

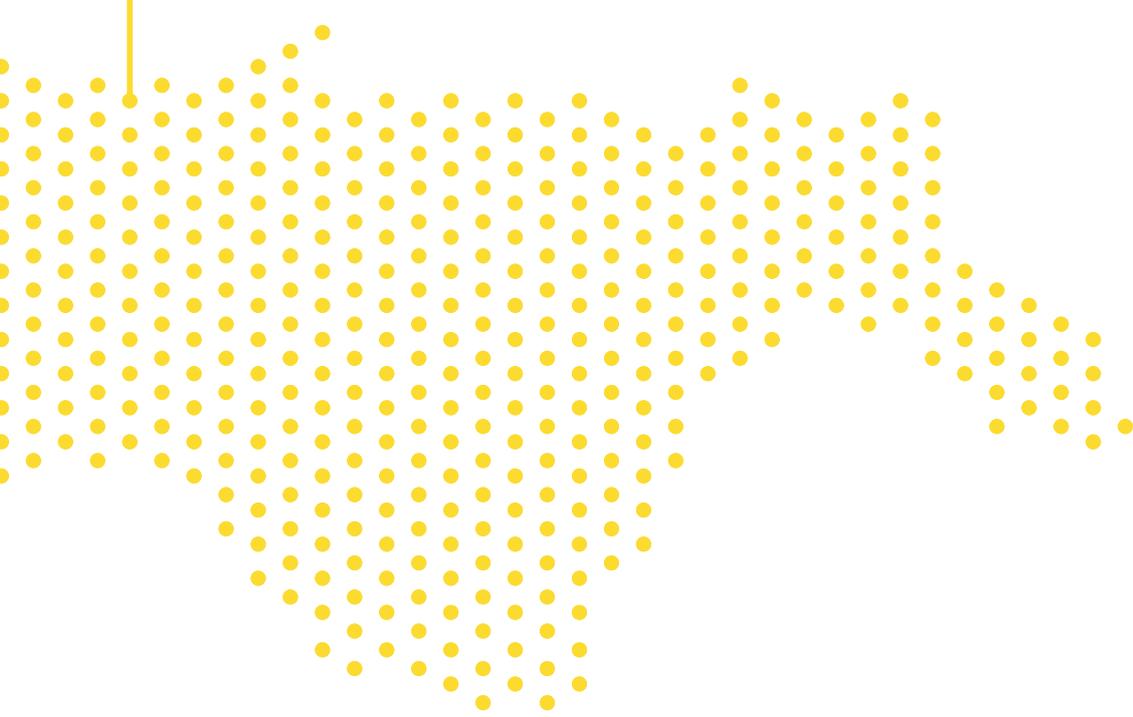


LOCAL POLICY REVIEW AND RECOMMENDATIONS FOR A TRANSITION TO 100% RE FOR KISUMU COUNTY, KENYA

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Kisumu County, Kenya



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This 100% Renewables Roadmap for Kisumu County, Kenya, is the culmination of the work under the 100% Renewables Cities and Regions Roadmap project. It represents the final outcome of an extensive consultation process, beginning with securing political commitment and engaging relevant stakeholders, and progressing through data collection and energy systems modelling to provide a feasible pathway towards 100% renewable energy use. This roadmap document outlines the local strategies, implementation mechanisms and recommendations for the local government to realise this vision.

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ABOUT 100% RENEWABLES CITIES AND REGIONS ROADMAP PROJECT

The 100% Renewables Cities and Regions Roadmap project facilitates the energy transition by raising local awareness on renewable energy sources, showcasing how local and national governments can create coordinated enabling frameworks and policies, exploring access to public and private sector finance, and building local renewable energy projects to address electricity, heating and cooling.

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ABBREVIATIONS AND ACRONYMS

Abbreviation	Description
AFOLU	Agriculture, Forestry and Other Land Use
BRT	Bus Rapid Transit
DFI	Development Finance Institutions
EV	Electric vehicles
FIT	Feed-in tariff
GWh	Gigawatt hour
IRP	Integrated Resource Plan
KCEP	Kisumu County Energy Plan
KCICCAP	Kisumu County Integrated Climate Change Action Plan
KeNHA	Kenya National Highways Authority
KNEECS	Kenya National Energy Efficiency and Conservation Strategy
LED	Light Emitting Diodes
LPG	Liquefied Petroleum Gas
LT-LEDS	Long Term Low Emissions Development Strategy
MW	Megawatt
NMT	Non-motorised transport
PPP	Public Private Partnership
RE	Renewable energy
REP	Rural Electrification Programme
SDMUAK	Street Design Manual for Urban Areas in Kenya
SHS	Solar home systems
SME	Small and medium enterprises
SWH	Solar water heater

PURPOSE OF THIS REPORT

This report “Local policy review and recommendations for Kisumu” is part of the *100% Renewables Cities and Regions Roadmap* project that aims to offer support to local and regional governments (LRGs) in their quests to attain 100% renewable energy use (100% RE) by mid-century. These recommendations should not be read in isolation but rather in combination with the 100% Renewables Roadmap for Kisumu County (“Roadmap”)—itself a culmination of work carried out through the Initial Status Report, National Energy Situational and Stakeholder Analysis, and the Energy System Modelling Results for Kisumu County—as well as existing local policies in Kisumu. These recommendations aim to build on the aforementioned reports, most specifically the Roadmap, to provide local policy recommendations that can assist Kisumu with closing the gap to 100% RE by 2050. Changes in policy and legislation seek to change the rules of the game and to change incentives, making it an important site of leverage for realising a transition to 100% RE.

The 100% Renewables Roadmap for Kisumu County provides a comprehensive overview of the energy sector, and puts forward pathways and options for transitioning to 100% RE. The report was organised into three action pillars made up of objectives, goals, indicators, actions and qualifying conditions. This report builds on the work of the Roadmap and provides guidance on how to close the gap towards 100% RE in 2050, focusing on extending existing policies and priorities of the local government as revealed through the roadmap development process, and is considered a living document. This is important as most of the policies available only reach up to 2030, and do not generally focus on transitioning energy demand towards renewables, and therefore provide little guidance as to how to get to 100% RE by 2050. So, the focus of this report lies in the “how”. Part of this is identifying the existing county mandate and the areas over which they have direct control and can drive action, as well as priority areas, and therefore where emphasis should be placed to have maximum impact.

This report is structured as follows: **Section 1** provides an overview of how the report fits into the overall project context. **Section 2** is a targeted local policy analysis conducted to map the current status in each focus area outlined in the Roadmap, the 2050 aspiration, to assess how far current policies get Kisumu towards 100% RE by 2050. The section also provides an overview of the importance of ensuring a just transition. **Section 3** discusses the current policy barriers to reaching 100% RE. Based on the diagnostic and policy barrier assessment, **Section 4** details local policy recommendations and **Section 5** concludes the report.

MAPPING KISUMU COUNTY'S CURRENT POLICY POSITION IN RELATION TO ATTAINING 100%RE

The intention of this section is to take stock of Kisumu County's current policy position in its journey towards 100% RE. Drawing on the modelling report, it sets out the goals for each sector by 2050, and maps existing policy interventions against these. It also considers the current status to assess progress towards attaining 100% RE, as well as opportunities and gaps, and highlights the importance of a just energy transition.

STATUS OF POLICY INTERVENTIONS AND PROGRESS TOWARDS ATTAINING 100% RE

Achieving 100% RE use across all end-uses is an ambitious goal, particularly when Kisumu County already faces challenges in access to clean energy. Such a change involves not just expanding renewable energy supply (for which Kenya is paving the way through its pioneering use of geothermal energy), but energy demand as well, in alignment with energy efficiency and conservation measures, behavioural changes, grid infrastructure upgrades, digitalisation, and so on. Kisumu County can cover a lot of ground by addressing the three priority areas identified through consultations—electricity (buildings), transport, and clean cooking—and by mainstreaming the use of renewable energy technologies in its territory alongside other development priorities. Working with neighbouring counties, as well as the national government and other actors such as utilities, is critical to ensure the successful realisation of this target.

The **Kisumu County Integrated Climate Change Action Plan (KCICCAP) 2022 – 2027** gives an overview of current emissions, emission projections for 2030 and 2050, and emission reduction goals as shown in Table 1 below. Kenya's counties benefited from the devolution of powers and mandates that came with their formation, allowing them the opportunity to define locally relevant energy plans and strategies. Some counties have integrated energy as a key component into their County Integrated Development Plans (CIDP) or have developed standalone energy plans (County Energy Plans (CEPs)). Given that the power sector is predominantly renewables based, and with transport and stationary energy use (including in buildings and homes) responsible for over 96% of emissions, they are clearly the two priority sectors for the transition to 100% RE, making policies targeting the demand side of utmost importance. In addition, given the dependency of Kisumu's residents on traditional biomass for cooking, interventions here in terms of switching to cleaner options can have immense benefits in addition to tackling climate change. Importantly, unlike most sector policies, the KCICCAP provides emissions projections and goals for the long term, up to 2050, and therefore provides useful guidance for the long-term planning of these sectors.



Table 1: Sectoral emission projections and goals for 2030 and 2050 in Kisumu (KCICCAP 2022 – 2027)

Sector	Emissions share	2030 projected emissions (Mt)	2030 goal	2050 projected emissions (Mt)	2050 goal
Transport	84.92% (7.85 MtCO ₂ e)	12.25 Mt	50% reduction	22.98 Mt	80% reduction
Stationary energy (including power, heating, cooling and cooking)	11.94% (1.10 MtCO ₂ e)	1.72 Mt	50% reduction	3.22 Mt	80% reduction
	Residential buildings – 56.63%	Firewood – 74.30% Charcoal – 20.90% Electricity – 2% LPG – 1.90% Kerosene – 0.90%			
	Commercial and institutional buildings – 41.96%	Firewood – 44.90% Charcoal – 54.70% LPG – 0.40%			
	Manufacturing industries and construction – 1.41%				
Waste	2.69% (0.25 MtCO ₂ e)	0.39	50% reduction	0.73	85% reduction
Agriculture, forestry and other land use (AFOLU)	0.45% (0.42 MtCO ₂ e)				

Each sector differs in their prospects for transitioning to 100% RE. They differ in terms of policy support, the roles of county government and clarity in devolution, the techno-economic feasibility of transitioning and associated time horizons, as well as how county governments work with other actors. Given these differing characteristics, Kisumu's transition to 100% RE should not aim to uniformly weight sectors, but instead prioritise those that hold the greatest potential and fall directly within their mandate. For other sectors, while county governments may apply pressure for change, they may not to the same extent be able to directly drive action. **Table 2** maps the main existing policy interventions for the **electricity (buildings)**, **transport** and **clean cooking** sectors in relation to the current status of these sectors and the 2050 100% RE scenarios.

