

A CALL TO ACTION

The Future of Africa's Sustainable Cities

Why Clean Cooking Matters



CLEAN
COOKING
ALLIANCE



Local Governments
for Sustainability
AFRICA



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Foreword



**DYMPHNA
VAN DER LANS**
CEO, Clean Cooking Alliance

The global trend toward urbanization is affecting almost every facet of human society, including how people cook. Every day, millions of city residents rely on cooking fuels and technologies that harm their health, well-being, and economic potential. And urban dynamics are not confined to city limits: Lack of access to clean cooking contributes significantly to environmental degradation and climate change.

These developments are especially pronounced in sub-Saharan Africa, which is home to many of the world's fastest-growing cities but also to the communities with the lowest rates of access to clean cooking.

This is both a challenge and an opportunity. Most of the infrastructure needed to support these growing cities has yet to be built, which gives today's urban planners, policymakers, and the private sector a valuable chance to lay the groundwork for widespread adoption of clean cooking solutions in the years ahead. This transition must begin now.

As world leaders gather for the 28th United Nations Climate Change Conference (COP 28), they must recognize that access to clean cooking in Africa's cities is critical for meeting national, regional, and global climate targets. With adequate resources and support from governments and finance institutions, Africa's cities can be foundational to a more sustainable, resilient, and inclusive future.



KOBIE BRAND
Regional Director, ICLEI Africa;
Deputy Secretary General, ICLEI;
Director: Cities Biodiversity Center

It gives ICLEI Africa great pleasure to have co-developed this important report with the Clean Cooking Alliance. For decades, ICLEI Africa has been supporting our network cities as they embark on their sustainability journeys. Transitioning to universal access to clean cooking is vital in ensuring that current and future generations gain access to the plethora of benefits that clean cooking offers, as detailed in this report.

We stand ready, alongside the Clean Cooking Alliance, partners, and friends to enact this report's call for radical collaboration and new ways of working, to ensure that the policies, plans, and financing needed to implement clean cooking in African cities are scaled.

ICLEI Africa is taking action through policy co-development, testing public and private partnerships, and implementing clean cooking projects in our network cities. It is vital that we harness our experience for scaled action that delivers life-changing clean cooking solutions for many more communities across the continent—and the world.

We look forward to continuing this conversation and welcome all partners and friends to join us in this movement for positive change.

Foreword



YVONNE AKI-SAWYERS OBE

Mayor of Freetown, Sierra Leone

In the diverse tapestry of Africa's urban landscapes, cooking is not merely a daily task but a cultural cornerstone. The choices we make regarding cooking practices reverberate through our societies, influencing health outcomes, social inclusion, environmental sustainability, and economic development.

As the Mayor of Freetown, I understand the multifaceted challenges our cities face, and I recognize the profound impact that equitable and sustainable cooking solutions can have on the lives of our people. Freetown, one of the most densely populated cities in West Africa, is home to more than 1.1 million residents. More than 95% of the city's population lacks access to clean cooking fuels and technologies and relies on the unsustainable use of biomass fuels for cooking.

Freetown, like many African cities, has witnessed the toll traditional cooking methods take on the environment and on residents' health. The stark reality underscoring the urgency for transitioning to sustainable alternatives is reflected in the number of incidents related to biomass fuel fires reported in the city's informal settlements, the number of trees cut down for fuel, and the amount of time spent by women performing cooking-related activities each and every day. My city has witnessed firsthand the devastating impacts of deforestation. On Aug. 14, 2017, a catastrophic landslide and flooding disaster ripped through Freetown. This caused about US\$ 82.4 million of destruction and damage to buildings, infrastructure, and a reported loss of more than a thousand lives, especially in informal settlements.

The city has put in place measures to promote clean and sustainable development across all sectors. These measures are embedded within the Transform Freetown

Agenda, including interventions such as the #Freetown the Treetown program to plant and grow a million trees between 2020 and 2022; as well as Freetown's first Climate Action Strategy (2022–2030), which commits to improving access to clean cooking by 30% by 2030 and 100% by 2050. The Enabling African Cities for Transformative Energy Access (ENACT) project, led by ICLEI Africa, and other programs are helping us meet our commitments to provide clean cooking access for all.

