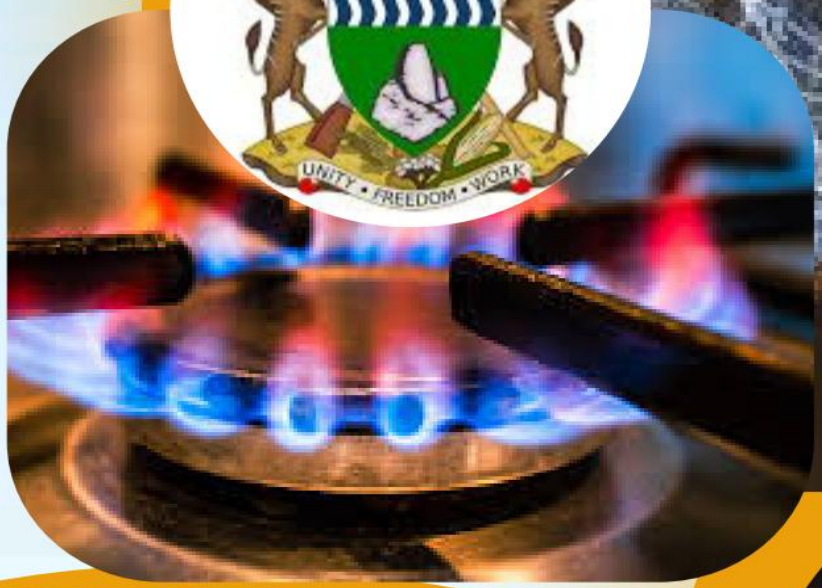
NATIONAL CLEAN COOKING STRATEGY FOR ZIMBABWE

2024-2030



Ministerial Foreword

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Glossary of Terms

Biomass	Organic material derived from plants and animals that can be used as a fuel source.
Clean Cooking	The use of cooking technologies and fuels that significantly reduce emission of harmful pollutants and improve health and environmental outcomes.
Community Engagement	Involvement of local communities in planning, implementing, and evaluating clean cooking initiatives.
Economic Viability	The ability of clean cooking solutions to be financially sustainable and affordable for households and communities.
E-cooking	Cooking with electricity.
Energy Efficiency	In clean cooking, energy efficiency means using less energy to produce the same outcome, reducing waste, lowering costs, and minimizing environmental impact.
Energy form	An energy form in clean cooking refers to the type of energy source i.e. solid (biomass pellets), liquid (ethanol, LPG), gaseous (biogas, natural gas), electric, or other technologies (solar thermal, hybrid systems) that enables efficient, low-emission cooking.
Energy source	Types of energy such as electricity, LPG, biofuels, charcoal, etc.
G-cooking	Cooking with gaseous forms of energy like LPG, natural gas and biogas.
Health Impacts	The effects on human health resulting from exposure to pollutants and emissions from cooking fuels and technologies.
Indoor Air Pollution (IAP)	The presence of harmful substances in the air within homes and buildings, primarily due to cooking and heating practices.
L-cooking	Cooking with liquid forms of fuel.
OT-cooking	Cooking using alternative technologies that are neither gas-based (G-cooking), liquid fuel-based (L-cooking), nor electric (E-cooking).
Renewable Energy	Energy derived from natural processes that are continuously replenished, such as solar, wind and biomass.
S-cooking	Cooking with solid forms of energy such as firewood and charcoal.

Sustainable Development Goals (SDGs)	A collection of 17 global goals set by the United Nations to address various global challenges, including energy access and climate action.
Technology Adoption	The process through which households and communities begin using new cooking technologies and fuels.

Abbreviations

AU-AFREC	African Union - African Energy Commission
CCS	Clean Cooking Solutions
COPD	Chronic Obstructive Pulmonary Disease
CSO	Civil Society Organisations
EECS	Emerging Efficient Cooking Solutions
GHG	Greenhouse Gas
GS	Gold Standard
IAP	Indoor Air Pollution
ICS	Improved Cookstove
IETA	International Emissions Trading Association
IPPs	Independent Power Producers
ISO	International Organisation for Standardization
ITMOs	Internationally Transferrable Mitigation Outcomes
IWA	International Water Association
MoEPD	Ministry of Energy and Power Development
MoHCC	Ministry of Health and Childcare
NCCS	National Clean Cooking Strategy
NCCTC	National Clean Cooking Technical Committee
NDCs	Nationally Determined Contributions
NGO	Non-Governmental Organization
NREP	National Renewable Energy Policy
OTC	Over the Counter
PWDs	Persons with Disabilities
RBF	Results-Based Funding
RE	Renewable Energy
SDGs	Sustainable Development Goals
SIRDC	Scientific and Industrial Research and Development Centre
STG	Sustainable Technologies Group
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
WHO	World Health Organization
ZIMSTATS	Zimbabwe National Statistics Agency

Executive Summary

The National Clean Cooking Strategy (NCCS) for Zimbabwe provides a strategic roadmap to transition the nation's cooking energy landscape towards sustainability, health, and economic inclusivity. Recognizing the adverse effects of traditional cooking methods, which contribute to environmental degradation, poor public health outcomes, and economic limitations, this strategy seeks to promote the adoption of diverse, clean cooking solutions. The strategy is aligned with Zimbabwe's national energy policies, international climate commitments, and health goals, ensuring a coordinated approach to achieving the Sustainable Development Goals by 2030. The clean cooking options include electricity, LPG, biogas, natural gas, solar, biofuels, and waste-to-energy (WtE) technologies, each tailored to address the unique needs of Zimbabwe's urban, peri-urban, and rural populations.

The development of the strategy was informed by a National Baseline Study conducted in October 2023, which surveyed 17 districts across the 10 provinces in Zimbabwe. The study analysed cooking practices, energy sources, and fuel use across households, businesses, and institutions in urban, peri-urban, and rural areas. Findings underscored the need for a dual approach: sector-wide strategies to enhance policy and infrastructure, coupled with subsector-specific strategies to address the distinct challenges associated with each clean cooking technology. This foundational data supported the creation of the initial draft of the strategy, which underwent extensive consultations with Ministry of Energy and Power Development (MoEPD) officials and local stakeholders. Feedback from multiple provincial meetings and a national validation meeting in Nyanga and Kadoma were incorporated, resulting in a final strategy that reflects input from diverse stakeholders across Zimbabwe.

Central to the strategy are goals and objectives targeting sector-wide improvements and guided by key pillars including policy development, technical capacity building, infrastructure enhancement, and financing. These objectives address essential areas, such as governance and coordination, establishing safety and quality standards, and promoting gender equity across the sector. Specific goals include integrating clean cooking solutions into infrastructure planning and development frameworks, providing financial resources to support gender and youth inclusion, and fostering local manufacturing of clean cooking technologies. The strategy also encourages continuous research and innovation, vital for adapting clean cooking solutions to Zimbabwe's evolving needs and conditions.

The strategy has nine sub-strategies providing targeted interventions for specific fuel and technology types: electricity-based cooking (E-Cooking), gaseous fuels (G-Cooking, covering LPG, biogas and natural gas), liquid fuels (L-Cooking), solid fuels (S-Cooking), solar-based cooking, and other emerging efficient cooking solutions (OT-Cooking). Each sub-strategy outlines strategic objectives to increase adoption, affordability, and accessibility. For instance, the E-Cooking strategy emphasizes improving electricity reliability to make electric cooking viable in both urban and rural areas, while the G-Cooking strategy focuses on expanding LPG and biogas infrastructure to improve access in peri-urban and institutional contexts. Solar-based cooking solutions are promoted to leverage Zimbabwe's high solar resource potential, offering a renewable alternative for clean cooking.

Financial support mechanisms are crucial to the success of the strategy, with proposals for innovative financing models like pay-as-you-go (PAYGO) systems, targeted subsidies, and micro-loans to make clean cooking technologies more affordable for low-income households. The strategy also highlights the role of public-private partnerships in expanding access to affordable cooking fuels and infrastructure. These collaborations will help build distribution networks, enhance technical support, and ensure quality standards for clean cooking appliances and fuels. The involvement of international donors and NGOs will further strengthen these efforts by providing additional funding, technical assistance, and training.

Effective governance is embedded in the strategy through the establishment of a National Clean Cooking Technical Committee. This committee will oversee implementation, monitor progress, and ensure accountability across all levels of government and among stakeholders. Designated focal points within relevant ministries will coordinate actions, track progress on objectives, and facilitate inter-agency cooperation. Community engagement is another cornerstone of the strategy, with a focus on educating the public about the health, environmental, and economic benefits of clean cooking. Awareness campaigns will address the risks associated with traditional fuels, promote the advantages of clean cooking technologies, and encourage behavioural change at the community level.

The roadmap accompanying the strategy lays out a structured timeline for achieving Zimbabwe's clean cooking goals by 2030. Key milestones are set for each sub-strategy, including targets for increasing adoption rates, expanding infrastructure, enhancing affordability, and supporting local manufacturing. This roadmap also includes mechanisms for tracking progress and adapting the strategy as needed, based on ongoing research and stakeholder feedback.

In essence, the National Clean Cooking Strategy is designed to create a cleaner, healthier, and economically resilient future for Zimbabweans. By addressing infrastructure, affordability, inclusivity, and community awareness, the strategy provides a robust framework to transform Zimbabwe's cooking energy sector and enhance the quality of life for millions across the nation. Through a collaborative approach involving government, private sector, NGOs, and development partners, Zimbabwe is positioned to meet its clean energy targets and foster sustainable growth, environmental stewardship, and social well-being.

Acknowledgments

The Ministry of Energy and Power Development (MoEPD) extends its sincere gratitude to all partners and stakeholders who contributed to the development of the National Clean Cooking Strategy (NCCS). Special acknowledgment goes to the United Nations Development Programme (UNDP) and UK Aid for their instrumental support, which was vital in shaping this strategy.

We also recognize the valuable input from various government ministries, departments, and agencies, including the Forestry Commission, Zimbabwe Energy Regulatory Authority (ZERA), Environmental Management Authority (EMA), Standards Association of Zimbabwe (SAZ), and the Rural Electrification Fund (REF), along with other environmental protection agencies whose expertise has strengthened the strategy's vision.

Our gratitude extends to private sector entities, non-governmental organizations (NGOs), and community representatives for their meaningful participation. Their involvement in both the development and the validation and proofing workshops held in Nyanga and Kadoma, respectively, ensured the strategy's practical relevance.

Finally, special thanks to the Organizing Committee from MoEPD and its partners, whose coordination efforts guided the strategy's formulation. Their leadership has been essential to this collaborative achievement, and we look forward to continued partnership with all stakeholders to advance Zimbabwe's clean cooking goals.

1 Introduction

1.1 Country Profile

Zimbabwe has a population of 15,178,979, comprising 48% male and 52% female, with 61.4% living in rural areas[1]. The country experiences an annual population growth rate of 1.5 percent. Of the 3,818,992 households in Zimbabwe, each has an average of four members. Covering a land area of 390,757 square kilometres, Zimbabwe has an average population density of 39 persons per square kilometre[2].

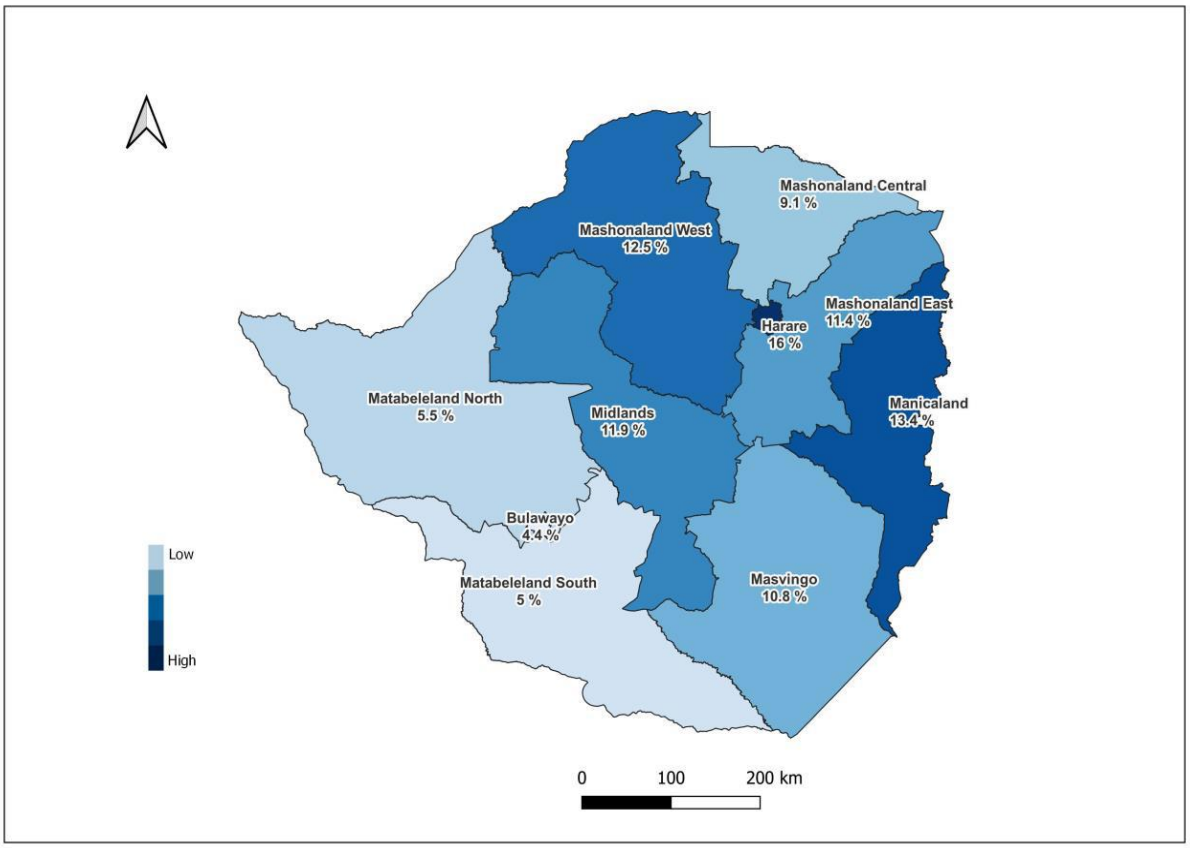

Fig. 1. Population Distribution in Zimbabwe by Province[3]

As indicated in Fig. 1, Harare Province is the most densely populated, with 2,427,231 persons, followed by Manicaland with 2,037,703 and Mashonaland West with 1,893,584. In all provinces, the female population is more than the male population[4].