Table 2: Current status and policy response’s level of alignment with 100% RE in 2050

Sector	2023-24 (Current status)	Overview of current policy interventions proposed	2050 (Modelling results)
Power (including energy efficiency)	<p>84.93% renewables (Kenya: hydro 22.5%; wind 14.3%; geothermal 44.55%; solar PV 3.54%)</p> <p>Kisumu installed capacity and electricity generation 2018</p> <p>Hydropower – 81 MW (517 GWh)</p> <p>Gas – 30 MW (65.5GWh)</p> <p>Sugar bagasse – 21 MW</p> <p>Electricity demand: 250.3 GWh</p>	<ul style="list-style-type: none"> • Promote use of alternative (renewable) sources of energy. • Develop renewable energy including solar, wind and biogas. • Formulate an Integrated Resource Plan (IRP). • Establish appropriate waste disposal facilities including waste-to-energy. • Create public awareness with respect to clean energy and energy-efficient technologies. • Provide and facilitate land rights access for renewable energy generation. • Provide financial incentives and reduce the process of development approval for developers who use the land for renewable energy generation. • To promote efficiency in the private sector and industry, the County Government shall enforce Energy Management Regulations 2012 which provide guidelines on energy auditing and management for all industrial, commercial and institutional energy users at least once every three years. • Develop and make available to investors a database of administrative requirements, procedures and regulations for operating RE systems. • Promote the development of local capacity for designing, installing, operating and maintaining renewable energy technology systems. • Promote and implement the use of solar PVs for energy supply in public institutions through public-private partnership. • Establish measures to ensure compliance with the Energy Regulations (solar water heating) in public buildings. • Facilitate resource mapping and maintain data. 	<p>Solar PV 9389 GWh</p> <p>Hydropower 834 GWh</p> <p>Biogas 239 GWh</p> <p>(based on Kisumu County’s RE resources only; not including grid imports)</p>

<p>Transport</p>	<p>30,977 motorcycles 2,406 tuk-tuks 15,929 cars (10 EVs) 2406 buses/trucks, 57.6% = non-motorised transport (NMT) 50 km NMT infrastructure 1 charging station</p>	<ul style="list-style-type: none"> • Hold a car-free day at least one Sunday per month starting in January 2021 • Hold monthly sustainable commuting (walking, cycling, or public transport) days for county/city staff from January 2021 • Introduction of 450 modern, accessible public transport vehicles that meet at least the Euro 4 standard, with an eventual transition to e-vehicles • LED/energy saving bulbs should be used for street lighting to minimise the cost of lighting the city • Install 100 km of street lights by 2030 • Increase mode of walking and cycling • Prepare a service plan, financial plan, and business plan for improved public transport services • Introduce a new public transport fleet consisting of 250 vehicles by 2023, growing to 450 vehicles by 2030 • Institute incentives for electrification, with a goal of electrifying 50% of Kisumu boda-bodas and tuk-tuks by 2025 • Plan for and implement solar technologies for street lighting and for use in public places, accompanied by storage and charging technologies 	<p>Hydrogen 3499 GWh NMT 1735 GWh</p>
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<p>Clean cooking</p>	<p>23% with access to clean cooking (incl. LPG)</p>	<ul style="list-style-type: none"> • Create financing schemes to promote uptake of energy-efficient appliances, including efficient cookstoves, in public institutions • Create financial incentives/financing schemes to promote uptake of biogas for cooking in households • Promote the development of local capacity for qualified personnel with skills necessary to install and maintain biogas systems • Develop and implement awareness programmes and invest in robust and comprehensive consultation processes that enable meaningful participation of the public in the implementation of policy and projects • Provide linkages to improve access to loan facilities • Lobby and facilitate discussions with the national government to reduce taxation on ethanol financing scheme/payment scheme to cover ethanol stoves' initial costs • The county government will support the national government in its efforts to promote the use of LPG • Establishing the feasibility of scaling up access to small-scale LPG cylinders and lobby the private sector to introduce supply of small-scale LPG cylinders in the county to increase uptake • Provide financial/tax incentive to the private sector entities setting up storage and filling plants within the county • The County to set the target of 48.17% of county households using cookstoves by 2022 • Promote the distribution of efficient cookstoves for households and institutions through the issuance of micro-loans • Establish mechanisms to enforce national government regulations on standards and efficient cookstoves • Develop a framework for phasing out the use of traditional biomass 	<p>Electric 383 GWh Ethanol 47 GWh Biogas 7 GWh Biomass 4 GWh</p>
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POWER

The power sector enjoys **clearly defined roles** between national and county governments as articulated in the National Energy Policy 2018 and Act of 2019. While the clarity on paper is important, conflict arises during implementation, as some counties have **inadequate financial resources and personnel** to carry out their devolved mandate. This allows national government ministries to **overstep their mandates**, meaning devolution is not achieved in practice. Given the current situation, the most appropriate role for counties in the power sector is under 1 MW where no distribution is required, such as mini-grids or solar home systems (SHS). Going beyond would require a change in mandates, and in the ability of county governments to play specific roles such as becoming an off-taker for new renewables-based, utility-scale power plants. The current **mandate** of the county government in the power sector constrains the role Kisumu could play and needs to be addressed. Furthermore, the dominant time horizon for the power sector policies is up to 2030, not 2050.

BUILDINGS

These local policy recommendations are particularly important to the buildings sector as it is a significant emitter. The sector lacks a dedicated county-level policy and falls directly under the mandate of county governments. This confluence of factors and the fact that county governments are tasked with implementing the Kenya National Energy Efficiency and Conservation Strategy (KNEECS) 2020, provide the space for these recommendations to envision and accelerate the transition of the sector to 100% RE by 2050, and offer concrete steps to make this possible. An urgent first step would be to develop a green buildings policy that could set the long-term vision and pathway for the buildings sector in the county. This would also serve as an example for other counties to follow, thereby extending the reach of this intervention. Energy efficiency holds major potential in the county and represents a low-hanging fruit in the transition to 100% RE, but needs to be scaled massively to reduce the forecast increase in energy demand.

TRANSPORT

With transport responsible for 85% of emissions and its current reliance on fossil fuels, the transport sector is a key frontier for the transition to 100% RE. However, the policy reviews uncovered gaps that can be addressed through policy decisions going forward.

There are currently no major plans for **electrification**, apart from the introduction of 450 electric vehicles (EVs), which offers no indication of what percentage of transport this would then cover. Clearer distinction between **retrofitting** existing vehicles and infrastructure, how much new infrastructure is needed, as well as how much of both retrofitted or new infrastructure will be compatible with 100% RE, is needed for determining strategies for achieving 100% RE by 2050. While there is real potential with boda-bodas and tuk-tuk electrification, no 100% electrification target exists, and details are lacking on how a full transition could be achieved. These forms of transport move the majority of the county population and hold major potential for electrification. However, all these forms are owned by **private operators**.

The existing policy for transport in Kisumu pays limited attention to the **transition of fuel types** in the sector and how to get there by 2050. There is limited coverage of the potential role of **green hydrogen** in the sector, although a hydrogen roadmap for Kenya has recently been completed. Although there is a goal to **modernise public transport**, there is little detail about what this would consist of and how it would be achieved.

The expansion of **NMT infrastructure** is a priority in the county, but so too is answering the question about how many of those reliant on NMT are captive users, with NMT being their only choice due to affordability. A question confronting the sector is what needs to happen to **expand choice, but not emissions**, or expanding choice for captive users which may lead to an increase in emissions to meet basic mobility needs.

In addition to these technoeconomic barriers, the transformation of the sector is stymied by the lack of **clarity of roles** between spheres of government. County governments can exert change through managing their transport fleet, non-motorised transport, and improving infrastructure to support vehicle charging and encourage the uptake of NMTs (see Roadmap) but national government also needs to play a pivotal role.

Lastly, the Kisumu Sustainable Mobility Plan is an encouraging development, but it covers only Kisumu city. There is a need for a **county-wide policy**, especially to cover emerging cities, and to develop integrated transport solutions for the entire county.

CLEAN COOKING

Clean cooking goals in the county are guided by a national goal of universal access to clean cooking by 2028. They are supported by national policies and strategies to achieve the goal, with which counties have to align. Efficient cookstoves are marked as a priority, given the currently low access to clean cooking in the county. However, efficient cookstoves are **not clearly defined** and includes use of fuels other than renewables (e.g. LPG), and therefore are not necessarily compatible with 100% RE. There is a big gap to bridge by 2030 given the current status, and this pressure could lead to **lock-ins** with fuels like LPG, which need to be intentionally utilised as transition fuels to avoid the risk of locking in fossil fuels to mid-century. **Electrification** will need to be integral to achieving 100% RE for cooking, but currently the plans and policies do not clearly support this objective to the level of ambition required. More detail on the specific **financing schemes/incentives** for the transition to clean cooking is needed, particularly given the major affordability challenges with electric cooking. Private players and service providers have been instrumental in driving progress in the sector, and it is therefore imperative that county governments establish how best to work with them. A contribution of these local recommendations is to provide steps to help take the 2028 target of universal access to clean cooking to universal access to 100% renewables-based cooking solutions by 2050.

THE IMPORTANCE OF PROCESS FOR A JUST TRANSITION

An additional imperative for the transition to renewables is that it must be just to ensure no one is left behind. Given that the transition to renewable energy at the pace required to meet national and international climate and development targets such as the Nationally Determined Contributions (NDCs) under the Paris Agreement, or the Sustainable Development Goals (SDGs) requires the active support and direction of public authorities, it also provides an opportunity to ensure that such a technological transition does not perpetuate the inequalities of our existing energy systems.

The concept of just transition emerged in the 1990s in the trade union movement to ensure that sectoral and economic transitions would not negatively impact workers, through providing various social protection measures including skills development and retraining, job guarantees, compensation, and adherence to labour rights (ILO, 2022; Sokona et al., 2023). As Sokona et al (2023:60) note: "The use of the concept has since broadened considerably, and increasingly entails the recognition that deep societal transformation is required beyond workers' rights and the need for all societies to undergo deep social, economic and political transformation." This can involve, for example, prioritising the needs of vulnerable groups in society, or ensuring that everyone has equal access to the benefits and opportunities provided by the shift to renewables. Key to orientating a just transition is its end goals, what countries are aiming towards in the face of the climate crisis. While end goals are specific to a country or region, there are universal elements: that a transition is towards low-carbon, climate-resilient economies and societies that can thrive amidst the massive shifts of the 21st century (PCC, 2022). Kenya's updated Nationally Determined Contribution highlights how Kenya is working towards a just transition: "Kenya has an extensive consultation process for social protection and institutionalised review by stakeholders. This serves, amongst others, to ensure all stakeholder interests are considered in all climate actions." (Government of Kenya, 2020:10).

A just approach to 100% RE needs to be promoted at every stage in Kisumu County to ensure the transition does not perpetuate existing inequalities within and beyond the county. Part of this is about capacity building and awareness raising. But it goes further than reskilling, retraining and compensation, and is about unlocking alternative development and industrialisation pathways that bring new sectors, jobs, and opportunities and allow Kisumu and Kenya to position themselves competitively in global value chains. Realising just transitions is about exploring different pathways, identifying appropriate policy levers, their impacts and unintended consequences. Here process design is crucial, to ensure the meaningful participation of marginalised groups, establishing the necessary tools and accompanying capabilities, and bringing together actors to work collaboratively on joint action (Borraine, 2023).

Given the complexity of the realities on the ground, pathways towards 100% RE should seek to keep options open, and adapt processes and approaches as new information becomes available. The most optimal pathway, of which there are many options and pathways, can only be determined through experimentation, learning and adapting.

Lastly, it is imperative to connect county-level perspective to the much bigger transitions unfolding and interacting nationally and internationally. This means that many of the risks and opportunities of transitioning (or not transitioning) are exogenous to a single county or country. National, regional, and local governments need to prepare and act accordingly, to shape a transition that is beneficial to their populations. Failure to do so will run the risk of being left behind, captive to an unplanned transition, leading to major negative impacts.