This report serves as a compass, guiding us toward a future where every African city can boast of accessible, clean, and efficient cooking solutions. It highlights the central role that access to clean cooking can have across multiple sustainable development goals, while addressing the issues of air pollution, health, gender equity, environment, and social development. It also sparks a call for city authorities and other key stakeholders to prioritize clean cooking and enhance multilevel and multisectoral collaboration to drive funding and implementation for large-scale clean cooking transitions across African cities.

There can be no global impact without local action, and providing access to clean cooking is no exception to this. I encourage my fellow mayors, policymakers, and citizens to engage actively in this urgent agenda and to contribute and share additional strategies and good practices. Together, we can shape a future where cooking is a sustainable, accessible, and culturally rich experience for all our people, and where our urban areas thrive without sacrificing the natural beauty that surrounds us.



CHILANDO NAKALIMA CHITANGALA

Mayor of Lusaka, Zambia, and Vice Chairperson of the Covenant of Mayors in the sub-Saharan Africa (CoM SSA) Regional Mayors Forum

It is my pleasure and with a deep sense of purpose that I write this foreword for this timely and relevant report, which demonstrates the need for radical collaboration to address one of the most pressing challenges of our time: the transition to clean cooking in our cities.

This urgent need for sustainable solutions to the clean cooking challenge cannot be overstated. Access to clean cooking is not just an energy or environmental issue; it is a matter of health and social equity that disproportionately affects women and girls. It affects millions of people in our vibrant African cities, and it is an essential element in our quest for a more resilient, healthier, and more prosperous future.

I am honored to be a part of this endeavor, both as the Mayor of Lusaka, Zambia, and as the Vice Chairperson of the Covenant of Mayors in sub-Saharan Africa's Regional Mayors Forum. CoM SSA represents a union of African cities committed to addressing climate change and enhancing the quality of life for our citizens. Through this initiative, we champion sustainability, and the transition to clean cooking stands as a vital intervention in fulfilling our vision for universal access to sustainable and clean energy in African cities.

This report serves as a poignant reminder of the situation in our cities, while highlighting opportunities that still exist. Its call to action offers a road map, guiding us on how to align our ambitions and mobilize the necessary capital to scale clean cooking solutions across our great continent.

The success of our endeavors depends on the passion, commitment, and unity of purpose that we bring to this cause. I hope that this report will catalyze action, inspiring us to join hands and usher in a new era of clean cooking in African cities. Together, we can build a healthier, more sustainable future for our communities, leaving no one behind.

I invite you to explore this report, add your voice to the conversation, implement the call to action, and join us in our mission to empower Africa's cities to enable the clean cooking transition. The time for change is now, and together, we can light the path to a cleaner, healthier, and brighter future for all.



Peter Irungu / Clean Cooking Alliance

PART ONE

There Is No Just Transition Without Clean Cooking For All

▶ African governments and city leaders are grappling with the complex challenges of climate change, pollution, nature loss, energy poverty, and inequality in rapidly growing cities across the continent. Prioritizing clean cooking can deliver a range of benefits across these critical focus areas and is essential for a just energy transition.

CLEAN COOKING IS ESSENTIAL FOR A JUST ENERGY TRANSITION IN RAPIDLY URBANIZING CONTEXTS.

The way in which cities are designed and governed affects the quality of life for billions of people. Urban areas are engines of economic growth and innovation, holding the key to achieving the 2030 Agenda for Sustainable Development and the Sustainable Development Goals (SDGs). Yet, cities are also the most significant carbon emitters, contributors of pollution, and consumers of resources, placing them on the front lines of today's complex environmental, economic, and social challenges. Today's cities account for 80% of global GDP, two-thirds of global energy consumption, and more than 70% of annual global carbon emissions.¹ But these numbers disguise a great deal of variation: Cities in low-income countries, including most of the ones in Africa, have contributed less than 0.2% of these total emissions to date.²

