



MINISTRY OF ENERGY AND  
PETROLEUM



# KENYA NATIONAL COOKING TRANSITION STRATEGY

2024 – 2028

## EXECUTIVE SUMMARY



Modern Energy  
Cooking Services



AGENCE FRANÇAISE  
DE DÉVELOPPEMENT



GREEN  
CLIMATE  
FUND



Loughborough  
University



GAMOS  
EAST AFRICA



german  
cooperation  
DEUTSCHE ZUSAMMENARBEIT



## Foreword



Cooking touches every home across the country. Today, the use of polluting fuels such as firewood, charcoal and kerosene has dramatic consequences for public health, the local and global environment, as well as the opportunities for women and girls. As a result, the Government of Kenya set an ambitious goal of universal access to clean cooking by 2028.

The aspiration for universal access was informed by the broader commitments we have made as a nation through the Sustainable Development Goals (SDGs) and our Nationally Determined Contribution (NDC) goal of lowering emissions by 43MtCO<sub>2</sub> equivalent by 2030. Kenya's Vision 2030 and the Bottom-Up Economic Transformation Agenda underlines Kenya's commitment to improving the livelihoods and welfare of its citizens. This strategy lays out a pathway for achieving universal access that will not only improve quality of life for those who cook, but will also create new jobs across the value chain by prioritising the local production of both cooking devices and the fuels that power them. In doing so, Kenya will be able to cement its role as a regional hub for clean cooking solutions.

Through a participatory approach that brought together key stakeholders from Kenya's rapidly growing clean cooking sector and deepened the evidence-base on critical sub-sectors, this strategy has been able to harmonise across the many different approaches to tackling the clean cooking challenge. It charts a pathway towards universal access that leverages Kenya's unique position as a regional innovation hub, with an array of clean cooking technologies already deployed at scale in the market. By building upon the firm foundation laid by the existing fuel-specific strategies and the actions of the private sector, this strategy aims to create the enabling environment in which all clean cooking solutions can thrive.

A handwritten signature in black ink, appearing to read 'Davis Chirchir', written over a horizontal line.

**Davis Chirchir, EGH**  
Cabinet Secretary  
Ministry of Energy and Petroleum



## Preface

Kenya is a global leader in the clean cooking space. We are fortunate to have a vibrant clean cooking sector, with many different sub-sectors offering consumers a diverse array of solutions. Until now, there has been limited coordination between these sub-sectors. As a result, the Cooking Transition Strategy was commissioned to harmonise across this diverse set of actors and provide coherence to Kenya's clean cooking sector. The strategy joins the dots between the existing fuel-specific strategies, such as the Bioenergy Strategy, the Bioethanol Masterplan, the LPG Growth Strategy, and the Electric Cooking Strategy, to create a cohesive enabling environment under which all solutions, both transitional and truly clean, can thrive.

The strategy focuses on clean cooking solutions (at point of use) that have a critical role to play in transitioning large segments of the population away from unsustainably harvested and inefficiently burned biomass. These include LPG, bioethanol, low emission/clean burning sustainable biomass e.g., briquettes and pellets, biogas, and electric cooking, which offer long-term sustainable pathways that leverage Kenya's abundant renewable energy resources.

The Kenya National Cooking Transition Strategy (KNCTS) articulates the next steps that households across Kenya can take in the journey towards universal access to clean cooking. It outlines five key actions that the government will take to facilitate this journey: bridging the supply gap for clean cooking solutions; bridging the affordability gap for the demand side; promoting local manufacturing and fuel production for local use and export; reframing and raising awareness on the role of clean cooking; and instituting accountability, planning, and continuous tracking of progress

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**Alex K Wachira, CBS**  
Principal Secretary  
State Department for Energy

## Acknowledgements

The Ministry of Energy and Petroleum (MoEP) is honored to present the Kenya National Cooking Transition Strategy (KNCTS), a collaborative effort between the MoEP through the Directorate of Renewable Energy and a consortium of development partners comprising Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Agence Française de Développement (Afd), UK Partnering for Accelerated Climate Transitions (PACT), Climate Compatible Growth (CCG), and the Modern Energy Cooking Services Programme (MECS).