The expectation is for these local policy recommendations to contribute towards a nationally and locally appropriate just transition towards 100% RE in Kenya and in Kisumu. This is to demonstrate that the journey is not only about a technological transition but a socioeconomic transition, and is linked to international processes. A focus on a just transition can also unlock international funding for supporting Kisumu's transition and create opportunities for the creation of new sectors, industries, enterprises and jobs.

POLICY BARRIERS

The current local policy infrastructure is insufficient to enable the realisation of a 100% RE vision by 2050, and current measures cannot adequately sustain momentum at the scale required to shift demand towards renewables (given Kenya's significant renewable electricity share already). The gap between existing policies and attaining 100% RE have in part to do with inadequate ambition on paper, but also to do with policy barriers that thwart the progress in implementation. Table 3 and the following paragraphs give a high-level overview of the types of barriers to 100% RE identified by policies, the 100% RE Roadmap, and the Multi-Level Governance Dialogue.

Table 3: A summary of policy barriers from the relevant policies, 100% RE Roadmap, and MLG Dialogue

Roles and coordination	Information and knowledge	Participation	Financial
<ul style="list-style-type: none"> Overlapping roles and mandates between various national government agencies and county governments creates ambiguity and impedes devolution Reluctance of national government to devolve authority and resources in the energy sector constraints the role of counties as implementers County governments classified as implementers, which limits devolution of planning Lack of clearly defined ways for benefit sharing of a just transition between the country, counties and communities 	<ul style="list-style-type: none"> Limited platforms for sharing information across counties and between national government and counties Lack of adequate data and data management to inform policy making Inadequate capacity at county level to fully implement energy functions Poor public awareness of the need for transitions to 100% RE Inadequate information about the risks and opportunities of a just transition 	<ul style="list-style-type: none"> Inadequate community participation and buy-in from a diversity of actors in energy planning to ensure a just approach Lack of structures for facilitating the involvement of the private sector Inadequate involvement of SMEs Greater participation involving local academic and research institutions for better data, analysis and recommendations 	<ul style="list-style-type: none"> Challenges funding high upfront capital investments Need to better leverage the role of DFIs Need funding for pilot and small-scale projects Need to define financial incentives and mechanisms for driving progress Need to align policy, projects and finance requests with a just transition to increase the appetite of external funders Need to identify how a just transition can manage the financial trade-offs

In addition to the sector-specific obstacles and gaps mentioned in Sections 2.1.1, 2.1.2 and 2.1.3, and highlighted in Table 3 above, **capacity building**, **awareness raising**, and **enterprise development** are cross-cutting requirements for all sectors. However, more detail is needed to communicate how these will be done specifically to maximise impact, pool efforts where appropriate, and carry out targeted initiatives where needed.

Where needed initiatives have been identified, the development and implementation of projects is imperative. **Funding** is essential in translating progress on paper to concrete progress on the ground. National budget offers sources of finance that counties can draw on to support their work in the aforementioned sectors. County budgets can also provide some funding, but as counties are operating under budget constraints, it is critical that the county budget is used as efficiently as possible. Perhaps even more important will be the ability of counties to attract external funding sources from private and international sources, for project preparation and

implementation, as one of the ways to address the financial constraints they are confronted with. For this, it is increasingly important for counties to align their projects with a just transition to enhance the likelihood of attracting external funding. More details about these funding sources are included in the 100% RE Roadmap for Kisumu County.

The current policy infrastructure for Kisumu is largely focused on goals for 2030, rather than for a longer term such as 2050. Kenya's Long-Term Low Emissions Development Strategy (LT-LEDS) for 2050 was launched in October 2023 and may help to **align national and county policy with a 2050 planning horizon**. This type of long-term work is needed to set a vision from which to work backwards and set the interim objectives that add up to the long term. **Establishing milestones for policy** will be important for identifying the steps that need to be taken and avoided to meeting 2050 targets, to ensure near-term action aligns with a long-term 100% RE compatible trajectory. However, Kenya's LT-LEDS is yet to be made publicly available, thus hindering the efforts to influence the long-term planning of the country. The LT-LEDS should be released as a matter of urgency, and well communicated, to reach and influence all levels of policy and planning, so that they can organise around this long-term strategy and vision.

Similarly, the current policy actions are also **inadequate in terms of their specificity and their ambition** for a long-term transition to 100% RE. Some of the policy interventions lack specificity in terms of **how** goals will actually be achieved, by **when**, and through **which** mechanisms. This lack of specificity delays progress and makes monitoring progress challenging. Greater specificity also points to changes that need to be made in the existing policy and regulatory infrastructure to enable change at the scale and speed required, and to **clarify who is responsible** for driving change and how they will be supported. Part of the lack of specificity in policy interventions is observable in the areas of disconnect or contradictions between policies or levels of government, which provide insufficient clarity around differentiating the roles of national and county governments.

Policy milestones can help to provide more granularity for "how" policies will be operationalised, identifying the importance of prioritising, sequencing, building on what exists, differentiating when a change can be made and how drastic it needs to be, and working towards a shift towards 2050-compatible pathways. This also helps to establish the different points at which different sectors are, in their journey to 100% RE, and how to tailor policy responses accordingly. Tailored policy responses as a result of stakeholder engagements at different stages of working towards the 100% RE goal help to ensure community buy-in and is a key ingredient in ensuring the success of a just transition. Identifying linkages between policy areas and how these can be operationalised to unlock more progress is another way in which the current policy response could be strengthened.

One of the most important gaps identified in the existing policy infrastructure is on **green buildings**, which means there is little guidance for the county on how to contribute to 100% RE with the buildings sector, despite it being one of the major emitting sectors and a devolved function. The current lack of **standards, regulations and legislation** are hindering concrete implementation in the sector, and as the sector holds much potential for efficiency gains and emissions reductions, it should be a priority in policy and regulatory development for the county moving forward.

Attaining 100% RE in Kisumu and in any county in Kenya, requires an examination of **the current state of devolution, and whether it equips or impedes counties in their efforts to realise this aspiration**. There is growing concern that the **existing state of devolution does not enable counties** to drive their transition, and leaves them dependent on the national efforts. Insufficient devolution of powers in the energy sector for instance, can lead to lacking capacity when it comes to developing projects, sustainable procurement practices, etc. in addition to quotidian challenges such as lack of resources and more pressing priorities. Importantly, devolution should not be seen as a zero-sum game, made up of turf wars between levels of government. Rather the focus needs to be on clear **demarcation of roles and responsibilities, supported by the necessary budget and human personnel**, and making changes where necessary. It is worth noting that the nature of this challenge is specific to each focus area. Section 4.1 offers guidelines for elements of devolution that could help counties and national governments work together to ensure devolution leads to meaningful change.

LOCAL POLICY RECOMMENDATIONS

The transition to 100% RE involves overcoming various barriers, which can be addressed through targeted local policy recommendations. The preceding sections have identified a range of policy barriers that hinder that progress. The role of the existing and proposed policies in addressing these barriers and facilitating implementation is covered in the following sections.

GUIDELINES FOR ENACTING LOCAL POLICY RECOMMENDATIONS

What Kisumu does is important as it has demonstrative significance, in that other counties will try to learn from or replicate what Kisumu is pioneering. The core intention of these local policy recommendations is to contribute to:

1. Converting progress on paper to progress on the ground. Part of the work of translating policy to action is in converting policy to legislation so that roles and responsibilities are clearly allocated, and mandated by law. Standards also have a key role to play in specifying the types of actions required for the transition, and for benchmarking against best practice.
2. Defining concrete steps and milestones is necessary to guide action now and to align near-term action with long-term goals. This includes a focus on the project level to organise around concrete action and crowd in funding from outside the county budget.
3. Decentralisation and acceleration which are two crucial forces to do more in condensed timeframes to achieve the ultimate goal of 100% RE.
4. Establishing monitoring and evaluation systems fundamental for assessing progress, to identify where progress is being made and challenges are being experienced. Both are necessary for learning and informing future action.
5. Promoting collaborative ways of working: While the focus of this report is on local policy recommendations for achieving 100% RE, achieving 100% RE is the work of a wide group of actors working together to achieve common goals.

Building on existing policy interventions and roadmap actions, this section makes specific recommendations as to how these could be enhanced. It does so by breaking down existing policy interventions, and proposing targets per policy action for 2024 - 2030, by 2030, and by 2050, to help identify what can be achieved in the near, medium and long term, the sequence of actions, and whether Kisumu is on track to 100% RE, and if not, how this gap can be narrowed. These recommendations build on the policy analysis in Section 2 to identify how to move from the current status towards the 2050 aspiration, to identify the ground that needs to be covered and how it can be best covered according to timeframes. Some guiding principles for implementing the local policy recommendations are provided in Figure 1.

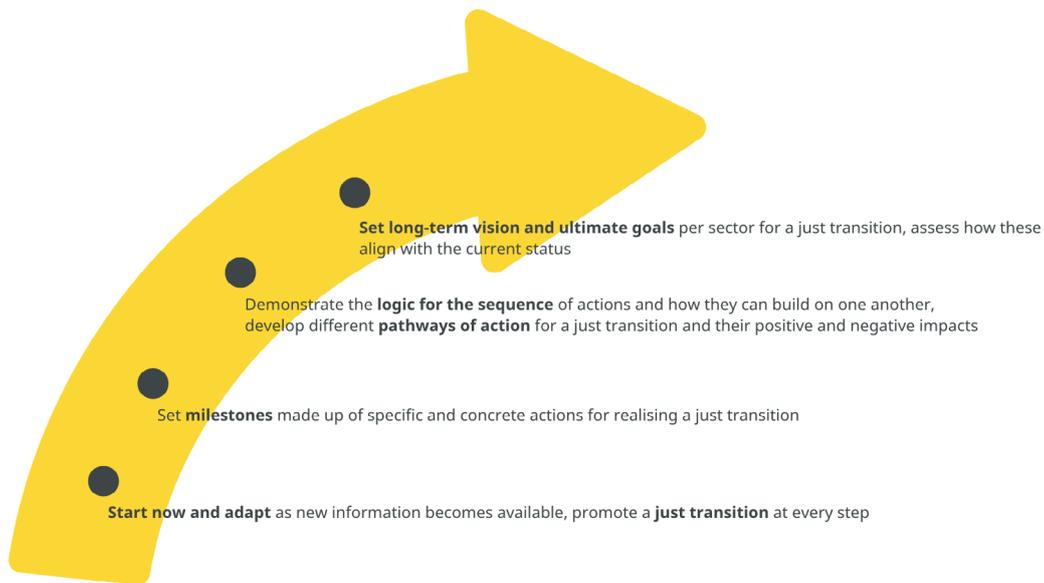


Figure 1: Guiding principles to accompany specific local policy recommendations to achieve 100% RE for Kisumu

Table 4 provides an overview of the current status of the power sector in Kisumu and Kenya, and tables 5 to 7 provide concrete options for how to close the gap between existing policy activities and the 2050 aspiration of 100% RE per sector. The tables are not exhaustive, nor should they be read as prescriptive. Instead, they should be used as working tables that are regularly updated and expanded as new policy activities emerge. Ultimately these tables aim to inform the work of Kisumu County Government with these indicative examples, while acknowledging that the County government is best placed to decide on its long-term vision and goals for a locally relevant just transition and how to get there, by operationalising and adapting its existing policy infrastructure.