The distribution of households indicates that Harare Province has 653,557 households, followed by Manicaland with 502,929 and Mashonaland West with 466,865. Masvingo Province has the highest average household size at 4.2 persons, followed by Matabeleland

[1] "Zimbabwe 2022 Population and Housing Census Report, Volume 1" (Zimbabwe National Statistics Agency, 2022).
[2] Ibid.
[3] Ibid.
[4] "Zimbabwe 2022 Population and Housing Census Report, Volume 2. Population Distribution by Ward" (Zimbabwe National Statistics Agency, 2022).

North, Midlands, and Mashonaland Central, each with an average of 4.1 persons per household[5].

Zimbabwe's energy landscape is characterized by a diverse mix of sources, with biomass being the predominant contributor. The country relies heavily on traditional energy forms, including firewood, coal, and hydropower, while also exploring renewable energy technologies to enhance sustainability and energy independence. According to AU-AFREC[6], biomass accounts for the majority of energy consumption at 72%, followed by oil products at 17%, electricity at 9%, and coal at 2%.

A report by the Zimbabwe National Statistics Agency (ZIMSTATS)[7] indicates that 33.7% of households in Zimbabwe are connected to grid electricity, while 28.3% utilise off-grid electricity, and 38% lack access to electricity. Furthermore, the report highlights that most households (2,314,523), or 60.6% of the total number of households, use firewood for cooking. In comparison, 38.6% of households use clean energy sources such as electricity, biogas, LPG, and alcohol/ethanol for cooking. Other solid fuels, including coal, charcoal, animal dung, and similar materials, are used by only 0.5% of households. Additionally, 0.2% of households use paraffin, while the remaining 0.1% do not engage in cooking.

Zimbabwe possesses vast renewable energy resources that are currently underutilised, offering significant potential for investment. These resources include solar, hydro, wind, geothermal, and biomass, which encompasses bagasse (sugarcane-based), biogas, and waste from forestry and sawmills.

1.2 Opportunities for Clean Cooking in Zimbabwe

Clean cooking solutions in Zimbabwe present significant opportunities to address the health, economic, and environmental challenges associated with traditional biomass fuels. The sector is still developing and includes a diverse range of stakeholders with varying priorities and approaches. According to the Clean Cooking Alliance[8], clean cooking refers to modern technologies that minimize environmental pollution and harmful gas emissions, including highly efficient stoves that can reduce fuel consumption by 30-60%. This shift moves away from traditional methods, such as open fires and smoke-emitting technologies like paraffin cooking, promoting the use of electricity, LPG, biogas, ethanol, and improved cookstoves. Supporting this transition are pro-clean energy policies, abundant renewable energy resources such as solar, biogas and biomass, and, local manufacturing capabilities that reduce reliance on imports. As consumer awareness of the health and environmental benefits grows, there is a strong willingness to adopt cleaner cooking methods. By harnessing these

[5] Ibid.

[6] African Energy Commission, 2019, https://au-afrec.org/zimbabwe#:~:text=The%20total%20primary%20energy%20supply,amount%20of%20up%20to%2072%25.8.

[7] "Zimbabwe 2022 Population and Housing Census Report, Volume 1."

[8] "The Value of Clean Cooking," Clean Cooking Alliance, accessed October 27, 2024, https://cleancooking.org/the-value-of-clean-cooking/.

opportunities, Zimbabwe can enhance its cooking sector, improve public health, and drive sustainable development.

Zimbabwe's legal and policy instruments, including the Biofuels Policy, Climate Change Policy, Renewable Energy Policy, and Energy Efficiency Policy, are supportive of clean cooking initiatives and encourage the transition from solid fuels to cooking methods that utilise electricity, LPG, and renewable energy sources such as solar, and biofuels. This policy direction is primarily driven by the adverse effects of solid fuels on the environment and the health of vulnerable groups, particularly children, women, people living with HIV, and communities susceptible to climate change. The policies advocate for the inclusion of all stakeholders, emphasizing community participation in developing and implementing transition strategies through participatory planning, consideration of user preferences, affordability, awareness campaigns, and standardized specifications. However, the current policies primarily address household cooking, neglecting the cooking activities of enterprises and institutions. Additionally, there are gaps concerning cooking technologies that are user-friendly for Persons with Disabilities, presenting opportunities for further innovation and product development in Zimbabwe's clean cooking sector.

The discovery of natural gas in Muzarabani and Lupane Districts offers significant potential for increasing the adoption of LPG and natural gas in clean cooking throughout Zimbabwe. Additionally, livestock resources in Matabeleland North, Matabeleland South, and Masvingo provinces present opportunities for biogas development from cow dung. Solar technology also enhances these prospects through solar cooking appliances and solar water heaters although initial costs can be high.

Mini-grids established by independent power producers (IPPs) like Nyangani Renewables, along with community mini-grids set up by NGOs and the Renewable Energy Foundation (REF) in areas such as Chipendeke, Hlabiso, Ngarura, Nyamwanga, Mashaba, and Dete, facilitate the deployment of clean cooking technologies. Households connected to community-based mini-grids, like those in Chipendeke and Mashaba, are already cooking with electricity, and hardware store owners at Hauna Business Centre reported an increased demand for electric cooking appliances following Nyangani Renewables' integration into the national grid.

There is significant potential for biofuels in Zimbabwe's cooking sector, with ethanol (gel) currently being the only biofuel in use; however, opportunities exist to expand this market with additional biofuels such as *Jatropha curcas* oil. Findings from the Baseline Study of 2023 reveal that Zimbabwe has a robust local capacity for the innovative design and manufacturing of clean cooking appliances that utilise various energy sources, encompassing a wide range of entities including companies like Treggers in Bulawayo and Capri in Harare, small and medium enterprises (SMEs), community initiatives, and individual efforts, with an estimated 16% of the population relying on self-made stoves. The types of appliances produced include those powered by LPG, biogas, electricity, charcoal, firewood, and other wood waste forms like briquettes and pellets. This innovation is reflected in the diverse stove designs that have been locally developed or modified, arising from collaborations among communities, research institutions, private companies, NGOs, and government departments.

Studies on willingness and ability to pay indicate a strong inclination among households to transition from solid fuels to cleaner energy sources. However, a review of literature revealed a significant gap in understanding the clean cooking needs of enterprises and institutions. Scoping studies suggest a substantial market for clean cooking products within various cooking enterprises, including formal businesses, home-based operations, and micro-enterprises located in markets and economic centers. Nevertheless, additional research is necessary to quantify this market segment accurately.

1.3 Rationale for Clean Cooking

1.3.1 Global Perspective

Long-term exposure to solid fuel combustion emissions significantly impacts human health, particularly in low- and middle-income countries. Studies indicate that solid fuel use is associated with increased infant and child mortality rates, reduced life expectancy, and a higher prevalence of chronic diseases such as cardiovascular and respiratory condition[9,10]. Specifically, exposure to fine particulate matter ($PM_{2.5}$) from solid fuels contributes to approximately 2.6 to 3.8 million premature deaths annually, with respiratory diseases being a major concern[11]. Additionally, systematic reviews have shown associations between solid fuel combustion and respiratory health issues, including chronic obstructive pulmonary disease (COPD) and lung cancer[12]. The cumulative effects of these health risks underscore the urgent need for interventions to reduce solid fuel use and promote cleaner energy alternatives[13].

Developing a robust global market for clean and efficient cookstoves and fuels can transform cooking worldwide, enhancing health, boosting livelihoods, empowering women, and protecting the environment[14]. With sustained focus and strategic implementation, clean cooking solutions can directly contribute to progress on Sustainable Development Goals (SDGs). This effort supports an environment conducive to achieving Agenda 2030, as clean cooking benefits transcend across many SDGs.

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[9] Wenming Shi et al., "Association Between Household Air Pollution from Solid Fuel Use and Risk of Chronic Diseases and Their Multimorbidity Among Chinese Adults," SSRN Scholarly Paper (Rochester, NY: Social Science Research Network, September 21, 2022), https://doi.org/10.2139/ssrn.4200018.

[10] Muhammad Irfan, Michael P. Cameron, and Gazi Hassan, "The Causal Impact of Solid Fuel Use on Mortality – A Cross- Country Panel Analysis," *International Journal of Energy Economics and Policy* 13, no. 1 (January 22, 2023): 144–53, https://doi.org/10.32479/ijeep.13498.

[11] Yaoxian Huang et al., "Impacts of Global Solid Biofuel Stove Emissions on Ambient Air Quality and Human Health," *GeoHealth* 5, no. 3 (2021): e2020GH000362, https://doi.org/10.1029/2020GH000362; Olayemi Fehintola Awopeju, "Health Effect of Biomass Fuel Smoke," in *Environmental Emissions* (IntechOpen, 2020), https://doi.org/10.5772/intechopen.94611.

[12] Valentina Guercio and Karen Exley, "Solid Fuel Combustion Exposure and Respiratory Health in Children and Adults in Europe, USA, Canada, Australia and New Zealand: A Systematic Review and Meta-Analysis," *ISEE Conference Abstracts* 2022, no. 1 (September 18, 2022), https://doi.org/10.1289/isee.2022.P-0144.

[13] Huang et al., "Impacts of Global Solid Biofuel Stove Emissions on Ambient Air Quality and Human Health."

[14] Ibid

1.3.1.1 Sustainable Development Goals (SDGs) and Clean Cooking

Clean cooking plays a vital role in advancing several SDGs and Table 1[15,16,17] highlights examples of how clean cooking contributes to achieving key SDGs.

Table 1 Clean Cooking Benefits and SDGs

SDG	Clean Cooking Benefits to the SDGs
SDG 1: No poverty	• Clean cooking significantly seeks to end poverty in all forms, by addressing energy poverty and its related health and economic impacts, providing essential services for a healthy and productive life, and saving households both time and money.
SDG 2: Zero hunger	• Access to clean cooking fuels enhances food preparation efficiency and safety, thereby improving nutritional outcomes, particularly for vulnerable populations, including women and people with disabilities.
SDG 3: Good health and wellbeing	• Clean cooking reduces household air pollution, a significant cause of respiratory and cardiovascular diseases, particularly affecting women and children exposed to smoke from traditional cooking methods. • Cleaner cookstoves decrease these health risks, lowering disease incidence and improving overall well-being. • Moreover, by making cooking more efficient, clean stoves promote diverse food preparation and better nutrition, supporting healthier lives and communities.
SDG 4: Quality education	• Clean cooking supports quality education, by creating healthier home environments and reducing time spent collecting fuel, especially for girls. • This enables children to focus on learning, attend school more consistently, and avoid health issues from smoke exposure that can interrupt their education.
SDG 5: Gender equality	• Clean cooking promotes gender equality and empowering women. By reducing the time spent on meal preparation and fuel collection, clean cooking allows women and girls to participate more in paid work. • Additionally, case studies from the Zimbabwe Domestic Biogas Programme show that installing biogas systems

[15] "The Value of Clean Cooking."

[16] Joshua Rosenthal et al., "Clean Cooking and the SDGs: Integrated Analytical Approaches to Guide Energy Interventions for Health and Environment Goals," *Energy for Sustainable Development* 42 (February 1, 2018): 152–59, https://doi.org/10.1016/j.esd.2017.11.003.

[17] Krittika Roy, "Transition to Cooking with Clean Fuels in Rural Households of India: Studying the Effect of Policy and Other Factors," *Energy for Sustainable Development* 80 (June 1, 2024): 101456, https://doi.org/10.1016/j.esd.2024.101456.

	encourages men to share cooking responsibilities[18], fostering a more equitable distribution of household chores.
SDG 7: Affordable and clean energy	• Clean cooking promotes access to affordable and sustainable energy through the use of clean cookstoves and fuels. • This reduces reliance on traditional biomass fuels, improves energy efficiency, and alleviates energy poverty, particularly in rural communities.
SDG 8: Decent work and economic growth	• Clean cooking enables more efficient use of time, allowing both women and men to engage in income-generating activities. • It promotes economic growth by creating jobs in the clean cooking sector and stimulating local economies through increased demand for clean cookstoves and fuels.
SDG 11: Sustainable cities and communities	• Clean cooking improves air quality and reduces environmental impact. • By minimizing emissions and reliance on unsustainable biomass fuels, clean cooking enhances public health and promotes more sustainable living conditions, contributing to cleaner and safer communities.
SDG 12: Responsible consumption and production	• Clean cooking promotes sustainable consumption by reducing reliance on unsustainable cooking fuels like firewood and charcoal, lowering forest degradation and air pollution. • It encourages efficient use of resources and minimizes waste, contributing to responsible production and consumption patterns.
SDG 13: Climate action	• Greenhouse gas emissions are reduced by adopting clean cooking and promoting climate resilience. • Up to 25% of black carbon emissions come from burning solid fuels for household energy needs. By transitioning to clean cooking solutions, such as improved cookstoves and biogas, households can lower their carbon footprints and address the basic energy needs of the poor while delivering significant climate benefits.
SDG 15: Life on land	• The promotion of sustainable cooking practices reduces pressure on forests and encourages responsible land use. • Up to 34% of wood harvested is unsustainable, contributing to forest degradation, deforestation, and climate change. • Adopting improved cookstoves and alternative fuels decreases the demand for firewood, helping to protect forest ecosystems, combat climate change, and promote biodiversity conservation.