We would also like to acknowledge the invaluable support accorded by the coordination committee, comprised of representatives from various government ministries, non-governmental organizations, national institutions, the private sector, academia, sectoral associations, development partners, and EED Advisory (lead consultants). This committee played a pivotal role in overseeing the development of the KNCTS. The committee was co-chaired by the Ministry of Energy and Petroleum (MoEP) and the Modern Energy Cooking Services Programme (MECS).

For a full list of institutions that have contributed to the development of this strategy through the coordination committee, the contributing studies/strategies commissioned by the coordination committee members, the sectoral roundtables, and key informant interviews, please see Annex 4 .



# Executive Summary

## Introduction

The Government of Kenya aims to achieve universal access to clean cooking by 2028. This target is motivated by the urgent need to accelerate the transition to cleaner cooking solutions to mitigate the negative impacts associated with the use of traditional fuels. It is also related to global commitments outlined in Kenya's Nationally Determined Contribution (NDC) under the UNFCCC Paris Agreement, the Sustainable Development Goals (SDGs), and the Sustainable Energy for All (SEforALL) agenda. This commitment is consistent with Kenya's Vision 2030, a strategic framework aimed at elevating the country to the status of a newly industrializing, middle-income country by 2030, with improved quality of life for all residents.

The Ministry of Energy and Petroleum commissioned the development of the Kenya National Cooking Transition Strategy (KNCTS) in September 2022 as a transparent, data-driven, and inclusive effort to articulate Kenya's national cooking sector priorities and aspirations. The strategy aims to transform the cooking sector in Kenya into a sustainable and profitable sector in line with the target of attaining universal access by 2028. KNCTS defines clean cooking as cooking with fuels and stove combinations that meet the standards defined by the World Health Organization (WHO) guidelines for indoor air quality. These include cooking solutions that attain Tier 5 on carbon monoxide emissions ( $\leq 3.0$  g/MJ) and Tier 4 on PM<sub>2.5</sub> ( $\leq 62$  mg/MJ) emissions. However, the strategy aims to ensure that all households are using clean cooking solutions as part of their fuel stack and to encourage as many households as possible to use clean fuels as their primary source.

## The current state of cooking in Kenya

The 2022 KNBS Demographic and Health Survey (DHS) reveals a high dependence on traditional cooking fuels. In total, 68.5% of the population, or 9.1 million households (1.7 million in urban areas and 7.4 million in rural areas), rely on traditional cooking fuel

options as their primary source. Firewood remains the predominant cooking fuel.

**9.1 million households** in Kenya (1.7 million in urban areas and 7.4 million in rural areas), rely on **traditional cooking fuel** options as their **primary source**.

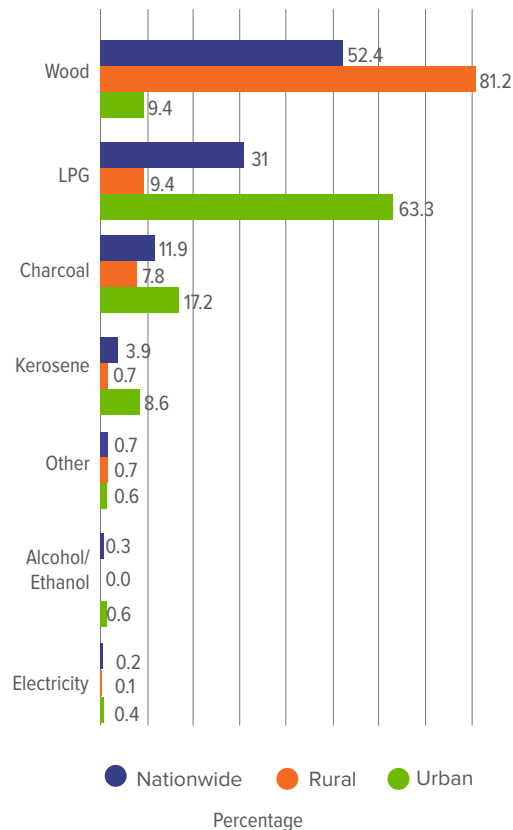


Figure ES 1: Main Cooking Fuel at the Household Level (compiled with data from KNBS & ICF, 2022)

At the county level, the prevalence (proportion of households without access) and the deficit (absolute number of households without access) vary across counties as shown in the figure below. While counties listed as underserved under the Kenya Off-grid Solar Project (KOSAP) have the highest prevalence of households without access to clean cooking solutions, Nakuru, Kakamega, Meru, Bungoma, and Nairobi counties have the highest deficit.

