Covenant of Mayors
in Sub-Saharan Africa

NAKURU COUNTY
COUNTY OF UNLIMITED OPPORTUNITIES

MITIGATION TARGET SETTING REPORT

Nakuru County, Kenya

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Abbreviations

AFOLU	Agriculture, Forestry and Other Land Use
BAU	Business as usual
BEI	Baseline Emissions Inventory
CGN	County Government of Nakuru
CH_4	Methane
CIRIS	City Inventory and Reporting Information System
CO_2	Carbon dioxide
CO_2e	CO_2 equivalents
$CO_2(b)$	Biogenic CO_2
CoM SSA	Covenant of Mayors in Sub-Saharan Africa
EC	European Commission
EU	European Union
GCoM	Global Covenant of Mayors for Climate & Energy
GHG	Greenhouse gas
GPC	Global Protocol for Community-Scale Greenhouse Gas Emission Inventories
GWP	Global Warming Potential
IE	Included elsewhere
IPPU	Industrial Processes and Product Use
LPG	Liquid petroleum gas
LULUCF	Land Use, Land Use Change and Forestry
NCCAP	National Climate Change Action Plan
NDC	Nationally Determined Contribution
NE	Not estimated
NO	Not occurring
N_2O	Nitrous oxide
RVA	Risk and Vulnerability Assessment
SDGs	Sustainable Development Goals
SEACAP	Sustainable Energy Access and Climate Action Plan
tCO_2e	Metric tonnes of CO_2 equivalents

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1. The Covenant of Mayors in Sub Saharan Africa (CoM SSA) and Sustainable Energy Access and Climate Action Plans (SEACAPs)

1.1 The Covenant of Mayors in Sub Saharan Africa (CoM SSA)

The Covenant of Mayors Sub-Saharan Africa (CoM SSA) is an initiative launched by the European Union (EU) to support local authorities in Sub-Saharan Africa tackle climate challenges and ensure access to clean energy. It is the "regional covenant" or chapter of the Global Covenant of Mayors for Climate & Energy (GCoM). CoM SSA is delivered through a partnership of global and local city networks as well as initiatives funded by the European Commission (EC). It is a bottom-up and voluntary initiative that invites cities to define and meet ambitious and realistic energy access and climate targets set by themselves, in line with GCoM requirements. This means that targets are at least as ambitious as cities' respective government's Nationally Determined Contribution (NDC) under the Paris Agreement. Furthermore, targets need to be in line with national adaptation and/or mitigation plans (where these exist) and be consistent with the principles around energy access and urban sustainability embodied in the Sustainable Development Goals (SDGs). Local authorities are encouraged to voluntarily commit to the implementation of a climate and energy action plan in their area of influence. They are also encouraged to define long-term visions and actions towards a sustainable future based on the pillars of climate change mitigation and adaptation, and sustainable, affordable and secure access to energy. CoM SSA is open to any city or subnational government in Sub-Saharan Africa, regardless of the size.

1.2 Sustainable Energy Access and Climate Action Plans (SEACAPs)

In order to translate their political commitment into practical measures, CoM SSA signatories commit to produce and implement a strategic and operational document called the Sustainable Energy Access and Climate Action Plan (SEACAP). The SEACAP is the key document that sets the strategies, plans and actions for a sustainable and low greenhouse gas (GHG) emission development pathway, while including climate adaptation actions and ensuring access to secure, affordable and sustainable energy, in response to the current and future impacts of climate change in the region. The SEACAP is both a strategic and an operational document. It uses the results of the Baseline Emissions Inventory (BEI) to identify the best fields of action and opportunities for reaching the local authority's GHG emission reduction targets. It is based on the climate change Risk and Vulnerability Assessment (RVA), which identifies the most relevant city climate hazards and vulnerabilities. It also includes an Access to Energy Assessment, which articulates a plan to improve access to secure, sustainable, affordable and reliable energy. The SEACAP defines concrete measures for climate mitigation, adaptation and access to sustainable energy, with timeframes and assigned responsibilities, translating the long-term strategy into action.

1.3 Phases of SEACAP development within the Mitigation pillar

The Mitigation pillar of the Sustainable Energy Access and Climate Action Plan (SEACAP) development typically involves four phases:

i. **Initiation phase** – Activities in this phase include the identification of national action plans on climate change mitigation, mobilising and engaging stakeholders and affirming political commitment of the heads of the municipality to the SEACAP development.

ii. **Planning phase** – This phase includes pre-assessment and development stages. Thus, it involves undertaking a baseline assessment of the status of mitigation in the city via a Baseline Emissions Inventory (BEI). The BEI offers an opportunity for local government authorities to obtain data specific to the city, thus increasing awareness of the current status and providing a premise for further action to improve the status quo. The BEI should, at minimum, measure the emissions of three sectors: stationary energy, waste and transport. Owing to the complexity of developing a BEI, a first inventory can be developed efficiently using national or regional proxy data, and supplemented where/if local data are available. Thereafter, target setting and development of long-term action plans to achieve the set targets would begin. These actions, which aim at promoting mitigation, include the development of favourable policies for the consumption of efficient and/or renewable energy in buildings and lighting, efficient land use planning and urban design, low-carbon transport modes, waste and wastewater management and potential energy generation.

iii. **Implementation phase** – This phase involves delivering practical actions, based on the actions that have been prioritised during the action planning process.

iv. **Monitoring and Reporting phase** – This phase involves reviewing progress and readjusting priorities. The proposed actions are monitored to ensure that the set targets are achieved. Specific procedures and processes for each of the actions are confirmed, while maintaining communication with the stakeholders throughout. On a regular basis, the progress made is assessed and priorities are adjusted to fit the current situation as needed. A progress report is to be submitted every second year after the year the SEACAP was developed, for monitoring and evaluation.

This document constitutes the Mitigation Target Setting Report, the target report component for the Mitigation pillar. This report will be used to guide the development of actions to reduce GHG emissions in Nakuru County, Kenya.

1.4 The purpose of setting targets

1.4.1 Long–term vision

Local authorities are required to establish a long-term vision which indicates the direction that the city wishes to follow. Setting a longer-term vision is considered a key success factor of SEACAPs as it clearly shows the local authority's political commitment and gives a strong message to citizens and stakeholders on how the local authority wants to develop in the future, paving the way for more substantial investment in sustainable infrastructure (Rivas et al., 2015). The vision should be realistic but still ambitious, and aligned with the national and international policy landscape. It should describe the desired future of the city.

1.4.2 Definition of Targets

Once the overarching vision for the pillar is established, it is necessary to translate this into more specific targets for the different sectors under each pillar in which the local authority intends to take action. The sector targets should follow the principles of the SMART acronym: Specific, Measurable, Achievable, Realistic, and Time-bound. SMART targets should be guided by the principles outlined in **Table 1**.

Table 1: SMART Targets

SMART Targets	Guiding Principle
S	**Specific** (well defined, focused, detailed and concrete): What are we trying to achieve? Why is this important? Who is going to do what? When do we need it done? How are we going to do it?
M	**Measurable** (kWh, time, money, %, etc.): How will we know when this objective has been achieved? How can we make the relevant measurements?
A	**Achievable** (feasible, actionable): Is this possible? Can we get it done within the timeframe? Do we understand the constraints and risk factors? Has this been done (successfully) before?
R	**Realistic** (in the context of the resources that can be made available): Do we currently have the resources required to achieve this objective? If not, can we secure extra resources? Do we need to reprioritise the allocation of time, budget and human resources to make this happen?
T	**Time-bound** (defined deadline or schedule): When will this objective be accomplished? Is the deadline unambiguous? Is the deadline achievable and realistic?