[18] SNV Netherlands Development Organisation, Zimbabwe Domestic Biogas Programme Final Evaluation Report, 2014.

1.3.1.2 The International Organisation for Standardization (ISO) and Clean Cooking.

The International Organisation for Standardization (ISO) plays a crucial role in advancing clean cooking by establishing standardised frameworks that enhance investment and growth in the sector. The ISO International Workshop Agreement 11:2012 demonstrated how a unified international framework can cater to various organisations' and governments' priorities while promoting clean cooking. In 2018, three ISO standards for the clean cooking sector were published, incorporating lessons from the 2012 International Water Association (IWA), experiences in technology testing, research on technology benefits, and effective communication with consumers. The IWA significantly improved the use of technology testing results, informing and strengthening the new ISO standards.

1.3.2 Zimbabwean Perspective

The majority of households in Zimbabwe rely on firewood for cooking, accounting for 60.6% of total usage. In contrast, 38.6% utilise cleaner energy sources, including electricity, biogas, LPG, or alcohol/ethanol. Other solid fuels, such as coal, charcoal, animal dung, and similar materials, are used by only 0.5% of households[19]. This data highlights the significant reliance on traditional fuels and underscores the need for promoting cleaner cooking alternatives to enhance health and environmental outcomes.

The cookstoves market in Zimbabwe is diverse, featuring a range of products that include high-end, mid-range, and low-value options. This market comprises various types of cookstoves, such as improved cookstoves (ICSs) primarily promoted by NGOs and development partners, as well as electric stoves, LPG stoves, biogas stoves, gel stoves, paraffin stoves, and firewood stoves. Retailers in this sector can be categorized based on income levels: low-income retailers mainly include market vendors and Chinese-owned shops, middle-income retailers consist of hardware stores and some major supermarkets, while high-end retailers are made up of brand sellers and specialized appliance shops.

Mutubuki-Makuyana[20] identified seven main types of stoves: traditional stoves, improved cookstoves (ICS), petroleum-based cookstoves (primarily paraffin stoves), ethanol-based stoves (mainly gel stoves), gas stoves (including LPG and biogas), and electric stoves. Additionally, there are combination stoves that utilise both electric and LPG fuels, providing users with versatile cooking options. The most commonly available cookstoves among retailers in Zimbabwe are electric and LPG stoves. In contrast, charcoal stoves and open firewood stoves, known as Mbare stoves, are primarily sold by vendors and metal fabricators in marketplaces. The market features both local and international cookstove brands, with manufacturers also representing a mix of local and international origins. During a market research study[21], two notable local manufacturers of electric and LPG stoves were identified as Treger Products and Capri. Additionally, improved cookstoves (ICSs) are produced by five other companies, as well as by community members trained by NGOs and civil society organisations (CSOs).

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[19] "Zimbabwe 2022 Population and Housing Census Report, Volume 1."
[20] Ibid
[21] Ibid

2 Situation Analysis and Baseline Study

A situation analysis of Zimbabwe's clean cooking sector identified key factors essential to the Baseline Study's background and the highlights summarized in section 2.1 established the context for conducting the study. As a result, the Baseline Study findings frequently reference the initial analysis to assess any significant changes. Additionally, the study remained open to new factors that emerged during the research and noted them accordingly.

2.1 National Legal and Policy Framework on Clean Cooking

Zimbabwean policy supports clean cooking and encourages a shift from solid fuels to electricity, LPG, and renewable energy sources such as solar, biogas, and other biofuels. This policy direction is driven largely by the negative environmental and health impacts of solid fuels, particularly on vulnerable groups, including children, women, people with HIV, and communities at risk from climate change.

The policies promote the inclusion of all stakeholders, advocating for community participation in crafting and implementing transition strategies through participatory planning, consideration of user preferences, affordability, awareness campaigns, and adherence to standard specifications. However, these policies currently focus on household cooking and do not extend to the cooking practices of enterprises and institutions. Fig. 2 illustrates the hierarchy of policies and laws in Zimbabwe relevant to the clean cooking sector.

Section 73 of Zimbabwe's Constitution[22] establishes a legal basis for environmental protection, promoting safe, sustainable practices like clean cooking and green building. It guarantees the right to a healthy environment, advocating pollution prevention, conservation, and sustainable resource use in tandem with social and economic development. This implies that clean cooking should be integrated into building planning, with energy-saving, waste management, water efficiency, and fire safety measures applied across residential and non-residential spaces, supporting both present and future generations.

Policies under the MoEPD addressing clean cooking include the National Energy Policy (2012), the National Renewable Energy Policy (NREP, 2019), the Biofuels Policy (2019), and the Energy Efficiency Policy (2024). The National Energy Policy prioritizes energy as a driver for economic growth and poverty reduction, while the NREP aims to expand electricity access, particularly in rural areas, through off-grid community projects. Additionally, the NREP includes biogas targets, while the Biofuels Policy (2020), though not directly related to clean cooking, has potential for alignment in the future. Additionally, the Climate Change Department further supports clean cooking with policies like the National Climate Change Policy (2017), Zimbabwe's Nationally Determined Contributions (2021), and the National Climate Change Response Strategy (2015). The Model Building By-laws (1977) of Zimbabwe are now outdated and do not align with Zimbabwe's Constitution or the Environmental Management Act. They lack provisions for air quality enhancement, sustainable building methods, and energy efficiency standards. Furthermore, a lack of resources, technical expertise, and trained

[22] "Constitution of Zimbabwe Amendment (No. 20)" (2013).

professionals pose significant challenges to implementing green building practices, such as clean cooking technologies and climate mitigation measures.

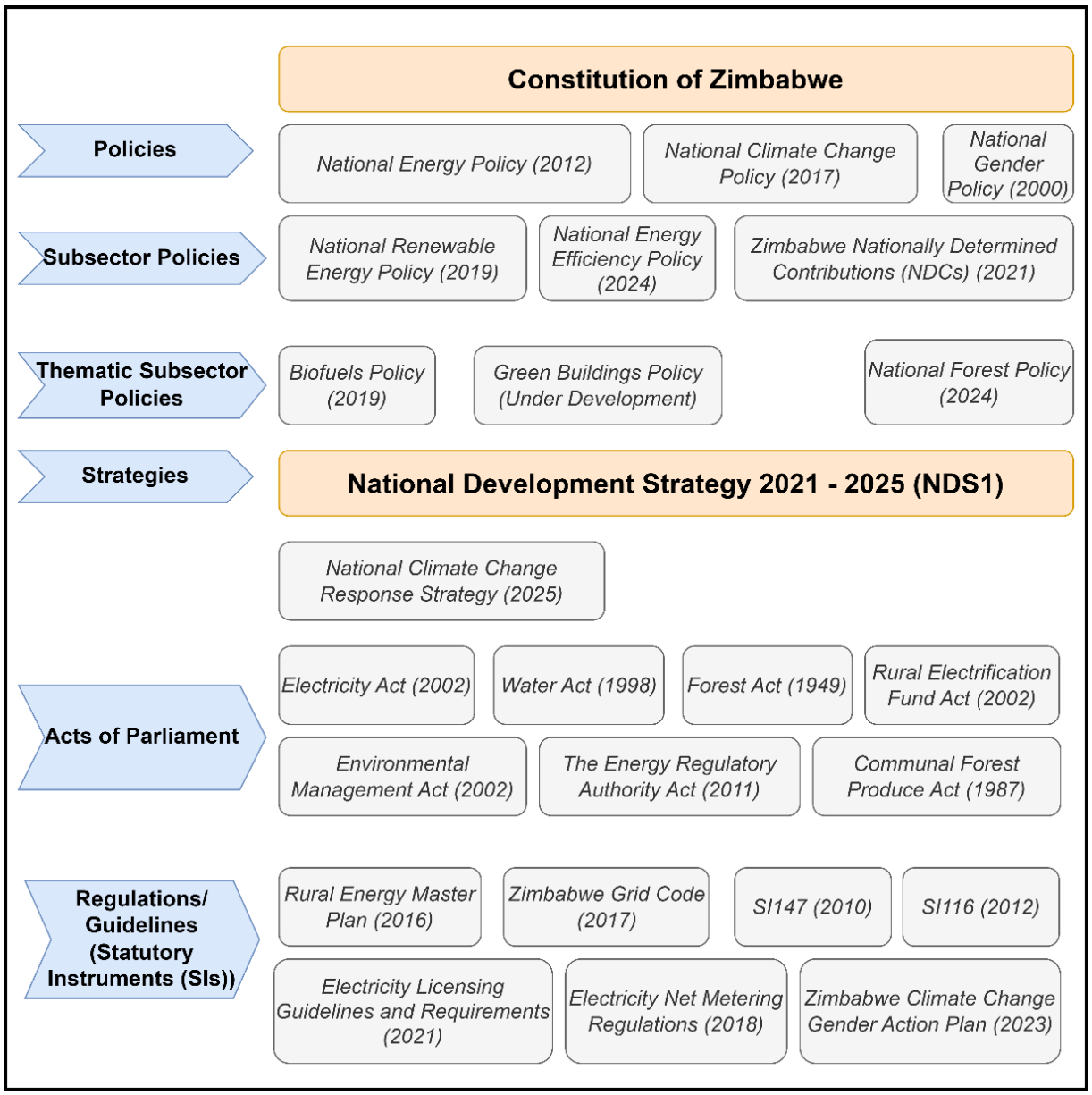

Fig. 2. Hierarchy of Selected Policies Related to Clean Cooking in Zimbabwe

Expanding electricity access is essential for promoting electric cooking (E-cooking) in both rural and urban areas. Limited access, especially in rural regions, and frequent power outages underscore the need for alternative strategies such as renewable energy mini-grids, expanded generation capacity through Independent Power Producers (IPPs), net metering, and grid modernization. For backup, households often rely on LPG and charcoal, with LPG used by 52% of urban residents, while 92.9% of rural areas still depend on firewood[23]. Despite only 15% of households preferring electricity and 4% charcoal, there is local capacity to produce clean cooking stoves including electric, LPG, and biogas options through private companies and

[23] "Zimbabwe 2022 Population and Housing Census Report, Volume 1."

community groups. Currently, 16% of households use self-made stoves, reflecting the willingness to adopt clean cooking solutions. Fig. 3 illustrates how Clean Cooking programs are integrated into various thematic areas in Zimbabwe, contributing to environmental sustainability, improved health outcomes, and economic empowerment.

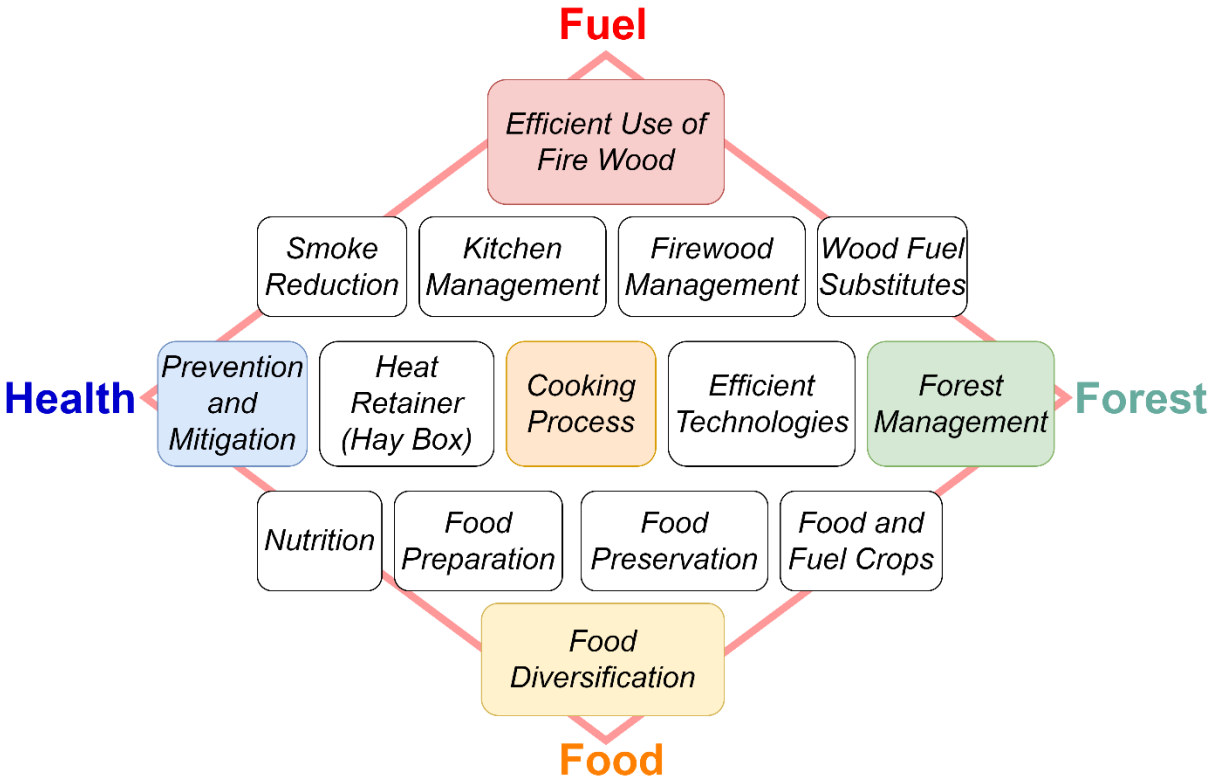

Fig. 3. Integration of Clean Cooking Programs Across Various Thematic Areas in Zimbabwe[24]

While stakeholders in Zimbabwe are actively advancing clean cooking initiatives, progress tracking toward clean cooking targets remains uncoordinated. This challenge arises because clean cooking programs are typically integrated into other development efforts, such as nutrition, resilience, cholera, and disaster response programs, rather than operating as independent initiatives. Consequently, information on clean cooking progress often does not reach MoEPD, the primary authority responsible for reporting on national energy access. Studies suggest that the Ministry could address this gap by partnering with local authorities to appoint clean cooking focal points on the National Clean Cooking Technical Committee (NCCTC).

