



**BASELINE SURVEY ON THE STATUS OF
IMPLEMENTATION OF THE ENERGY ACT:
CASE OF NAIROBI, MOMBASA, NAKURU &
KISUMU**



By.

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Sustainable Energy Access Forum Kenya

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EXECUTIVE SUMMARY

SEAF-K forum aims to address the limited level of multi-stakeholder engagement by using a holistic approach that brings together all the stakeholders in the energy sector and to provide a platform for addressing the various challenges encountered in the sector. SEAF-K believes that once sustainable energy solutions are provided with a joint thrust through sufficient policy, financial, technological and institutional support frameworks, Kenya can secure a sustainable pathway towards access to modern energy services for all.

This report is compiled as part of the Governance Thematic Working Group's advocacy and capacity building initiatives, to inform the Group, the Secretariate and the SEAF Kenya stakeholders about the status of RE governance at the county level, as well as the potential for various renewable energy programmes that can be supported in Kisumu, Nakuru, Nairobi and Mombasa Counties.

The first chapter of this report provides an overview of the SEAF-Kenya, study methodology and approaches. The second chapter focusses on the policy landscape pertinent to renewable energy in Kenya. The third chapter follows with deep-dive into renewable energy institutional frameworks. And highlights the key players and energy actors at national and county levels.

Chapter four captures with an analysis of the status of implementation of the energy act 2019 at the county level. It looks into institutional and policy mandates of county governments and goes ahead to provide the status of energy governance in the said counties.

Chapter five gives a summary of challenges and priority actions targeting renewable energy in the four select counties. Chapter six concludes by summarizing the findings and proposing recommendations for the Governance Thematic Working Group to consider in its advocacy and capacity building roles.

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ACRONYMS

	African Development Bank
ADB	
AREI	African Renewable Energy Initiative
AU	African Union
BIO-NET	Kenya Biogas Stakeholders Network
CAHOSCC	African Heads of States and Government on Climate Change
CCAK	Clean Cooking Association of Kenya
CIDP	County Integrated Development Plan
COP	Conference of the Parties to the United Nations Framework Convention on Climate Change
ECAS	Environmental Capacities and Sustainability Institute
EPRA	Energy and Petroleum Regulatory Authority.
GESIP	Green Economy Strategy and Implementation Plan (GESIP)
GHG	Greenhouse Gas
ICLEI	International Council for Local Environmental Initiatives
IPCF	International Public Climate Finance
IRENA	International Renewable Energy Agency
NDC's	Nationally Determined Contributions
NDCs	Nationally Determined Contributions
RE	Renewable Energy
SDGs	Sustainable Development Goals
SE4ALL	Sustainable Energy for All
SEAF-K	Sustainable Energy Access Forum – Kenya
SEFA	Sustainable Energy Fund for Africa
SSA	Sub-Saharan Africa
TWG	Thematic Working Group
UN	United Nations
UNEP	United Nations Environment Programme
VAT	Value Added Tax

1.0 INTRODUCTION

1.1 Background

Sustainable Energy Access Forum – Kenya (SEAF-K) is a non-political, not for profit voluntary organization which was established in 2015. The Forum is a national network of CSOs, private sector, development partners, individuals and vendors who advocate for access and use of clean, affordable and modern energy services and products. It delivers her mandate through four thematic working groups which include Research and Development, Membership Outreach and Capacity Building, Information and Communication, and Governance.¹

The Governance Thematic Working Group (GTWG) has the mandate to advocate for energy policies that positively impact on the economy, the environment and social welfare, analyze the impact of such energy policies at national, county and household levels, and convene CSOs to strategize on how to affect policy change at all levels.

GTWG uses policy advocacy, analysis, and education to influence a prosperous economy based on secure, clean, affordable energy. Its vision is a world that runs on secure, clean, affordable energy, and its mission is to transform public policy to aid the rapid progress and access of sustainable energy for all.

1.2 Scope of Work and Approach

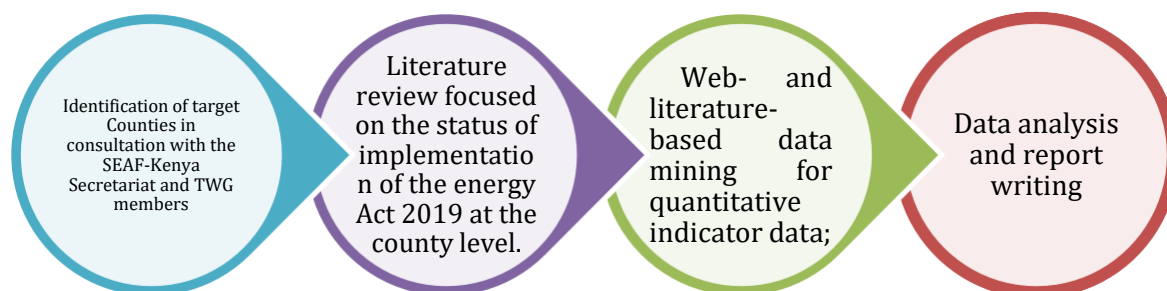
The task had one key component: Undertake a baseline survey on the status of implementation of the energy Act 2019 with focus on Nairobi, Nakuru, Kisumu and Mombasa. See figure 1 below for illustration of the scope.

The Consultant worked in close association with the Secretariat and Governance Thematic Committee members. A coordination mechanism was in place to review progress, provide guidance and advice. The consultant undertook a detailed desk top

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review focusing on the energy sector with special attention to four counties of Nakuru, Nairobi, Kisumu and Mombasa. The overall approach adopted was as illustrated in figure 1 below.

FIGURE 1: STUDY APPROACH

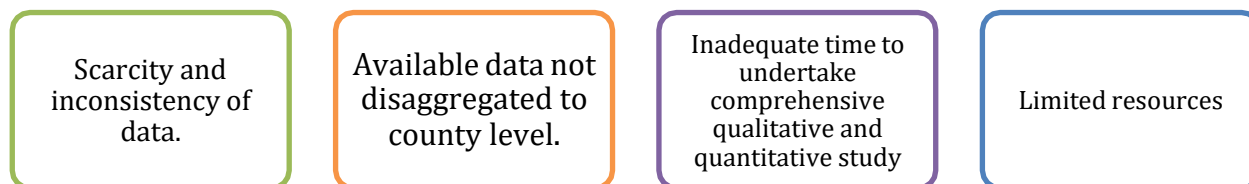


The consultant adopted categories of indicator as follows: (1) global, regional national frameworks policy and legislative frameworks relevant to sustainable energy (2) energy related challenges (3) energy policy interventions at the select counties.