1.4.3 Additional factors to consider

With regards to mitigation, all local governments and cities are required to set and report city-wide emission reduction targets. The GCoM defines eight categories of requirements for target setting, as indicated in **Table 2**.

Table 2: Categories of requirements for target setting

Boundary (geographical coverage, sectors, and GHGs)	The emissions boundary shall be consistent with all emissions sources included in the GHG emissions inventory, with the possibility to exclude sources that are not controlled by the local government. In cases where the target boundary does not align with the inventory boundary, any additions or exclusions shall be specified and justified.
Target type	Local governments shall use one of the following four target types: base year emissions target, base year intensity target, baseline scenario target, or fixed level target. For a baseline scenario target, the modelling methodologies, and parameters shall be transparently described.
Target year	The target year shall be the same as the target year adopted in the Nationally Determined Contribution (NDC). Cities that set a target year beyond 2030 shall include an interim target before 2030.
Baseline year (for base year target and base year intensity targets only)	The base year shall be the same as the base year used in the NDC. Where the base year is different from the NDC (e.g. due to a lack of data availability), this shall be justified.
Ambition	At a minimum, the target shall be as ambitious as the unconditional components of the NDC. Local governments should set targets that are more ambitious than the NDC.
Units	Targets shall be reported as a percentage (%) reduction from the base year or scenario year. The absolute emissions in the target year(s) in metric tonnes CO_2e shall also be reported.
Transferable emission units	The use of transferable emissions units is only permissible when a city's target ambition exceeds the NDC. Where this is the case, the local government shall report the target, with and without the transferable emissions units, as well as identify the source of the transferable emissions units.
Conditional Components	Any conditional components included in the target shall be identified. Where possible the conditional components should also be quantified. Conditional components include where cities set a stretch target, or where actions are identified for other key stakeholders beyond that which they have committed to themselves (for example, where a local government assumes a more ambitious reduction in the carbon-intensity of the national electricity grid than that committed to in the NDC or official government policy), if possible.

2. Summary of the BEI

2.1 Background of the BEI

The purpose of the BEI was to identify the activities in Nakuru County that are the primary sources of GHG emissions, thereby contributing to climate change on a global scale. If produced consistently, the emissions inventory can be used to track how emissions change over time and to identify and monitor the impact of appropriate mitigation interventions and low-emission targets.

The BEI for Nakuru County was developed in accordance with the requirements of the Global Protocol for Community-scale Greenhouse Gas Emission Inventories (GPC) standard, an international standard for cities, using a Proxy Data Tool developed by ICLEI Africa, which was built on the City Inventory Reporting and Information System (CIRIS) tool for GHG inventories for subnational governments. The GHG inventory for Nakuru County uses a combination of local data, where available, and downscaled national and regional (proxy) data for Kenya and East Africa. The BEI includes GHG emissions from three sectors[1]: stationary energy, transport and waste. The Nakuru County BEI covers a continuous 12-month period from January 2019 to December 2019 and estimates all emissions from the stationary energy, transport and waste sectors as a result of activities within the county's geographical boundary.

2.2 Overview of GHG emissions in Nakuru County

Nakuru County is located in the Great Rift Valley in central Kenya and occupies a land area of approximately 7 500 km^2. The county had a population of 2 162 202 people in 2019 (4.5% of Kenya's total population). There are two main urban centres within Nakuru County: Nakuru city, which is Kenya's fourth largest city, and Naivasha. The major road connecting the port of Mombasa, and Nairobi, to Uganda traverses through Nakuru County. In addition, Nakuru County holds some of Kenya's most significant electricity generation capacity, including one of the largest geothermal power plants in Africa.

Total GHG emissions for Nakuru County in 2019 were estimated at 1 642 867 tCO_2e (**Table 3**). This estimate includes emissions from the stationary energy, transportation and waste sectors. This is equivalent to approximately 0.8 tCO_2e per person. For comparison, national emissions for Kenya in 2010 were 17 000 000 tCO_2e when considering only the stationary energy, transport and waste sectors (Republic of Kenya, 2015). This is equivalent to approximately 0.4 tCO_2e per person. However, emissions per person in Nakuru County in 2019 were only about one sixth of the global average (World Bank, 2022).

The total GHG emissions in Nakuru County for 2019 are equivalent to 37 000 cars travelling from Nakuru city centre to Nairobi city centre and back every day for a year.

[1] Under the BASIC reporting level of the GPC, reporting emissions from the stationary energy, transport and waste sectors is mandatory. Under the BASIC+ reporting level, emissions from agriculture, forestry and other land use (AFOLU) and industrial processes and product use (IPPU) can be optionally included.

Table 3: Summary of GHG emissions by sector for Nakuru Country ($ktCO_2e$)

Sector		Total by scope			Total by city-induced reporting level
		Scope 1	Scope 2	Scope 3	BASIC
Stationary Energy	Energy use	669 273	34 587	NE[2]	703 860
	Energy generation supplied to the grid	NE	–	–	
Transportation	All transportation	544 749	0	NE	544 749
Waste	Generated in the region	394 258	–	NO[3]	394 258
	Generated outside the region	NE	–	–	
IPPU	All IPPU	NE	–	NE	
AFOLU	All AFOLU	NE	–	NE	
TOTAL		**1 608 280**	**34 587**	**NE**	**1 642 867**

2.3 GHG emissions by sector and subsector

The total GHG emissions for Nakuru County in 2019 (including emissions from stationary energy, transportation and waste) are estimated at 1.6 million tCO_2e. **The largest contributing sector was stationary energy, contributing 43% of emissions, followed by transportation (33%) and waste (24%)**, as shown in **Figure 1**.

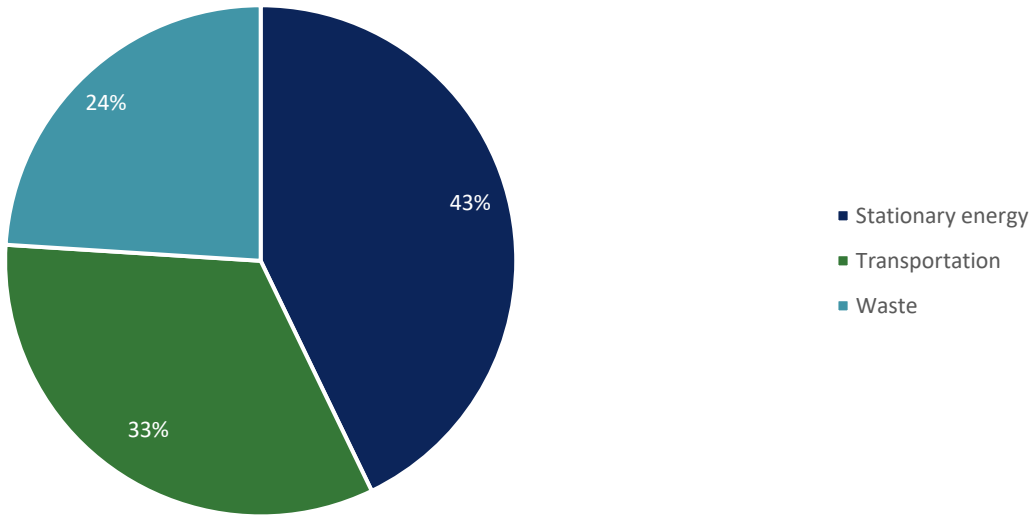

Figure 1: Sector contributions to GHG emissions in Nakuru County

[2] NE = Not estimated
[3] NO = Not occurring

In Nakuru County, the stationary energy sector accounted for 703 860 tCO_2e (43% of total GHG emissions) in 2019. The largest proportion of emissions in the stationary energy sector come from energy use in residential buildings (37%). This is followed by energy use in manufacturing and construction (30%) and in energy industries or charcoal production (23%). The remaining emissions in the stationary energy sector come primarily from energy use in commercial and institutional buildings (8%), while less than 1% come from energy use in agriculture, forestry and fishing activities (**Figure 2**).