A review of available literature reveals a higher number of user finance options compared to funding facilities for stakeholders, such as cookstove suppliers. In rural and low-income communities, grant funding from development partners is the most common, while user investments represent 30% of the funding sources for other communities. Studies show users are generally willing to cover at least 30% of the stove costs, though many households are reluctant to incur debt for improved cookstoves. Additionally, literature also indicates that

[24] Practical Action, Feasibility and scoping study for improved cook stoves/ fuel market development program, 2015, unpublished, UNICEF internal resources

85% of Zimbabwean households prefer stoves with an oven and multiple burners, while 75% favour freestanding, movable stoves over countertop models.

2.2 Baseline Study Findings

A Baseline Study was conducted, and data were collected from households, institutions, and enterprises across 14 districts in 10 provinces. Participants included commercial banks, microfinance institutions, NGOs, development finance institutions, consumer/asset finance companies, and venture capitalists. In addition, cooking energy suppliers and appliance distributors were engaged through formal interviews, transect walks, and informal discussions at economic hubs such as business centres, bus stations, flea markets, and marketplaces. Key findings were classified into factors that either hinder or support the scale-up of clean cooking solutions.

In sampled areas, the Baseline Study found that 61.2% of households used firewood for cooking, 52% relied on LPG, 40.4% on electricity, and 9% on charcoal. Other fuels recorded included wood chips (2.5%), biogas, coal, and crop waste (each at 1.7%). Firewood use was highest in rural areas (59%) and least common in peri-urban areas (19%). LPG use was more prominent in peri-urban areas (40%) and urban areas (34%) but less common in rural settings (24%). Electricity was primarily used in urban (39%) and peri-urban areas (24%), with limited use in rural areas (14%). Charcoal usage was mainly in peri-urban areas (17%) and comparatively lower in urban and rural zones (5% and 3%, respectively). Gender analysis showed both men and women predominantly used firewood (43% and 35%, respectively), followed by LPG (28% and 34%), electricity (23% and 26%), and charcoal (6% and 5%). Cooking enterprises in the study area largely depended on firewood (56.3%), followed by LPG (31.3%), electricity (18.8%), and charcoal (6.3%). Institutions with cooking needs primarily used electricity (72.7%), while others used firewood (45.5%), LPG (18.2%), and biogas (9%).

As of December 2023, the study estimated Zimbabwe's clean cooking market to include approximately 2,928,583 households, with 61.4% in rural areas, based on an annual population growth rate of 1.5%[25]. An additional 22,353 households per year are projected to require a transition from firewood, charcoal, and other solid fuels to clean cooking solutions. These findings underscore the ongoing demand and potential market for expanding clean cooking solutions across various demographic and geographic areas.

A scenario analysis was conducted to estimate the financing required for user investments in clean cooking stoves. Findings indicated that, as of December 2023, an investment of US$791.5 million was needed, with an additional annual requirement of US$6 million to accommodate population growth. The analysis projected that 44% of this total (US$344 million) could come from users as self-finance across the three customer segments (i.e low, middle and high income), 7.5% (US$59 million) from stove suppliers via credit facilities and microfinance options, and the remaining 49% (US$387.8 million) from development partners. The findings were categorized into factors that either promote or deter the transition to clean cooking. Encouragingly, there were considerably more factors supporting the scale-up of clean

[25] "Zimbabwe 2022 Population and Housing Census Report, Volume 1."

cooking. However, the report first addresses deterrent factors, as they require immediate attention to facilitate a successful transition.

2.2.1 Barriers to Clean Cooking Adoption

2.2.1.1 Absence of a Unified Definition of Clean Cooking

The absence of a unified definition of Clean Cooking among stakeholders in Zimbabwe creates ambiguity, often leading to conflicting program outcomes and a regressive emissions state. According to ISO Standards[26], Clean Cooking involves processes that reduce emissions to health-safe and environmentally sustainable levels, as further detailed in the Zimbabwe National Climate Change Response Strategy (2015)[27]. Many stakeholders, however, lack awareness of this full definition, resulting in fragmented approaches that fall short of supporting a complete national transition. A clear, Zimbabwe-specific definition of Clean Cooking is essential to guide development programs effectively toward this goal.

2.2.1.2 No Coordinated Clean Cooking Initiatives

The lack of collaboration among stakeholders in Zimbabwe's clean cooking sector results in poor program implementation, as many initiatives are integrated into broader development programs that report to ministries other than the MoEPD. Consequently, information about these projects often does not reach the MoEPD, creating significant gaps in reporting their impacts in national SDG progress reports. To address this, it is recommended that MoEPD partner with local authorities to establish clean cooking focal points on the National Clean Cooking Technical Committee. Local authorities, knowledgeable about local cookstove programs, have shown willingness to participate, which would bridge information gaps, enhance planning inclusivity, align objectives, standardize reporting, and enable local authorities to guide clean cooking initiatives strategically.

2.2.1.3 Designs of Infrastructure and Buildings do Not Incorporate Clean Cooking

The third major finding regarding the feasibility of clean cooking in Zimbabwe is that cooking is often an afterthought in infrastructure design, which leads to its exclusion from development planning. As a result, communities must improvise or retrofit cooking solutions, often missing key clean cooking requirements. Three main issues were identified:

1. Most infrastructure is designed for a single energy source, such as electricity or firewood. When the primary source is unavailable, users resort to alternative fuels, leading to makeshift cooking areas that lack proper facilities for safety and smoke removal.
2. Some buildings, such as rural clinics, do not incorporate cooking facilities despite their mandates to serve pregnant women. Many clinics lack kitchens or canteens, resulting in unsafe, makeshift cooking structures that overlook environmental and health considerations.
3. In some cases, multiple energy sources like electricity, biogas, and firewood are integrated into the design, as seen at St David's Bonda Girls High School, which has

[26] ISO/TR 21276:2018 - Clean cookstoves and clean cooking solutions — Vocabulary, First edition 2018-04
[27] "Zimbabwe's National Climate Change Response Strategy," 2015.

well-planned cooking spaces. This approach enhances energy security and creates safer cooking environments.

Overall, these findings highlight the need for stakeholders to integrate clean cooking into the design of buildings and infrastructure.

2.2.1.4 Perception of Cost

The fourth factor identified in the Baseline Study is that communities perceive clean cooking fuels and electricity as more expensive than conventional fuels like firewood and charcoal. This perception is based on absolute costs rather than the cost per meal cooked using each energy source. Further studies are needed to assess the accuracy of this perception, as this information will be crucial for promotional campaigns aimed at encouraging the adoption of clean cooking technologies.

2.2.1.5 Safety Concerns

The fifth factor that may deter the uptake of LPG, natural gas, and biogas is what this report terms "*the fear of gas*." While the market shows a strong preference for LPG (evidenced by four out of the nine highest-ranked stoves using it), households expressed significant safety concerns. They appreciate LPG for its speed, cleanliness, and ease of use, but many believe it poses safety risks. Additionally, households perceive LPG as expensive, fearing that larger stoves will necessitate larger cylinders.

A group of Persons with Disabilities (PWDs) interviewed in Gwanda highlighted the lack of training on handling LPG, identifying it as a critical gap. They also noted that LPG availability can be inconsistent. These insights lead to several conclusions:

1. Households require training on the safe use and management of LPG stoves to dispel myths and fears, especially as the country explores potential natural gas reserves in Muzarabani and Lupane, and promotes biogas usage.
2. A backup support structure is needed to address safety issues, such as potential gas leaks. Local authorities should have trained personnel to certify safe LPG installations in new homes.
3. The Zimbabwe Energy Regulatory Authority (ZERA) should assess potential supply gaps in LPG and develop strategies to ensure a consistent supply, as disruptions can discourage households from adopting LPG.

2.2.2 Opportunities for Advancing Clean Cooking Adoption

The study identified eight key factors that create opportunities for transitioning to clean cooking. Firstly, financial entities are interested in developing financial products tailored for clean cooking initiatives. Secondly, the market is favourable for clean cooking technologies, with a clear preference among consumers and a demonstrated willingness and ability to pay for these solutions. Additionally, there are underserved market segments that present growth potential, particularly in redesigning clean cooking products and facilities to accommodate Persons with Disabilities. Local authorities are also planning renewable energy mini grids, enhancing access to renewable energy services for communities. Furthermore, Zimbabwe has a strong opportunity to expand local manufacturing in the clean cooking sector. With existing suppliers and distributors, the country has a foundational production capacity that, if

strengthened, can reduce reliance on imports, lower costs, and enhance access to clean cooking solutions.

2.2.2.1 Favourable Funding Landscape

The Baseline Study revealed a diverse funding landscape in the country, comprising commercial banks, microfinance institutions, NGOs, development finance institutions, consumer finance companies, and venture capitalists, all of which show interest in the clean cooking sector. Financial products offered include asset finance, working capital facilities, term loans, trade finance, equity, grants, and concessional loans, indicating a range of available instruments to support clean cooking technologies. However, only 20% of these organisations have actively financed clean cooking, with one having funded over 60 types of clean cooking technologies globally, including the tsotso stove in Zimbabwe. The focus has primarily been on manufacturers and residential users, with potential to expand financing to distributors and carbon credit projects. Nonetheless, challenges persist in financing end-users and promoters, including small average financing amounts, collection difficulties, consumer affordability, high transaction costs, currency fluctuations, the unbanked status of users, and a lack of supportive policies.

2.2.2.2 The Need for Alternative Clean Cooking Technologies

Households' dissatisfaction with their current cooking fuels creates opportunities for them to seek alternatives, positioning clean cooking technologies as viable options. The study found a strong preference for clean cooking technologies, particularly electricity and LPG, among households, institutions, and enterprises. Although firewood is the most commonly used fuel, many expressed frustrations about the labour involved in its use, including fetching, heavy lifting, and cleaning soot from cooking appliances. While firewood is considered more reliably available than electricity, LPG is increasingly seen as a necessary backup due to frequent power cuts, making it a more common choice.

2.2.2.3 Potential for Investment in Clean Cooking Technologies

The study revealed a strong willingness among households to invest in clean cooking technologies. Out of 721 surveyed households, 100% expressed readiness to invest in their preferred stoves. Notably, 15% could afford their preferred stoves without assistance, while another 15% were willing to contribute at least 50% of the cost. Additionally, 14% were willing to pay between US$300 to US$1000, and 52% indicated a willingness to spend between US$50 to US$299. These findings challenge the notion that households are too poor to invest in stoves and highlight their commitment to user investments.

Furthermore, the analysis indicated that respondents had the capacity to pay, primarily through salaries (30%), income-generating activities (22%), agriculture (20%), and savings (14%). However, many participants were unaware of the variety of stove options available in the country. The Willingness and Ability to Pay questionnaire identified 46 stove types using different energy sources, resembling a catalogue without pricing. Many households expressed appreciation for this catalogue and requested its availability in public spaces to assist in stove selection. Notably, men acknowledged a gender-related gap in awareness and choice regarding cooking options, recognizing the need for more accessible information. The

presence of various payment methods for stoves supports scalable business models that enhance affordability.

2.2.2.4 Inclusive Clean Cooking Solutions

The study identified opportunities to redesign stoves for inclusivity, especially to better serve Persons with Disabilities (PWDs). Interviews with PWDs highlighted design gaps in current clean cooking technologies, presenting a chance to enhance accessibility and support the Leave-No-One-Behind initiative.

2.2.2.5 Opportunities in Local Authority Initiatives

The study found that some Local Authorities are planning renewable energy mini-grids and attracting investors, with resource sites being mapped and inspected by ZERA and MoEPD. This presents an opportunity to integrate clean cooking needs into local energy planning. Additionally, Zimbabwe has stakeholders with the capacity to design and manufacture clean cookstoves across private, research, and community levels. Clean cooking appliances are available across diverse income levels, including in formal stores and local markets.

2.2.2.6 Carbon Credit Finance

The International Emissions Trading Association (IETA) and the University of Maryland's Centre for Global Sustainability (CGS) project that carbon market transactions could exceed USD 100 billion annually by 2030 if countries pursue trading under Article 6 of the Paris Agreement. Article 6 facilitates cooperation among countries to achieve emissions reductions, supporting the Paris goal of keeping global temperature increases below 2°C and ideally limiting them to 1.5°C above pre-industrial levels. Carbon trading, the buying and selling of carbon credits, is central to this cooperative approach. Under the UNFCCC's Article 6[28], countries can now engage in voluntary cooperation through bilateral agreements, enabling Internationally Transferrable Mitigation Outcomes (ITMOs) to be exchanged among nations and private sector actors. Three tools available under Article 6 include:

1. **Article 6.2:** Facilitates bilateral exchanges of mitigation outcomes, counted towards each country's Nationally Determined Contributions (NDCs).
2. **Article 6.4:** Introduces a UN-backed mechanism for validating and issuing carbon credits.
3. **Article 6.8:** Supports non-market cooperation on achieving NDCs.

Until COP28, carbon credits were mainly traded through brokers or directly with companies aiming to offset emissions. Leading platforms in carbon trading include Nasdaq, CME Group, AirCarbon Exchange (ACX), Carbon Trade Exchange (CTX), and Xpansiv. CTX, active since 2009, trades credits certified by standards like Verra and the UN's Clean Development Mechanism. Now, Article 6 mechanisms allow countries to operate outside traditional carbon credit markets, bypassing platforms like Verra and Gold Standard (GS).