1.3 Study Limitations

Some of the limitations of the study included;

FIGURE 2: STUDY LIMITATIONS



2.0 GLOBAL AND REGIONAL FRAMEWORKS RELEVANT TO CLIMATE CHANGE AND SUSTAINABLE ENERGY

2.1 Global Framework on Climate Change and Sustainable Energy

The world has over the years come to the realization of the fact that climate change is real. Going by the immense impacts such as the rise in sea level, melting of the permafrost, randomized spread of diseases such as malaria and dengue fever, rampant forest and wild fires, massive bleaching and death of coral reefs on a global scale among many others, have shed a necessary need for immediate action to curb this climate change menace before it is too late (IPCC, 2021). In line with this, different globally binding polices and Acts have been developed to guide a global response in this regard.

According to the Intergovernmental Panel on Climate Change (IPCC), the continued use of fossil fuels across the globe is one of the leading causes of increased global warming and climate change impacts (UNFCCC, 2021). As such, one clear path to the much-needed reduction of the climate change impact is the adoption of green, alternative, renewable and sustainable energy sources.² A study by the IPCC further revealed that more than two-thirds of the Green House Gas emissions can be linked to the carbon dioxide emissions from the combustion of fossil fuel and related industrial process. The panel also touted that at the heart of climate change emergency solution is sustainable energy. Further, the transition is not more sustainable as it has to be guided by the Paris Agreement in which member states agreed to maintain their average global temperatures at 1.5 degrees Celsius (IPCC, 2011). Key to attaining this figure was the transition to more sustainable energy sources among other interventions.

Another global framework that stands out in the discussion on climate change is the UNSDGs, particularly, SDG 13-Climate Action, and SDG 7- Affordable and clean Energy. These two forms both a central and active role in guiding the discussion in the transition

² Ibid

toward use of sustainable energy (United Nations, 2015). They outline the positive and negative impacts of such transitions with the aim of educating and persuading countries and individuals alike on the need to shift toward more sustainable and renewable energy sources.³

Additionally, as part of the UN Climate Change Conference, COP 26 that took place in Glasgow in November 2021, with the main agenda of tackling the climate change crisis by undertaking, promoted green economic recovery and recognized the role of sustainable energy transition to this process.⁴ A progress in this direction has since been touted as being part of the change. In addition to this, the NDC's discourse has also been recharged as a way of setting the countries on toes based on their individual agreements to meet the Paris Agreement, which was ratified by 189 countries.⁵

Despite the existence of the above international policy frameworks, climate change scientists are warning that humanity is running out of time to limit global warming to 1.5°C. The Emission Gap Report 2021 shows that new national climate pledges combined with other mitigation measures put the world on track for a global temperature rise of 2.7°C by the end of the century. If implemented effectively, net zero emissions pledges could limit warming to 2.2°C closer to the well-below 2°C goal of the Paris Agreement (UNEP & DTU Partnership, October 2021)

2.2 Regional Framework relevant to Climate Change and SustainableEnergy

The African Continent has also not been left out in the discussion on climate change and sustainable energy. The region has taken both policy change and climate funding to aid in the transition toward a more sustainable energy usage. In the funding front, different actors have come out to support climate change adaptation and mitigation initiatives across all the African countries. Through the Sustainable Energy Fund for Africa (SEFA),

³ Ibid

⁴ See UNFCC, 2021

⁵ Ibid

the African Development Bank has provided catalytic financing with the aim of creating sustainable energy solutions with a focus on the African energy problems (AfDB, 2021). SEFA also seeks to unlock the private sector potential and investments aimed at renewable energy uptake and overall energy efficiency on the continent. It also aims to offer concessional finance instruments that remove market barriers for actors seeking to venture into renewable energy business (AfDB, 2021). Recent initiatives under this Forum include the \$39 Million loan funding that SEFA offered to Gabon for the development of its first independent hydroelectric power project.⁶

On the policy front, the Africa Renewable Energy Initiative (AREI), is one of the frameworks that have been developed as part of guiding the continent toward transformation of the continent toward a future powered by renewable and sustainable energy. The AREI initiative seeks to bring to life transformative Africa-owned and led initiatives and efforts that seek to scale up and accelerate harnessing of the vast renewable energy potential that the continent possess.

The AREI initiative is a mandate under the African Union (AU) and endorsed by the African Heads of States and Governments on Climate Change (CAHOSCC) (AREI, 2018). It has the initial mandate of attaining 10 Gigawatts of new and additional renewable energy generation capacity by 2020 and at least 300 Gigawatts of renewable energy generation capacity across the continent by 2030 (AREI, 2015). Further, in its mandate of supporting sustainable energy production, it focuses also on setting up integrated solutions with a view of the global twin challenges of climate change and universal energy access. The same structure has become the premise of the initiative which advocates for a need for a net-zero, low carbon and zero carbon energy systems.⁷ All these are to be attained in agreement with the continent's commitments under the principles set out in the United Nation's Framework Convention on Climate Change (UNFCCC).⁸

⁶ Ibid

⁷ Ibid

⁸ Ibid

2.3 National Energy Policy and Legislative Landscape

Kenya continues to adopt policies, legislation and initiatives that are aimed at helping the country to cope with the adverse impacts of climate change. On the sustainable energy front, there are series of legislations that have been put forth, assented into law and also adopted to aid in the much needed transition to renewable energy (Takase et al, 2021) Different statistics have continually pointed to a positive trend in shift to the use of renewable energy sources despite being marked as one of the countries in the Sub-Saharan Africa (SSA) experiencing an energy crisis.⁹ Studies show that, for a long time the access to modernized and renewable energy sources was considered a privilege. (Petrik et al,, 2020). Thus, a larger majority of the people opt to use wood fuel and biomass which account for more than 68% of the energy usage in the country.¹⁰ Generally, an energy production mix in Kenya looks more like 52.1% for hydropower production, 32.5% for fossil fuel, 13.2% for geothermal energy, 1.8% for biogas cogeneration and 0.4% for the wind power production (IRENA, 2021)