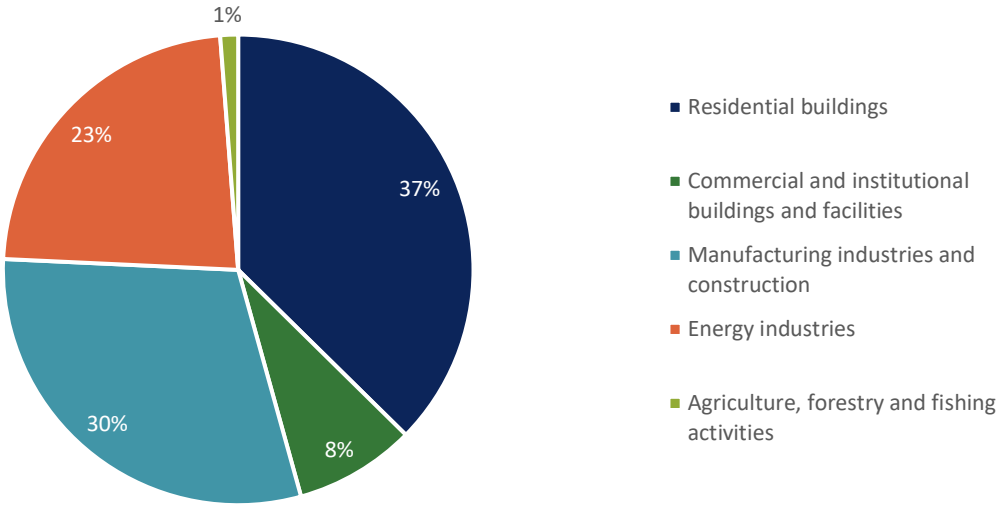

Figure 2: Subsector contributions to stationary energy GHG emissions in Nakuru County

The transportation sector accounted for 544 749 tCO_2e (33% of total GHG emissions) in 2019. Transport sector emissions included in the BEI are all a result of fossil fuel use for road transport (43% petrol and 57% diesel), including public and private passenger vehicles as well as freight transport (**Figure 3**).

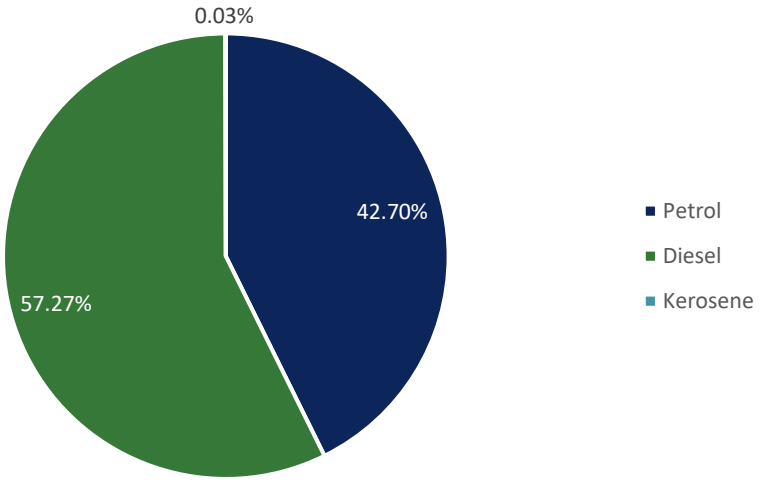

Figure 3: Emissions from the transportation sector in Nakuru County by fuel

The waste sector in Nakuru County was responsible for 394 258 tCO_2e (24% of the county's total GHG emissions) in 2019, all of which arise from waste and wastewater treated in the region. The largest contributor to waste sector emissions was the disposal of solid waste, which accounted for 46% of emissions in the sector. Landfilled and dumped solid waste accounts for the largest portion of waste emissions at 46%, while wastewater accounts for 27% of waste emissions. Incineration and burned waste accounts for a further 26% of the emissions. Biological treatment of waste accounts for 1% of emissions (**Figure 4**).

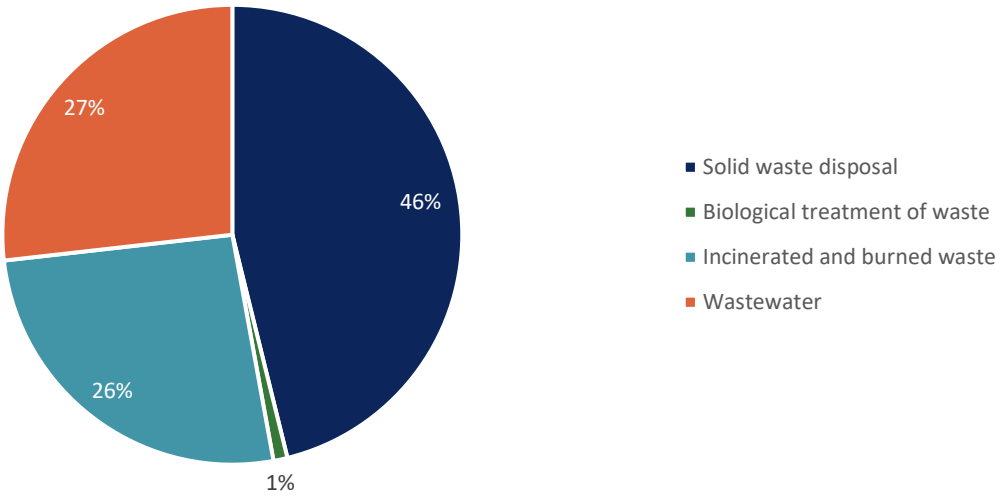

Figure 4: Subsector contributions to waste sector GHG emissions in Nakuru County

2.4 GHG emissions by gas

Emissions of the three most common GHGs (Scope 1 emissions) are included in the BEI – carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Scope 2 emissions (i.e. emissions from electricity consumption) are only reported in CO_2e due to the grid emission factor being expressed as kg CO_2e/kWh and are therefore not disaggregated by gas. Similarly, emissions resulting from charcoal production are only reported in total CO_2e due to the emission factor being expressed as kg CO_2e/tonne. For Scope 1 emissions, carbon dioxide (CO_2) contributes 64% of total emissions, followed by methane (CH_4) at 30% and nitrous oxide (N_2O) at 6%.

Biogenic CO_2 emissions (shown as CO_2(b)) for each sector are shown in **Figure 5**. However, CO_2(b) emissions are not included in the total GHG emissions reported from the inventory for Nakuru County. Biogenic CO_2 emissions are those emissions that result from biomass materials that naturally sequester CO_2, including fuels produced by living organisms or biological processes (for example through forestry or agriculture), but not fossilised or from fossil sources. This includes CO_2 emissions from the combustion of wood fuel and charcoal, as well as the combustion of biogenic materials during waste treatment. While CO_2 emitted from any source contributes to the greenhouse effect, following international protocols, these emissions are not included in the overall total for the GHG inventory. This is because they are considered to be offset by the growth of biomass, or accounted for under land use and land use change (Greenhouse Gas Protocol, 2015). **It is estimated that 3 442 776 tCO_2(b) were emitted in Nakuru County in 2019 – double the total emissions included in the inventory. 99% of these emissions are linked to the combustion of charcoal and wood in the stationary energy sector, especially in residential buildings.** The remaining 1% of biogenic CO_2 emissions result from solid waste disposal. While the targets set in this report do not explicitly include biogenic CO_2 emissions, reducing the use of unsustainable biomass fuels and thereby reducing biogenic CO_2 emissions can contribute positively to climate change mitigation.