Meru, Bungoma, and Nairobi counties have the highest deficit. These five counties account for 1.83 million households, or 21% of the national deficit, which is comparable to the estimated 1.69 million households not using clean cooking solutions in the fourteen KOSAP counties. The top five counties with the highest prevalence account for 0.58 million households, or 6%, of the total.

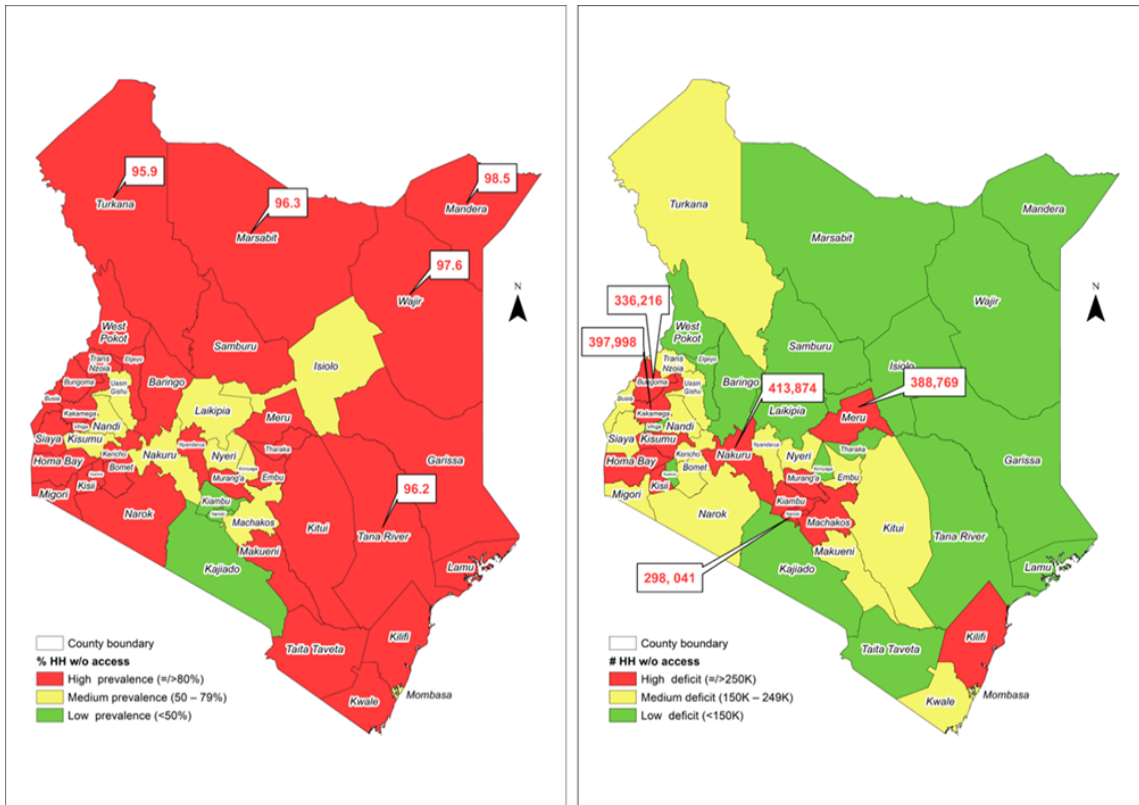


Figure ES 2: Household without Access to Clean Cooking – Prevalence versus Deficit (compiled with data from KNBS & ICF, 2022)

**Nakuru, Kakamega, Meru, Bungoma, and Nairobi** counties have the highest deficit of clean cooking solutions accounting for **1.83 million households**, or **21% of the national deficit**.