Looking at the statistics, one would easily agree that Kenya has such a huge potential for renewable energy use and production (Suswatch, 2020). With aspects such as wind power, hydroelectric and even biomass production taking up a huge chunk cumulatively of the energy production, it looks right if handled properly and in time.¹¹ In the same light, one aspect that has been noted by the Ministry of Energy and Petroleum is that there is limited accessibility to the modern energy options (Ministry of Energy, 2018). Further, there is an increased pressure on biomass supply, fluctuating energy prices, high demand for electric power than the country's ability to build more sustainable sources and also a high inability of the country's power and lighting company to link willing

⁹ Ibid

¹⁰ Ibid

¹¹ Ibid

consumers to the purchase of power all while ensuring rural electrification process by grid development.¹²

According to IRENA, the Kenyan situation looks promising (Lebedys et al., 2021). As mentioned earlier, renewable energy forecasts put Kenya as having great potential for sustainable energy productions. In the wind power production, Kenya has an 80% potential for production based on the wind density at 100m height against the proportion of land.¹³ This is 20% more potential over that which can be harnessed globally. The net solar power production of between 1600-1900 KWh/year is also 25 % more in terms of potential production against what it is currently producing (Agnieszka Hellen, 2019).

In terms of renewable energy production, 2018 and 2019 were the years where Kenya had the highest sustainable energy output, of 78% and 80% respectively. In all these, the Energy Act 2019 made great impact (EPRA, 2021).

There are other policies, regulations and legal frameworks guiding Kenya's power and renewable energy sector and are relevant to counties' sustainable energy targets (See table 2 below).

TABLE 1: POLICY, LEGISLATION AND STRATEGIES RELEVANT TO RENEWABLE ENERGY IN KENYA (ADOPTED FROM SOURCE: ICLEI 2020)

No	Policy/Strategies	Relevance
1.	The Constitution of Kenya 2010	<p>The Constitution is the supreme law of the Republic and binds all persons and all State organs at both levels of government. It states that Kenya shall ensure sustainable exploitation, utilization, management and conservation of the environment and natural resources. It created the devolved system of government, consisting of the national government and 47 county governments, and provides a framework for self-governance at the local level.</p> <p>County governments have a key delivery role in the planning and development of electricity and gas reticulation and energy regulation. Article 203(2) requires that county governments be allocated a minimum of 15</p>

¹² Ibid

¹³ Ibid

		per cent of the annual national fiscal revenue, but the actual allocation often surpasses this minimum, which gives county governments considerable influence on investments in energy efficiency actions.
2.	The Energy Act 2019	This is the anchor legal instrument influencing sustainable energy sector in Kenya. It provides for the establishment of energy sector entities and regulates the production, supply and use of energy. It states the national and county governments' obligations to facilitate the provision of affordable energy services to all persons in Kenya.
3.	Sustainable Energy for All Action Agenda	The agenda outlines how the country will achieve its SE4All goals of universal access to modern energy services, increase the rate of energy efficiency, and increase to 80% the share of RE in the energy mix by 2030.
4.	The Big 4 Agenda	Ministry of Energy has identified strategic initiatives for the Big Four Agenda. The initiatives focus on the realization of improved energy access, energy efficiency and conservation.
5.	Climate Change Act 2016	<p>It sets a response framework to climate change and provides mechanisms and measures to achieve low-carbon and climate resilient development.</p> <p>It requires the adoption of a National Climate Change Action Plan. The Action Plan shall aim to enhance energy conservation and efficiency and the use of renewable energy among end-users, industrial, commercial, transport and domestic users and put in place measures for climate change mitigation.</p>
6.	National Climate Change Action Plan (NCCAP 2018-2022)	<p>The Five-year Plan aims to guide Kenya's climate change actions. It identifies six priority mitigation sectors; the energy sector is one of them. These sectors are expected to reduce their GHG emissions, so that Kenya can meet its Nationally Determined Contribution goal of reducing its GHG emissions by 30 per cent by 2030, from the business-as-usual level. Improvement of energy efficiency and conservation is identified as one of the key action areas. The following results are expected by June 30th, 2023:</p> <ul style="list-style-type: none"> • The number of companies participating in energy efficiency initiatives shall be doubled to 1,000 (including 1,000 energy audits). • Minimum Energy Performance Standards shall be developed for five more appliances; existing testing facilities shall be scale up to cover these five appliances.

		<ul style="list-style-type: none"> • The losses in electricity transmission and distribution shall be reduced from 18 per cent to 14 per cent. • 3.3 million Compact Fluorescent Lamps (CFLs) shall be distributed to households through the CFL initiative. • Energy efficiency and conservation projects shall be delivered, which focus on: <ul style="list-style-type: none"> ○ efficient lighting, ○ energy efficiency in buildings, ○ Minimum Energy Performance Standards, ○ the distribution of clean lighting
7.	Sessional Paper No. 4 on Energy (issued by the Ministry of Energy and Petroleum) 2004	<p>The Session Paper provided a policy framework upon which cost-effective, affordable and adequate quality energy services should be made available to the domestic economy on a sustainable basis. One of the objectives was to promote energy efficiency and conservation through:</p> <ul style="list-style-type: none"> • encouraging the private sector's participation in energy conservation and efficiency, • enhancing the provision of energy audits and awareness-raising among industries and financial institutions on the benefits of energy efficiency, • the establishment of energy and equipment testing laboratories for efficiency and accelerated equipment ageing testing, • the promotion of cost-effective industrial energy efficiency and conservation measures, • the dissemination of energy efficiency and conservation information to consumers, • the development of standards and codes of practice on cost-effective energy use.
8.	REREC- Strategic Plan 2017–2021	<p>This strategic plan focuses on the rolling out of RE and mini-grids in achieving REREC's electrification targets for public facilities. The plan provides a roadmap for electrification of public facilities and nearby households. By 2020, the plan projects to electrify 28,323 public facilities, 3,787 of which will be off-grid areas electrified through solar PV.</p>
9.	Least Cost Power Development Plan (LCPDP)	<p>The LCPDP is a Kenyan Energy Sector Report intended to guide the power sector on the status, generation and transmission expansion opportunities, as well as resource requirements for expansion programmes. Timelines for RE project implementation in Kenya are driven by the LCPDP, not counties. For instance, all RE generation plans in Kisumu County must be included in the LCPDP and there must be harmony between county energy plans and the LCPDP.</p>