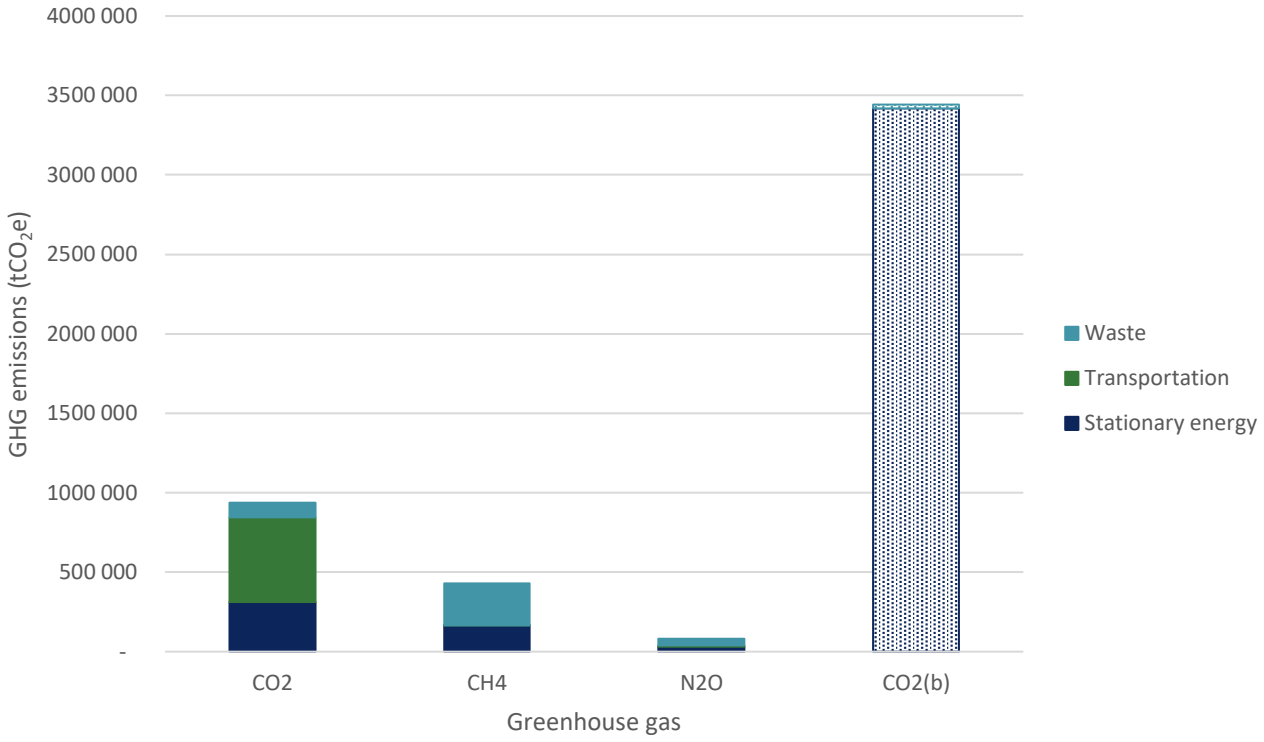

Figure 5: Emissions by sector for each greenhouse gas in Nakuru County

3. Target setting methodology

Mitigation targets for Nakuru County were set through a multi-pronged approach involving the numerical downscaling of national mitigation targets, quantification of the mitigation potential of targets and priority actions as well as several rounds of stakeholder engagement. This process was designed to align with the CoM SSA requirement that targets be "at least as ambitious as the unconditional component of the nationally determined contribution (NDC)" and to ensure that targets are both ambitious and realistic.

3.1 Development of a business-as-usual scenario

The national mitigation targets for Kenya, outlined in the NDC and National Climate Change Action Plan 2018–2022 (NCCAP), are baseline scenario targets (Republic of Kenya, 2020; Government of Kenya, 2018). This means that the targets are set relative to a baseline or business-as-usual (BAU) scenario that estimates how GHG emissions are likely to change in future in the absence of additional climate change mitigation actions. To align with Kenya's national approach and ensure that the targets are at least as ambitious as those in the NDC, Nakuru County's mitigation targets are also set relative to a BAU scenario, developed for the county.

The first step in generating mitigation targets for Nakuru County was therefore to develop a downscaled BAU scenario based on the national BAU scenario. The sections below outline the methodology for developing Nakuru County's BAU scenario, and present the results of that process.

3.1.1 Methodology for downscaling the national BAU scenario

The national BAU scenario for Kenya presented in the NCCAP 2018–2022 Mitigation Technical Analysis Report includes seven sectors, namely: 1) forestry (LULUCF[4]); 2) electricity generation; 3) energy demand; 4) transportation; 5) agriculture; 6) industrial processes; and 7) waste. For each sector, estimated emissions are presented in the document for every five years from 1995 to 2030, as shown in **Table 4**. The first step in developing the Nakuru County BAU scenario was to identify which sectors in the NCCAP correspond to the sectors included in the Nakuru County BEI (namely stationary energy, transportation and waste). The alignment of national and county-level sectors is shown in **Table 5**.

Table 4: Baseline emission projections for Kenya ($MtCO_2e$ per year)

Sector	Baseline GHG Emission ($MtCO_2e$)							
	1995	2000	2005	2010	2015	2020	2025	2030
Forestry (LULUF)	10	21	18	21	26	25	23	22
Electricity Generation	0	1	1	1	1	12	24	41
Energy Demand	4	5	5	6	7	8	9	10
Transportation	4	4	4	7	9	12	16	21
Agriulture	24	23	26	30	32	34	36	39
Industrial Processes	1	1	1	2	3	4	5	6
Waste	1	1	2	2	2	3	3	4
Total	**44**	**55**	**57**	**70**	**80**	**96**	**115**	**143**

(Source: NCCAP 2018–2022 Mitigation Technical Analysis Report)

[4] LULUCF = Land Use, Land Use Change and Forestry

Table 5: Alignment of GHG emission sectors in the NCCAP 2018–2022 and Nakuru County BEI

Sectors in Kenya's NCCAP 2018–2022	Sectors in the Nakuru County Baseline Emissions Inventory
Energy demand[5]	Stationary energy
Electricity generation[6]	
Transportation	Transportation
Agriculture	Not included – AFOLU
LULUCF	
Industrial processes	Not included – IPPU
Waste	Waste

For the development of the Nakuru County BAU scenario, it was assumed that the annual growth rate for emissions in each sector at the county level would be the same as the annual growth rate for the corresponding national sector. Therefore, the annual growth rate for each of the relevant national sectors was calculated for each five-year period from the information in **Table 4**, using the following equation (where the years were replaced for each relevant period):

$$\text{Annual emissions growth rate for sector} = \left(\frac{\boldsymbol{National\ Sector\ Emissions_{2020}}}{\boldsymbol{National\ Sector\ Emissions_{2015}}}\right)^{\frac{1}{5}} - \mathbf{1}$$

The annual growth rates for each sector were then applied to the baseline emissions for the corresponding sector in Nakuru County to estimate the growth in emissions from 2019 to 2030.