Characterisation of households without access to clean cooking solutions yields four market segments, as shown below. All households without supply fall into four quadrants: Q1(non-commercial markets with adequate supply chains) – Urban households that cannot afford clean cooking solutions, Q2 (commercial markets) – Urban households that can afford clean cooking solutions, Q3 (non-commercial markets with inadequate supply chains) – Rural households that cannot afford clean cooking solutions, and Q4 (commercial markets with inadequate supply chains) – Rural households that can afford clean cooking solutions.

households that can afford clean cooking solutions, Q3 (non-commercial markets) – Rural households that cannot afford clean cooking solutions, and Q4 (commercial markets with inadequate supply chains) – Rural households that can afford clean cooking solutions.

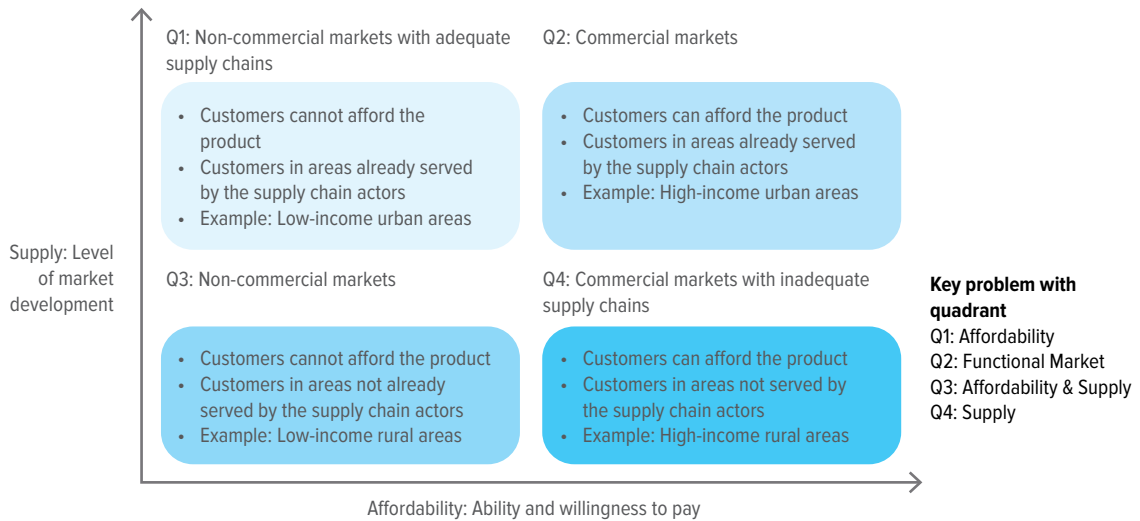


Figure ES 3: Market Segmentation





Further analysis to estimate the Total Addressable Market (TAM) and Total Serviceable Market (TSM) for clean cooking stoves and appliances indicates

that out of 9.1 million households, only 0.6 million fall under the total serviceable market, as shown in the figure below.

