy Statement: To enhance sustainable energy procurement.						
i. Develop and implement power procurement guidelines, standardized processes, and practices to attract investments in the energy sector.	Power procurement guidelines, standardized processes and practices.	Published power procurement framework. Adopted M&E framework for energy sector investments. Developed power procurement process. Published end user tariffs.	3 years	20	• GoK • Development partners • Private sector	• SDE • KPLC	• SAGAs in MoEP • National Treasury
ii. Enhance collaboration between sectors and agencies to fast-track developments that increase electricity capacity expansion.	Increased collaboration to ensure adequacy of capacity to meet the country's energy demand.	Stakeholders engagement in power procurement. Number of projects initiated. Comprehensive guiding collaboration framework between research institutions and the Energy Sector players.	2025-2034	10	• GoK • Development partners • Private sector	• SDE	• National Treasury • CoG • SAGAs in MoEP.

28. Energy Security

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility

							Lead	Support
	Policy Goal/Objective: Promote renewable energy resource development and utilization.							
	Statement 1: Enhance energy security in the country.							
i.	Ensure diversification of the energy mix in the medium and long term for a balanced power system.	LCPDP with several generation sources.	Adequate reserve margins in power generation and dispatch. A balance generation mix from several sources. Solar and wind power plants with storage systems. An updated LCPDP.	2 years	5	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • COG
ii.	Facilitate public and private investment across the power supply value chain.	New generation capacity to meet growing demand.	Increased generation capacity by public companies. New generation capacity developed by IPPs.	2 years	5	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • COG
iii.	Minimize dispatch of thermal plants and avoid development of non-renewable energy resources.	Dispatch of thermal generation reduced.	Reduced thermal generation. Increase in renewable energy dispatch.	2 years	2	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • COG
iv.	Undertake feasibility studies for pumped hydro projects including identification of suitable sites.	Feasibility studies on pumped hydro.	Identification pumped hydro projects sites.	3 years	200	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • COG

v	Development of and planning for firm capacity in order to maintain at least 15% firm power generation capacity.	Maintaining and planning for adequate generation reserve margin.	A reserve margin of 15% in the system. LCPDP with at least 15% annual reserve margin.		10	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • COG
vi.	Adequate strategies for national energy independence to ensure firm power import contracts do not exceed 20%.	Enhanced national power generation capacity.	A maximum of 20% contracted generation capacity of the annual peak or projected peak demand.	2025-20340	15	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • COG
vii.	Mobilize adequate investments for development of grid infrastructure and regional grid interconnections for resilience, cross-border exchanges.	Enhanced national transmission grid.	Reduced power outages. Reliable and stable grid.	2025-2034	200	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • COG
viii.	Continue with oil and coal development activities and strengthen legal and regulatory frameworks to	Country readiness to deploy local oil and coal electricity production and direct industrial use.	Production of crude oil. Exploration and development of coal and oil resources.	2025-2034	200	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• SAGAs in MoEP • CoG • NOCK • Community

enhance the national energy security.

29. Integrated Energy Planning

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame FY	Estimated Cost	Funding Sources	Responsibility	
							Lead	**Support**
Policy Goal/Objective: Enhance institutional capacity, governance and collaborative frameworks.								
Statement 1: Enhance the integrated energy planning in the energy sector.								
i.	Establish an institutional framework for integrated energy planning at the National and County level.	Institutional framework.	Energy Planning and Coordination Unit. INEP Committee. County Energy Planning Committee. County Energy Departments.	1 year	400	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP • CoG	• National Treasury • SAGAs in MoEP • CRA • Academia • Research Institutions
ii.	Build the capacity of Ministries, Departments, agencies and Counties in INEP.	Skilled personnel for integrated energy planning.	Training needs assessment. Peer to peer learning Secondment of officers.	2025 – 2034	500	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP • CoG	• National Treasury • SAGAs in MoEP • CRA • Academia • Research Institutions
iii.	Mobilize adequate financial	Adequate financial resources.	Amount of funding allocated.	2025 – 2035	700	• GoK	• MoEP • CoG	• National Treasury

	resources for integrated national energy planning.		Resource mobilization framework.			• Development partners • Private Sector • Non-State Actors		• SAGAs in MoEP • CRA • Academia • Research Institutions
iv.	Develop county energy plans and integrate all plans to INEP.	Energy plans and sub-plans.	Energy plans/ sub-plans.	2025 – 2035	100	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP • CoG	• National Treasury • SAGAs in MoEP • CRA • Academia • Research Institutions
v.	Enhance data management and governance in the energy sector.	Adequate, reliable and accessible data and information for integrated energy planning.	Data & information available and information for INEP. Harmonized data collection mechanism. Data management & governance policy. A centralized data repository for the energy sector. Data Working Group.	2 years	25	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP • CoG	• National Treasury • SAGAs in MoEP • CRA • Academia • Research Institutions
vi.	Establish frameworks for monitoring, evaluation and reporting of energy plans.	Monitoring, evaluation, reporting & learning framework.	Monitoring, evaluation, reporting & learning framework for integrated energy planning.	2 years	10	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP • CoG	• National Treasury • SAGAs in MoEP • CRA • Academia • Research Institutions