Table 4: Current status of the power sector (2023) and energy modelling results for 100% RE by 2050

	Current status of the power sector	Energy modelling results for 2050
Power	<p>Kenya: 84.93% renewables (2023) (hydro 22.5%; wind 14.3%; geothermal 44.55%; solar PV 3.54%)</p> <p>Kisumu: Installed capacity and electricity generation (2018): Hydropower – 81 MW (517GWh); gas – 30 MW (65.5GWh); sugar bagasse – 21 MW</p>	<p>Solar PV 9389 GWh</p> <p>Hydro 834 GWh</p> <p>Biogas 239 GWh</p> <p>(based on Kisumu County's RE resources only)</p>

Table 5: Local policy recommendations for the power sector for 100% RE by 2050

Policies with overlapping policy goals for the power sector	Existing policy goals and gaps	2024 – 2030 recommendations	2030 recommendations	2050 recommendations
	<p>Current status of the power sector</p> <p>Kenya: 84.93% renewables (2023) (hydro 22.5%; wind 14.3%; geothermal 44.55%; solar PV 3.54%)</p> <p>Kisumu: Installed capacity and electricity generation (2018): Hydropower – 81 MW (517GWh); gas – 30 MW (65.5GWh); sugar bagasse – 21 MW</p>	<p>Energy modelling results for 2050</p> <p>Solar PV 9389 GWh</p> <p>Hydro 834 GWh</p> <p>Biogas 239 GWh</p> <p>(based on Kisumu County's RE resources only)</p>		

<p>Kisumu County Integrated Development Plan, 2023 -2027</p> <p>Kisumu County Environment Policy, 2019</p> <p>Kisumu County Energy Plan (CEP), 2021-2026 (Draft)</p>	<p>Development and deployment of renewable energy</p> <p>Promote use of alternative (renewable) sources of energy and the use of renewable energy technologies</p> <p>Develop renewable energy including: biomass, solar, mini-hydro, mini-wind, agro-waste; municipal waste</p> <p>Deploying renewable energy technologies (energy generation, lighting, etc.)</p> <p>Promote access and utilisation of solar energy technologies or clean and affordable energy sources</p> <p>Formulate an Integrated Resource Plan (IRP), as a platform for the development of alternative energy generation</p> <p>Provide and facilitate land rights access for renewable energy generation</p> <p>Provide financial incentives and reduce the process of development approval for developers who use the land for renewable energy generation</p> <p>Explore large-scale options of auction schemes or feed-in tariffs (FiT of Energy Act 2019)</p>	<ul style="list-style-type: none"> • Lobby national government for change in regulations to give county governments the mandate for electricity generation and purchasing. County governments need the mandate to issue generation licences for renewables, control distribution of electricity, issue energy purchase agreements (transferral of powers from Energy Act of 2019) • Lobby government for regulations for wheeling and net metering • Identify rooftops for situating solar PV technologies • All new power generation in Kisumu to be renewables-based: <ul style="list-style-type: none"> ◦ Develop regulations to support this ◦ Include more solar home systems (SHS), embedded generation and mini-grids ◦ Private generation ◦ Kisumu Solar Plant (40 MW) to be commissioned by December 2023 under a PPA (take-or-pay) ◦ KOPERE Solar Power Project at 50 MW • Conduct feasibility studies for local manufacturing of renewable energy technologies (small and utility scale) • Identify the local potential for manufacturing, installation, and maintenance of renewable energy technologies and integrate it into plans • Explore synergies in supply and value chains with neighbouring counties • Explore the potential of green hydrogen, particularly for energy-intensive uses 	<ul style="list-style-type: none"> • 100% RE electricity by 2030, phase out local thermal plants • All municipal buildings to be retrofitted with solar PV and energy efficiency retrofits • All new commercial and public buildings to have solar PV. This should be considered when approving building plans in the county • First round of projects through FiT or auction scheme operational • Support SMEs in local production • Explore the potential of green hydrogen, particularly for energy-intensive uses 	<ul style="list-style-type: none"> • 100% renewable energy use, through a combination of 100% renewable grid electricity and local energy sources and transitioned demand, energy efficiency and conservation measures, etc • Scale up local production and establish thresholds as part of the FiT or auction schemes • Scale up FiT/auction scheme to meet growing demand
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<p>N/A</p>	<p>Off-grid solutions</p> <p>The role of solar as an off-grid solution is highlighted by numerous policy documents but all fail to provide targeted support</p>	<ul style="list-style-type: none"> • Set targets per decade for SHS to provide electricity access: 3.5% of the Kisumu population per year to be connected through SHS and mini-grids from 2020 to 2030 to reach the goal of universal access by 2030 • Develop guidelines and spread awareness among the community about the use of pay-as-you-go (PAYG) models. Guidelines should be communicated to the community to ensure they are aware of the possible uses and any pitfalls to be mindful of • Integrate off-grid solutions and associated business models (e.g. PAYG) into electrification plans 	<p><i>Target: Electricity access to reach 90% by 2030 through on grid and off grid). Kisumu County Energy Plan projects 65% grid-connected by 2030, meaning the 25% gap needs to be closed by off-grid</i></p> <ul style="list-style-type: none"> • Develop a plan to handle e-waste generated from used or broken solar panels and/or batteries and other parts after their useful lifetime 	<ul style="list-style-type: none"> • Expansion of off-grid systems in terms of capacity and in terms of percentage (%) of the population to meet the target of 100% of Kisumu residents having access to electricity
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<p>N/A</p>	<p>Solar-powered irrigation</p> <p>NB: No direct county policy support for solar pumping for powered irrigation (although there is water policy). Such a policy (or guidelines/rules) needs to be developed and implemented to create the necessary incentives</p> <p>IDP highlighted increasing land acreage under irrigation from 15 to 45% between 2018 and 2022</p>	<ul style="list-style-type: none"> • Develop a policy to support the use of solar-powered pumps for irrigation, as well as necessary programmes and incentives needed for implementation • Allocate support through county budget or a DFI to fund the upfront investment of \$150-250 per system, and annual allocation to meet a 5% annual growth target • Increase land acreage under irrigation from 15% to 45% between 2018 and 2022 (as highlighted in the IDP) • Spread awareness across the agricultural sector about the potential benefits of solar water pumps, and collaborate with existing private sector actors to ensure their efficient operation and maintenance • Create safeguards and also bring awareness of the risk of over-pumping. Sensitise policymakers regarding the potential indirect harms of reckless solar water pumping, e.g. reduced groundwater 	<ul style="list-style-type: none"> • Increase annually (e.g at 5% per annum) to reach close to universal coverage of irrigation by 2030 • Integrate policies for renewables in agriculture into agriculture and water policies • Develop a plan to handle e-waste generated from used or broken solar panels and/or batteries and other parts after their useful lifetime 	<ul style="list-style-type: none"> • Reach universal coverage, expand the pumping capacity of those systems that need it to increase crop yields
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<p>Kisumu Sustainable Mobility Plan, 2020</p> <p>Kisumu County Environment Policy, 2019</p> <p>Kisumu County Energy Plan, 2021-2026</p>	<p>Energy-efficient lighting</p> <ul style="list-style-type: none"> • Only 458 streetlights in 2019. Increase the uptake of efficient (LED) and solar lights and for streets and public areas – 1000 existing lights to be retrofitted • The County government shall implement energy-efficiency measures on all county government premises, including streetlighting and public buildings based on annual energy audits. (KCEP) 	<p><i>Target: Install 30 km of streetlights from 2023 to 2025 (Kisumu Sustainable Mobility Plan 2020)</i></p> <ul style="list-style-type: none"> • Retrofit existing streetlights with LED lights and solar streetlights • Expand streetlight coverage - all new streetlighting to be LED and solar-powered • Implement procurement policies that prioritise the purchase of LED streetlights for all public lighting projects • Include capital costs for streetlighting in budget allocations annually 	<p><i>Target: Install 100 km of streetlights by 2030 (Kisumu Sustainable Mobility Plan 2020)</i></p> <ul style="list-style-type: none"> • Incorporate highly energy efficient lighting in 50% of county facilities 	<p><i>Target: All streetlighting to be LED and solar streetlights</i></p> <p><i>Target: All county facilities to feature highly energy-efficient lighting</i></p>
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<p>Kisumu County Environment Policy, 2019</p> <p>Kisumu County Energy Plan, 2021-2026</p>	<p>Waste-to-energy</p> <p>Develop a PPP strategy for waste-to-energy projects [Public Private Partnership Bill, 2021 (National)]</p> <p>Establish appropriate waste disposal facilities including waste-to-energy</p> <p>The county government will put in place measures to increase its waste collection, disposal and management services before it can explore the option of solid waste-to-energy</p> <p>Establish a regulatory and institutional framework that encourages private sector investment in waste management, including methane capture, electricity generation and biogas production from waste</p> <p>Establish the feasibility of waste-to-energy production through a private-public partnership mechanism</p>	<ul style="list-style-type: none"> Localise and utilise PPP Bill of 2021 to facilitate the development of waste-to-energy projects, to demonstrate the potential of PPPs for waste-to-energy projects Run pilot programmes for waste separation and collection Conduct feasibility studies for a waste-to-energy plant in Kisumu Map projects suitable for PPPs Identify expertise and skills required to oversee the issuance and development of a PPP project Develop local guidelines for instituting PPPs in Kisumu, including obtaining necessary cooperation or financing required from the national government 	<p><i>Target: Achieve 80% of waste recovery by 2030 (Vision 2030)</i></p> <ul style="list-style-type: none"> Award tender for waste-to-energy plant based on outcome of feasibility study Scale up waste separation and collection pilots 	<p><i>Target: 100% waste recovery and diversion to waste-to-energy projects</i></p> <p><i>Target: Full coverage of waste separation and collection across the county</i></p>
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<p>N/A</p>	<p>Bioenergy</p> <p>Partner with the private sector to develop waste-to-energy technologies and solutions to utilise organic waste generated in the county for biogas and electricity production</p>	<ul style="list-style-type: none"> • Run pilot schemes to separate organic waste (feedstock for the biogas plant) from general waste • Conduct feasibility studies on pilot biogas projects • Work with stakeholders such as farmers to exchange on the potential of biogas, especially for cooking • Explore the use of sugar by-products, such as ethanol, as a clean cooking fuel 	<ul style="list-style-type: none"> • Run pilot biogas projects starting with schools and public facilities to use biogas for cooking • Work with technology providers to expand the availability of biogas and ethanol stoves 	<p>All schools and public facilities to become hubs for organic waste collection and biogas digesters utilising the products for clean cooking</p>
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<p>Kisumu County Energy Plan, 2021-2026 (Draft)</p> <p>Kisumu County Environment Policy, 2019</p> <p>Kisumu County Energy Plan, 2021-2026 (Draft)</p>	<p>Energy efficiency and conservation in county facilities</p> <p>Audit and implementation of recommendations in selected healthcare facilities and treatment plants. This includes the validation of current audits, design of interventions and facilitation of funding</p> <p>Energy-efficiency interventions include implementing solar water heating, LED lighting, clean cooking solutions and solar PV and storage</p> <p>Develop a system for energy management graduation for domestic, low and high industry consumers</p> <p>The County government shall promote and encourage energy efficiency practices in the private sector to contribute towards the national efforts</p> <p>The county intends to promote the supply of energy-efficient appliances for households to promote energy-efficiency practices and contribute to doubling the rate of energy efficiency</p>	<p><i>Target: Energy efficiency target - Improve to 18% by 2025 (baseline year 2020)</i></p> <ul style="list-style-type: none"> • Conduct energy audits in public and commercial buildings. Allocate responsibilities to county officials to implement using Energy Management Regulations of 2012 • Retrofit old municipal buildings with solar PV systems, solar water heaters (SWH) and energy-efficiency interventions • Consider and define energy-efficiency criteria when approving building plans, building off of Kenya's building code • Establish monitoring processes to track energy-efficiency progress • Learn from neighbouring counties and national or global best practices • Create awareness and share information on energy-efficiency practices with households and commercial and industrial institutions • Train county staff and personnel in energy-efficiency practices • Revise and update the energy management regulations of 2012 to be in line with updated targets and new technologies and plans • Ensure new buildings meet energy conservation building codes, include LEDs, SWHs, energy-efficient appliances • Develop specific incentives to encourage energy-conservation practices • Identify financing solutions and business models for energy-efficiency contracts 	<ul style="list-style-type: none"> • Conduct audits to assess where progress has been made and which areas are lagging. Scale up areas of progress and address lagging areas • Continue with SWHs and solar PV for public buildings • Explore a range of financing options for implementing EE projects in county facilities • Engage with and specify incentives for energy efficiency commercial and industrial setups 	<p>All existing and new county facilities to align with energy-efficiency standards and have installed renewable energy and energy-efficiency technologies</p>
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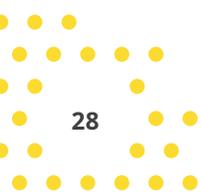
	<p>Encourage use of energy-efficient appliances:</p> <ol style="list-style-type: none"> 1. Appliances - Choose energy-rated appliances to reduce electricity bills 2. Lighting – Using efficient lighting bulbs, smart lighting, and even indicate ‘switch off when not in use’ <ul style="list-style-type: none"> - Allow natural light into the premises - Choose selective lighting and automatic dimming for areas with natural lighting, this is especially for hospitals and schools 3. Self-consumption - solar irradiance for Kisumu County areas account for viable solar projects, therefore solar is a great alternative for commercial and institutes. More power can be fed back into the grid as per the Feed-in Tariff of Energy Act 2019 		<ul style="list-style-type: none"> • Establish cooperation with national and international initiatives and standard-setting organisations to improve building energy efficiency in Kisumu • Make energy efficiency a key criterion in approving building plans • Energy-efficiency improvements to be in line with Kenya’s national targets. 	
<p>N/A</p>	<p>County-wide energy efficiency improvements</p> <p>Improving overall energy efficiency and conservation measures in the county</p>	<ul style="list-style-type: none"> • Continue localising Kenya’s National Energy Efficiency and Conservation Strategy 2020 • Develop a green buildings policy and support this by developing standards and laws to set and enforce targets to aid implementation and monitoring of progress in the sector 		