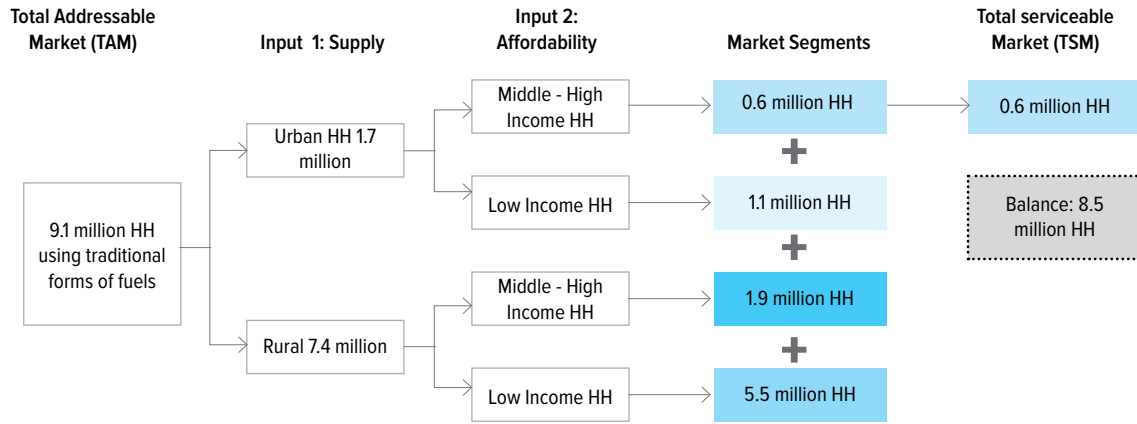


Figure ES 4: Estimates of the Number of Households per Market Segment



## Policy and institutional infrastructure

The cooking sector in Kenya is influenced by policies, regulations, legislations, and standards operating at the global, regional, national, and sub-national levels. The Ministry of Energy and Petroleum is tasked with promoting access to clean cooking, ensuring a favourable policy environment, and attracting investments into the cooking sector. However, several public sector entities work closely with MoEP to achieve this goal. These include the core ministries of energy and petroleum, health and environment, and climate change. The coordination of efforts among these ministries needs improvement, and the Ministry of Energy and Petroleum specifically requires increased support to achieve this objective.

## Barrier analysis

The process of developing the KNCTS strategy sought to go beyond the conventional menu of challenges to identify the most binding of these constraints by employing the growth diagnostic framework (Hausmann et al., 2008). The process of analysing barriers identifies the three most binding constraints, which are (i) supply gap (limited or no

supply chains); (ii) affordability (relatively lower income or high incidence of poverty); and (iii) availability of low-cost or no-cost alternatives as shown below. While certain counties may face contextual challenges, the majority are impeded by these three critical constraints.

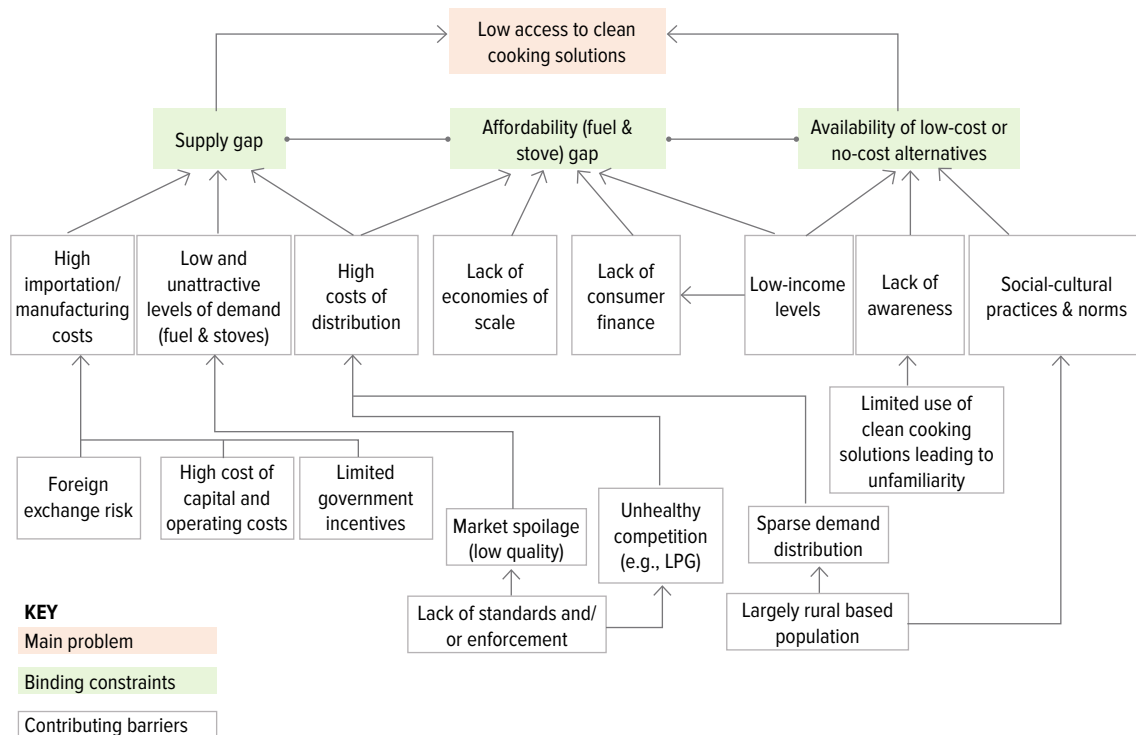


Figure ES 5: Problem Tree – Identifying the Binding Constraints (EED Advisory, 2023)