3.1.2 Estimated emissions for Nakuru County under a BAU scenario

Under the BAU scenario, **GHG emissions from Nakuru County are expected to increase by 65% in 11 years (approximately 4.7% per year) from 1 642 867 tCO_2e in 2019 to 2 718 694 tCO_2e in 2030, if no emission reduction actions are taken** (**Figure 6**). Proportionally, the largest expected growth in emissions is from the transportation sector, which is expected to increase from 33% of total emissions in 2019 to 37% in 2030.

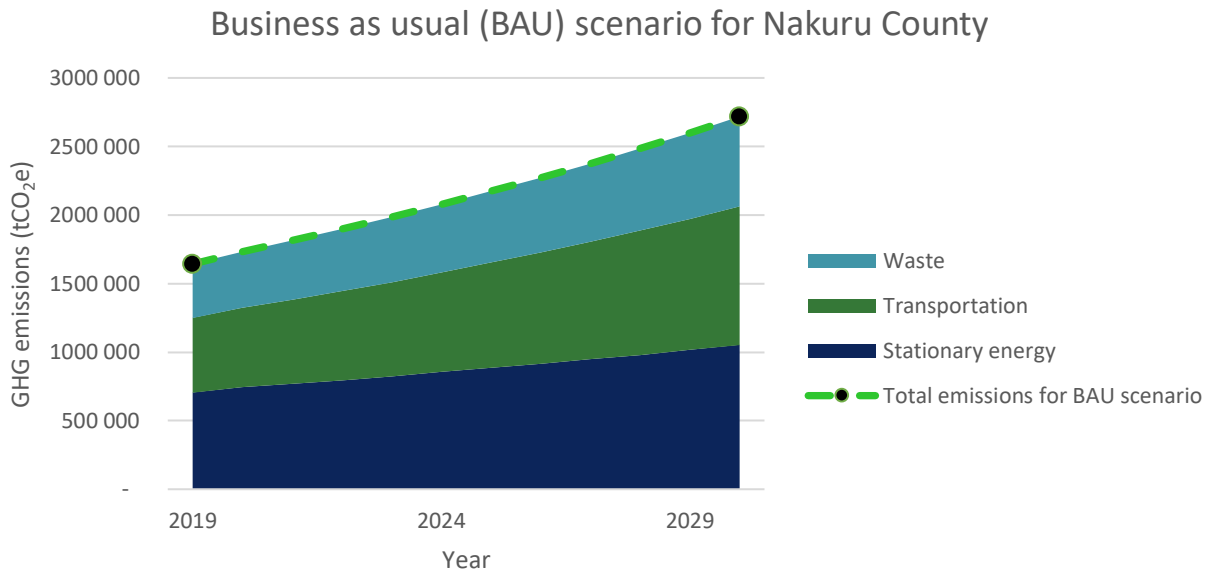

Figure 6: Estimated GHG emissions for Nakuru County from 2019 to 2030 under a BAU scenario

[5] The growth rate for emissions from the national energy demand sector was applied to stationary energy sector Scope 1 emissions in Nakuru County, which refers to direct emissions from the consumption of fuels (e.g. wood, charcoal, biogas, LPG, diesel) in buildings and facilities.

[6] The growth rate for emissions from the national electricity generation sector was applied to stationary energy sector Scope 2 emissions in Nakuru County, which refers to indirect emissions from the consumption of grid-supplied electricity in buildings and facilities in the county. **It was assumed that emissions from the consumption of grid-supplied electricity in Nakuru County would grow at the same annual rate as emissions from electricity generation at the national level in Kenya.**

3.2 Review and consideration of Kenya's NDC

Following the development of the BAU scenario for Nakuru County based on the national BAU scenario, the national targets were also downscaled. This was done to provide a set of benchmarked targets to guide the Nakuru County target setting process and ensure alignment between national and county-level targets.

In the updated NDC, Kenya, like many other African countries, outlines unconditional, conditional and overall targets. The **unconditional target** is the emission reduction that the country **commits to achieving using available and accessible domestic resources**. The **conditional component** of the target is **dependent on the country receiving international support** in the form of finance, technology development and transfer, and capacity building. **The overall target is the emission reduction that the country aims to achieve**, combining unconditional and conditional targets.

The original NDC submitted by Kenya in 2016 commits the country to reducing its GHG emissions by 30% by 2030 compared to the BAU scenario. The updated NDC (2020) commits the country to abating its GHG emissions by 32% by 2030 compared to the same BAU scenario (overall target). Of the 32% target, Kenya commits to bearing 21% of the cost of this mitigation action from domestic resources (unconditional), while the remaining 79% is subject to international support in the form of finance, technology development and transfer, and capacity building (conditional).

The NCCAP 2018–2022 Mitigation Technical Analysis Report provides a breakdown of the 2016 NDC target by sector (**Table 6**). This breakdown was used as a basis for developed downscaled targets for each sector in the Nakuru County BEI.

Table 6: Kenya's emission reduction potential and the NDC targets by sector ($MtCO_2e$ per year)

Sector	Total Emissions ($MtCO_2e$)	Emission Reductions Relative to Baseline ($MtCO_2e$)			
		High Range*	Low Range*	Technical Potential	NDC Target
	2030	2030	2030	2030	2030
Forestry	22	20.1	11.3	40.3	20.10
Electricity Generation	41	12.6	7.5	18.63	9.32
Energy Demand	10	–	–	12.17	6.09
Transportation	21	3.5	2.0	6.92	3.46
Agriculture	39	2.8	1.6	5.53	2.77
Industrial Processes	6	1.3	1.0	1.56	0.78
Waste	4	0.4	0.4	0.78	0.39
Total	**143**	**40.1**	**23.8**	**85.8**	**42.9**

(Source: NCCAP 2018–2022 Mitigation Technical Analysis Report)

For the purposes of downscaling national mitigation targets, the following steps were taken:

1. Scaling the targets for each national sector, in proportion, to increase the overall target from 30% to 32%.
2. Calculating the target for each national sector as a percentage of the BAU scenario emissions for that sector.
3. Using the sector alignment in **Table 5**, applying the targets from each national sector to the corresponding sector in Nakuru County. This produced an overall target for each sector.
4. To calculate the unconditional targets for each sector, the overall targets from the previous step were multiplied by 21%, corresponding to the proportion of the overall target in the updated NDC that will be achieved through domestic resources. Similarly, overall targets were multiplied by 79% to calculate the conditional components.
5. Emission reductions for the unconditional and overall targets in each sector were then calculated and added together to calculate county-wide unconditional and overall targets.

These downscaled targets (**Table 7**) were provided to participants at the target setting workshop as guidance to benchmark the ambition of Nakuru County against the national mitigation targets for Kenya and to ensure alignment with the national process.

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Table 7: Draft downscaled mitigation targets for Nakuru County for the target setting process

Nakuru County sector	Target as a % reduction off business-as-usual scenario by 2030		
	Overall target (equivalent to NDC)	Unconditional component (21% of overall target)	Conditional component (79% of overall target)
Stationary energy	57.5%	12.1%	45.4%
Transport	17.6%	3.7%	13.9%
Waste	10.4%	2.2%	8.2%
Overall	**31.3%**	**6.6%**	**24.7%**

3.3 Stakeholder engagement in mitigation target setting

3.3.1 Mitigation target setting and action planning workshop

A participatory workshop was held in Nakuru on 17 and 18 November 2021 to define an overarching mitigation vision for Nakuru County, to set sectoral targets and to develop mitigation actions. 45 participants attended this workshop, including representatives from Nakuru and Naivasha municipalities, civil society organisations, utilities like NAWASSCO, and the County Government of Nakuru (CGN). Departments of the CGN represented at the workshop included Health and Sanitation; Water, Energy, Environment and Natural Resources; Tourism; Public Works; Information and Computer Technology; Legal Office; Agriculture; Livestock; Economic Planning; and Disaster Risk Management.