10.	The Energy (Mini-Grid) Regulations, 2018	Given that RE transition in Kisumu County will entail the development of minigrids in areas far from the national grid, the regulations pertaining to this sector are quite relevant. EPRA was expected to publish the Mini-Grid Regulations and the Regulatory Impact Assessment for public comment in the second half of 2019.
11.	Kenya Electricity Sector Investment Prospectus, 2018–2022	<p>The current Kenya Electricity Sector Investment Prospectus was developed by energy sector institutions. It presents investment and financing opportunities in geothermal development, power generation, electricity transmission and distribution, off-grid electrification, and energy efficiency.</p> <p>This investment prospectus outlines areas for mobilization of resources and multi-stakeholder engagement to facilitate implementation of priority projects in the electricity sector. It also presents the opportunity for increased private-sector participation across all sub-sectors through the private-public partnerships framework, feedin tariffs, and renewable energy auctions frameworks, among other things.</p>
12.	Kenya National Electrification Strategy 2018	It expects to provide 2 million of the expected 5.7 million new connections required for universal electricity access by 2022 in Kenya.
13.	Kenya Electricity Grid Code	The Kenya Electricity Grid Code is the primary technical document of the electricity supply industry (ESI), collating the majority of the technical regulations covering the generation, transmission, distribution and supply of electrical energy
14.	Energy (Electricity Licensing) Regulations 2012	<p>These regulations apply to any person who engages or intends to engage in the generation, transmission, distribution and supply of electrical energy in Kenya as per the requirements of the Energy Act.</p> <p>Under the Licensing Regulations, no permit or license is required to generate electricity where the electricity generated does not exceed 1 MW and is generated for own consumption. A permit is however required for the generation and supply of electrical energy not exceeding 3 MW and a license is required for generation, transmission, distribution or supply of electrical energy exceeding 3 MW.</p>
15.	Energy (Solar Photovoltaic Systems) Regulations 2012	These regulations, made under Section 110 of the Energy Act 2006, provide rules and standards for the installation of solar photovoltaic (PV) systems in Kenya. They apply to a solar PV system manufacturer, importer, vendor,

		technician, contractor, system owner, and to solar PV system installation and consumer devices
16.	Data Protection Bill 2018	This is a relevant bill to the RE sector and particularly in the 'towards 100% RE' project given its extensive data needs. One provision likely to affect off-grid energy companies is the condition for transfer of data out of Kenya, which prevents employees and customer data from being transmitted or stored in another country unless that country also has similar data protection regulations.
17.	The VAT Act 2018 and Finance Act 2020	<p>It exempted all specialized solar equipment and accessories from paying VAT. However, the Act restricts specialized equipment to only those used in the development and generation of wind and solar energy, including deep-cycle batteries which use or store solar power. The introduction of 8% VAT on petroleum products (including kerosene) in this policy amongst other measures, significantly increases the price of kerosene and may render kerosene unaffordable for the off-grid community. This may increase the demand for solar lighting devices.</p> <p>However, on the 30th of June 2020, the President of Kenya enacted the Finance Act, effective from July 2020, which will result in the introduction of 14% VAT on off-grid solar products that were exempted in the previous Finance Act.</p>
18.	The Public Private Partnership (PPP) Act 2013	It provides for the participation of the private sector in the financing, construction, development, operation and maintenance of infrastructure projects of the government through concessions or other contractual arrangements. The Act also established the Public Private Partnership Unit to regulate, monitor and supervise the implementation of project agreements on infrastructure.
19.	Second Kenya's Nationally Determined Contribution	Kenya's Nationally Determined Contributions are one of the drivers of RE developments in the country. In 2015, Kenya committed to reducing its GHG emissions by 30% by 2030 relative to the BAU scenario of 143 MtCO ₂ eq; and in line with its sustainable development agenda. This is also subject to international support in the form of finance, investment, technology development and transfer, and capacity building.
20.	The Public Private Partnership (PPP) Act 2013	It provides for the participation of the private sector in the financing, construction, development, operation and maintenance of infrastructure projects of the government through concessions or other contractual arrangements. The Act also established the Public Private Partnership Unit to regulate, monitor and supervise the implementation of project agreements on infrastructure.

21.	Feed-in Tariff (FiT) Policy (2008) –amended 2010, 2012	The FiT Policy offers a framework for electricity generated from RE sources (specifically wind, biomass and small hydro) in order to safeguard the investments made by the respective developers in undertaking feasibility studies; and to boost the development of RE sources for electricity generation. FiTs allow power producers to sell RE generated electricity to the off-taker (KPLC) at a predetermined tariff for a given period. The FiTs per RE technology are detailed in the FiT policy.
22.	Energy (Appliances’ Energy Performance and Labelling) Regulations (Issued by the Ministry of Energy and Petroleum) 2016	The Regulations require that specified appliances manufactured or imported in Kenya shall be tested for energy performance in an accredited laboratory, get registered with the ERC, and be affixed with appropriate energy star label.
23.	Energy Management Standards 2018	The Kenya Bureau of Standards is developing energy management standards to cover energy management systems, energy auditing and energy efficiency performance measurement & verifications.
24.	Energy (Energy Management) Regulations (issued by the Energy Regulatory Commission)	This document requires that all commercial buildings, and industrial and institutional facilities, whose energy consumption exceeds 180,000 kWh per year should develop an energy management plan, carry out energy audits at least once every three years, and implement at least 50 per cent of the energy savings recommendations within three years.
25.	Green Economy Strategy and Implementation Plan (GESIP) (issued by the Ministry of Environment, Natural Resources) 2016	<p>The GESIP is a blueprint for enhancing low-carbon, resource-efficient, equitable, and inclusive socio-economic transformation. Furthermore, it focuses on eliminating the social-economic constraints to attaining Kenya Vision 2030 and is aligned with the outcomes of the United Nations Conference on Sustainable Development (Rio+20).</p> <p>The plan is to facilitate Kenya’s transition to a sustainable path through five thematic areas and strategies, which are promoting sustainable infrastructure, building resilience, sustainable natural resource management, promoting resource efficiency, social inclusion and sustainable livelihoods.</p> <p>The GESIP aims at guiding national and county governments and other stakeholders on the transition to sustainable development pathways to realize Kenya Vision 2030 and calls for a greater focus on green growth, a cleaner environment and higher productivity. The objectives for increasing national energy efficiency include:</p>

		<ul style="list-style-type: none"> • Develop sector-specific energy efficiency targets and benchmarks, • Roll out demand-side energy efficiency programmes in buildings and facilities, • Roll out supply-side energy efficiency programmes through system reinforcement, efficient transformers, and grid extension projects, • Adopt Minimum Energy Performance Standards for lighting and industrial products, • Develop technical and infrastructural capacity for energy audits, equipment testing and certification, • Review national and country policies to respond to new technology and innovation, and • Enhance the application of voluntary management approaches to energy efficiency, clean and renewable energy.
26.	Performance Standards for Cooking Stoves 2019	New Performance Standards for cookstoves have been gazetted. CCAK is developing a voluntary star labelling scheme for cookstoves on sale based on these standards.