vii.	Establish mechanisms for regular stakeholder engagement to foster a shared understanding.	Stakeholder engagements.	Stakeholder engagement strategy. Stakeholder engagement forums.	2025 – 2035	50	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP • CoG	• National Treasury • SAGAs in MoEP • CRA • Academia • Research Institutions
viii.	Enhance the use of geospatial tools and harmonize energy planning tools used for INEP.	Integrated and harmonized energy planning systems and tools.	Geospatial planning committees. Geospatial system. Harmonized energy planning tools. Established capacity in geospatial systems and INEP tools.	2025 – 2034	200	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP • CoG	• National Treasury • SAGAs in MoEP • CRA • Academia • Research Institutions

30. Devolution

	Policy Statement	**Expected Output**	**Key Performance Indicators**	**Time Frame**	**Estimated Cost (Ksh. Million)**	**Funding Sources**	**Responsibility**	
							Lead	**Support**
	Policy Goal/Objective: Enhance institutional capacity, governance and collaborative frameworks.							
	Statement 1: To strengthen devolution through energy planning and renewable energy integration.							
i.	Support the Counties in mobilizing adequate resources for implementation of	Adequate financial resources for county energy functions.	Amount of funding allocated. Resource mobilization framework.	2025 – 2035	15,000	• GoK • Development partners • Private Sector	• MoEP • CoG	• National Treasury • SAGAs in MoEP

	devolved energy functions.					• Non-State Actors		• CRA
ii.	Support the Counties to establish their respective, dedicated energy directorates.	County Energy Directorates.	County Energy Directorates.	1 year	470	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP • CoG	• National Treasury • SAGAs in MoEP • CRA
iii.	Support the Counties in building their capacity in order for them to discharge their energy functions.	Skilled personnel for discharge of the devolved energy functions.	Training needs assessment. Trainings to county officers. Peer to peer learning. Secondment of officers.	2025 - 2034	470	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP • CoG	• National Treasury • SAGAs in MoEP • CoG • CRA
iv.	Support the Counties to develop county specific energy policies and regulations.	County specific energy policies and regulations.	County specific energy policies and regulations.	2 years	470	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP • CoG	• National Treasury • SAGAs in MoEP • CRA

31. Land Acquisition

Policy Statement	Expected Output	Key Performance Indicators	Timeframe	Estimated Cost (Kshs. M)	Funding sources	Responsibility	
						Lead	Support
Policy Goal/Objective: Support environmental and social sustainability.							

Policy Statement	Expected Output	Key Performance Indicators	Timeframe	Estimated Cost (Kshs. M)	Funding sources	Responsibility	
						Lead	Support
Statement 1: Streamline land acquisition for energy infrastructure.							
i. Develop and implement a standardized framework for land and wayleave acquisition for energy projects.	Standardized land and wayleave acquisition framework for energy projects.	Published regulations/ framework for land and wayleave acquisition. Approved collaboration framework for stakeholder engagement. Disaster risk management mechanism on land-based energy resources.	2 years	45	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• SAGAs in MoEP • CoG • NLC • MoL • MINA • Non-State Actors
ii. Implement public sensitization and participation programs for energy projects and programmes.	Public Sensitization program for energy projects and programmes developed.	Approved Public sensitization programs for energy projects and programmes. Number of public sensitization programs on energy projects and programmes. Timely land/wayleave acquisition for energy projects.	2027	80	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• SAGAs in MoEP • CoG • NLC • MoL • MINA • Non-State Actors

32. Environmental Issues in Energy

Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding sources	Responsibility	
						Lead	Support
Policy Goal/Objective: Support green industrialization, environmental and social sustainability.							
Statement 1: Enhance environmental sustainability in energy projects.							
i. Develop and implement environmental sustainability framework for energy sector projects.	Environmental sustainability framework for energy sector projects.	A multi-sectoral energy sector committee to coordinate climate change matters established. A framework to mainstream ecosystem and biodiversity management into energy sector developed.	2025-2034	100	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • CoG
ii. Establish programmes to enhance energy sector technical capacity to comply with environmental management regulations.	Programmes to enhance energy sector technical capacity to comply with environmental management regulations established.	Programmes established to enhance energy sector technical capacity to comply with environmental management regulation. Number of sensitization and awareness creation forums.	2025-2034	100	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • CoG
Statement 2: Promote cogeneration, gasification and waste to energy technologies.							
i. Formulate and implement national measures for	National Strategy for Coordinating Cogeneration,	National strategy for coordinating cogeneration,	2025-2034	40000	• GoK • Development partners	• SDE	• SAGAs in MoEP • CoG