Kisumu County Environment Policy, 2019	Create public awareness with respect to clean energy and energy efficient technologies	<ul style="list-style-type: none"> Roll out broad public awareness campaigns for renewable energy and energy efficiency 		
Additional recommendations for ensuring a future-proof and just transition towards 100% renewables in the power sector				
<ul style="list-style-type: none"> When conducting stakeholder engagement, ensure the voices of vulnerable groups are centred. Women and youth are particularly affected by energy insecurity and pollution Deal with informality and associated problems in a sensitive way, keeping in mind socioeconomic welfare In addition to waste-to-energy, begin considering disposal options for e-waste generated by greater electrification (solar panels, batteries, etc.) in accordance with national legislation and guidelines. Informality is also a significant concern here Explore ways to integrate RE technologies into the built environment to minimise land use, and other solutions such as floating photovoltaics, keeping in mind impacts on livelihoods Ensure policies target as many groups as possible, and that no one group benefits unduly from fiscal and other benefits for example. For example, policies should also include rural areas, lower-income groups, etc 				

Table 6: Local policy recommendations for the transport sector for 100% RE by 2050

Policies with overlapping policy goals for the transport sector	Existing policy goals and gaps	2024 – 2030 recommendations	2030 recommendations	2050 recommendations
<p>Current status of the transport sector</p> <p>30 977 motorcycles</p> <p>2406 tuk-tuks</p> <p>15929 cars (10 EVs and 1 charging station)</p> <p>2406 buses/trucks</p> <p>57.6% = NMT</p> <p>50 km NMT infrastructure</p>		<p>Energy modelling results for 2050</p> <p>100% renewable-based transport based on:</p> <p>3,499 GWh green hydrogen</p> <p>1,735 GWh electric</p> <p>Non-motorised transport</p>		

<p>Kisumu Sustainable Mobility Plan 2020 & 100% RE Roadmap</p>	<p>Car-free days</p> <p>Promote one car-free day a month (Saturday/Sunday)</p>	<ul style="list-style-type: none"> Scale up beyond a pilot project 	<ul style="list-style-type: none"> Scale up beyond a pilot project 	
	<p>Car-free zones</p> <p>Designate car-free areas in 5 streets</p>	<p><i>Supported by Kisumu Sustainable Mobility Plan, 2020, "pedestrian only" zones. Set targets for 2030 and 2050 to scale up the action</i></p>	<ul style="list-style-type: none"> Achieve milestones set in the KSMP and scale up 	<ul style="list-style-type: none"> Achieve milestones set and scale-up
	<p>Improvement of infrastructure to support non-motorised transport from 50 km to 200 km</p>	<p><i>Supported by Kisumu Sustainable Mobility Plan, 2020:</i></p> <ul style="list-style-type: none"> <i>Implement pedestrian and road safety elements in 40 school zones if not already completed in 2022</i> <i>Rehabilitate 28 km of recently constructed KeNHA corridors with road safety improvements, including the redesign of 20 unsafe intersections, if not already completed in 2022</i> <i>Develop 20 km of safe pedestrian infrastructure by 2022; 50 km by 2025</i> <i>Develop 15 km of cycle tracks (if not already done by 2022); 24 km by 2025</i> <i>Complete the 3.7 km lakefront greenway by 2025</i> <i>Design all NMT facilities in compliance with the Street Design Manual for Urban Areas in Kenya (SDMUAK)</i> <i>Implement a first-phase bikeshare system with at least 400 cycles by December 2024</i> 	<ul style="list-style-type: none"> <i>Construct 100 km of footpaths and 31 km of cycle tracks consistent with SDMUAK guidelines</i> <i>Improve 100 km of streets with a complete pedestrian realm, including footpaths and crossings on major streets and safe shared space on neighbourhood lanes, by 2030</i> <i>Install bicycle parking racks at 50 locations by 2030</i> <i>Develop 31 km of cycle tracks by 2030</i> Institute planning practices that facilitate the use of public transport and NMT to access citizens' needs 	<p><i>Construct 200km of transport infrastructure to support NMT by 2050</i></p> <ul style="list-style-type: none"> Ensure adequate maintenance of NMT infrastructure, and expand it as needed



<p>Kisumu Sustainable Mobility Plan</p>	<p>Modernising and expanding public transport reach</p>	<ul style="list-style-type: none"> • Prepare a service plan, financial plan, and business plan for improved public transport services, if not already completed in 2021 • Initiate the public transport reform process in 2021 and launch regulated services if not already completed in 2022 • Implement the 5 km first-phase BRT along the Kisumu Boys-Mamboleo corridor by 2028 • Ensure that all public transport vehicles introduced after 2022 continue to meet the Euro 4 standard or better 	<ul style="list-style-type: none"> • <i>Introduce a new public transport fleet consisting of 250 vehicles by 2023, growing to 450 vehicles by 2030</i> • Set targets per decade for modern public transport system including number of electric vehicles, kilometres of BRT, rail, NMT, based on expected vs. actual performance of such measures 	<ul style="list-style-type: none"> • Set targets per decade for modern public transport system including number of electric vehicles, kilometres of BRT, rail, NMT
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<p>Kisumu Sustainable Mobility Plan & 100% RE Roadmap</p>	<p>Electrifying transportation solutions and advancing commercial electric mobility</p>	<ul style="list-style-type: none"> • Continue with the Kisumu sustainable mobility plan to create an enabling environment for these players by investing in charging infrastructure, battery swapping, and working with micro-financiers for retrofitting existing vehicles and rolling out new EVs • Conduct a feasibility study on electrification if not already completed in 2022 • 50% of boda-bodas and tuk-tuks electrified by 2025. All new tuk-tuks and boda-bodas to be electric • Invest in the charging infrastructure to facilitate the roll-out of electric vehicles • Install charging infrastructure in bus depots to facilitate electric transport (buses, mini-buses, etc.). Explore large parking lots for initial rollout (e.g. the mall) • Promote the use of electric two- and four-wheelers through awareness campaigns and benefits such as parking benefits, tax exemptions, etc • Investigate the possibility of electrifying public transport through electricity or hydrogen, including freight vehicles 	<ul style="list-style-type: none"> • Transition to a fully electric bus fleet by 2030 • Electrification penetration targets for private vehicles, minibus taxis (matatus) • Increased electrification of boda-bodas and tuk-tuks • Extend charging infrastructure • Develop plans to encourage electrification of freight vehicles 	<ul style="list-style-type: none"> • Extend electric bus route coverage and integrating with tuk-tuks and boda-bodas • Penetration targets for private vehicles and minibus taxis • Extend charging infrastructure
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Additional policy recommendations to consider in ensuring a future-proof and just transition in Kisumu’s transport sector

- When planning improved streetlighting or public transport routes, take into account the transport use patterns of a wide range of social groups e.g. women, who may have specific concerns, such as safety, that can improve outcomes for the community as a whole
- Tax benefits or other incentives for electric vehicles can be considered, as well as disincentives for certain classes of ICE vehicles, where feasible
- Water transport and its electrification can also be explored in the future as technologies improve
- Policies/procedures should be put in place to handle the waste produced by electric vehicles, complementing any existing measures for lead-acid batteries and the like. Second-life uses for used batteries can also be considered in the future. Ensuring sufficient safety standards in their handling and operation would be critical, and may require cooperation with the national government
- Mobility apps, real-time transit information systems, and bike-sharing technologies can be considered, to enhance the accessibility and convenience of NMT options for residents
- Invest in green infrastructure including greenways, urban parks, and tree-lined streets, to enhance the aesthetic appeal and environmental quality of public spaces (as mentioned in the 100%RE Roadmap)
- Designate zero-emission zones and low-emission districts where only electric or low-emission vehicles are allowed, with pedestrian-friendly features and better walking and cycling paths

NB: Italicised fonts are recommendations already existing in county documents for up to 2030, 2040 and 2050.