The evolving carbon credit methodologies, like the Clean Cooking and Climate Consortium's (4C) new approach under Article 6, highlight opportunities to standardize and boost financial

[28] Unlocking Climate Ambition: the Significance of Article 6 at COP28, 2023 https://unfccc.int/news/unlocking-climate-ambition-the-significance-of-article-6-at-cop28

support for clean cooking projects across markets. The average price for GS Clean Cookstove credits in Africa ranged from US$8 to US$10 per ton of CO_2 equivalent[29], while Over the Counter (OTC) market prices were as low as US$3.40 per ton[30]. Fluctuations in 2023 were influenced by concerns over crediting accuracy. By the end of 2023, the Clean Cooking and Climate Consortium (4C) announced plans for a new, modular methodology under Article 6 of the Paris Agreement. This approach aims to credit emissions reductions across diverse cooking transition scenarios, including biomass and clean fuels[31].

The Quantum database shows no recent Verra-registered projects in Zimbabwe; however, 20 projects were registered under the Gold Standard between March 2022 and July 2023. Key promoters include The African Stove Company (clean cooking), Namene Solar Lights Ltd (solar lights), and CO2balance UK Ltd (Manicaland Safe Water projects). Zimbabwe regulates carbon credits through three Statutory Instruments issued in 2023 (SIs 150, 152, and 158) and now has a dedicated Zimbabwe Carbon Association to advocate on carbon credit matters.

2.2.2.7 Incentives to Promote Transition to Clean Cooking Technologies

Incentives can include profits, tax holidays, public recognition, business referrals, group incentives, and financing. For instance, in Indonesia, the World Bank implemented a results-based funding (RBF) program, rewarding market players for selling and sustaining clean biomass stove use based on expected customer service improvements rather than production or sale price[32,33]. Effective incentives should support a broad stakeholder ecosystem to avoid market imbalances. For example, if RBF targets manufacturers, users could also receive discounts or promotions to encourage clean cooking adoption. Energy Sector Management Assistance Programme (ESMAP) suggests key considerations for supplier incentives and financing mechanisms[34] (see Table 2).

Table 2 Financing Incentives and Attributes

Questions to Address for Supplier Incentives	**Questions to Address for Financing Mechanisms**
• Is there business development support available for capacity building? • Is there a fund supporting business innovation or Research and Development? • Are there targeted incentives for gender inclusion such as for women-led businesses?	• Are there targeted incentives to promote higher tier or high performing solutions? • Are there specific financing or subsidy programmes for clean cooking solutions targeted to low-income consumers? • Are there specific financing facilities available to support suppliers/

[29] African Cookstove prices fall further as demand wans, Quantum Commodity Intelligence, 2023.
[30] Ibid
[31] New Article 6 cookstoves methodology to be released in September, Quantum Commodity Intelligence, 2023.
[32] Incentivizing a Sustainable Clean Cooking Market: Lessons from a Results-Based Financing Pilot in Indonesia, International Bank for Reconstruction and Development / The World Bank, 2018
[33] Ibid
[34] Financing Incentives and Attributes – ESMAP-RISE; https://rise.esmap.org/pillar/clean-cooking/indicator/financing-incentives-and-attributes

• Are there programmes for commercial entities to invest in efficient, low emission stoves? • Are there duty exemptions, tax benefits, and/or subsidies to support clean cooking solutions?	consumers to develop/purchase clean cooking solutions? • Are there social safety/security net programmes covering clean cooking solutions for low-income households? • Are there provisions to support public institutions in getting incentives/subsidies for clean cooking solutions? For example, for school meal programmes? RBF funding for rural clinics is an example of provisions that can be leveraged on by incentives.

A verification process is crucial for developing incentives, serving as the benchmark for monitoring and evaluating progress. It must be transparent and inclusive to ensure compliance; complicated claiming processes can deter beneficiaries. Linking the verification process to existing sector verification methods, such as carbon credits assessments, can provide a robust framework. Simplified versions of these assessments can help prepare project developers for initiating carbon finance projects in clean cooking. Independent verification, including remote monitoring of cookstove construction and usage, should also be encouraged. Recommended Incentives for Local Manufacturing of Clean Cooking Technologies include:

1. **Results-Based Financing (RBF) Fund**: An RBF fund is recommended for the clean cooking sector, with seed capital sourced from the local market. Financial requirements for stove purchases amount to approximately US$791.5 million as of December 2023, with an additional US$6 million needed annually for population growth. About 44% (US$344 million) can be obtained from households as self-finance, which can seed the RBF scheme. This fund can be replenished by US$2.64 million yearly, allowing for significant progress toward reducing households using solid fuels from 61.4% to 30%.
2. **Tax Holidays**: Offering tax holidays to local manufacturers can encourage entrepreneurs to develop clean cooking technologies by mitigating initial financial risks. This gesture of goodwill from the government supports shared risk-taking.
3. **Carbon Credit Financing**: Supporting the development of carbon credit finance projects can serve as a strong economic incentive, motivating entrepreneurs to invest in local clean cooking technology manufacturing[35].

[35] https://www.stlouisfed.org/~/media/Education/Lessons/powerpoint/Incentives_Are_All_Around_Us.pptx?la=en#:~:text=Positive%20incentives%20are%20rewards%20that,measurable%20reward%20for%20doing%20so

4. **Public Recognition**: Awards and public recognition can enhance business morale and profile companies as leaders in low-emission cooking, particularly in the context of sustainable reporting and global collaborations under Article 6.
5. **Business Referrals**: Creating a system of business referrals tied to financial incentives can drive collaboration. Recognized businesses can be automatically invited to Investor Forums to pitch their projects to potential investors.

3 Clean Cooking Strategy and Approach

3.1 Definition of Clean Cooking

Clean Cooking refers to cooking methods that minimize emissions to levels that promote health and reduce negative environmental impacts[36]. This encompasses cooking in households, institutions, and enterprises and includes pre-cooking, cooking, and post-cooking processes that utilise heat released during combustion to prepare food[37]. Key aspects of Clean Cooking include:

1. Effective fuel usage involving a comprehensive approach that includes processes, habits, fuel management, cooking management, stove efficiency, and cooking infrastructure. Thus, Clean Cooking extends beyond merely the choice of stoves or cooking fuels/electricity.
2. Programs should aim for incremental benefits in achieving net-zero indoor air pollution and environmental impacts. It is essential for stakeholders to adopt a shared definition and design programs accordingly; otherwise, conflicting objectives may lead to unintended negative impacts.
3. The distinction between reduced effects and zero effects lies in their scale. While reducing indoor air pollution is preferable to allowing it to persist, achieving zero indoor air pollution is the ultimate goal. Similarly, while reducing environmental impacts is beneficial, aiming for net-zero impacts is more realistic, as all technologies will generate some level of pollution. Net zero signifies that the adverse effects of technologies are offset by well-planned initiatives designed to achieve an overall net-zero effect.

Zimbabwe's Clean Cooking Strategy aims to enhance access to efficient and sustainable cooking technologies, addressing environmental and health issues linked to traditional cooking methods. The strategy recognizes diverse community needs and promotes various clean cooking solutions while emphasizing stakeholder engagement and capacity building among local manufacturers. Financial mechanisms like Results-Based Financing (RBF) and carbon credit systems are crucial for incentivizing investments. Collaboration among government, NGOs, and the private sector is essential to foster innovation and ensure the availability of clean cooking options. By prioritising user preferences and raising awareness, the strategy seeks to reduce reliance on solid fuels and improve public health and environmental sustainability.

3.2 Strategic Goals.

The target of establishing a low-carbon cooking sector in Zimbabwe by 2030 encompasses the goals outlined in Fig. 4.

[36] ISO/TR 21276 - Clean cookstoves and clean cooking solutions — Vocabulary, First Edition, 2018-04
[37] ISO/TR 21276 - Clean cookstoves and clean cooking solutions — Vocabulary, First Edition, 2018-04

Fig. 4. Strategic Goals for Achieving a Low-Carbon Cooking Sector in Zimbabwe

3.3 Strategic Objectives.

As illustrated in Fig. 5, the strategic objectives offer a comprehensive framework for promoting clean cooking initiatives in Zimbabwe. These objectives focus on enhancing access to clean cooking technologies, improving energy efficiency, and reducing reliance on harmful cooking fuels. By prioritizing innovation, capacity building, and policy development, the objectives aim to drive the widespread adoption of sustainable cooking solutions. Additionally, they emphasize collaboration between government agencies, private sector stakeholders, and communities to foster a supportive environment for scaling up clean cooking solutions. Ultimately, these strategic objectives are designed to achieve a cleaner, healthier, and more sustainable cooking sector in Zimbabwe.

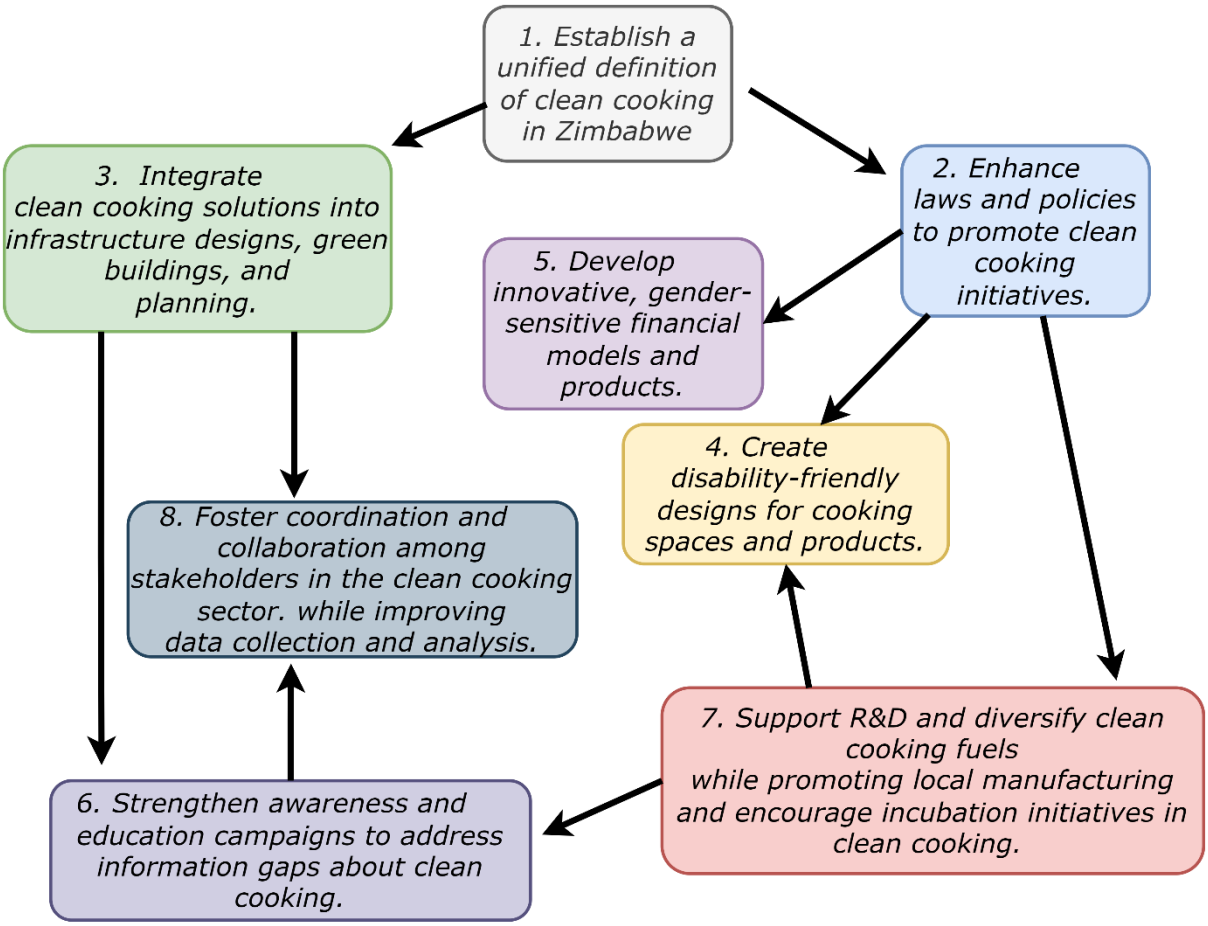

Fig. 5. Strategic Objectives for Advancing a Low-Carbon Cooking Sector in Zimbabwe

3.4 Strategic Principles

1. **Incentives for the Sector:** Implement zero-rated taxes and value-added tax exemptions on imports of clean cooking technologies and appliances to encourage adoption.
2. **Resource Allocation:** Sufficient resources must be allocated to raise awareness and conduct safety campaigns about clean cooking technologies, along with supporting local manufacturing and research and development (R&D) for user- and disability-friendly cookstoves.
3. **Institutional Collaboration:** Strengthening coordination and collaboration among institutions is essential for the sustainability of clean cooking initiatives and programs.
4. **Replicating Success:** The strategy should draw lessons and best practices from Zimbabwe and other countries in the region and the continent to enhance its effectiveness.
5. **Participatory Approaches:** Leveraging participatory approaches has proven successful and should be integrated into the strategy to ensure broad stakeholder engagement.

3.5 Strategic Approaches

1. **Inclusivity:** Emphasize the principle of leaving no one behind, ensuring that all community members, including vulnerable populations, have access to clean cooking solutions.

2. **Multi-Stakeholder Engagement:** Foster collaboration among various stakeholders, including government, private sector, civil society, and communities, to create a cohesive strategy for promoting clean cooking.
3. **Cook Stove Testing Protocols:** Implement standardized cookstove testing protocols to assess efficiencies and performance continuously. Key protocols include:
    a. **Water Boiling Test:** Measures the time and fuel required to boil a specific volume of water.
    b. **Controlled Cooking Test:** Evaluates the stove's performance in realistic cooking scenarios.
    c. **Emissions Testing:** Assesses the environmental impact of cookstoves by measuring pollutant emissions.