Africa is urbanizing at unprecedented levels. Approximately 70% of the world's population is expected to be urban (2.5 billion more people) by 2050, and almost 90% of this growth is projected to take place in developing regions, mainly Africa and Asia.³ Currently, 17 of the 20 world's fastest-growing cities are in Africa, as the continent's urban populations are growing twice as fast as their rural counterparts.⁴ Africa is also at the center of efforts to combat climate change, and climate impacts are already being felt, even though Africa contributes less than 9% of global carbon emissions.⁵ Adding to the complexity, the continent is still grappling with the challenge of alleviating energy poverty and inequality amid a rapidly growing population—projected to increase from 1.4 billion people today to at least 2.4 billion by 2050—and the increasing pressure on existing energy resources.⁶



Alex Kamweru / United Nations Foundation

African cities already produce about 60% of the continent's GDP, currently valued at US\$ 700 billion and expected to reach US\$ 1.7 trillion by 2030.⁷

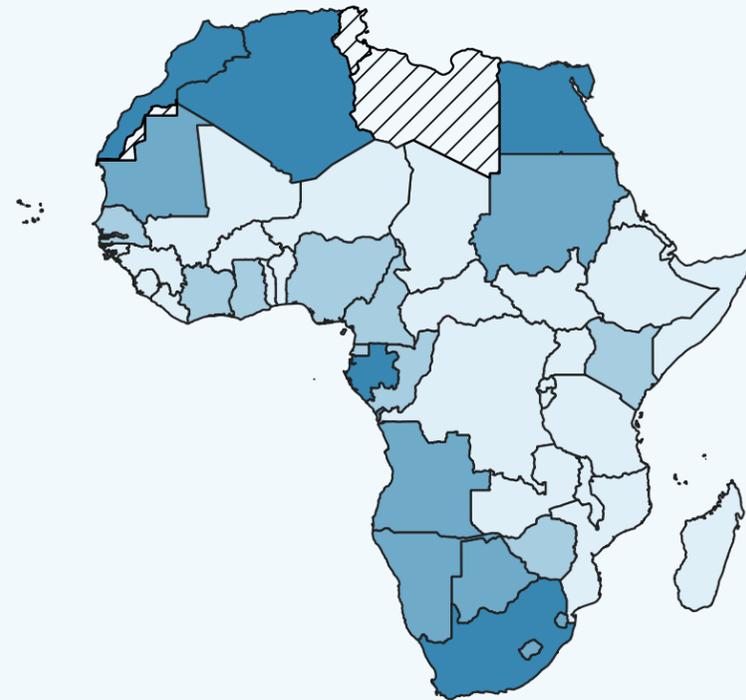
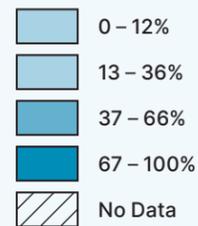
Yet, deepening inequalities related to energy access are preventing African cities from unleashing their full potential to drive sustainable development and increase opportunities for a growing youth population. In sub-Saharan Africa, cities currently use significantly less energy per capita than the global average, partly due to affordability, low access rates, and low levels of economic development.⁸ However, demand for energy services in Africa is expected to grow by a third between 2020 and 2030 as African countries further urbanize.⁹ The focus on decarbonization and the just transition has surged

as national and local governments work to tackle climate change and fulfill commitments to low-carbon and climate-resilient development. Investments in modern, clean sources of energy in African cities are urgently required to ensure that the continent can develop robust, inclusive, and low-carbon economies.

Energy poverty is recognized as a major obstacle to Africa's transformation goals as outlined in Agenda 2063: The Africa We Want.¹⁰ In sub-Saharan Africa, over 600 million people live without access to electricity and nearly 900 million without access to clean cooking fuels.¹¹ Unlike in Asia, where the access deficit to clean cooking has dropped significantly over the past decade, the number

of households in sub-Saharan Africa that lack access to clean cooking has more than doubled since 1990.¹² While energy access has often been viewed as a rural problem, in Africa it persists in urban areas, especially for the urban poor and those living in informal settlements and slums. In Africa, urban growth is increasingly concentrated in unplanned informal settlements with an acute shortage of critical infrastructure and essential services, including access to clean cooking.¹³ This is revealing a new face of poverty in which urban communities cannot access or afford essential modern energy services for their development and empowerment. In sub-Saharan Africa, only 37% of the urban population has access to clean cooking fuels and technologies;

PERCENT OF THE TOTAL POPULATION WITH ACCESS TO CLEAN COOKING FUELS



Data Source:
Tracking SDG 7: The Energy Progress Report;
IEA, IRENA, UNSD, World Bank, WHO, 2030

Figure 1: Clean Cooking Access in Africa in 2021¹⁵

less than 20% of Zambia's urban population has access to clean cooking, and in Uganda it's as low as 1.5%.¹⁴

Reliance on traditional cooking methods, particularly in low- and middle-income countries, involves the use of polluting solid fuels, such as wood and charcoal.