Table 7: Local policy recommendations for the clean cooking sector for 100% RE by 2050

Policies with overlapping policy goals for the clean cooking sector	Common policy goals	2024 – 2030 recommendations	2030 recommendations	2050 recommendations
<p>Current status of the clean cooking sector</p> <p>23% with access to clean cooking (incl. LPG)</p>	<p>Modelling results for 2050</p> <p>100% renewable cooking, based on:</p> <p>electric 383 GWh (84%); ethanol 47 GWh (13%); biogas 7 GWh (2%); biomass 4 GWh (1%); bio-Ethanol 47 GWh</p>			

<p>Kisumu County Energy Plan, 2021-2026 (Draft)</p>	<p>Promote the use of cleaner cook stoves in urban and rural areas</p>	<p><i>Target: 100% of cooking in commercial institutions and households is based on renewables-based sources of electricity by 2028</i></p> <ul style="list-style-type: none"> • Create financing schemes to promote uptake of energy-efficient appliances, including efficient cookstoves, in public institutions • Invest in information dissemination and awareness raising for consumers • Continue with stakeholder engagement to understand any reluctance to take up cleaner cooking methods • Align the goals of reliable and affordable electricity access with efforts to promote electric cooking • Develop clear plans to utilise LPG as a transition fuel only, setting targets for its phase out where feasible and replacement with renewable sources of energy. Identify and promote cookstove technologies and modifications that can allow an easy switch from LPG to biofuels 	<ul style="list-style-type: none"> • Provide details of schemes for other energy-efficient cookstoves options not previously considered, and expand to residential and/or commercial sector • Begin promoting the use of alternatives to LPG in cooking, matched with benefits and incentives • Begin phasing out the use of LPG and replacing it with biofuels or electric cooking, providing financial incentives where possible, for commercial institutions 	<p><i>Target: 100% of cooking in commercial institutions and households is based on renewables-based sources of electricity</i></p>
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<p>Kisumu County Energy Plan, 2021-2026 (Draft)</p>	<p>Electric cooking in urban areas</p>	<ul style="list-style-type: none"> • Develop differentiated strategies, for example targeting high-income groups, to promote the spread of electric cooking. For example, malls and other retailers can be consulted to promote electric cooking options • Consult commercial institutions to suggest plans to shift towards bioenergy-based or electric cooking • Stimulate the development of capacity and small enterprises to support the roll-out of local clean cooking solutions by partnering with NGOs, local institutions for capacity building and enterprise development support 	<p>Target: 20% adoption of clean cooking methods (excl. LPG) by 2035?</p> <ul style="list-style-type: none"> • Promote the use of e-cooking as an alternative to LPG in cooking in urban households and commercial institutions, matched with benefits and incentives 	<p><i>Target: 100% of cooking in commercial institutions and households is based on renewables-based sources or electricity</i></p>
<p>Kisumu County Energy Plan, 2021-2026 (Draft)</p>	<p>Develop alternatives to LPG as a cooking technology</p>	<ul style="list-style-type: none"> • Develop guidelines for the cases where LPG will be used as a transition fuel for clean cooking, and by when it would be phased out • Conduct feasibility studies to investigate infrastructure needs for alternative fuels e.g. electricity, ethanol, biofuels, etc. 	<ul style="list-style-type: none"> • Target institutional users first when it comes to shifting from LPG, through incentives or disincentives • Expand the use of electric cooking. Align additional electric cooking demand with plans for improving electricity supply 	<p><i>Target: 100% of cooking in commercial institutions and households is based on renewables-based sources or electricity</i></p>
<p>N/A</p>		<p>Stimulate the development of county capacity and small enterprises to support the roll-out of local clean cooking solutions</p>	<p>Capacity building and enterprise development support</p>	

Additional recommendations for ensuring a future-proof and just transition towards 100% renewables in the cooking sector

- If resources are constrained, prioritise the most vulnerable populations first for financial or other assistance
- While women and children are disproportionately impacted by indoor air pollution from cooking, stakeholder consultation should involve the whole household to ensure the sustainability of solutions

A FRAMEWORK FOR SUPPORTING DEVOLUTION OF GOVERNANCE FOR 100% RE BY 2050

At the heart of achieving 100% RE in Kisumu is realising effective devolution. Ambiguity in the devolution, particularly in but not limited to the power sector, suggests its political and financial importance. This is often why national governments are reluctant to allow for genuine decentralisation. While this is a political problem, it is also about strengthening and clarifying a multi-level governance approach, and not about different levels of government replacing or competing with one another (Zalanger et al., 2020). The following guidelines in Table 8 are adapted from Zalanger et al. (2020), to a framework of action for the journey to 100% RE through devolution to assist with addressing some common challenges. The contention is for decentralisation to be effective, it needs to move from deconcentration, to delegation, to full devolution. The following framework aims to provide a set of guiding questions which counties and national governments can ask to determine the extent of devolution that has been achieved and to identify the work that lies ahead to support the attainment of 100% RE.

Table 8: A framework for guiding decentralisation to achieve 100% RE (Adapted from Zalanger et al., 2020)

Framework dimensions	Guiding questions
Decision-making, mandate and roles	<ul style="list-style-type: none"> • Has devolution in legislation taken place? • Are roles clearly defined between national and county governments? • Has devolution in reality taken place, including politically, that gives county governments the mandate and decision-making powers necessary to drive change in their sectors?
Access to financial and human resources	<ul style="list-style-type: none"> • Has devolution led to the commensurate reallocation of budget to the counties? • Does the county government possess the necessary human resources to carry out the functions devolved to them?
Effective coordination	<ul style="list-style-type: none"> • Are there effective coordination mechanisms in place to ensure alignment within county governments and between county and national governments? • Are their mechanisms in place to coordinate actions between government, the private sector and NGOs?
Local capacity	<ul style="list-style-type: none"> • Does the county government possess the necessary technical expertise for robust planning and implementation? • Does county government possess the necessary skills to communicate planning priorities to communities, to listen to community needs and to incorporate these in planning processes? • Is the county government up to date with the state of knowledge in their focus area and recent policy developments?
Actor networks	Is the county government equipped to facilitate stable actor networks in a given policy area to build awareness, capacities and buy-in to support implementation in the policy area?
Cross-cutting	What changes are needed in each dimension to realise full devolution in practice?

CONCLUSION

This local policy review and the recommendations developed have shown that while Kisumu County is taking steps towards improving energy access and ensuring the spread of renewable and sustainable forms of energy use, there is still plenty to do until it reaches a fully renewable energy system. It is important to note that progress is not uniform, suggesting a differentiated approach to sectors is needed for this transition.

Kisumu County's Government has a central role to play in setting an ambitious long-term vision for the county, and steering a just transition to get there. They have already indicated a strong political commitment towards this goal. The County's role is to steer a transition, not command it, as alone they will be unable to realise the transition (Borraine, 2023). The challenge is to find ways of working collaboratively with all the necessary actors to catalyse the change needed.

Much of the time the county's role is about removing barriers, creating an enabling environment so that others can act. The same applies to the national government. Devolution supported by the necessary human and financial resources is particularly important in allowing counties to act, and is the responsibility of the national government.

While progress is evident, much work lies ahead to realise a just transition to close the gap to 100% RE by 2050. This includes:

- Differentiating between sectors in terms of their technoeconomics and time horizons, policy support, and state of the evidence base. All sectors are not equal; therefore, a policy response must reflect this in how it prioritises and incentivises action. Transport, buildings and energy efficiency should all be focus areas.
- Recognising mandates as key, as is coherence. There needs to be clear allocation of roles and responsibilities, to do the most with what exists, and make the case for change where barriers are being encountered.
- Achieving granularity in terms of milestones, timeframes, priorities and sequencing, supported by necessary policies, laws and regulations is essential for enabling action.
- Aligning near-term with long-term visions. This is about creating action pathways that catalyse action at scale and speed, and keeping options open to course correction and avoiding lock-ins.
- Translating progress on paper to progress on the ground, identifying what is preventing this and how to address such stumbling blocks.
- Monitoring and evaluating to assess progress, learning and adapting, and having systems and structure to ensure a transparent and robust approach.
- Moving from incremental progress to a step change, taking a systemic view of the County's energy system and its interdependence with other counties and the national government, to unlock the scale and speed of change required.

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ANNEXURE

Below is a list of additional actions and targets that are included in various national and local policies and the Kisumu County Climate Action Plan (KCICCAP) but were not prioritised to be included in the Roadmap (see *Roadmap Towards 100% Renewable Energies - Kisumu County, Kenya*).

Energy Sector: National Targets		
Subsector	Policy	Action
Electricity generation	Nationally Determined Contribution (NDC, 2020)	Increasing the share of renewables in the electricity generation mix of the national grid.
Energy utilisation and resource efficiency	Nationally Determined Contribution (NDC, 2020)	<ul style="list-style-type: none"> Enhancement of energy and resource efficiency across the different sectors. Clean, efficient and sustainable energy technologies to reduce over-reliance on fossil and non-sustainable biomass fuels.
Electricity generation	National Climate Change Action Plan (NCCAP, 2018 - 2022)	<ul style="list-style-type: none"> Developing 2,405 MW of new grid-connected renewable electricity generation capacity, and retirement of three thermal plants by 2022. The proposed new additional generation capacity is 2,405 MW, comprising geothermal - 913 MW; solar - 442 MW; hydro - 93 MW; wind - 800 MW; biomass/ biogas - 157 MW; and distributed solar and mini-grids - 30 MW. As part of the action to increase the proportion of renewable generation in the grid, the GoK also plans to retire the following three grid connected thermal plants: Kipevu - 120 MW; IberAfrica - 108.5 MW and Tsavo: 74 MW thermal power plants.
Electricity generation	National Climate Change Action Plan (NCCAP, 2018 - 2022)	<ul style="list-style-type: none"> Waste-to-Energy incineration <ul style="list-style-type: none"> Although this option has been rejected in previous consultations with key stakeholders and was not included in the recommended options for NCCAP 2018-2022, it still offers an opportunity for addressing the solid waste management problem in the bigger cities in Kenya (Nairobi, Mombasa, Kisumu, Nakuru and Eldoret).
Energy and resource efficiency: Industry	National Climate Change Action Plan (NCCAP, 2018)	<ul style="list-style-type: none"> Industrial energy efficiency improvement with a mitigation potential of about 1.1 MtCO₂e per year by 2030. Results from energy audits undertaken in different commercial and industrial facilities in Kenya indicate potential for measures like the use of more efficient pumps and motors. With payback times of less than two years, savings in electricity consumption of between 8% (for a tourist resort) and 26% (for a tea factory) could be achieved.

Energy and resource efficiency	Kenya National Energy Efficiency and Conservation Strategy, 2020	Reduce transmission and distribution system losses from 23 to 15 per cent. Strategies for system stabilisation have also been recommended with a target to install 1 MW of energy storage given that there is no such facility currently. Lastly, the strategy sets targets for the utility to invest five billion shillings for the implementation of energy conservation measures. This is envisaged to run on a Super Energy Service Company (ESCO) model.
Energy access	Kenyan National Electrification Strategy (KNES), 2018	Universal access (100%) to electricity for all households and businesses between 2022-2030 through grid intensification and densification, grid expansion, and off-grid supply solutions (both mini-grids and standalone systems).
Energy generation: geothermal	National Energy Policy, 2018	<ul style="list-style-type: none"> • The government shall continue to support and fund geothermal resource assessment and development so as to manage the geothermal exploration risk and attract investors. • Promote research, development and capacity building for geothermal development by providing fiscal and other incentives. • Streamline licensing and allocation of geothermal blocks with incentives and sanctions in order to accelerate geothermal development. • The government to package incentives through attractive pricing to promote and encourage direct uses of geothermal resources such as utilisation of heat, water, gases and minerals. • Promote early geothermal generation through implementation of efficient modular geothermal technologies.
Energy generation: hydro	National Energy Policy, 2018	<ul style="list-style-type: none"> • The government to develop a hydro risk mitigation mechanism to address risks such as prolonged droughts so as to cushion generators, transmitters, distributors and consumers against effects of adverse hydrology. • The government to establish a coordinated approach for the management of water reservoirs. • Develop a framework for coordination for use of water resource against various interests. • The government to finance conservation of hydro power water catchment areas. • The government shall implement hydro power projects as multipurpose projects. • The government to invest in increased storage capacity for hydro power reservoirs. • The government to finance pre-feasibility studies for identification of potential hydropower sites.