    These approaches will support the development and adoption of effective clean cooking technologies while ensuring broad participation and continuous improvement in the sector.

3.6 Principles/Enablers of Success.

Achieving successful clean cooking in Zimbabwe requires a multifaceted approach that addresses various key factors. The following factors are essential for driving the effective implementation and sustainability of clean cooking solutions:

1. **Common Definition:** Establish a shared understanding of what constitutes clean cooking.
2. **Energy Efficiency:** Prioritize energy-efficient technologies and practices.
3. **Integrated Approaches:** Implement both bottom-up and top-down strategies for broader engagement.
4. **Synchronised Government Approach:** Ensure coordinated action across all levels of government.
5. **Multi-Stakeholder Engagement:** Involve various stakeholders, including communities, NGOs, and the private sector.
6. **Gender Mainstreaming:** Address gender considerations to enhance participation and benefits.
7. **Disability Inclusion:** Ensure that clean cooking solutions are accessible to people with disabilities.
8. **Resource Allocation:** Commit adequate resources to support clean cooking initiatives.
9. **Effective Monitoring and Evaluation:** Establish robust systems to track progress and measure impact.

These principles will guide the successful implementation of clean cooking strategies in Zimbabwe.

4 Strategies for Transition to Clean Cooking

4.1 Clean Cooking Objectives for Zimbabwe

The objectives align with international Clean Cooking standards, including ISO guidelines and UNFCCC Nationally Determined Contributions (NDCs). For Zimbabwe, the clean cooking goals should aim for Net Zero contributions to indoor air pollution, total air pollution, and environmental impacts by 2030. Achieving Net Zero air pollution means that cooking practices must not generate additional smoke or particulate matter indoors or outdoors. Additionally, Net Zero environmental impacts involve:

1. Utilising fuels that do not compromise existing carbon sinks, avoiding forest degradation through efficient cookstoves, like tsotso stoves, and sustainable fuels that do not require tree cutting.
2. Ensuring that fuels do not disrupt atmospheric conditions or contribute to greenhouse gas emissions (CO_2, CH_4).
3. Implementing smokeless stoves, clean fuel sources, and cooking systems that maintain emissions within acceptable environmental limits.
4. Attaining fuel efficiency that leads to net-zero emissions.
5. Ensuring that cooking technologies do not generate harmful waste or pose health and safety risks to people and ecosystems.
6. Integrating innovative technologies, such as carbon capture, to enhance emissions reduction strategies and contribute to net-zero goals.

4.2 Clean Cooking Strategies

The National Clean Cooking Strategy aims to establish a comprehensive framework to transition Zimbabwe towards sustainable, efficient, and accessible cooking solutions. Central to this strategy is a well-defined policy framework that aligns national goals with international standards and best practices. Building technical capacity among stakeholders, including government, industry, and community actors, is essential for effective implementation. Support for innovation, research, and development will drive advances in clean cooking technologies, while targeted training programs will equip industry players, private sector partners, suppliers, and financiers with the skills needed to foster growth in this sector. Adequate financial resources and established clean cooking standards will ensure product quality, safety, and accessibility, facilitating the shift towards cleaner fuels and technologies. By fostering strategic partnerships and robust governance mechanisms, including a National Clean Cooking Technical Committee with designated focal points, this strategy aims to coordinate efforts and maximize impact across all sectors, accelerating Zimbabwe's transition to clean cooking solutions.

Strategy 1: Strengthen Governance and Coordination for Clean Cooking

Key Stakeholders: Ministry of Energy and Power Development; Ministry of Environment, Climate and Wildlife; Ministry of Local Government and Public Works; and Ministry of National Housing and Social Amenities.

Objectives:

SO1. Strengthen governance and coordination within the Clean Cooking sector.
SO2. Increase awareness of Clean Cooking technologies and their benefits among users and stakeholders.
SO3. Promote behaviour change towards adopting Clean Cooking practices.
SO4. stablish effective monitoring, evaluation, and learning (MEL) mechanisms.

Strategy 2: Integrate Clean Cooking into Infrastructure, Green Buildings, and Planning

Key Stakeholders: Ministry of Local Government and Public Works; Ministry of National Housing and Social Amenities; Ministry of Energy and Power Development; Ministry of Health and Child Welfare; Ministry of Primary and Secondary Education; Ministry of Higher and Tertiary Education, Innovation, Science and Technology Development; and Local Authorities.

Objectives:

SO1. Ensure accessible energy infrastructure for Clean Cooking.
SO2. Secure reliable sources of Clean Cooking fuel and energy.
SO3. Make Clean Cooking technology consistently available, including stoves, appliances, and accessories powered by electricity, LPG, biogas, biomethane, and other sustainable fuels. Technologies that sustainably use firewood or integrate carbon management innovations are also included.
SO4. Incorporate Clean Cooking infrastructure and technology in building and infrastructure design.
SO5. Develop innovative financing models for Clean Cooking infrastructure and retrofitting.

Strategy 3: Mobilize Gender and Youth-Inclusive Financing for Clean Cooking Transition

As of December 2023, the estimated financial need for household stove purchases in Zimbabwe stands at US$791.5 million, with an additional US$6 million required annually due to population growth. Preliminary studies suggest potential funding sources, including 44% from households, 7.5% from suppliers and microfinance, and 49% from development partners. Further studies are needed to determine financing needs for business expansion, awareness initiatives, incubation, research, and development.

Key Stakeholders: Ministry of Energy and Power Development; Financial Institutions; Ministry of Youth Empowerment and Development, and Vocational Training; Donors; and NGOs.

Objectives:

SO1. Support local innovation, production, and redesign of Clean Cooking technologies to reduce reliance on imported stoves.
SO2. Build stakeholder capacity to attract investment in Clean Cooking.
SO3. Develop a diverse financing portfolio, including household self-financing, supplier credits, and development funds.
SO4. Enhance financial inclusion to broaden Clean Cooking access.
SO5. Strengthen awareness and education campaigns.

SO6. Foster collaborative financing models among stakeholders.
SO7. Leverage carbon credit financing to support Clean Cooking initiatives.
SO8. Prioritize verified clean cooking outcomes to increase competitiveness for international funding.
SO9. Implement data-driven decision-making to support transparent and impactful financial planning.

Effective financing strategies, based on measurable impacts, are critical for attracting international support and advancing Clean Cooking goals in Zimbabwe.

Strategy 4: Promote Gender and Social Inclusion in the Clean Cooking Sector

Key Stakeholders: Ministry of Energy and Power Development; Ministry of Youth Empowerment and Development, and Vocational Training; and Ministry of Women Affairs, Community, Small and Medium Enterprises Development.

Objectives:

SO1. Establish or enhance forums for active participation of women, youth, the elderly, and individuals with specific needs.
SO2. Ensure Clean Cooking benefits are accessible and inclusive for all groups.
SO3. Encourage active stakeholder engagement across the Clean Cooking sector.

This strategy aims to integrate gender and social inclusion, ensuring equitable participation and access to Clean Cooking initiatives.

Strategy 5: Support Local Manufacturing of Clean Cooking Technologies and Appliances

Key Stakeholders: Private Sector; Standards Association of Zimbabwe; Ministry of Energy and Power Development; Ministry of Industry and Commerce; Financial Institutions; Ministry of Women Affairs, Community, Small and Medium Enterprises Development; and Ministry of Youth Empowerment and Development, and Vocational Training.

Objectives:

SO1. Engage the private sector in Clean Cooking initiatives.
SO2. Develop consumer financing models to make Clean Cooking affordable.
SO3. Support the private sector in implementing innovative financing models.
SO4. Strengthen capacity for manufacturers, suppliers, and distributors of Clean Cooking appliances through technical assistance and mentorship.
SO5. Enable private sector access to carbon financing opportunities.
SO6. Promote inclusive business models that support lending to youth, women, and marginalized groups.

This strategy aims to bolster local manufacturing and financing in the Clean Cooking sector, promoting economic growth and accessibility.

Strategy 6: Develop and Review Standards for Clean Cooking

Key Stakeholders: Standards Association of Zimbabwe; Ministry of Energy and Power Development; Universities; Scientific and Industrial Research and Development Centre (SIRDC); Private Sector; NGOs; Technical and Polytechnic Colleges; Environmental Management Agency (EMA); and, Forestry Commission.

Objectives:

SO1. Establish Clean Cooking Technical Sub-Committees (CCTC-subs) at national and district levels.
SO2. Build national capacity with appropriate equipment and trained personnel for testing Clean Cooking technologies.

This strategy aims to ensure the development and consistent review of standards, enhancing the quality and safety of Clean Cooking technologies across energy sources.

Strategy 7: Support Innovation and Incubation in Clean Cooking

Key Stakeholders: Ministry of Energy and Power Development; Universities; SIRDC; Private Sector; NGOs; Technical and Polytechnic Colleges; Ministry of Women Affairs, Community, Small and Medium Enterprises Development; and Ministry of Youth Empowerment and Development, and Vocational Training.

Objectives:

SO1. Identify gaps in the Clean Cooking market and value chain, and mobilize resources to support innovation.
SO2. Establish functional district/regional innovation and incubation hubs for Clean Cooking.
SO3. Support local innovators with Intellectual Property registration and management.
SO4. Conduct market research to guide impactful Clean Cooking interventions and emission reduction.

Strategy 8: Advance Research and Development in Clean Cooking

Key Stakeholders: Ministry of Energy and Power Development, Universities, SIRDC, Private Sector, NGOs, Technical and Polytechnical Colleges, Ministry of Health and Child Welfare, Ministry of Women Affairs, Community, Small and Medium Enterprises Development, Ministry of Youth Empowerment and Development and Vocational Training.

Objectives:

SO1. Identify information gaps in Clean Cooking market and value chain.
SO2. Conduct research for a data-driven transition to Clean Cooking.
SO3. Establish district research centres for Clean Cooking.
SO4. Mobilise resources for Clean Cooking R&D.
SO5. Perform market research to support strategic interventions and emission reduction.
SO6. Use data insights to understand consumer needs and design effective financial products.

Strategy 9: Address Cross-Cutting Issues in Clean Cooking

Key Stakeholders: Ministry of Energy and Power Development, Media, Traditional and Local Leaders, Ministry of Health and Child Welfare, Ministry of Lands, Agriculture, Water, Fisheries& Rural Resettlement, Consumer Council of Zimbabwe, Ministry of Youth Empowerment and Development and Vocational Training.

Objectives:

SO1. Promote youth inclusion in Clean Cooking.
SO2. Increase awareness through communication and outreach.
SO3. Develop capacity-building and knowledge-sharing programs.
SO4. Conduct baseline studies on health impacts of bio-slurry as fertilizer.
SO5. Study health risks of indoor air pollution from cooking.
SO6. Encourage local production of Clean Cooking technologies.
SO7. Strengthen institutional capacities for Clean Cooking.
SO8. Facilitate stakeholder engagement to attract resources.
SO9. Develop a comprehensive monitoring and evaluation framework.
SO10. Uphold consumer rights, including safety, information, choice, and health.

These strategies support inclusive, data-driven growth and consumer rights within Zimbabwe's Clean Cooking sector.

5 Clean Cooking Sub-Strategies

The National Clean Cooking Strategy emphasizes a diverse approach to transforming Zimbabwe's cooking energy landscape by promoting cleaner and more efficient technologies. This section explores the various sub-strategies focused on specific cooking solutions, starting with e-cooking (electric cooking), followed by other key alternatives such as LPG, biogas, natural gas, and solar-based cooking. Each sub-strategy outlines targeted objectives to increase adoption, enhance accessibility, and build local manufacturing and technical capacity, ultimately driving Zimbabwe's transition to a more sustainable and inclusive cooking environment.

5.1 Cooking With Electricity (E-Cooking)

Strategic Sub-Objectives (SSOs)

SSO1. Local Manufacturing

- Encourage and support the local manufacturing of electric cooking appliances to boost the availability of locally produced options and decrease the dependency on imported electric cookers within Zimbabwe.

SSO2. Electricity Supply and Reliability

- Enhance electricity supply and reliability, with a focus on expanding service to underserved rural communities to make e-cooking viable across all areas.

SSO3. Affordability

- Increase the affordability of cooking with electricity through targeted subsidies, tariffs, or incentives, making e-cooking accessible to a broader demographic.

SSO4. Awareness

- Raise awareness about the health, environmental, and economic benefits of e-cooking among households and cooking enterprises, promoting its adoption across various sectors.

5.2 Cooking with LPG, Biogas and Natural Gas (G-Cooking)

Strategic Sub-Objectives (SSOs)

SSO1. Awareness and Education

- Raise public awareness on the benefits of LPG, biogas, and natural gas for cooking, focusing on health, safety, and environmental advantages.
- Conduct consumer education sessions on biogas and its technology, creating a knowledge base that encourages adoption in households, enterprises, and institutions.

SSO2. Accessibility and Market Development

- Develop policies to improve access to LPG, biogas and natural gas, promoting their use in public institutions over biomass, and establishing branded cylinder recirculation models to increase safety and convenience.
- Expand gas cylinder inventory and distribution networks through collaborations with the private sector, aiming to increase rural access from 24% to 70%.
- Produce and distribute catalogues and maps of gas cookstoves, appliances, refilling stations, and suppliers to facilitate easy access.

SSO3. Affordability and Financing

- Create innovative financing models to reduce the upfront cost of gas installations, such as portable biogas systems and PAYGO technology, making it easier for urban and peri-urban areas to adopt these solutions.
- Incentivize local manufacturing of gas appliances to reduce reliance on imports, improving affordability while boosting local production.