The first step under the target setting component of this workshop was to establish an overarching mitigation vision for Nakuru County. Visions for climate change mitigation and climate action in general from existing national and county-level policies and plans were presented. Based on these, participants discussed and proposed several mitigation visions in an initial session. These visions were synthesised and a draft vision was then proposed to participants in a later session for consideration. Minor additional adjustments were made to the draft vision and it was then adopted by the workshop participants.

Following the compilation of a mitigation vision, the BAU scenario and draft downscaled targets were presented to the workshop participants, along with the methodology for downscaling. The participants were then broken up into three sector groups (stationary energy, transportation and waste) to discuss the downscaled targets, and develop proposed targets for their sector. Once the groups had developed proposed targets, these were presented to all participants in plenary. The proposed targets were discussed, adjusted and then adopted by the workshop participants.

3.3.2 Validation of SEACAP findings

After the mitigation target setting and action planning workshop in November 2021, the technical SEACAP development team developed a draft Mitigation Target Setting Report and Mitigation Action Planning Report. During this process, an analysis of the GHG emission reduction potential of the planned actions was undertaken. Once complete, a comparison of the mitigation targets and actions was undertaken to ensure the alignment in ambition between the targets and the actions planned to achieve them. No changes were made to the overarching mitigation vision and targets in this process.

The draft targets and actions were presented to Nakuru County stakeholders in a final validation meeting on 4 February 2022. Once the targets had been validated in this meeting, the present Mitigation Target Setting Report, including the overall mitigation vision and targets, was finalised.

4. Overall vision and target

The long-term mitigation vision of Nakuru County formulated in line with the national and international policy environment is as follows.

A low-carbon county that supports sustainable development by 2030.

In addition to this qualitative vision, Nakuru County has set a city-wide mitigation target. The boundary of the city-wide mitigation target is aligned with the GHG emissions incorporated in the BEI, as outlined in **Table 8**.

Nakuru County seeks to reduce GHG emissions by 33% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions of at least 6% compared to the BAU scenario from domestic resources, while the remaining 27% is conditional on external support.

This overall target of 33% is equivalent to a reduction of 890 963 tCO_2e compared to the BAU scenario by 2030. If this target is achieved, GHG emissions in Nakuru County will be limited to 1 827 730 tCO_2e in 2030 (**Figure 7**). The unconditional target of 6% is equivalent to a reduction of 168 101 tCO_2e compared to the BAU scenario by 2030. If this target is achieved, GHG emissions in Nakuru County will be limited to 2 550 592 tCO_2e in 2030 (**Figure 7**).

Table 8: Details of county-wide mitigation targets for Nakuru

Target type	Baseline scenario target
Geographical boundary	The entire geographical area of Nakuru County, 7 499 km^2 (same as BEI)
Gases included	Carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O) (same as BEI)
Sectors/sources included	Stationary energy, transportation, and waste (same as BEI)
Target year	2030
Baseline scenario	The BAU scenario projects the growth in GHG emissions in the absence of mitigation action, estimating that GHG emissions in Nakuru County will grow to 2 718 694 tCO_2e by 2030.
Target scenario	The target is to reduce GHG emissions by 33% by 2030 compared to the BAU scenario. If this target is achieved, GHG emissions will be limited to 1 826 963 tCO_2e in 2030. Achieving this target is dependent on the implementation of climate change mitigation actions in the stationary energy, transportation and waste sectors.
Conditional components	Of the 33% target, Nakuru County commits to achieving a reduction in GHG emissions of at least 6% by 2030 compared to the BAU scenario from domestic resources (unconditional). The remaining 27% reduction off the BAU scenario is conditional on external support, in the form of finance, technology development and transfer, and capacity building.
Sources for the scenarios	BEI of Nakuru County; Kenya's National Climate Change Action Plan 2018–2022: Mitigation Technical Analysis Report (Government of Kenya, 2018); Kenya's Updated Nationally Determined Contribution 2020 (Republic of Kenya, 2020)
Global Warming Potential (GWP)	The GWP values used are those established by the Intergovernmental Panel on Climate Change (IPCC, AR2) (same as BEI)

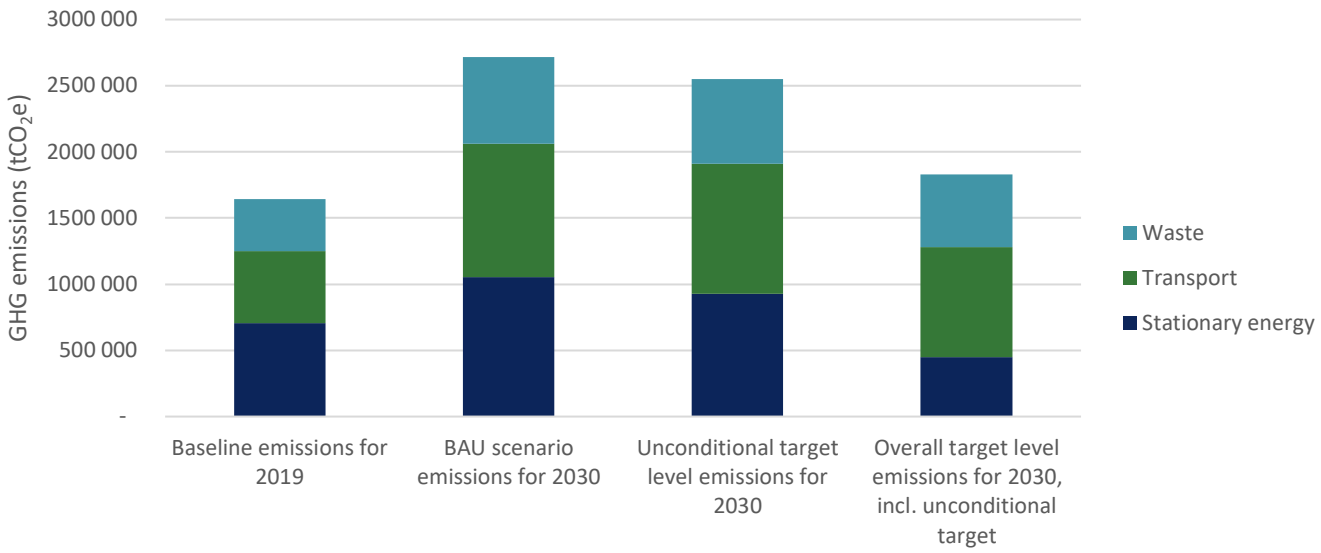

Figure 7: Baseline emissions for 2019, and emissions under the BAU and target scenarios for Nakuru County in 2030

5. Sectoral Targets

During the participatory mitigation target setting and action planning workshop, as well as the subsequent validation meeting, the key stakeholders of Nakuru County agreed on mitigation targets for each of the three emitting sectors included in the BEI.

5.1 Stationary energy sector target

Nakuru County seeks to reduce GHG emissions from the stationary energy sector by 57.5% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the stationary energy sector of at least 12% compared to the BAU scenario from domestic resources, while the remaining 45.5% is conditional on external support.

The targets for the stationary energy sector are aligned with the overall targets for the energy demand and electricity generation sectors in Kenya's NCCAP 2018–2022, and the proportion of the national NDC target that is unconditional. If the overall target of 57.5% is achieved, it is equivalent to a reduction in GHG emissions of 605 751 tCO_2e compared to the BAU scenario in 2030 (**Table 9**; **Figure 8**).