3.0 RENEWABLE ENERGY INSTITUTIONAL FRAMEWORKS

3.1 Energy Actors and Players

The Energy Act of 2019 consolidates institutions relating to energy, and provides for national and county governments' functions in relation to energy. The Act gives more mandates to the national and county governments in the energy sector such as planning, regulation, operation and development have been shared between the two levels. The detailed presentation is on table 2 below.

TABLE 2: MANDATES OF NATIONAL AND COUNTY GOVERNMENTS ON RENEWABLE ENERGY

Role of National Government	Role of County Governments
<p>1. Policy formulation and National Energy Plans</p>	<p>1. County Energy Planning</p>
<ul style="list-style-type: none"> ▪ Formulation of the National Energy Policy. ▪ Preparing Integrated National Energy Plan, incorporating coal, RE and electricity masterplans. ▪ Provision of land and rights-of-way for energy infrastructure. 	<ul style="list-style-type: none"> ▪ Preparation of county energy plans, incorporating coal, RE and electricity master plans. ▪ Physical planning relating to energy resource areas such as dams, solar and wind farms, municipal waste dumpsites, agricultural and animal waste, ocean energy, woodlots and plantations for production of bio-energy feed-stocks. ▪ Provision of land and rights-of-way for energy infrastructure. ▪ Facilitate energy demand by planning for industrial parks and other energy consuming activities. ▪ Preparation and imp
<p>2. Energy Regulation</p>	<p>2. County Energy Regulation</p>

<ul style="list-style-type: none"> • Regulation and licensing of importation, transportation, storage of coal for the purposes of electricity generation. • Regulation and licensing of production, conversion, distribution, supply, marketing and use of RE. • Regulation and licensing of generation, importation, exportation, transmission, distribution, retail and use of electrical energy. • Approval of energy purchase agreements as well as network service and common user facility contracts. • Protection of consumer, investor and other stakeholder interests. • Preparation and enforcement of regulations and standards. • Formulation of national codes for energy efficiency and conservation in buildings. • Issuance of energy-saving certificates to enhance energy efficiency and conservation. • Setting, reviewing and adjustment of energy tariffs and tariff structures. • Resolution of complaints and disputes between parties over any matter in the energy sector. • Prosecution of offences under the Energy Act • Certification of electrical workers and contractors, solar system installation technicians and contractors 	<ul style="list-style-type: none"> • Regulation and licensing of retail supply of coal products for domestic uses. • Regulation and licensing of biomass and charcoal producers, transporters and distributors. • Customize national codes for energy efficiency and conservation in buildings to local conditions. • Regulation and licensing of retail petroleum service stations. • Regulation and licensing of county gas reticulation systems. • Regulation and licensing of designated parking for petroleum tankers. • Regulation and licensing of biogas systems.
<p>3. Energy operations and development</p>	<p>3. County energy operations and development</p>

<ul style="list-style-type: none"> ▪ Generation importation and exportation of coal, geothermal and other energy based natural resources. ▪ Transportation and storage of coal. ▪ Generation, transmission, distribution (including reticulation) and retail of electricity. ▪ Collect and maintain energy data. ▪ Implementation of the rural electrification programme and management of the rural electrification programme fund. ▪ Undertake feasibility studies and maintain data with a view to availing the same to developers of energy resources and infrastructure. ▪ Provide technical and other capacity-building support to county governments. ▪ Administration and management of the Sovereign Wealth Fund, the Consolidated Energy Fund, and the National Energy Conservation Fund. ▪ Providing security for energy infrastructure including power plants, control centres, electricity supply lines and substations 	<ul style="list-style-type: none"> ▪ Electricity and gas reticulation. ▪ Provide and maintain adequate street lighting. ▪ Collect and maintain energy data. ▪ Implementation of county electrification projects. ▪ Undertake feasibility studies and maintain data with a view to availing the same to developers of energy resources and infrastructure. ▪ Establishment of energy centres for promotion of renewable energy technologies, energy efficiency and conservation. ▪ Security of energy infrastructure (power plants, control centres, electricity supply lines and substations). ▪ Undertake energy efficiency and conservation measures within the county
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The Act establishes the powers and functions of the energy sector's entities and actors in the promotion of renewable energy exploration, recovery and commercial utilization of geothermal energy, regulation of midstream and downstream petroleum and coal activities. It further provides for regulation, production, supply and use of electricity and other energy forms (Ministry of Energy, 2019). Table 3 below highlights energy actors and their roles and responsibilities.

TABLE 3: INSTITUTIONAL FRAMEWORKS GUIDING THE ENERGY SECTOR IN KENYA

Actors	Responsibilities
Ministry of Energy	Formulation energy policies, planning, training and resource mobilization
County Ministries of Energy	Enforcement, policy formulation, fundraising and inspection
Energy Regulatory Commission (ERC)	Regulation: Tariff-setting, review, licensing, enforcement, dispute settlement, approval of power purchase agreements and network service contracts
Energy Tribunal	Hearing appeals and determine energy related matters
Kenya Power	Purchasing, transmission, distribution, supply and retail sales of electricity
Kenya Electricity Generating Company Ltd (KenGen)	Electric power generation through hydro, geothermal, thermal and wind sources.
Rural Electricity Authority (REA)	Electricity supply to rural areas, managing rural electrification fund, resource mobilization and promotes the development and use of renewable energy
Geothermal Development Co Ltd (GDC)	Development of geothermal resources in Kenya
Kenya Electricity Transmission and Communication Ltd	Development of national transmission grid network and facilitation of regional power trade.
Independent power producers (IPPs)	Private companies that generate power and sell electricity in bulk to KPC.
Kenya Petroleum Refineries Ltd (KPRL)	Processing crude oil
Kenya Pipeline Company Ltd (KPC)	Storage, transportation and handling of refined petroleum products in Kenya
National Oil Corporations of Kenya Ltd (NOCK)	Stabilizing the petroleum supply market by participating in all aspects of the petroleum industry
Oil Marketing Companies (OMC)	Importation, storage, wholesale, export and retail of products
Petroleum Institute of East Africa (PEEA)	Capacity-building and awareness creation.
Oil Exploration and Production Companies (OIEPS)	Licensed to undertake exploration and production of petroleum products
NEMA	Environmental aspects of the energy sector
Kenya Association of Manufacturers (KAM)	Support energy efficiency and conservation measures, provide; professional technical services; promoting a clean and healthy environment.
Research and think tanks	Research, capacity-building, technology transfer and policy support

generation application; and to coordinate enactment of county energy laws, policies and regulations.