These fuels are burned inefficiently in open fires or rudimentary cookstoves, releasing harmful pollutants and greenhouse gases such as black carbon, carbon dioxide (CO₂), and methane. Research has shown that incomplete

biomass combustion, along with unsustainable biomass harvesting, contributes approximately 2% of global emissions of carbon dioxide equivalent (CO₂e).¹⁶ Burning solid fuels for cooking in homes is responsible for more than 50% of human-generated emissions of black carbon, which has a climate warming impact that is 460 to 1,500 times that of CO₂.¹⁷ Moreover, wood fuel used for household cooking and heating makes up roughly 55% of harvested wood globally.¹⁸

In Africa, wood fuel collection and charcoal production are

the primary drivers of forest degradation, and the use of wood fuel for cooking accounts for 75% of sub-Saharan Africa's energy demand.¹⁹ Africa is home to 26 of the 30 countries with the largest projected increase in charcoal and wood fuel demand between 2020 and 2040,²⁰ and in nine African countries—Burundi, Eritrea, Ethiopia, Guinea-Bissau, Kenya, Lesotho, Liberia, Rwanda, and Uganda—wood fuel emissions account for more than 50% of national emissions.²¹ Unsustainable biomass harvesting for cooking leads to habitat loss and reduced biodiversity, exacerbates soil erosion, and disrupts local water cycles.

Currently, as African cities grow, so does the demand for charcoal, which many urban households rely on as an inexpensive and easily accessible energy source for energy and cooking.

In sub-Saharan Africa, it is predicted that charcoal consumption will double by 2030, primarily to supply the region's growing urban centers.²² In the Democratic Republic of Congo (DRC), where 90% of the population relies on charcoal for cooking, over 400,000 hectares of primary forest were reportedly lost in 2020, mainly due to the expansion of agriculture and the

demand for wood and charcoal.²³ In the capital city of Kinshasa, which is projected to become the world's largest city by 2075,²⁴ an estimated 4.8 million cubic meters of wood fuel and charcoal are used each year.²⁵ This has increased pressure on the forest ecosystems and other natural landscapes surrounding cities. In Rwanda, where forested land represents only 20% of the small country's total area, 380 hectares of wood are needed each week to supply fuel to just the capital city, Kigali.²⁶ In the Atsimo-Andrefana and Menabe regions of Madagascar, 28,000 hectares of natural forests are unsustainably harvested each year for charcoal production, two-thirds of which is used by urban residents.²⁷ The household energy sector in urban Zambia is dominated

by charcoal: Over 75% of peri-urban and urban households, regardless of income, use charcoal as their primary cooking fuel source.²⁸

Clean cooking technologies, such as efficient stoves and modern fuels like biogas, ethanol, liquefied petroleum gas (LPG), and renewable electric cooking devices, reduce climate harming emissions and the demand for firewood and charcoal, alleviating pressure on forests and ecosystems. Today's highly efficient stoves can reduce fuel use by 30%–60%, resulting in fewer carbon emissions.^{29,30} New research demonstrates that a concerted transition from burning wood and charcoal to cooking with LPG, renewable-energy based electricity, or a combination of both would result

“CITIES ARE WHERE THE CLIMATE BATTLE WILL LARGELY BE WON OR LOST.”

**ANTÓNIO GUTERRES,
UNITED NATIONS SECRETARY-GENERAL**

in significant benefits for the climate, as well as for biodiversity and health. Cumulative emissions of CO_{2e} would decrease by about 3 billion tons by 2040—equivalent to the annual emissions from about half a billion cars (one-third of the automobile fleet on the planet today).³¹ This transition to clean cooking fuels would also dramatically reduce short-lived climate forcers, specifically black carbon and also organic

carbon, volatile organics, and carbon monoxide. Reducing the production of these climate forcers would induce a rapid cooling effect because these pollutants impose an immediate climate response.