## The five-point agenda

This strategy aims to guide and orient the country toward the goal of universal access through five interconnected action agendas (see the figure below). Additionally, the five-point agenda will guide the sector to realise the targets under the composite policy scenario (CP-S), which aims to have at least 50% (LPG stoves), 30% (bioethanol) 10% (electricity) 3% (biogas technology), 7% (low emission/clean burning sustainable biomass e.g., briquettes and pellets), of households in Kenya, using the designated clean cooking solution. The overarching action agenda five (5) will ensure that this strategy is instituted, implemented, and supported while also ensuring that plans are built on this framework.

The implementation budget is estimated to be KES 65 billion (US\$435 million) spread over five years. This includes private sector investments, carbon finance and other climate finance options, public finance, philanthropic contributions, and development agency assistance. Additionally, the strategy recommends the creation of a fund dedicated to clean cooking. It proposes that the government publicly announce its financial commitment in the inaugural financing round to demonstrate the efficacy of the fund's framework.

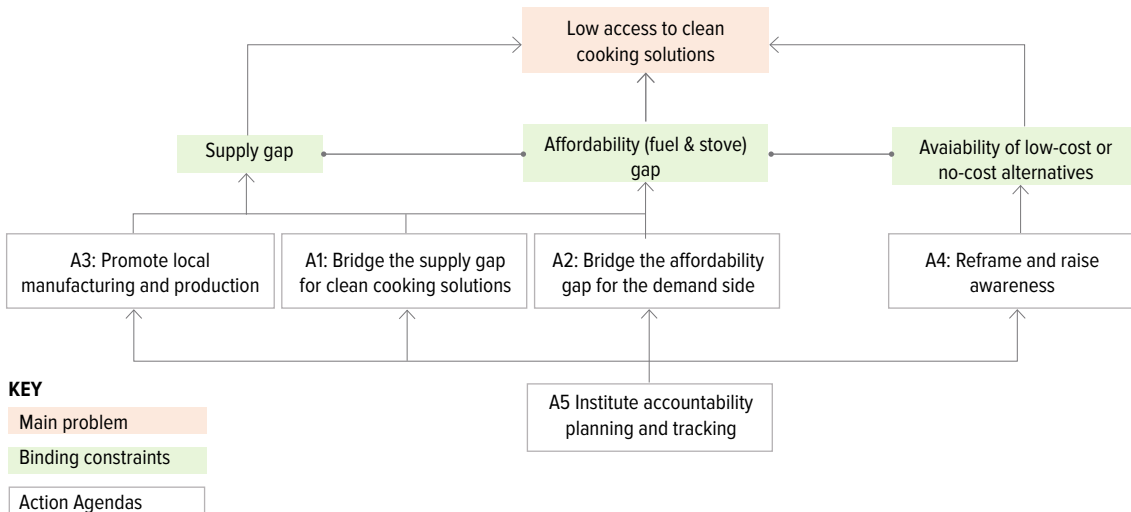


Figure ES 6: Targeting the Action Agenda



## Costs and benefits of implementing the strategy

Implementing the strategy considering 100% utilisation of clean cooking solutions necessitates an annual government cost of US\$210,711,189, along with private costs (borne by households) amounting to US\$71,568,309. Whereas the fuel (US\$178 million) and stove (US\$10.3 million) subsidy costs are allocated to the government, they will be primarily financed through trading of clean cooking co-benefits (e.g., carbon credits, averted disability-adjusted life years, and time savings) generated from the sustained use of clean fuels and technologies.

The government's spending covers stove subsidies and bioethanol subsidies, which the main supplier of the solution currently provides. Consequently, the overall social and private benefits would reach US\$240,106,966. It's important to note that the actual benefits could be even greater, as the current assessment does not factor in elements such as job creation and government revenues from taxes. Implementation of the strategy (at 100% utilisation of the cooking solutions) is projected to prevent approximately 26,589 deaths related to household air pollution, save 789.7 hours per household per year spent on firewood collection, and avoid the

emission of 16 MtCO<sub>2</sub>e annually. While the strategy initially focuses on ensuring households are using clean cooking solutions as part of their fuel stack, the results of the modelling exercise emphasise the advantages that support a compelling case for pushing towards 100% use of clean cooking solutions for all cooking needs. This approach aims to maximise the benefits derived from such transitions.