SSO4. Technical and Infrastructure Support

- Promote the use of diverse feedstocks to enhance biogas production viability and sustainability.
- Increase technical capacity within the biogas sector by training experts capable of installing and maintaining quality biogas digesters, ensuring the longevity and effectiveness of biogas installations.
- Incentivize and assist schools, institutions, and other communal spaces to install biogas digesters, promoting shared kitchens or a "rent-a-stove" model in economic centres to maximize resource efficiency.

SSO5. Innovation and Safety Improvements

- Encourage the development of user-friendly technologies like LPG and natural gas meters, and alerts to prevent sudden fuel depletion during cooking.
- Strengthen market confidence in gas safety through regulatory standards and quality checks, ensuring safe, reliable options for consumers across all sectors.

SSO6. Natural Gas Research and Planning

- Conduct comprehensive studies to assess the feasibility of natural gas as a sustainable cooking fuel in Zimbabwe, exploring potential supply channels and infrastructure requirements to support long-term adoption.

Through these objectives, the strategy seeks to increase clean fuel adoption, enhance infrastructure and accessibility, support local manufacturing, and promote long-term sustainability in Zimbabwe's cooking energy landscape.

5.2.1 Women and G-Cooking

Strategic Sub-Objectives (SSOs)

SSO1. Knowledge and Empowerment

- Equip women with comprehensive knowledge of safe and effective usage of LPG, biogas, and natural gas, highlighting the potential of g-cooking to enhance women's earning potential, household decision-making, and social status within communities.

SSO2. Economic Empowerment in Cooking Businesses

- Strengthen economic opportunities for women in cooking-related businesses by promoting the adoption of efficient g-cooking technologies, such as LPG, biogas, and natural gas appliances, to support profitable and sustainable operations.

SSO3. Income Diversification and Active Participation in the Value Chain

- Encouraging women's active participation in the g-cooking value chain through roles in distribution, sales, maintenance, and education supports both income diversification and economic resilience for women. By creating accessible entry

points across these roles, this approach opens up new professional and entrepreneurial opportunities, contributing to gender balance and strengthening women's economic empowerment within the sector.

SSO4. Profitability and Productivity in Women-led Enterprises

- Enhance the profitability of women-owned enterprises by promoting g-cooking solutions that offer a reliable and clean energy source, reducing fuel costs, improving productivity, and enabling growth in business.

SSO5. Career Advancement in the G-Cooking Industry

- Increase representation of women in technical, managerial, and operational roles within the g-cooking industry by providing skills training and development programs, paving pathways for professional women in a growing sector.

SSO6. Engagement in Clean Cooking Markets

- Develop targeted outreach and support strategies to engage women as both consumers and entrepreneurs within clean cooking markets, improving access to affordable g-cooking resources and fostering inclusivity.

SSO7. Confidence and Safety Education

- Build women's confidence and knowledge in using LPG, biogas, and natural gas through safety education and practical training sessions, addressing common safety concerns and promoting wider adoption of clean cooking technologies.

This approach focuses on empowering women through knowledge, economic support, and career opportunities, establishing a solid foundation for their active engagement and leadership in the g-cooking industry.

5.3 Cooking With Liquid Fuels (L-Cooking)

Strategic Sub-Objectives (SSOs)

SSO1: Awareness and Feasibility Studies

- Increase awareness of biofuel applications in cooking, focusing on the potential for institutions to transition from petroleum-based oils to bio-oils in heat transfer systems.

SSO2: Biofuel Research and Development

- Conduct studies to assess the feasibility and effectiveness of biofuels for use in cooking technologies, particularly in institutional jacket stoves.

SSO3: Biofuels Policy Revision

- Revise the biofuels policy to explicitly incorporate clean cooking objectives, ensuring alignment with national energy and environmental goals.

SSO4: Collaboration with Ethanol Producers

- Collaborate with ethanol-producing and sorghum distillation companies to allocate a quota of ethanol for testing biofuels cooking technology uptake in Zimbabwe, fostering innovation and local production.

SSO5: Standards Development

- Develop and implement standards for biofuels cooking technology in Zimbabwe to ensure safety, efficiency, and compatibility with existing cooking systems.

SSO6: Pilot Programs and Demonstrations

- Launch pilot programs in selected institutions to demonstrate the feasibility and benefits of using biofuels in jacket stoves, providing data and insights to support broader adoption.

SSO7: Capacity Building for Biofuel Integration

- Train technical staff and operators within institutions to manage biofuel-based systems in jacket stoves, ensuring safe and efficient usage while building local expertise in biofuel integration.

This integrated sub-strategy aims to promote biofuels as a viable alternative in the L-cooking sector, supporting the transition from petroleum-based fuels to cleaner, renewable options across households, enterprises, and institutions.

5.4 Cooking With Traditional Solid Fuels (S-Cooking)

Strategic Sub-Objectives (SSOs)

SSO1. Charcoal Usage Restrictions

- Restrict the use of charcoal for cooking to protect carbon sinks, promoting environmental sustainability and reducing forest degradation.

SSO2. Charcoal Import Regulation

- Regulate the importation of charcoal into the country to control supply and mitigate environmental impacts associated with charcoal production.

SSO3. Promotion of Alternative Bio-charcoal

- Encourage the use of alternative bio-charcoal derived from household and municipal waste to reduce reliance on traditional charcoal.

SSO4. Sustainable Charcoal Production

- Promote the production of charcoal from invasive tree species rather than indigenous trees to conserve natural forests while utilising available resources.

SSO5. Firewood Usage Reduction

- Aim to reduce the use of firewood for cooking by 2030 through targeted interventions and public awareness campaigns.

SSO6. Establishment of Woodlots

- Promote the establishment of community woodlots to ensure sustainable firewood resources, reducing pressure on natural forests.

SSO7. Alternative Fuel Promotion

- Advocate for the use of alternative fuel sources, such as briquettes and pellets, as an interim measure to transition from firewood use to cleaner cooking options.

SSO8. Capacity Building and Awareness

- Raise awareness and develop the capacity of stakeholders in sustainable cooking to initiate clean cooking programs and initiatives, ensuring widespread participation and support.

SSO9. Research and Data Collection

- Conduct research to gather data on traditional fuel usage patterns and preferences, enabling targeted interventions that address the specific needs of different demographics and regions.

SSO10. Community Engagement

- Foster community engagement in the transition to alternative fuels through workshops and awareness campaigns, encouraging local participation and ownership of the initiative.

This comprehensive strategy seeks to mitigate the environmental impacts of traditional fuels, promote sustainable alternatives, and enhance the health and well-being of communities through cleaner cooking solutions.

5.5 Solar-Based Cooking

This sub-strategy aims to promote solar energy as a comprehensive clean cooking solution. Solar cooking is an application of solar electric or thermal technology and it encompasses several forms:

1. **Solar Thermal Cooking**: This method uses solar thermal energy without electricity, employing devices like parabolic solar cookers, solar ovens, and solar water heaters. Solar cookers can reach temperatures up to 148°C, allowing for cooking, sterilization, and food preservation[38]. Advantages include zero fuel costs and environmental friendliness, while the main drawback is slower cooking times.
2. **Solar-Powered Electric Cooking**: This approach uses electricity generated by solar systems for cooking. It includes standalone systems or those that use grid energy, often employing induction stoves or pressure cookers[39]. This method can be used anytime, even during bad weather, due to battery storage.
3. **Battery-Based Cooking**: Hybrid systems utilise batteries charged by solar PV or grid electricity, providing backup during outages. These systems are suitable for areas with inconsistent power supply and promote investment in solar home systems. However, high upfront installation costs are a significant disadvantage.
4. **Solar Mini Grid Cooking**: Cooking devices connected to a solar mini grid fall under electric cooking. Users pay for electricity usage, unlike standalone systems where upfront costs are incurred. For example, the Mashaba Solar Mini Grid in Gwanda, Zimbabwe, uses prepaid meters, eliminating high initial costs for users.

Strategic Sub-Objectives (SSOs)

SSO1. Promote Solar Water Heating

- Encourage the use of solar water heating systems to reduce cooking time and save energy across households, institutions, and enterprises.

[38] Your Guide to cooking with solar energy – LGCY Power https://www.lgcypower.com/cooking-using-solar-power/#:~:text=A%20solar%20box%20cooker%20has,sunlight%20on%20a%20small%20area.

[39] Solar Electric Cooking: Status August 2022; UNHCR; https://www.unhcr.org/media/case-study-solar-electric-cooking

SSO2. Increase Uptake of Solar Cooking Solutions

- Facilitate the adoption of various types of solar cooking technologies for households, institutions, and enterprises.

SSO3. Incentivize Solar Cooker Adoption

- Provide incentives for the purchase and use of different forms of solar cookers.

SSO4. Support Innovations in Solar Cooking Technologies

- Encourage the development of innovative and efficient solar cooking technologies through grants and other support mechanisms.

This strategy seeks to harness solar energy effectively, enhancing cooking efficiency and sustainability while reducing reliance on traditional fuels.

5.6 Waste to Energy for Cooking (WtE)

Strategic Sub-Objectives (SSOs)

SSO1. Awareness and Education

- Raise awareness of the benefits of Waste to Energy (WtE) in clean cooking, particularly targeting local authorities, institutions, and high organic waste generators, to promote adoption and understanding of WtE technologies.

SSO2. Financing and Business Models

- Develop innovative business and financing models to lower the high upfront costs of WtE installations, making them more accessible and financially viable for communities and institutions.

SSO3. WtE Plant Development

- Encourage local authorities to develop WtE plants utilising sewage and other organic waste, turning municipal waste streams into valuable energy resources for clean cooking.

SSO4. Capacity Building and Technical Expertise

- Increase the technical capacity of the WtE sector by training experts in designing and installing high-quality WtE systems, ensuring sustainable and efficient plant operation.

SSO5. Technology Innovation and Application

- Support advancements in WtE technology, such as the development of compressed biomethane as a cooking fuel, and encourage other innovations that can be efficiently integrated into the clean cooking sector.

This strategy aims to position WtE as a sustainable and economically viable solution within the clean cooking sector by fostering awareness, financial accessibility, and technical expertise.

5.7 Other Alternative Cooking Technologies (OT-Cooking)

Strategic Sub-Objectives (SSOs)

SSO1. Promote Emerging Efficient Cooking Solutions (EECS)

- Encourage the adoption of advanced cooking technologies, such as electric, solar, and hybrid systems, to enhance efficiency and reduce emissions.

SSO2. Research and Development

- Invest in R&D to explore innovative clean cooking technologies and collaborate with academic institutions and industry stakeholders.

SSO3. Incentivize Innovation

- Create incentive programs for the development and commercialization of efficient cooking technologies through grants, subsidies, or tax breaks.

SSO4. Capacity Building

- Provide training for local entrepreneurs and technicians on the design, installation, and maintenance of EECS and clean cooking technologies.

SSO5. Consumer Awareness

- Launch campaigns to educate consumers about the benefits of efficient cooking solutions and the environmental and health impacts of traditional methods.

SSO6. Collaboration and Partnerships

- Foster partnerships among government, NGOs, and the private sector to enhance resources and technology transfer for advancing clean cooking solutions.

This strategy aims to leverage innovation and collaboration to improve cooking efficiency, reduce environmental impacts, and enhance community health.

6 National Clean Cooking Strategy (2024 to 2030)

6.1 National Clean Cooking Road Map

The roadmap outlined in Table 3 presents a systematic approach encompassing essential governance, infrastructure, financing, inclusivity, standards, and skills development, with cross-cutting issues reserved for broad-based awareness and support. It outlines Zimbabwe's long-term vision for a transition to clean cooking, emphasizing gender inclusion, local manufacturing, and robust policy frameworks. Through broad stakeholder engagement and diversified financing, the roadmap strategically fosters sustainable, community-driven, and accessible clean cooking solutions nationwide.