Given these impacts, national governments are increasingly recognizing clean cooking as a critical lever to meet climate targets. As of March 2023,

98 low- and middle-income countries (LMICs) already included household energy or clean cooking measures in their nationally determined contributions (NDCs) to the Paris Agreement.³² Of those, 72 LMICs include specific clean cooking targets in their NDC, while the remaining 26 include adjacent goals, such as household energy efficiency, forest conservation, or air quality, which could be

partially met through clean cooking activities (see Appendix). The Clean Cooking and Climate Consortium and other initiatives are supporting countries' efforts in using clean cooking energy interventions to achieve climate goals as part of their NDC targets or through the international carbon market.³³ The Paris Agreement recognizes that cities and subnational governments are important entities for achieving global climate goals. However, these jurisdictions are often not involved in national climate policymaking and implementation, causing a lack of coordination between local activities and national plans. As a consequence, municipalities often receive insufficient mandates and funds to fulfill the tasks they are charged with carrying out.³⁴

Although many LMICs are transitioning toward modern, cleaner types of energy such as ethanol, LPG, and electricity, demand for firewood and charcoal continues to grow due to rapid population growth in cities and the lack of alternative energy sources that are readily available and affordable.³⁵

Clean cooking fuels and technologies often have high upfront costs, and without subsidies or flexible payment

mechanisms, they can significantly increase a household's cost of living. This can be challenging for poor urban families as they may spend up to 22% of their income on energy—a share that cannot be increased without exacerbating financial struggles.³⁶ While LPG is often the most affordable clean cooking solution in urban areas, recent price spikes are making it unaffordable for 30 million people across Africa, pushing many to revert to the traditional use of biomass.³⁷ Robust markets and innovative business models are required to deliver a wide range of affordable clean cooking solutions to growing urban populations.

The distribution of clean cooking solutions in urban settings, where population density is higher and roads are generally in better condition, can cost one-fifth the amount compared to remote rural areas.³⁸ The business case for clean cooking in urban and peri-urban contexts is also much easier to make than in rural settings, where customers tend to have higher price sensitivity and lower familiarity with clean cooking technologies. In sub-Saharan Africa, the share of urban citizens who have access to electricity is 81%, while rural electrification



Peter Irungu / Clean Cooking Alliance

rates hover around 29%.³⁹ However, very few urban dwellers in the region use electricity for cooking due to high upfront costs, unreliability of supply, and lack of awareness of the benefits of clean cooking, as well as sociocultural norms associated with cooking in many African countries. Urban households in Africa will likely gain clean cooking access primarily through a combination of LPG and electricity, which together account for over 95% of the viable options in most households and communities.⁴⁰ Innovative distribution and consumer financing solutions, such as pay-as-you-go LPG and electric cooking offerings, are making these solutions increasingly accessible and affordable for urban customers.



Carol Gathigia / Clean Cooking Alliance

PAYG TECHNOLOGY IS UNLOCKING CLEAN COOKING FOR URBAN CUSTOMERS

Despite the increased availability of clean cooking fuels in urban areas, affordability remains one of the biggest barriers for consumers. Over the past few years, pay-as-you-go (PAYG) business models have transformed the off-grid solar industry. This type of consumer financing of energy products is poised to do the same for the clean cooking industry.

Pay-per-use services make clean cooking solutions available and affordable for households, typically through a smart metering technology that allows customers to purchase fuel in small increments, without a large upfront deposit. In the past five years, metered LPG canister solutions have increased across Africa and Southeast Asia, but recent innovations also include the introduction of metered biogas, electric, and gasifier pellet stoves in some markets. Based on data provided by Angaza, a software platform that supports more than 200 distribution partners in over 50 countries, PAYG cookstove sales registered on the platform have been growing at a compound annual growth rate of over 140% since 2017.⁴¹