The avoided unsustainable wood harvest is equivalent to **466,543ha** (≈11% of Kenya's forest cover of **4.2 million hectares**) based on an average wood production of **3.2 tonnes** per hectare.



### Note to the Reader

This strategy is presented in four chapters.

#### Chapter 1

*Baseline* which describes the current state of play.

#### Chapter 2

*Barriers, Challenges, and Opportunities* which explains the historical context and the causes of the current state of play while outlining the opportunities.

#### Chapter 3

*Target Setting* which offers a vision for the cooking industry in 2028.

#### Chapter 4

*Logic of Intervention* which explains the actions needed to propel the sector toward universal access to clean cooking by 2028.

This document should be read together with the associated modules that provide more details on the aspects discussed here. The modules shown in the table below can be accessed here.

#	Report	Title
1	Module 1	Assessment of the Demand and Supply of Cooking Solutions in Kenya
2	Module 2	Policy and Institutional Framework in Kenya
3	Module 3	Financing Options for the Kenya Cooking Sector
4	Module 4	Barriers and Opportunities in the Cooking Sector in Kenya
5	Module 5	Case Studies: Lesson Learnt From Promoting Clean Cooking Solutions



This strategy seeks to bring about a profound transformation in the cooking sector, going beyond the goal of simply increasing stove sales. It aims to make the sector sustainable and profitable, capitalising on various opportunities such as becoming a significant source of foreign exchange, reducing Kenya's reliance on fossil fuel imports, generating employment throughout the stoves and fuels value chain, offering substantial potential for greenhouse gas reduction, creating opportunities for carbon projects, contributing revenue to the electricity utility, and serving as a viable source of government taxes, among other benefits.

This strategy establishes a baseline by detailing the status of access to fuels and cooking appliances. It also provides insights into the reasons behind the existing situation. The objective is to shift the sector from this baseline to a desired outcome within a specified timeframe, using a clearly defined five-point action agenda. This agenda targets market entry barriers, including policy and institutional gaps, inadequate market information, limited access to finance, supply gaps, and low awareness among the critical actors in the sector. The goal is to bring about lasting changes in the cooking sector in Kenya, attracting private sector investment and creating a self-sustaining industry independent of donor funds in the long term. Four strategies have been simultaneously formulated alongside the overarching strategy: (i) the Kenya National Electric Cooking Strategy, (ii) the Liquefied Petroleum Gas (LPG) Strategy, (iii) the National Knowledge Management Strategy for the Cooking Sub-Sector in Kenya, and (iv) Behaviour Change Communication (BCC) Strategy.

These strategies delve into specific measures aimed at encouraging the use of electric appliances for cooking, promoting LPG solutions, forming a baseline for reframing and raising awareness of the role of clean cooking, and promoting accountability, planning, and continuous tracking of progress in the sector.

Additionally, Endeavor has commissioned a study on resource mobilisation to fund the strategies. This study will detail the various funding opportunities for the cooking sector in Kenya.

According to Sustainable Energy for All (SEforAll), the indicator for universal access to affordable, reliable, and modern energy services target is the **proportion**

**of the population with primary reliance on clean fuels and technology**<sup>1</sup>. Considering the local realities, where 68.5% of the population, equivalent to 9.1 million households (1.7 million in urban areas and 7.4 million in rural areas), primarily depend on traditional cooking fuels, this strategy does not envision a scenario in which all households in Kenya will adopt clean cooking solutions by 2028 as primary cooking solutions, particularly considering that many of these households use non-commercial fuels.

The strategy does not anticipate government subsidies for recurrent expenditure, such as cooking fuel costs. As of June 2022, the public debt had reached KES 8.59 trillion, and it is expected to surpass the KES 10 trillion debt ceiling by June 2024<sup>2</sup>, driven by the significant devaluation of the Kenya Shilling against major foreign currencies, with 51.1% of external debt denominated in foreign currency, leading to increased repayment expenses<sup>3</sup>.