The main sources of energy are electricity, solar, liquified petroleum gas, biogas, paraffin, charcoal and firewood. High level energy sources are cleaner but cost more and are used by households with higher levels of income compared to simpler sources of fuel, mainly firewood. 63.2% of the population use paraffin as cooking fuel, 20.2 % use LPG, 10.5% use charcoal and 1.8% use firewood. For lighting, 68% of the households use electricity, 28.8% use paraffin while 2.9% use grass and 1.7% use dry cells.

Priority energy activities include increased uptake of renewable energy through installation of solar panels and LED light, introducing innovative clean cooking-ethanol stove tier 4, energy generation from waste water ponds, and carrying out energy audits.

4.1.2 Nakuru County

Nakuru County is one of the 47 Counties of the Republic of Kenya established in the Constitution of Kenya 2010 (Nakuru County Government, 2018). It covers 7498.8 Km² and has an estimated population of 2.1 million with 1,054,898 males and 1,049,490 females.¹⁶

The major environmental threats in the County include climate change, deforestation, pollution, drought and flooding. Demand for wood fuel and

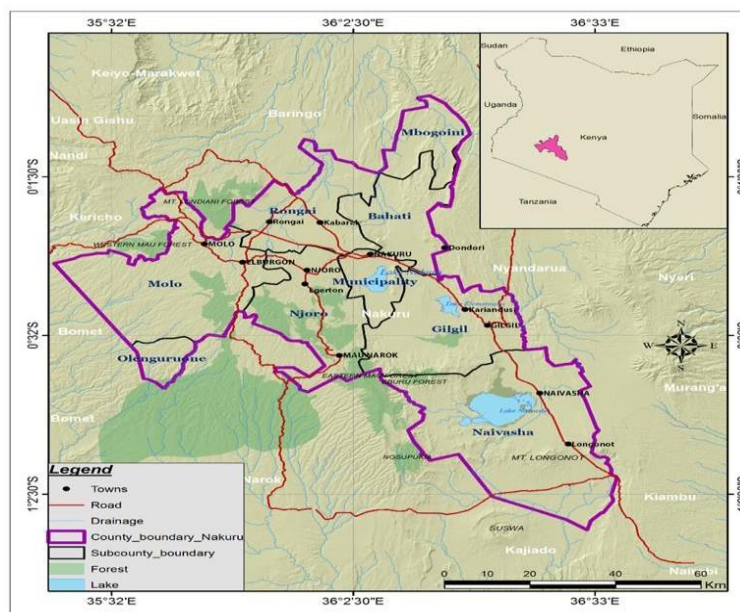


FIGURE 4: MAP OF NAKURU COUNTY

¹⁶ Nakuru County CIDP 2018-2022

other timber products have caused deforestation leading to aridity and increased soil erosion.¹⁷

The County is the home to Olkaria geothermal power plant, which is the single largest geothermal plant in Africa. Electricity is the main source of energy for lighting in the at 55.4 percent where firewood and charcoal are the major sources of energy for cooking at 42.6 percent and 30,7 percent respectively. Electricity coverage in the county stands at 80 percent with most of these connections being in urban areas. Other renewable energy sources like wind, solar and biogas account for less than 3 percent. Most of the county receives enough sun throughout the year that can support the use of solar energy. The

County is working to enhance the use and adoption of renewable energy sources of energy in the current CIDP.¹⁸ It seeks to: promote green energy use and development, enhance energy planning, regulation, operation and development; and establishment of energy centers for promotion of renewable energy technologies.¹⁹

The County has a functional Water, Environment, Energy and Natural Resources sector. It draws its mandate from Governor Executive order No. 1 of November. The sector's mission is to conserve environment, provide potable water and sustainable energy (Nakuru County Government, November 2021). Table 4 shows a summary of the policy and legislation landscape guiding energy governance.

TABLE 4: POLICY LANDSCAPE GUIDING ENERGY GOVERNANCE

No	Framework	Description
1.	Nakuru County Climate Change Act 2020	Puts in place the framework and mechanism to bring together all relevant stakeholders to respond collectively to climate change. It establishes climate Change Fund,

¹⁷ Ibid

¹⁸ Ibid

¹⁹ Ibid

		which is a dedicated budget for climate-related activities across the departments.
2.	Nakuru County Sustainable Energy Access and Climate Action Plan (SEEnCAP)	Complements existing efforts to update the existing county plans with sound scientific evidence and a participatory approach. It seeks to reduce greenhouse gas emissions, improve responses to climate change impacts and enhance residents' access to sustainable energy.
3.	County CIDP 2018-2022	Seeks to promote renewable energy sources including wind energy, solar energy, bio-energy and hydro-energy. It also provides for incentives to investors to establish waste-to-energy infrastructure. linkages with other plans.

4.1.3 Kisumu County

Kisumu County is County number 42, created through the devolved system of governance by the Constitution of Kenya 2010 (GoK, 2010). The county hosts the third largest city in Kenya (Kisumu County Government, 2018). Economic activities of the residents are trade, farming and fishing. According to the 2019 National Census, Kisumu County has a population of 1,155, 574.²⁰ The population density is 550 persons per Km². The population distribution by sex is 556,942 males and 594,609 females (KNBS, 2019) There are 300,745 with a mean household size of 3.8 compared to 12143,913 households nationally.²¹