Bboxx, a UK-based next-generation utility, launched its Bboxx Cook offering in 2021 with PAYG LPG pilot programs in the Democratic Republic of Congo and Kenya. In 2023, Bboxx partnered with SP, a leading LPG company in Rwanda, to replace environmentally harmful charcoal by providing 10,000 households with PAYG LPG by the end of the year. Bboxx plans to roll out the product offering

to all 10 of its operational markets in 2024, partnering with leading LPG companies to reach more than 10 million households encompassing more than 50 million people by 2028 and saving more than 60 million trees each year.⁴²

In cities across Kenya and Tanzania, **Circle Gas** serves more than 100,000 households, installing a full set of equipment that includes a stove, smart meter, and LPG cylinder. This equipment is owned and maintained by Circle Gas, which allows customers to pay for only the gas they use, even meal by meal, with mobile money. Circle Gas is identifying areas of highly concentrated charcoal and kerosene users and working with communities to install local LPG depots to ensure that customers have a secure and affordable supply of LPG, which is topped up before they run out.⁴³

PayGas, a French-South African startup, is dispensing LPG via patented, cashless, micro-refilling stations with its Pay As You Gas™ model. PayGas is providing clean cooking access to 120,000 low-income customers through 10 refilling stations in Cape Town and Johannesburg and is working with multiple partners to roll out its innovative models across other cities. In 2022, PayGas conducted a feasibility study in an informal settlement of Freetown, Sierra Leone, through ICLEI Africa's **Enabling African Cities for Transformative Energy Access (ENACT) project**.

Daniel Mutema /
Clean Cooking Alliance



KENYA

Circle Gas has installed full sets of cooking equipment in 100,000+ households



PART ONE

Clean cooking is essential for equitable economic growth in cities, particularly for women and youth, as it increases household productivity, provides employment, and saves time, with women's aggregate time loss from wood fuel collection and cooking averaging about five hours per day.⁴⁴ However, just and equitable clean cooking transitions must recognize and address the dynamics of local charcoal value chains. As a result of high urban demand, charcoal production has evolved into a growing regional industry that provides income for many people. Africa accounts for two-thirds of the world's charcoal production.⁴⁵ The charcoal industry is an important economic driver in areas where human settlements and forests intermingle. A recent study conducted through the ENACT project found that more than half of residents in Susan's Bay informal settlement in Freetown, Sierra Leone, rely on the sale of wood and charcoal for income.⁴⁶ Over 300,000 people in DRC are employed by the wood fuel

energy sector, and revenue related to charcoal production can account for 75% of a producer's household income.⁴⁷ In Zambia, large trucks ferry charcoal from rural and peri-urban areas to local and regional marketplaces on a daily basis, with charcoal traders earning about US\$ 400 each month.⁴⁸ While the industry is tied to powerful and widespread economic forces, pilot programs are making inroads, including the United States Agency for International Development's Alternatives to Charcoal initiative in Zambia, which used market-driven approaches to reduce charcoal energy consumption by 25% in the city of Lusaka while supporting alternative livelihoods in charcoal producing communities.⁴⁹

Enabling a just transition in cities through access to clean cooking solutions will create avenues for sustainable and inclusive employment.⁵⁰ The transition to clean energy is expected to generate more than 10 million net new jobs

globally by 2030,⁵¹ offsetting the 2.7 million jobs expected to be lost in fossil fuel sectors.⁵² Clean cooking sector jobs also offer entry into the formal economy and increase entrepreneurial opportunities, especially for women and youths. For electricity and LPG, capital infrastructure projects focused on grid or pipeline extension or fuel-storage facilities create job surges during construction periods and improve local economic environments.⁵³ The clean cooking sector also drives employment through manufacturing, sales, delivery, and other indirect work multipliers in the clean cooking value chain. In Kenya alone, in 2019, the clean cooking sector is estimated to have provided 19,000 direct, formal jobs and up to 35,000 direct, informal jobs.⁵⁴ Such inclusive economic growth is critical to making urban households financially secure and climate resilient.