Table 3. National Clean Cooking Roadmap Outlining the Key Pillars, Strategic Objectives, Key Actions and Outcomes

Pillars	Strategic Objectives (SOs)	Key Actions	Outcomes	Timeline	Responsible Ministries/ Agencies
1. Governance, Policy, and Coordination	SO1. Establish inclusive governance structures SO2. Develop supportive policies SO3. Implement monitoring and evaluation frameworks	i. Develop and implement a national Clean Cooking policy ii. Establish multi-stakeholder governance bodies, including a CCTC at national and district levels iii. Commission Clean Cooking Energy Accessibility Study iv. Create an M&E framework and periodic reporting	i. Clear governance structure ii. Inclusive policy framework iii. Coordinated activities	2024-2026	MoEPD; Ministry of Local Government and Public Works; Ministry of Finance; Ministry of Health & Child Care; Ministry of Women Affairs, Community, Small and Medium Enterprises Development; Local Authorities; Ministry of Environment, Climate and Wildlife; and Other Relevant Line Ministries
2. Infrastructure Integration and Access	SO1. Incorporate Clean Cooking in national infrastructure	i. Integrate Clean Cooking standards into the National Green Building Policy ii. Retrofit public facilities (clinics, schools etc.) with multi-energy	i. Widespread adoption of Clean Cooking infrastructure	2024-2030	MoEPD; Ministry of National Housing and Social Amenities; Local Authorities; Ministry of Primary & Secondary Education;

	SO2. Enhance access to Clean Cooking energy and facilities	cooking systems (electricity, LPG, biogas) iii. Develop financing mechanisms for Clean Cooking infrastructure and retrofitting in peri-urban and rural areas	ii. Improved access to Clean Cooking energy		Ministry of Public Service, Labour, and Social Welfare; Ministry of Environment, Climate and Wildlife; and Other Relevant Line Ministries
3. Standards, Innovation, and Research	SO1. Establish comprehensive standards and testing SO2. Support innovation and research for technology adoption	i. Create CCTC subcommittees for technology standardization and testing ii. Establish testing labs for Clean Cooking technologies iii. Develop a national Clean Cooking Research Framework to guide R&D priorities iv. Engage universities and private sector on Clean Cooking IP development	i. High-quality, safe Clean Cooking products that meet national standards ii. Increased R&D in Clean Cooking	2024-2030	Standards Association of Zimbabwe (SAZ); MoEPD; ZERA; Ministry of Higher Education, Science and Technology Development; SIRDC; Universities; EMA; Forestry Commission; Private Sector; Ministry of Environment, Climate and Wildlife; and Other Relevant Line Ministries
4. Local Manufacturing and Private Sector Engagement	SO1. Foster local production of Clean Cooking technologies SO2. Support private sector financing and technical capacity	i. Facilitate inclusive partnerships among major manufacturers and artisans to promote localized production ii. Develop consumer finance programs and business training for local suppliers iii. Mobilize private sector for production of high-demand Clean Cooking tech to reduce imports and boost affordability	i. Boosted local production ii. Increased access to affordable and locally made Clean Cooking technologies	2024-2030	MoEPD; Ministry of Industry & Commerce; Ministry of Finance; Private Sector; NGOs; Ministry of Women Affairs, Community, Small and Medium Enterprises Development; Ministry of Environment, Climate and Wildlife; and Other Relevant Line Ministries

5. Inclusive Financing for Clean Cooking	SO1. Develop inclusive financing models SO2. Mobilize funding and partnerships for sector growth	i. Collaborate with financial institutions to offer inclusive loans and credit for Clean Cooking solutions ii. Establish Clean Cooking Investment Forums and coordinate joint financing programs with public and private investors iii. Launch consumer and business finance options to empower marginalised groups (youth, women and PWDs) with lower interest rates and flexible terms	i. Increased financing options for diverse groups ii. Expanded Clean Cooking adoption through affordable solutions	2024-2028	MoEPD; Financial Institutions; NGOs; Local Business Incubation Hubs; Development Partners; Ministry of Women Affairs, Community, Small and Medium Enterprises Development; Ministry of Environment, Climate and Wildlife; and Other Relevant Line Ministries
6. Community Engagement, Behaviour Change, and Awareness	SO1. Drive behaviour change toward Clean Cooking SO2. Increase stakeholder awareness and community engagement	i. Develop and implement community-level Clean Cooking awareness campaigns, including Clean Cooking Weeks and Demonstration Days ii. Engage community and social influencers (local leaders, churches) to champion clean cooking practices iii. Set up accessible information centres and local Clean Cooking fairs to connect communities with suppliers	i. Improved public understanding of Clean Cooking benefits ii. Increased community adoption of Clean Cooking technologies	2024-2030	MoEPD; Ministry of Youth Empowerment, Development and Vocational Training; Ministry of Local Government and Public Works; Community-Based Organisations; NGOs; Ministry of Environment, Climate and Wildlife; and Other Relevant Line Ministries
7. Gender and Social Inclusion	SO1. Promote gender equality in Clean Cooking	i. Host Clean Cooking training events for women and youths	i. Increased participation and	2024-2030	Ministry of Women's Affairs Community, Small and Medium Enterprises

	SO2. Ensure inclusion of vulnerable groups (Women, Youth and PWDs)	ii. Build capacity and empower women entrepreneurs in gas distribution, appliance sales, and support sectors iii. Create a mentorship program targeting young women in Clean Cooking roles (suppliers, technicians, etc.) iv. Design accessible Clean Cooking infrastructure for PWDs	empowerment of women, youth, and PWDs in the Clean Cooking sector		Development; Ministry of Youth Empowerment, Development and Vocational Training; MoEPD; Community Organisations; NGOs; Development Partners; Ministry of Environment, Climate and Wildlife; and Other Relevant Line Ministries
8. Skills Development and Capacity Building	SO1. Enhance Clean Cooking expertise in Zimbabwe SO2. Develop curriculum for Clean Cooking skills training	i. Design Clean Cooking training modules for Technical Vocational Colleges, Polytechnics, and Universities ii. Develop certifications for Clean Cooking installation, sales, and repair iii. Facilitate industrial attachments, internships, and mentorships with private Clean Cooking companies and hubs iv. Provide grants/bursaries to students pursuing Clean Cooking studies	i. Increased capacity and technical skills among Zimbabwean workforce in Clean Cooking ii. Improved local expertise	2024-2030	MoEPD; Ministry of Higher Education, Science and Technology Development; Technical Colleges; Universities; Development Partners; UNESCO; Private Sector; Ministry of Women's Affairs Community, Small and Medium Enterprises Development; Ministry of Youth Empowerment, Development and Vocational Training; Ministry of Environment, Climate and Wildlife; and Other Relevant Line Ministries
9. Monitoring, Evaluation, and Learning (MEL)	SO1. Establish comprehensive monitoring and	i. Implement performance tracking and data collection across Clean Cooking programs	i. Data-driven decisions and	2024-2030	MoEPD; Ministry of Finance; NGOs; Universities; Ministry of Environment, Climate and

	learning mechanisms	ii. Train stakeholders in MEL methodologies to ensure accurate reporting iii. Introduce a results-based financing framework to reward efficient programs and innovative approaches iv. Commission a periodic study on sector progress, including policy impact, technology uptake, and community adoption rates	continuous improvements ii. Transparency in Clean Cooking initiatives		Wildlife; Monitoring Bodies; and Other Relevant Line Ministries
10. Cross-Cutting Issues	SO1. Promote health and environmental benefits SO2. Uphold consumer rights and safety	i. Conduct baseline studies on health impacts of Clean Cooking (e.g., indoor air pollution, use of bio-slurry) ii. Raise awareness on Clean Cooking health and safety benefits through workshops and materials in local languages iii. Ensure regulatory compliance with consumer rights, including safety standards, warranties, and servicing of appliances	i. Improved public health ii. Environmental sustainability iii. Enhanced consumer trust and safety	2024-2030	Ministry of Health & Child Care; Ministry of Public Service, Labour, and Social Welfare; Consumer Protection Commission; EMA; MoEPD Ministry of Environment, Climate and Wildlife; and Other Relevant Line Ministries

6.2 National Clean Cooking Implementation Plan

This implementation plan outlines Zimbabwe's strategic approach to transition toward sustainable and inclusive clean cooking solutions by 2030. With a focus on policy development, infrastructure integration, inclusive financing, and local manufacturing support, the plan establishes clear pathways to reduce dependence on traditional cooking fuels, improve public health outcomes, and promote environmental sustainability. It integrates key pillars such as gender and youth inclusion, quality standards, innovation, and broad-based public awareness to foster a collaborative environment that supports clean cooking initiatives across the country. Through structured timelines, responsible governance, and continuous monitoring and evaluation, this plan positions Zimbabwe to achieve its clean cooking goals in a way that aligns with national development priorities and community needs.

6.2.1 Objective and Purpose

Objective:

To transition Zimbabwe toward sustainable clean cooking practices by 2030 through enhanced governance, infrastructure integration, inclusive financing, local manufacturing support, innovation, and public engagement.

Purpose:

This plan aims to establish a structured pathway to reduce reliance on traditional fuels, improve health outcomes, promote environmental sustainability, and foster economic opportunities in the clean cooking sector.

6.2.2 Key Actions and Milestones

Actions are prioritized under each pillar, with milestones set at three intervals (2024-2025, 2026-2028, 2029-2030) for phased completion and Table 4 outlines key actions and the milestone targets. Achieving the set goals for clean cooking requires a dedicated budget to support the prioritized actions and ensure milestones are met across each phase.

Table 4. Key Actions and Milestones for Implementing the National Clean Cooking Strategy

Pillar	Key Actions	Milestones
1. Governance and Coordination	i. Develop and implement a National Clean Cooking policy ii. Form multi-stakeholder committees, ensuring cross-sectoral engagement	**2025** i. National policy launched ii. Committees formed to guide implementation
2. Monitoring and Evaluation	i. Establish a baseline for tracking progress and impact ii. Develop M&E frameworks with software for real-time data collection iii. Schedule quarterly stakeholder review meetings for transparent updates and accountability	**2024** i. Baseline established ii. Quarterly review structure implemented

3. Infrastructure Integration	i. Incorporate Clean Cooking requirements into public infrastructure guidelines ii. Begin retrofitting of public facilities (schools, clinics) with clean cooking technology iii. Update the Green Building Code to include clean cooking standards	**2026** i. Green Building Code updated ii. 50% of identified public facilities retrofitted
4. Inclusive Financing	i. Design targeted financial products for vulnerable groups (women, youth and PWDs) ii. Introduce payroll deduction schemes to make clean cooking solutions affordable for employees.	**2026** i. Financial products launched ii. Adoption rates tracked and reported
5. Sector Development	i. Partner with GENEZ and Youth Associations to conduct awareness and training campaigns. ii. Actively support women-led initiatives in LPG distribution and clean cooking infrastructure projects.	**2025** i. 30% increase in women's participation in clean cooking initiatives
6. Standards and Quality Assurance	i. Establish local testing facilities for clean cooking technologies. ii. Standardize quality assurance requirements to support local manufacturers in producing high-quality, safe products.	**2026** i. 90% adoption rate of quality standards among local manufacturers
7. Innovation and Research	i. Set up innovation hubs and incubation programs to foster development in clean cooking technologies. ii. Mobilize international and local funding resources for research on clean cooking products.	**2027** i. Innovation hubs fully operational ii. Research funds secured
8. Cross-Cutting Public Awareness	i. Launch public awareness campaigns on clean cooking benefits, focusing on health and energy efficiency. ii. Develop and distribute educational materials in multiple languages and formats to reach diverse audiences.	**2025** i. 60% population awareness achieved ii. Educational materials widely distributed

6.3 Monitoring and Evaluation (M&E)

The Monitoring and Evaluation (M&E) approach for the National Clean Cooking Strategy aims to ensure effective implementation and continuous improvement of the initiative. The framework will focus on the following components:

1. **Performance Indicators**: Establish clear metrics to monitor adoption rates of clean cooking solutions, access to clean cooking, distribution of financing, integration of clean cooking infrastructure, and levels of public awareness. These indicators will provide a comprehensive view of progress toward strategic goals.
2. **Data Collection**: Implement a robust data collection system utilising digital tracking tools, regular surveys, and field reports to gather accurate and timely information. This will facilitate real-time monitoring and enhance the reliability of the data collected.
3. **Evaluation Cadence**: Conduct bi-annual reports to assess progress and impact, complemented by a thorough comprehensive review at the end of each implementation phase. This will ensure accountability and provide insights into the effectiveness of the strategy.
4. **Adjustments**: Leverage M&E findings to inform and guide annual adjustments in activities and budget allocations. This adaptive approach will enable stakeholders to respond effectively to emerging challenges and opportunities, optimizing the impact of the clean cooking initiative.

Key Indicators:

1. **Policy Development and Governance**: Number of policies developed, committees established.
2. **Infrastructure Integration**: Percentage of public facilities retrofitted.
3. **Financial Inclusion**: Loan and subsidy uptake by vulnerable groups.
4. **Standards and Quality**: Percentage of products certified as meeting standards.
5. **Innovation and Adoption**: Rate of adoption in communities and institutions.
6. **Access to clean cooking**: Percentage of households with access to clean cooking facilities.

6.4 Communication Plan

The communication plan for the National Clean Cooking Strategy is designed to effectively convey the initiative's goals, engage stakeholders, and promote the benefits of clean cooking solutions. The strategy will encompass the following key components:

1. **Target Audiences**: The communication plan will focus on several key stakeholders, including:
    a. **Government Agencies**: Ensuring alignment and support from relevant ministries and departments to facilitate policy implementation.
    b. **Local Communities**: Engaging residents directly affected by clean cooking initiatives to raise awareness and encourage adoption.
    c. **Private Sector**: Involving businesses in the clean cooking supply chain to foster partnerships and innovation.

d. **Non-Governmental Organisations (NGOs)**: Collaborating with NGOs to leverage their outreach capabilities and community trust.
e. **Development Partners:** Informing and mobilizing funding and technical support from international and local development partners.

2. **Channels**: A multi-faceted approach will be employed to disseminate information effectively:
   a. **Media**: Utilise traditional media outlets, such as television and radio, to reach a broad audience with impactful messaging.
   b. **Community Meetings**: Organize local gatherings to facilitate face-to-face engagement, allowing for deeper discussions and personalized outreach.
   c. **Social Media**: Leverage digital platforms to share success stories, updates, and resources, engaging a wider audience, particularly the youth.
   d. **Local Influencers**: Partner with respected community figures and local influencers to amplify messaging and build credibility within target audiences.
3. **Key Messages**: The communication strategy will emphasize the critical benefits of clean cooking solutions, including:
   a. **Health Benefits**: Highlighting the reduction in indoor air pollution and associated health risks, especially for women and children.
   b. **Environmental Impact**: Addressing how clean cooking practices contribute to reduced forest degradation and lower greenhouse gas emissions.
   c. **Economic Growth**: Demonstrating how clean cooking solutions can stimulate local economies, create jobs, and improve overall livelihoods.
4. **Feedback Mechanisms**: To ensure ongoing engagement and adaptation of the communication strategy, various feedback mechanisms will be implemented:
   a. **Surveys**: Conduct regular surveys to gather insights on public perception, awareness levels, and the effectiveness of communication efforts.
   b. **Community Meetings**: Facilitate open discussions during community meetings to solicit feedback and address concerns directly from stakeholders.
   c. **Social Media Engagement**: Actively monitor and respond to comments and messages on social media platforms to foster dialogue and gauge public opinion.

By implementing this comprehensive communication plan, the National Clean Cooking Strategy aims to build strong stakeholder relationships, raise awareness, and drive the adoption of clean cooking solutions across Zimbabwe.