The County covers approximately 567 km² on water and 2086 km² land area,

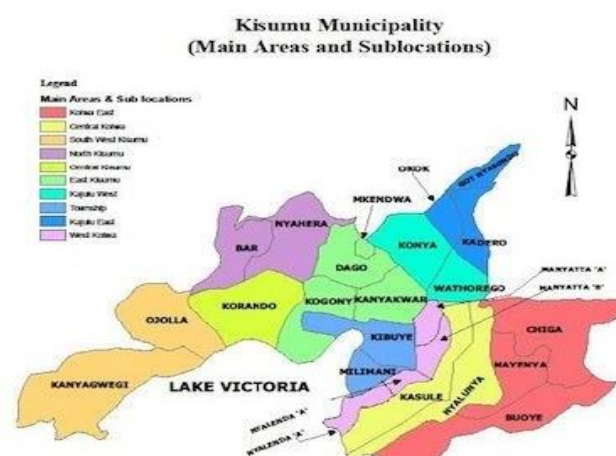


FIGURE 5: MAP OF KISUMU COUNTY

²⁰ Ibid

²¹ Ibid

representing 0.36% of the total land area of Kenya's 580,367 km². (Kisumu County Government, 2018)

The climate of the county is generally warm with manual monthly variation in temperatures between 23⁰C and 33⁰C throughout the year.²²

Climate change possess significant environmental challenges facing Kisumu County as evidenced by frequent floods, droughts and water shortages, poor drainage and solid waste management. The main human activities contributing to environmental degradation include unsustainable land use practices, poor soil and water management practices, deforestation, overgrazing and pollution, air and noise pollution. In addition to these challenges are the sectoral policies and laws which are not in harmony with each other and the constitution.²³

The County has a functional energy department whose mission is to provide sustainable, accessible, efficient, effective and innovative services for the growth and development of energy and industry within Kisumu County (Kisumu County Government, 2021). The directorate of renewable energy is mandated to promote development and use of renewable energy sources and advocates for facilitation of scaling up of clean cooking mechanisms and fuels in Kisumu County through promotion and expedition of enabling policies, creating public awareness and capacity building for sector players.²⁴

The main energy sources within Kisumu County are electricity and thermal (firewood at 49.6%, charcoal at 22.2%, kerosene at 7.8%, LPG at 18.7%, biogas and solar).²⁵ The county has not tapped into the solar and renewable energy potential. The grid electrification rate is 52.6%; electricity consumption 250.3 GWh as at 2015. The use of firewood, charcoal and paraffin is prevalent at 49.6%, 22.2% and 7.8% respectively (ICLEI, 2021).

²² Ibid

²³ Ibid

²⁴ Ibid

²⁵ See CIDP

The County has set a target to increase electrification in the CIDP 2018-2022 to 90%. Electricity in the county is dominated by SMEs, public and private sector players.²⁶

Kisumu County has developed policies and strategies that ensures that there is an increase in energy access in line with the County's SE4All Kenyan Action Agenda as well as other policies. These are summarized in table 5 below:

TABLE 5: POLICIES AND LEGAL FRAMEWORKS GUIDING ENERGY SECTOR IN KISUMU

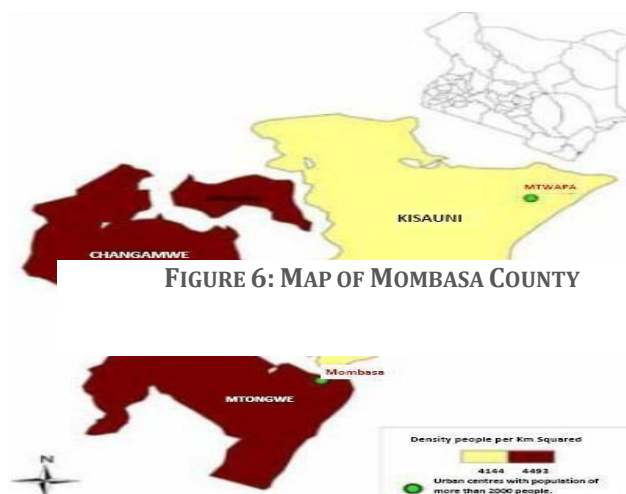
No	Policy	Description
1.	The Kisumu County Draft Sustainable Energy Policy 2016 (draft)	This policy was prepared by the County Government of Kisumu, as part of the county's constitutional mandate to regulate energy and energy targets, in line with the targets and measures set out in the SE4All Kenya's Action Agenda and other relevant policies in the country. It also contains policy interventions per objective and target in the county.
2.	The Kisumu County Draft Energy Masterplan 2017	This masterplan details the access to electricity and access to clean cooking status of the county through a household survey that was conducted. It also points out the challenges faced by the county in increasing access to energy and proposes policy recommendations for the county. The current energy mix, energy demand and actors are also outlined in this document. The masterplan is planned to be completed in the 2020/2021 financial year.
3.	The Kisumu County Integrated Development Plan (2018-2022)	As inferred from the name, this is a county development plan developed every 5 years. The current CIDP in Kisumu County is the second, valid for 2018 to 2022. This CIDP II cuts across all the county departments and is currently being reviewed.

²⁶ Ibid

4.2.4 Mombasa County

Mombasa County is located in the South Eastern part of the Coastal region of Kenya (Mombasa County Government, 2018). It covers an area of 229.9 Km² excluding 65 km² of water mass which is 200 nautical miles inside the Indian Ocean. It has a population of 1.19 million and 378,422 households.²⁷

The County also enjoys proximity to the expansive water mass as it borders the Exclusive Economic Zone of the Indian Ocean to the East.²⁸ The annual temperature is 27.9⁰c and a maximum of 33.1⁰c. The hottest month is February with a maximum average of 33.1⁰c while the lowest temperature is in July with a minimum average of 22.7⁰c. Average humidity at noon is about 65%. The County has experienced several effects of climate change.²⁹



The main source of cooking energy for the county residents is paraffin at 53.6%, charcoal at 30%, firewood at 8.8% LPG at 4.7% and electricity at 1.7%. For lighting, paraffin at 51.5% followed by electricity at 47.5%. The County has a high potential for generation of solar and wind energy, but this remains unexploited.³⁰ The county has potential for solar and wind energy. However, it suffers from inadequate resources and unmapped potential. There is renewed emphasis on modernization of Mombasa County's energy infrastructure, with a special focus on development of renewable, affordable and reliable energy sources, as well as the expansion of the rural electrification program.³¹

²⁷ See (KNBS, 2019)

²⁸ Ibid

²⁹ Ibid

³⁰ Ibid

³¹ Ibid

The County has prioritized projects such as composting of biogas generation, tree planting, development and use of solar photovoltaics. It has an operational department of trade and investment, energy and industry. The department is mandated to promote utilization of renewable energy by developing a county policy on energy provision and promote utilization of renewable energy. It is also supposed to enhance renewable energy generation and energy regulation and reticulation.