<p>Energy generation: small hydro</p>	<p>National Energy Policy, 2018</p>	<ul style="list-style-type: none"> • Finance conservation of hydro power water catchment areas. • Provide incentives for Public Private Partnerships in small hydro schemes. • Invest in hydrological data collection, management and dissemination. • Promote development of capacity and knowledge on usage of appropriate technologies. • Formulate and enforce standards, legal and regulatory regimes for small hydro schemes.
<p>Energy generation: biogas</p>	<p>National Energy Policy, 2018</p>	<ul style="list-style-type: none"> • Develop and implement public awareness programmes on the benefits and potential of biogas technology. • Undertake and promote RD&D of biogas energy technologies. • Provide appropriate fiscal incentives for local manufacture of biogas plant and equipment, large-scale production, storage and distribution. • The government to initiate capacity-building programmes on biogas technology in learning institutions. • The government to develop and enforce legal and regulatory requirements on biogas. • Support domestic and community-based biogas plants among urban, rural population and institutions. • Promote the use of biogas as an alternative to wood fuel and kerosene for domestic and commercial energy needs. • Roll out biogas initiatives to supply the remaining public institutions including prisons, schools and hospitals as well as biogas bottling plants across the country.

Energy generation: solar	National Energy Policy, 2018	<ul style="list-style-type: none"> • Undertake awareness programmes to promote the use of solar energy. • Enforce regulations on standards. • Regular review of standards for solar energy technologies and equipment. • Provide incentives to promote the local production and use of efficient solar systems. • Enforce regulations on building codes on water heating and lightning. • Provide a framework for connection of electricity generated from solar energy to national and isolated grids, through direct sale or net metering. • Enhance penalties for theft and vandalism of solar systems. • Support hybrid power generation systems involving solar and other energy sources to manage the effects caused by the intermittent nature and availability of solar energy. • Roll out installation of solar PV systems in all the remaining public facilities in the off-grid areas. • Procure and distribute solar lanterns to light up rural, peri-urban and urban areas. • Undertake RD&D on solar technologies.
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<p>Energy generation: cogeneration</p>	<p>National Energy Policy, 2018</p>	<ul style="list-style-type: none"> • Provide incentives for investment in efficient and emerging cogeneration technologies. • Promote community programmes and projects in production and supply of agro-waste. • Support co-generators in implementing capacity-building programmes in cogeneration technologies. • Carry out public awareness and sensitisation programmes in cogeneration. • Formulate and implement a national strategy for coordinating development of co-generation. • Undertake RD&D in co-generation technologies. • Support PPP arrangements to accelerate investment in cogeneration. • Formulate and implement information dissemination strategy to investors on issues relating to licensing, taxation and feed in tariff policy. • Develop and implement regulatory framework for certification of cogeneration projects.
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Energy efficiency	National Energy Policy, 2018	<ul style="list-style-type: none"> • Provide appropriate fiscal and other incentives to enhance uptake of energy optimisation technologies. • Build capacity and empower the energy efficiency and conservation directorate to champion and spearhead energy efficiency and conservation activities. • Enforce building codes to enhance the concept of green design in buildings. • Develop and enforce standards for fuel economy of motor vehicle operations and maintenance practices. • Promote safe and fuel-efficient transportation for passengers and cargo. • Adopt the use of new and efficient technologies in energy efficiency and conservation. • Develop, disseminate and implement a National Energy Efficiency and Conservation Plan in consultation with relevant stakeholders. • Undertake research and development in energy efficiency and conservation. • Collaborate in the preparation of education curricula on energy efficiency and conservation. • Implement international co-operation programmes in energy efficiency and conservation. • Collaborate with the private sector in energy efficiency and conservation.
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Energy Sector: Local Targets

Energy generation	Kisumu County Integrated Development Plan, 2018 -2022	<ul style="list-style-type: none"> • Promote use of alternative sources of energy and the use of renewable energy technologies. • Develop renewable energy including: biomass, solar, mini-hydro, mini-wind, agro-waste, municipal waste. <ul style="list-style-type: none"> ◦ Promote access and utilisation of solar energy technologies. • Formulate an Integrated Resource Plan (IRP), as a platform for the development of alternative energy generation.
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Energy generation	Kisumu County Environment Policy, 2019	<ul style="list-style-type: none"> • Develop and promote an integrated county strategy for generation and sustainable utilisation of renewable energy. • Promote adaptation of the cleaner production concept in all energy production and consumption activities. • Promote investments in clean energy.
Energy generation	Kisumu County Environment Policy, 2019	Establish appropriate waste disposal facilities including waste-to-energy.
Energy management	Kisumu County Environment Policy, 2019	Develop a system for energy management graduation for domestic, low and high industry consumers.
Energy access	Kisumu County Environment Policy, 2019	Facilitate public access to clean and affordable energy sources.
Awareness raising	Kisumu County Environment Policy, 2019	Create public awareness with respect to clean energy and energy efficient technologies.
Energy generation	Kisumu County Climate Change Act, 2020	<ul style="list-style-type: none"> • Mitigation in energy generation: <ul style="list-style-type: none"> ◦ The officer responsible shall promote the use of renewable energy and the development of new clean energy technologies in order to reduce greenhouse gas emissions. • Mitigation in waste management: <ul style="list-style-type: none"> ◦ The officer responsible shall promote sustainable use of solid and liquid wastes for energy generation and other uses.
Energy generation	Kisumu County Energy Plan, 2021-2026 (Draft)	<ul style="list-style-type: none"> • Provide and facilitate land rights access for renewable energy generation. • Provide financial incentives and reduce the process of development approval for developers who use the land for renewable energy generation.

<p>Energy generation: waste-to-energy</p>	<p>Kisumu County Energy Plan, 2021-2026 (Draft)</p>	<ul style="list-style-type: none"> • Although the waste generated in Kisumu County may be sufficient for waste-to-energy technologies as indicated above, the waste collected is not enough to make waste-to-energy technologies commercially viable. Therefore, the county government will put in place measures to increase its waste collection, disposal and management services before it can explore the option of solid waste to energy. • Establish a regulatory and institutional framework that encourages private sector investment in waste management, including methane capture, electricity generation and biogas production from waste. • Partner with the private sector to develop waste-to-energy technologies to utilise organic waste generated in the county for biogas and electricity production. • Establish the feasibility of waste-to-energy production through a private-public partnership mechanism.
<p>Energy utilisation and efficiency</p>	<p>Kisumu County Climate Change Bill, 2020</p>	<ul style="list-style-type: none"> • The officer responsible shall promote conservation and efficient utilisation of energy to reduce greenhouse gas emissions and encourage the use of alternative fuels. • The officer responsible shall in the performance of the responsibilities in subsection: promote the development of energy conservation and efficiency projects in all sectors.
<p>Energy efficiency: industry</p>	<p>Kisumu County Energy Plan, 2021-2026 (Draft)</p>	<ul style="list-style-type: none"> • The county government shall promote and encourage energy efficiency practices in the private sector to contribute towards the national efforts. • The county intends to promote the supply of energy-efficient appliances for households to promote energy-efficiency practices and contribute to doubling the rate of energy efficiency.
<p>Energy efficiency: public sector</p>	<p>Kisumu County Energy Plan, 2021-2026 (Draft)</p>	<p>To promote energy efficiency measures in the public sector, the county government shall implement energy efficiency measures on all County government premises, including streetlighting and public buildings based on annual energy audits.</p>

Energy management	Kisumu County Energy Plan, 2021-2026 (Draft)	To promote efficiency in the private sector and industry, the county government shall enforce Energy Management Regulations 2012 which provides guidelines on energy auditing and management for all industrial, commercial and institutional energy users at least once in every three years. The County government shall provide financial incentives to the industries and commercial entities that comply with energy efficiency standards and Energy Management Regulations 2012 and adopt energy efficiency measures.
Industry	Kisumu County Climate Change Act, 2020	<ul style="list-style-type: none"> • The officer responsible shall promote cleaner production processes in industries to reduce the increase in greenhouse gas emissions: <ul style="list-style-type: none"> ◦ promote new technologies in industries; and ◦ consult with other relevant stakeholders to regulate and enforce emission reduction in industries.

<p>General</p>	<p>Kisumu County Energy Plan, 2021-2026 (Draft)</p>	<ul style="list-style-type: none"> • Develop and make available to investors a database with relevant information on administrative entry requirements and procedures for operating biomass system, solar, wind, and hydro power plants, the legal and regulatory framework for such investments and relevant market information. • Establish enforcement mechanisms to enforce regulations and standards developed by the national government that are aimed at promoting renewable energy technologies. • Promote the development of local capacity for designing, installing, operating and maintaining renewable energy technology systems. • Create awareness on the benefits and importance of renewable energy as well as the available financing mechanism among the private sector. • Lobby the national government to develop and enact net metering and electricity wheeling regulations. • Promote and implement the use of solar PVs for energy supply in public institutions through public-private partnership. • Establish measures to ensure compliance with the Energy (Solar Water Heating) Regulations in public buildings. • Promote local capacity building on techniques for energy efficiency and conservation for public institutions; create awareness in collaboration with EPRA and other relevant agencies on the implementation of energy efficiency measures in public institutions. • Facilitate resource mapping and maintain data on hydropower potential, including historical water flow and river elevation profiles in the county, as well as solar, biomass and wind potential in the county.
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Transport Sector: National Targets

<p>General</p>	<p>Nationally Determined Contribution (NDC, 2020)</p>	<ul style="list-style-type: none"> • Reduce greenhouse gas (GHG) emissions by 30% by 2030 relative to business as usual. • Low-carbon and efficient transportation systems.
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Public transport	National Climate Change Action Plan (NCCAP, 2018)	Update and implement planning and building control regulations to encourage compact development, mixed use and reduced provision of parking near mass rapid transport (MRT) stations.
NMT	National Climate Change Action Plan (NCCAP, 2018)	Construct 150 km of non-motorised transport facilities, including pedestrian and bicycle access within and to town centres and MRT stations.
On-road transport	National Climate Change Action Plan (NCCAP, 2018)	<ul style="list-style-type: none"> • Improvement of heavy-duty truck efficiency. • Import and pilot the use of 150 electric hybrid vehicles (buses, GoK cars) by 2019 and provide appropriate incentives for their use by 2022. • Pilot the use of electric 2- and 3-wheeler vehicles in at least two counties by 2020.
Rail transport	National Climate Change Action Plan (NCCAP, 2018)	Extension of the standard gauge railway (SGR) line from Nairobi to Naivasha by 2022 (Naivasha-Kisumu Section).
E-mobility	Kenya National Energy Efficiency and Conservation Strategy, 2020	Increasing the share of electric vehicles in the transport sector has been identified as the second target, aiming to reach 5% annually by 2025.
Public transport	Kenya National Energy Efficiency and Conservation Strategy, 2020	Targets to increase the number of passengers using commuter trains from 116,000 to 150,000 per day.
Rail transport	Kisumu County Integrated Development Plan, 2018 -2022	Expansion of railway transport: This will entail construction of Standard Gauge Railway (SGR) Phase 2 (Nairobi –Malaba) which comprises of Phase 2A (Nairobi –Naivasha); Phase 2B (Naivasha– Kisumu) and Phase 2C (Kisumu –Malaba).
Transport Sector: Local Targets		
General	Kisumu Sustainable Mobility Plan, 2020	<ul style="list-style-type: none"> • Hold a car-free day at least one Sunday per month starting in January 2021. • Hold monthly sustainable commuting (walking, cycling, or public transport) days for county/city staff from January 2021. • Capacity building.
Public transport	Kisumu Sustainable Mobility Plan, 2020	Introduction of 450 modern, accessible public transport vehicles that meet at least the Euro 4 standard, with an eventual transition to e-vehicles.
Streetlights	Kisumu Sustainable Mobility Plan, 2020	<ul style="list-style-type: none"> • LED/energy saving bulbs should be used for streetlighting to minimise the cost of lighting the city. • Install 100 km of streetlights by 2030.