							Lead	**Support**
	promoting cogeneration, gasification and WTE technologies.	Gasification and WTE Technologies. Infrastructure for cogeneration, gasification and WTE developed.	gasification and WTE technologies developed. Number of Plants on cogeneration, gasification and WTE developed. A Standardized PPA for cogeneration, gasification and WTE in developed.			• Private Sector • Non-State Actors		• NEMA • Academia • Public institutions
ii.	Capacity building on Cogeneration, Gasification and WTE.	Capacity building program and implementation. Strategy on cogeneration, gasification and WTE technologies.	Capacity building strategy developed. Number of trainings contacted. Number of personnel trained.	2025-2034	150	• GoK • Development partners • Private Sector • Non-State Actors	• SDE	• SAGAs in MoEP • CoG • NEMA • Academia • Public institutions

33. Gender Equality, Diversity and Social Inclusion (GEDSI) in Energy

Policy Statement	**Expected Output**	**Key Performance Indicators**	**Time Frame** **FY**	**Estimated Cost (Khs. Million)**	**Funding Sources**	**Responsibility**

							Lead	Support
	Policy Goal/Objective: Enhance institutional capacity, governance and collaborative frameworks.							
	Statement 1: Mainstreaming gender equality, diversity and social inclusion in energy.							
i.	Strengthen GEDSI responsive institutional frameworks to enhance gender mainstreaming.	GEDSI responsive energy sector.	Energy Sector GEDSI Strategy.	2 years	25	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• SAGAs in MoEP • CoG • Research institutions • Academia
ii.	Develop and operationalize GEDSI disaggregated data systems.	GEDSI disaggregated Data.	GEDSI disaggregated data.	2 years	30	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• SAGAs in MoEP • CoG • Research institutions • Academia
iii.	Promote GEDSI in employment and leadership in the energy sector.	Presence of GEDSI in the energy sector at all levels.	Streamlining of GEDSI in energy projects and functions.	2 years	5	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• SAGAs in MoEP • CoG • Research institutions • Academia

iv.	Establish programmes targeted in creating public awareness on GEDSI.	GEDSI Programmes/Projects.	Number of GEDSI Programmes/Projects. Number of GEDSI engaged in energy projects and functions.	2 years	10	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• SAGAs in MoEP • CoG • Research institutions • Academia

34. Research, Development and Innovation

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
	Policy Goal/Objective: Enhance institutional capacity, governance and collaborative frameworks.							
	Statement 1: Fostering research, development, and innovation to unlock new opportunities in the energy sector.							
i.	Promote the development of locally produced energy technologies such as solar panels, wind turbine parts, geothermal equipment, transmission & distribution equipment clean cooking equipment, and energy efficiency technologies to drive industrial growth and job creation.	Locally manufactured energy components.	Developed quotas on locally manufactured energy components. Number of locally manufactured energy components developed annually. Percentage of locally manufactured content in energy projects.	5 years	500,000,000	• GoK • Development partners • Private Sector	• SDE	• SAGAs in MoEP • National Treasury • CoG • MITI • KEPSA • KAM • Academia • Research institutions

			Jobs created in the local energy manufacturing sector.					
ii.	Prioritize research and innovation to develop cost-effective, locally made energy solutions and reduce reliance on imports.	Local green manufacturing industry.	Total funding allocated to RDI in the energy sector. Number of domestic alternatives to imported energy technologies developed. Reduction in energy production costs due to RDI projects.	5 years	100,000,000	• GoK • Development partners • Private Sector	• SDE	• SAGAs in MoEP • National Treasury • CoG • MITI • KEPSA • KAM • Academia • Research institutions
iii.	Establish platforms to link research with industrial applications and strengthen collaboration between academia, industry, and research institutions.	Skilled personnel and job creation.	Number of innovation platforms established for linking RDI with industry. Number of collaborative projects between academia, industry, and research institutions.	2025 – 2034	500	• GoK • Development partners • Private Sector	• SDE	• SAGAs in MoEP • National Treasury • CoG • MITI • KEPSA • KAM • Academia • Research institutions
iv.	Facilitate partnerships to commercialize energy innovations and lower production costs.	Collaborative frameworks in innovations and RDI	Private sector investment leveraged for energy RDI initiatives.	2025 – 2034	100	• GoK • Development partners • Private Sector	• SDE	• SAGAs in MoEP • National Treasury • CoG • MITI