5.0 ENERGY CHALLENGES AND PRIORITY ACTIONS BY THE SELECT COUNTIES

The implementation of the Energy Act 2019 at the county level can be confirmed to be on course as outlined in the table below. The majority of the programmes and projects include solar lighting, domestic biogas plants, solar-power coolers, school solar equipment, clean cooking mechanisms, energy audits and phasing out kerosene Lanterns. However, despite the strides made in realization of the sustainable energy for all, challenges still remain at the county level. The key challenge is the lack of weak institutions. Energy is not given much prominence as the sector is included as part of larger departments of water, environment among others. Table 6 below highlights some of the challenges as well as priority actions that the 4 Counties are implementing in response to the listed challenges.

TABLE 6: ENERGY CHALLENGES AND PRIORITY ACTIONS FROM THE SELECT COUNTIES

County	Challenges	Priority Actions
Nairobi County	<ul style="list-style-type: none"> ○ Power theft due to poor planning ○ High taxation rate and overall high living standards have made it harder to acquire the alternative source of power such as solar powered lighting and cooking systems. ○ Water shortage which affects the hydroelectric power supply leading to rampant black outs. ○ In effective and unsustainable governance systems 	<ul style="list-style-type: none"> ▪ Increase uptake in renewable energy: installing solar panels and LED lighting; introducing innovative clean cooking-ethanol stove tier-4 and; energy generation from waste water ponds ▪ Increase energy efficiency in institutional buildings: carrying out energy audits
Nakuru County	<ul style="list-style-type: none"> ▪ Climate change effects such as prolonged drought, flooding. ▪ Resistance to shift to alternative clean energy solutions. ▪ Environmental degradation which has hampered sustainability of tree planting exercise and reduced water resource base ▪ Inadequate staff due to natural attrition 	<ul style="list-style-type: none"> ▪ Physical planning relating to energy. ▪ Establishment of energy centres for promotion of renewable energy technologies. ▪ Providing information related to clean energy and

	<p>without replacement.</p> <ul style="list-style-type: none"> ▪ Inadequate funding for departmental programmes. ▪ Increasing energy costs 	development.
Mombasa County	<ul style="list-style-type: none"> ▪ Over dependence on unsustainable sources of energy such as paraffin, kerosene, charcoal etc ▪ Slow grid penetration in the remote areas. ▪ Slow uptake of renewable energy due logistical issues in delivery 	<ul style="list-style-type: none"> ▪ Solve the slow grid-penetration into the remote areas with the aid of the Rural Electrification Initiatives. ▪ Installation of green energy alternatives such as wind and solar.
Kisumu County	<ul style="list-style-type: none"> ▪ Lack of awareness on clean energy opportunities ▪ High cost of renewable energy sources ▪ Unreliable electricity and charcoal supply ▪ Adverse environmental and health impacts, as a result of using highly polluting fuels ▪ The ever-increasing mismatch between the supply and demand biomass. ▪ Conflicting legal and policy interventions at County and National level. 	<ul style="list-style-type: none"> ▪ Reduce cost of power ▪ Increase business hours ▪ Increase access to clean energy ▪ Increase the number of electrified markets and dispensaries. ▪ Regulate downstream petroleum activities ▪ Develop county energy masterplan

6.0 CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

This baseline study has examined the status of implementation of the Energy Act 2019 at the select 4 Counties of Nairobi, Nakuru, Mombasa and Kisumu. It has established varied landscape for institutional and policy frameworks guiding these counties towards realizing SE4All. The study has also established the existence of renewable energy potential, relevant energy policies as well as the institutions and financial models in place to enable roll-out of renewable energy projects. Following the study, barriers, and recommendations for the Governance Thematic Working Group are summarized below:

- Transposition of national legislation into County laws: Often the way ministry directives have been translated into county legislations presents hurdles. This has been exacerbated by lack of clarity on how these should be applied to renewable energy targets. Additionally, specificities and implementation vary across the 4 Counties.
- Unrealistic renewable energy targets and lack of dedicated policy mechanisms: policies do not work well where policy makers and funding agencies have excessively high expectations regarding time and cost, which may come as a result of unrealistic targets which are well captured in their CIDPs and generic policies which lead to loss of credibility.
- Insufficient and unsuitability of county level funding schemes. The limited county level funding and investments in RE impairs the participation of county actors in co-funded programs and their access to co-funded financial instruments.
- Benefits of information sharing. Openness about results, be it success or failures, is essential to accelerate the commercial readiness of the sector. Experience from Kisumu shows that policies work well where county governments work closely with the investors and communities.

- Governance fragmentation and lack of motivation. Most counties have fragmented governance structures with responsibilities spread across numerous departments, agencies and directorates etc. There seems to be little political goodwill and appetite for greater integration and no bold targets are set, making it difficult to push for RE action at the county level.
- There is a lack of streamlined processes for the licensing and permitting of RE projects within and between counties as well as the national government (regional blocks provides an avenue for cross-county partnerships and collaboration). This poses a barrier as getting a clear view on who should be involved, at what stage and for what purpose, can be very time consuming. Lack of specified timeframes for decision making hinders development as it can result in a lengthy process.
- Inadequate consultation, stakeholder engagement, and dissemination of the sector priorities and achievements have been recorded. Sharing successes of the sector is crucial to increase stakeholder acceptance and ownership. This is why lack of data has been recognized as a major issue in previous studies.

6.2 Recommendations

This study reinforces the need for a dedicated legal framework for RE at the County level. Moreover, more financial support for continued research and demonstration should be provided at the county level by launching new funding mechanisms specific to the RE sector. Results also show the importance of developing guidelines, strategic and integrated plans.

To counter the identified challenges to sustainable energy governance and ensure the smooth implementation of the Energy Act 2019, the Governance Thematic Working Group should push and advocate for national and county governments to undertake measures such as:

1. Hiring more energy technical staff to satisfy the demand and need for county energy policy formulation and implementation as well as monitoring.
2. Lobby for more funding through County Assemblies, Senate and Parliament as well as the Council of Governors to enable counties have funds for renewable energy infrastructure and build human resources capacity.
3. Partner with local and international organizations and development partners as well as private sector players to enact policies, build capacities and monitor progress of renewable energy programmes.
4. Ensure inclusion and implementation of renewable energy targets in county policies and plans and towards the achievements of NDC, SDG 7 and the Vision 2030

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