Given this context, the strategy aims to ensure that all households use a clean cooking solution as part of their fuel stack, with the objective of encouraging as many households as possible to use clean cooking solutions as their primary source. It is important to note that the proposed action agendas are designed to establish essential elements in fuel supply and adoption, laying the groundwork for a cross-subsidy program post-2028.

The following general definitions are adopted and used throughout this document.

- **Cooking solution:** Any combination of technology and fuel used for cooking.
- **Traditional cooking solutions:** Cooking technologies that do not advance thermal efficiency or a reduction in emissions. These include the three-stone fires, metallic charcoal stoves, kerosene wick stoves, and unvented coal stoves.
- **Improved cooking solutions:** Refers to cooking solutions that improve, however minimally, the adverse health, environmental, or economic outcomes from cooking with traditional solid fuel technologies.

1 Department of Economic and Social Affairs. (n.d.). Sustainable Development Goals. United Nations. Retrieved August 19, 2023, from <https://sdgs.un.org/goals/goal>

2 Parliament of Kenya. n.d. Public Debt Stock Projected to Surpass The Kshs. 10 Trillion Mark by June 2024. <http://www.parliament.go.ke/index.php/public-debt-stock-projected-surpass-kshs-10-trillion-mark-june-2024#:~:text=10%20trillion%20debt%20ceiling%20by,Abdi%20Shurie>.

3 Deloitte. (2023). Kenya Budget Highlights 2023/24 Navigating headwinds for inclusive growth.

- **Clean cooking solutions:** Refers to cooking solutions with low particulate matter and carbon monoxide emissions levels at the point of use. These include solar, electric, biogas, natural gas, LPG, and alcohol fuels, including ethanol. For other fuels and technologies to be classified as clean, they must achieve tier 5 of ISO standards (that aligns with the 2014 WHO guidelines) for CO emissions and tier 4 or tier 5 for PM2.5 emissions. A stove that achieves Tier 4 or Tier 5 for PM2.5 emissions based on the voluntary performance targets (VPTs) is classified as clean for PM2.5 emissions, and stoves must also be classified as Tier 5 for CO emissions to be considered clean for health<sup>4</sup>.
- **Multi-tier framework (MTF) for cooking:** A multi-dimensional, tiered approach to measuring household access to clean cooking solutions across six technical and contextual attributes with detailed indicators and six thresholds of access ranging from Tier 0 (no access) to Tier 5 (full access). The aggregate MTF tier is the lowest tier rating across the six attributes: convenience, (fuel) availability (a proxy for reliability), safety, affordability, efficiency, and exposure (a proxy for health related to exposure to pollutants from cooking activities).
- **Modern energy cooking services:** Refers to a household context that has met the standards of Tier 4 or higher across all six measurement attributes (convenience, availability, affordability, efficiency, and exposure) of the multi-tier framework.
- **Modern cooking solutions:** Includes biogas technology, electric cooking appliances, LPG stoves and bioethanol stoves and their associated fuels.
- **Primary cooking solution** - the cooking solution that is most used (frequency of use).
- **Access rate:** Whilst different documents have adopted different definitions of access, spanning from ownership to primary use, this strategy defines access to clean cooking solutions as the use of a clean cooking fuel/technology as part of a household/enterprise/institution's fuel stack. In this strategy, the access rate is, therefore the same as the use rate.
- In this strategy, the **use rate** is used interchangeably with the access rate.
- **Use rate:** The share (%) of households/enterprises/institutions using a particular cooking fuel/technology as part of their fuel stack.
- **Ownership rate:** The share (%) of households/enterprises/institutions that own (but not necessarily use) a particular cooking fuel/technology as part of their fuel stack.
- **Primary use rate:** The share (%) of households/enterprises/institutions using a particular cooking fuel/technology as their primary cooking solution.
- **Electric cooking devices** refer to appliances capable of preparing a majority of the dishes made by a standard stove
- **Exchange Rate** 1 US\$ is 150 KES. Rate as of November 2023.

4 World Health Organisation. (2023). Defining clean fuels and technologies. <https://www.who.int/tools/clean-household-energy-solutions-tool-kit/module-7-defining-clean>