			Number of energy innovations registered.					• KEPSA • KAM • Academia • Research institutions
v.	Provide intellectual property protection and commercialization support to bring local energy technologies to market.	Increased local technology development.	Number of innovators provided with IP protection assistance. Number of energy technologies successfully commercialized with government support. Time reduced from innovation to market launch for supported technologies.	2025 – 2034	500	• GoK • Development partners • Private Sector	• SDE	• SAGAs in MoEP • National Treasury • CoG • MITI • KEPSA • KAM • Academia • Research institutions

35. Human Resource Development and Retention

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	**Support**
	Policy Goal/Objective: Enhance institutional capacity, governance and collaborative frameworks.							
	Statement 1: Development of human capacity and retention of staff in the energy sector.							

i. Establish a centralized framework to promote inter-institutional collaboration for skill and knowledge development in the energy sector.	Inter-institutional collaboration frameworks.	Inter-institutional framework developed. A national registry of capacity-building programs established.	2025	300	• GoK • Development partners • Private Sector	• MoEP	• SAGAs in MoEP • National Treasury • CoG • MITI • KEPSA • KAM • Academia • Research institutions
ii. Establishment of a knowledge management framework and human resource retention plan in the energy sector.	Knowledge management framework.	Knowledge framework developed. Skills Retention Committee established. Established national energy sector training and retention strategy. Targeted programs to retain specialized personnel.	2025	150	• GoK • Development partners • Private Sector	• MoEP	• SAGAs in MoEP • National Treasury • CoG • MITI • KEPSA • KAM • Academia Research institutions
iii. Promote recognition and accreditation of novel and innovative courses and development of energy sector personnel.	Skilled personnel.	Training needs assessment. Trainings & Capacity Building. Peer to peer learning Secondment of officers Exchange programs. Succession planning of personnel.	Continuous 2025 – 2035	30000	• GoK • Development partners • Private Sector	• MoEP	• SAGAs in MoEP • National Treasury • CoG • MITI • KEPSA • KAM • Academia • Research institutions

iv. Foster linkages and partnerships between energy sector entities, academia, and research institutions to promote knowledge sharing for capacity building.	Stakeholder engagement framework.	Stakeholder Strategy. Stakeholder forums.	engagement engagement	2025 – 2034	500	• GoK • Development partners • Private Sector	• MoEP	• SAGAs in MoEP • National Treasury • CoG • MITI • KEPSA • KAM • Academia • Research institutions

36. Cyber Security, ICT and Artificial Intelligence

	Policy Statement	Expected Output	Key Performance Indicators	Time Frame	Estimated Cost (Ksh. Million)	Funding Sources	Responsibility	
							Lead	Support
	Policy Goal: Develop, modernize and optimize energy infrastructure.							
	Statement 1: Deployment of cybersecurity measures, robust data protection frameworks and integration of artificial intelligence.							

i.	Establish a comprehensive framework for coordinating cybersecurity and data protection measures, ensuring seamless integration across the energy sector.	Resource allocation framework.	Risk management and mitigation framework established. Deployment of advanced security technologies. Budgetary allocation for cybersecurity and ICT. Engagement of cyber security personnel in SAGAs.	2 years	200	• GoK • Development partners • Private sector	• SDE	• ICT Authority • SAGAs in MoEP • CoG • CA • MICDE • MICNG
ii.	Enhance capacity-building initiatives.	Skilled personnel for integrated energy planning.	Training needs assessment Trainings on cybersecurity. Peer to peer learning forums. Employment of cybersecurity personnel.	2025 – 2034	250	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• ICT Authority • SAGAs in MoEP • CoG • CA • MICDE • MICNG
iii.	Strengthen collaboration with regional and international entities to address cross-border cyber threats targeting energy infrastructure.	Regular stakeholder engagements.	Stakeholder engagement Strategy. Stakeholder engagement forums.	2024 – 2035	50	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• ICT Authority • SAGAs in MoEP • CoG • CA • MICDE • MICNG

iv.	Strengthen collaboration among energy sector institutions to develop and implement robust business continuity and crisis management frameworks.	Inter-institutional collaboration frameworks.	Cyber security framework developed. Cyber Security Unit established. Formation of Cyber Security Committee. Develop preparedness and response mechanisms.	1 years	50	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• ICT Authority • SAGAs in MoEP • CoG • CA • MICDE • MICNG
v.	Adopt artificial intelligence technologies in management of energy sector systems.	AI Integration and development in the sector.	Training programmes on AI in the energy sector.	2 years	100,000	• GoK • Development partners • Private Sector • Non-State Actors	• MoEP	• ICT Authority • SAGAs in MoEP • CoG • CA • MICDE • MICNG