Table 9: Mitigation targets for the stationary energy sector in Nakuru County

Baseline emissions for 2019 (tCO_2e)	703 860	**Rationale**
BAU scenario emissions for 2030 (tCO_2e)	1 053 480	Aligned with unconditional and overall targets in Kenya's NDC and NCCAP 2018–2022 for the energy demand and electricity generation sectors.
Unconditional target reduction off BAU scenario by 2030 (%)	12%	
Unconditional target scenario emissions for 2030 (tCO_2e)	927 062	
Overall target reduction off BAU scenario by 2030 (%)	57.5%	
Overall target scenario emissions for 2030 (tCO_2e)	447 729	

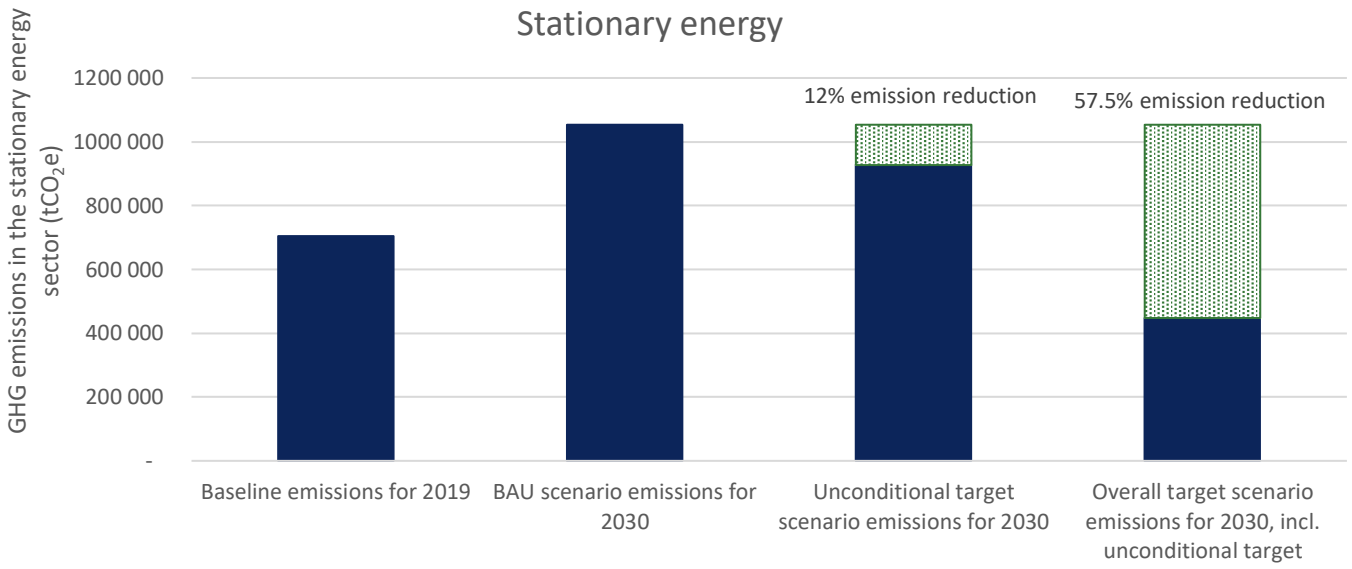

Figure 8: GHG emissions from the stationary energy sector in Nakuru County in the 2019 baseline, BAU and target scenarios

The subsectors under stationary energy generating the highest emissions in 2019 were residential buildings (263 045 tCO_2e); manufacturing industries and construction (211 466 tCO_2e); energy industries: charcoal manufacturing (162 153 tCO_2e).

5.2 Transport sector target

Nakuru County seeks to reduce GHG emissions from the transportation sector by 17.6% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the transportation sector of at least 2.7% compared to the BAU scenario from domestic resources, while the remaining 14.9% is conditional on external support.

The overall target for the transportation sector is aligned with the overall target for the transportation sector in Kenya's NCCAP. The unconditional component of the transportation sector target for Nakuru County is proportionally slightly lower than the unconditional component of Kenya's NDC. This is because the County Government of Nakuru has limited ability to implement actions relating to the national road and standard gauge railway that run through the county which are a major source of emissions and a critical component of a sustainable transport system, respectively (**Table 10**; **Figure 9**).

Table 10: Mitigation targets for the transportation sector in Nakuru County

Baseline emissions for 2019 (tCO_2e)	544 749	**Rationale**
BAU scenario emissions for 2030 (tCO_2e)	1 009 769	Aligned with overall targets in NCCAP 2018–2022 for the transportation sector. Slightly less ambitious than NDC for unconditional target due to limited scope for County Government of Nakuru to influence planning on national roads and railways.
Unconditional target reduction off BAU scenario by 2030 (%)	2.7%	
Unconditional target scenario emissions for 2030 (tCO_2e)	982 505	
Overall target reduction off BAU scenario by 2030 (%)	17.6%	
Overall target scenario emissions for 2030 (tCO_2e)	832 050	

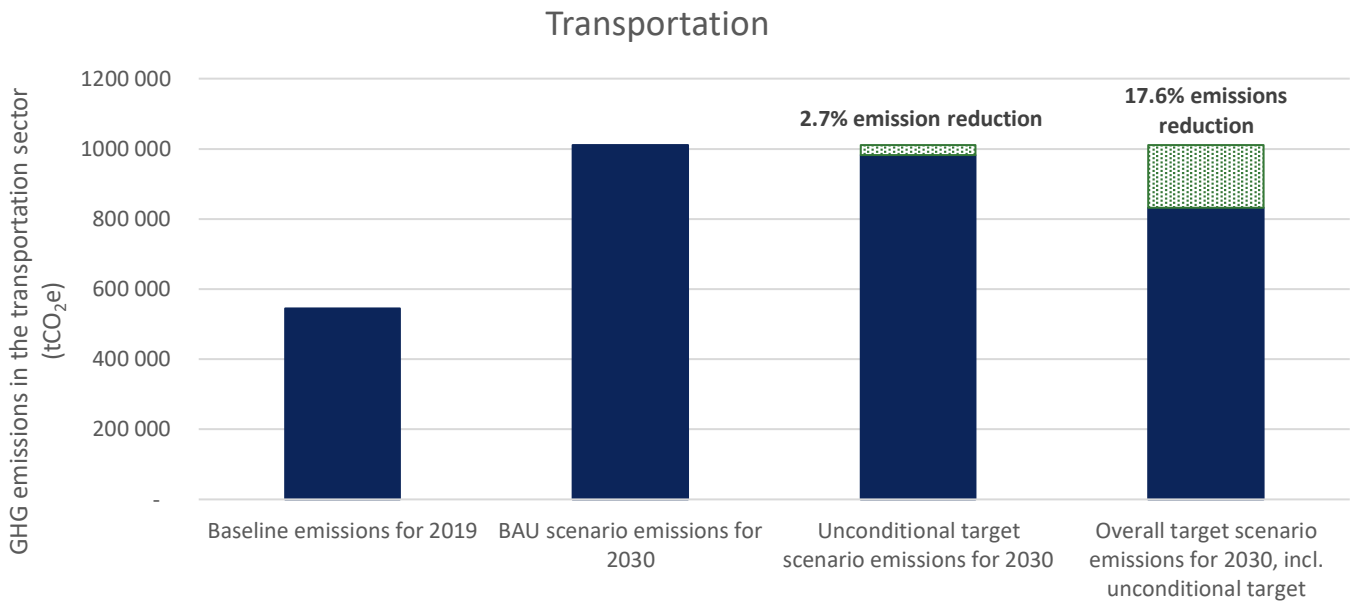

Figure 9: GHG emissions from the transportation sector in Nakuru County in the 2019 baseline, BAU and target scenarios

Emissions from the transport sector included in the 2019 BEI are all derived from road transport. These emissions are from the use of diesel and petrol in vehicles for public, private and freight transport.