<p>Non-motorized transport</p>	<p>Kisumu Sustainable Mobility Plan, 2020</p>	<ul style="list-style-type: none"> • Increased mode of walking and cycling: <ul style="list-style-type: none"> ◦ Construction of 100 km of footpaths and 31 km of cycle tracks consistent with SDMUAK guidelines. ◦ Implementation of bikeshare in Kisumu. • Reduction in the use of personal motor vehicles (PMV): <ul style="list-style-type: none"> ◦ Demand-based parking fees adopted and improved parking enforcement instituted. ◦ Monthly car-free day implemented. ◦ Pedestrian-only zones created. ◦ Congestion charging implemented. • Improved air quality: <ul style="list-style-type: none"> ◦ Better public transport and NMT facilities. ◦ All public transport vehicles are Euro 4 or better. ◦ Introduction of electric vehicles. • Improved road safety to increase attraction to walking and cycling: <ul style="list-style-type: none"> ◦ Well-designed footpaths and cycle tracks. ◦ Safe pedestrian crossings (table-tops). ◦ Improved intersections.
<p>Non-motorized transport</p>	<p>Kisumu Sustainable Mobility Plan, 2020</p>	<ul style="list-style-type: none"> • Implement pedestrian and road safety elements in 40 school zones by 2022. • Rehabilitate 28 km of recently constructed KeNHA corridors with road safety improvements, including the redesign of 20 unsafe intersections, by 2022. • Improve 100 km of streets with a complete pedestrian realm, including footpaths and crossings on major streets and safe shared space on neighbourhood lanes, by 2030 (intermediate milestones: 20 km by 2022; 50 km by 2025). • Develop 31 km of cycle tracks by 2030 (intermediate milestones: 15 km by 2022; 24 km by 2025). Complete the 3.7 km lakefront greenway by 2025. • Install bicycle parking racks at 50 locations by 2030. • Design all NMT facilities in compliance with the Street Design Manual for Urban Areas in Kenya (SDMUAK). • Implement a first-phase bikeshare system with at least 400 cycles by December 2024.

Public transport	Kisumu Sustainable Mobility Plan, 2020	<ul style="list-style-type: none"> • Prepare a service plan, financial plan, and business plan for improved public transport services by 2021. • Initiate the public transport reform process by 2021 and launch regulated services by 2022. • Introduce a new public transport fleet consisting of 250 vehicles by 2023, growing to 450 vehicles by 2030. • Install high-quality bus shelters at 30 high-priority bus stops on existing routes by 2021. • Install shelters at the remaining 91 bus stops on existing routes by 2023. Install 46 additional bus shelters on new routes by 2030. • Develop 13 km of new streets and introduce new routes to expand public transport coverage by 2030. • Implement the 5 km first-phase BRT along the Kisumu Boys-Mamboleo corridor by 2028. • Ensure that all public transport vehicles introduced after 2022 meet the Euro 4 standard or better. • Conduct a feasibility study on electrification by 2022. Transition to a fully electric bus fleet by 2030.
On-demand transport	Kisumu Sustainable Mobility Plan, 2020	Institute incentives for electrification, with a goal of electrifying 50 percent of Kisumu boda-bodas and tuk-tuks by 2025.
General	Kisumu County Climate Change Bill, 2020	The officer responsible shall in consultation with relevant departments, authorities and agencies develop and implement a county transport policy and plan that addresses greenhouse gas mitigation matters.

Public transport	Kisumu County Energy Plan, 2021-2030	<ul style="list-style-type: none"> As a long-term policy intervention, the county government shall facilitate a modern public transport system combined with the provision of park and ride facilities. Improve the public transport system by establishing a proper, well-managed public transport system (including appropriate public transport information, punctuality/regularity and improved accessibility). To contribute to the greenhouse emission reduction as per the updated NDC, the County government shall integrate transport into the county's physical and spatial planning, develop and implement NMT infrastructure and improve the road network to provide for proper stops for matatus, boda-boda and tuk-tuks. In the long term, the county will promote alternative mass public transport modes such as the train and BRT system. To realise non-motorised and energy-efficient modes of transport (NMT) the County government in the short and medium-term shall be maintaining the transport mix since the present range of transportation means matching the users' demand and financial capacity.
Streetlights	Kisumu County Energy Plan, 2021-2030	Plan for and implement solar technologies for streetlighting and for use in public places.
General	Kisumu County Integrated Development Plan, 2018 -2022	Develop and implement mechanisms to ensure that the existing and future transport infrastructure is climate change resilient.
Non-motorized transport	Kisumu County Integrated Development Plan, 2018 -2022	Construct new and rehabilitate old bridges and footpaths.
Clean Cooking Sector: National Targets		
General	Nationally Determined Contribution (NDC, 2020)	<ul style="list-style-type: none"> Reduce greenhouse gas (GHG) emissions by 30% by 2030 relative to business as usual. Universal access to clean cooking by 2028.

General	Kenya Ethanol Cooking Fuel Masterplan, June 2021	<ul style="list-style-type: none"> • Zero-rating of VAT on ECF which will stimulate demand. • Short-term zero-rating of 25% import duty for denatured ethanol as a cooking fuel. • Design subsidy schemes to reduce the high upfront cost of clean cookstoves, specifically targeting those living below the income poverty line. • Consistent review and expansion of existing regulations on kerosene and charcoal to other counties with the growth of the ECF market. • Awareness and communication campaigns will help inform consumers about the dangers of traditional fuel sources, as well as the availability of affordable clean cooking solutions, such as ECF.
Residential	National Climate Change Action Plan (NCCAP, 2018 - 2022)	<ul style="list-style-type: none"> • Reduce the number of household biomass related deaths from 49% of total deaths to 20%. • Development and distribution of 4 million improved biomass (charcoal and biomass) stoves by 2022 <ul style="list-style-type: none"> ◦ The action entails the design, manufacture and distribution of improved cookstoves that either use charcoal or firewood. This action is closely linked to the implementation of the Nationally Appropriate Mitigation Action (NAMA) for the Charcoal Sector (mitigation potential of 5 MtCO₂e per year by 2030). • Development and distribution of 1.5 million clean energy (LPG, biogas and ethanol) stoves by 2022 <ul style="list-style-type: none"> ◦ This action requires significant development of the fuel supply chains, including storage, distribution and dispatch facilities.
Residential	Kenya National Energy Efficiency and Conservation Strategy, 2020	Targets the use of improved efficient biomass cookstoves at 50 percent of all households currently using biomass cookstoves.
General	Kenya National Energy Efficiency and Conservation Strategy, 2020	<ul style="list-style-type: none"> • 50% households utilising clean energy. • Develop a clean cooking awareness and communication strategy. • Enhance research, innovation and development in the clean cooking sector. Develop economic incentives to promote the adoption of clean cooking technologies.

General	Kenya Bioenergy Strategy 2020 - 2027	<ul style="list-style-type: none"> Achieving the target of its population enjoying access to modern bioenergy services. Achieve universal access to clean cooking, by 2028, two years ahead of the schedule set out in the Kenya Sustainable Energy for All (SEforAll). Promote sustainable production and consumption of bioenergy. Accelerate transition to clean cooking technologies and fuels. Provide potential investors with requisite information on viable opportunities for bioenergy development in Kenya. Serve as a framework for regional and international cooperation and trade in bioenergy and related feedstocks.
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Clean Cooking Sector: Local Targets

General	Kisumu County Energy Plan, 2021-2026 (Draft)	Create financing schemes to promote uptake of energy-efficient appliances, including efficient cookstoves, in public institutions.
Residential: Biogas	Kisumu County Energy Plan, 2021-2026 (Draft)	<ul style="list-style-type: none"> Create financial incentives/financing schemes to promote uptake of biogas for cooking in households. Promote the development of local capacity for qualified personnel with skills necessary to install and maintain biogas systems through existing county Vocational Training Centres (VTC). Develop and implement awareness programmes on costs, use and the health, economic and environmental benefits of biogas, especially among the households that would benefit most. Providing linkages to improve access to loan facilities, to enable residents to cover the initial costs of installation of biogas systems and where possible provide subsidies.

Residential: Ethanol	Kisumu County Energy Plan, 2021-2026 (Draft)	<ul style="list-style-type: none"> • Lobby and facilitate discussions with the national government to reduce taxation on ethanol. • In collaboration with EPRA and Kenya Bureau of Standards (KeBS), establish mechanisms to implement standards set by the national government. • In collaboration with ethanol stove traders, develop and implement a financing scheme/payment scheme to cover ethanol stoves' initial costs. • Enhance distribution by creating awareness among potential users and small-scale traders.
General	Kisumu County Energy Plan, 2021-2026 (Draft)	<ul style="list-style-type: none"> • The county government will support the national government in its efforts to promote the use of LPG. • The county aims to reduce reliance on charcoal, firewood and paraffin for cooking by, mitigating financial and cultural barriers to the use of LPG. • Establishing mechanisms to enforce existing regulations to protect investments in LPG and avoid cross-filling of LPG cylinders. • Establishing the feasibility of scaling up access to small-scale LPG cylinders and lobby the private sector to introduce supply of small-scale LPG cylinders in the county to increase uptake. • Providing financial/tax incentive to the private sector entities setting up storage and filling plants within the county. • Enhance demand for LPG by sensitising potential end-users about the safety and health benefits of LPG use.

<p>General</p>	<p>Kisumu County Energy Plan, 2021-2026 (Draft)</p>	<ul style="list-style-type: none"> • The national government has set a target of 57.7% of households in the country to be using efficient cookstoves by 2022. The County Government of Kisumu intends to contribute to the national target and enhance the use of efficient cookstoves in Kisumu County for households to replace the inefficient cookstoves. Thus, the County sets the target of 48.17% of county households using cookstoves by 2022, respectively. • The County government shall enhance demand for efficient cookstoves by creating awareness on the availability and benefits of efficient cookstoves to potential users. • Promote the distribution of efficient cookstoves for households and institutions through the issuance of micro-loans in collaboration with existing community-based organisations and distributors. • Establish mechanisms to enforce national government regulations on standards and efficient cookstoves. The national government currently has in place Energy (Improved Biomass Cookstoves) Regulations, 2013. the County Government of Kisumu shall establish mechanisms to enforce these regulations. • Develop a framework for phasing out the use of traditional biomass.
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100% RENEWABLES CITIES & REGIONS ROADMAP

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