5.3 Waste sector target

Nakuru County seeks to reduce GHG emissions from the waste sector by 16.4% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the waste sector of at least 2.2% compared to the BAU scenario from domestic resources, while the remaining 14.2% is conditional on external support.

The unconditional target for the waste sector is aligned with the targets for the waste sector in Kenya's NCCAP 2018–2022 and NDC. The conditional component of the target, and therefore the overall target, is substantially more ambitious than the national waste sector target in the NCCAP 2018–2022. This is because Nakuru County is pioneering sustainable and low-emission waste management systems and the County Government of Nakuru, with external support, will be able to be more ambitious than the national waste management targets (**Table 11**; **Figure 10**).

Table 11: Mitigation targets for the waste sector in Nakuru County

Baseline emissions for 2019 (tCO_2e)	394 258	**Rationale**
BAU scenario emissions for 2030 (tCO_2e)	655 444	Aligned with unconditional targets in NCCAP 2018–2022 and NDC for the Waste sector. More ambitious than NCCAP for overall target, due to proactive sustainable waste management approach of County Government of Nakuru.
Unconditional target reduction off BAU scenario by 2030 (%)	2.2%	
Unconditional target scenario emissions for 2030 (tCO_2e)	641 024	
Overall target reduction off BAU scenario by 2030 (%)	16.4%	
Overall target scenario emissions for 2030 (tCO_2e)	547 951	

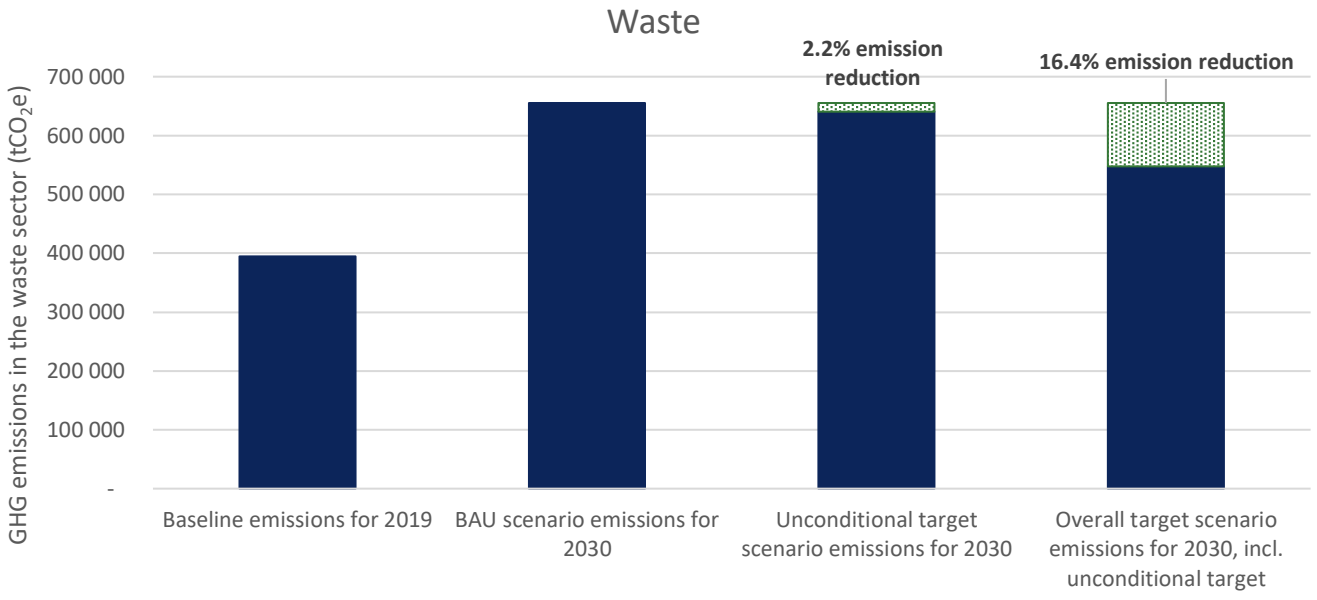

Figure 10: GHG emissions from the waste sector in Nakuru County in the 2019 baseline, BAU and target scenarios

The subsectors within the waste sector generating emissions in 2019 were: solid waste disposal (181 943 tCO_2e); wastewater treatment (105 637 tCO_2e); and incineration and open burning (102 790 tCO_2e).

6. Conclusion

The business-as-usual scenario projects that GHG emissions from Nakuru County will increase by 65% in 11 years (approximately 4.7% per year) from 1 642 867 tCO_2e in 2019 to 2 718 694 tCO_2e in 2030 if no additional emission reduction actions are taken.

Nakuru County has therefore developed GHG emission reduction targets, as part of the development of a Sustainable Energy Access and Climate Action Plan (SEACAP) under the Covenant of Mayors in Sub-Saharan Africa (CoM SSA). These targets are aligned with Kenya's national and international commitments, including the country's updated Nationally Determined Contribution (NDC) submitted in 2020, as well as the National Climate Change Action Plan 2018–2022 (NCCAP).

The overarching vision, county-wide targets and sectoral targets presented in this report were developed through a multi-pronged approach encompassing both technical and participatory methodologies. Draft targets were developed based on downscaled national GHG emission reduction targets. These targets were then modified in a participatory workshop by local and national stakeholders and validated by the County Government of Nakuru.

The county-wide and sectoral targets are guided by the following overarching vision for mitigation in Nakuru County:

A low-carbon county that supports sustainable development by 2030.

In alignment with this vision, **Nakuru County seeks to reduce GHG emissions by 33% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions of at least 6% compared to the BAU scenario from domestic resources, while the remaining 27% is conditional on external support.**

This county-wide target is aligned with the national climate change mitigation targets for Kenya, which are outlined in the NDC target. Kenya commits to abating national GHG emissions by 32% by 2030 compared to the BAU scenario. Of this 32% target, Kenya commits to bearing 21% of the costs of this mitigation action from domestic resources (unconditional), while the remaining 79% is subject to international support in the form of finance, technology development and transfer, and capacity building (conditional). In addition, the targets for each emitting sector in Nakuru County are aligned to the unconditional target in the NDC and the sectoral targets in the NCCAP.

The following targets have been set for each emitting sector:

- *Nakuru County seeks to reduce GHG emissions from the stationary energy sector by 57.5% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the stationary energy sector of at least 12% compared to the BAU scenario from domestic resources, while the remaining 45.5% is conditional on external support.*
- *Nakuru County seeks to reduce GHG emissions from the transportation sector by 17.6% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the transportation sector of at least 2.7% compared to the BAU scenario from domestic resources, while the remaining 14.9% is conditional on external support.*
- *Nakuru County seeks to reduce GHG emissions from the waste sector by 16.4% by 2030 compared to the business-as-usual scenario. Nakuru County commits to achieving a reduction of GHG emissions from the waste sector of at least 2.2% compared to the BAU scenario from domestic resources, while the remaining 14.2% is conditional on external support.*

If these targets are achieved, GHG emissions from Nakuru County will be limited to 1 827 730 tCO_2e in 2030.

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