CASE STUDY

TRANSFORMING URBAN LIVELIHOODS THROUGH CLEAN COOKING

Implemented by ICLEI Africa, with support from Energy 4 Impact-Mercy Corps, the [Enabling African Cities for Transformative Energy Access \(ENACT\) project](#) serves as a compelling example of how enhancing access to clean cooking can foster inclusive economic development in cities, particularly in urban informal settlements and slums. The project is funded by the UK Government through the Transforming Energy Access program managed by the Carbon Trust.

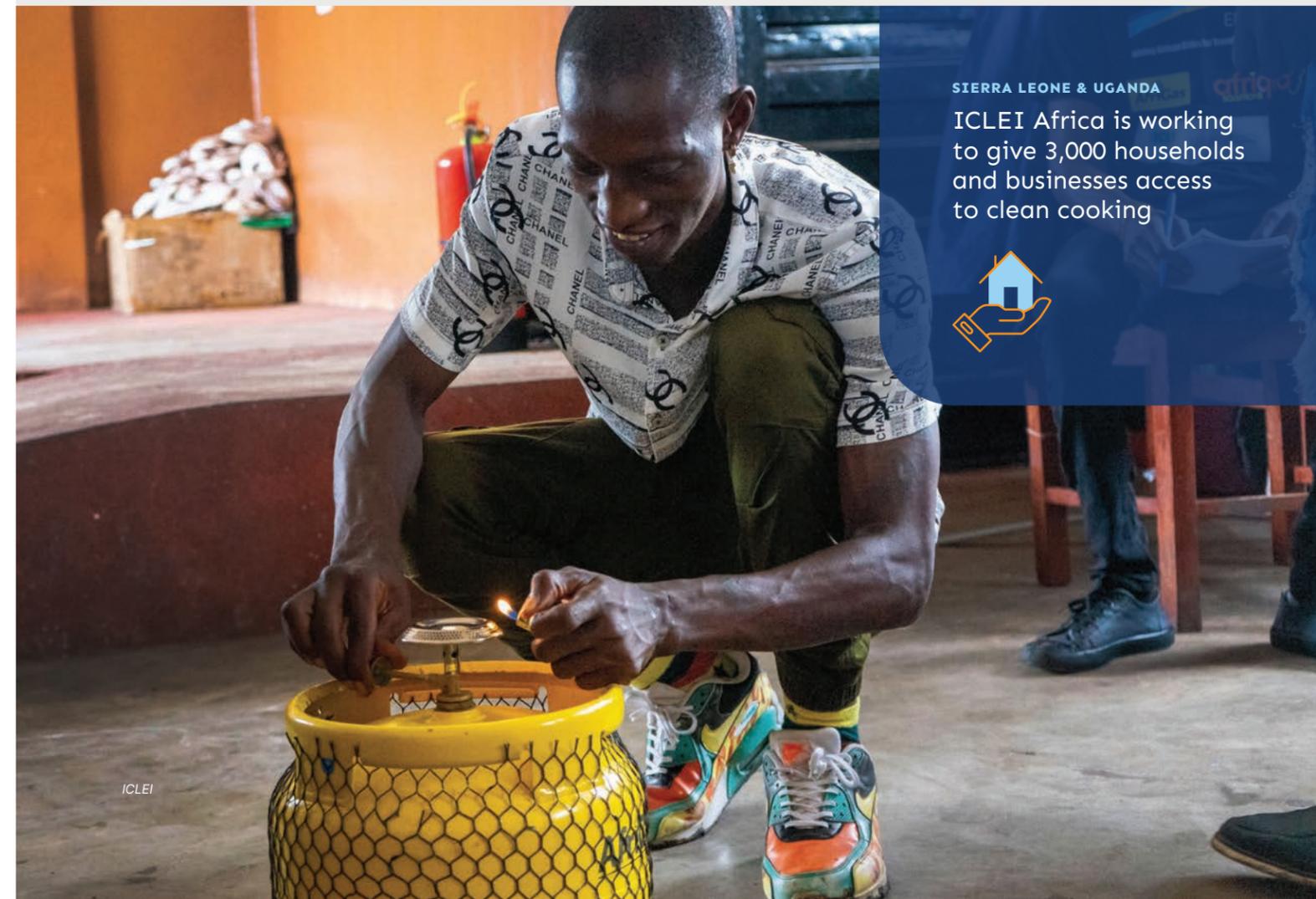
ICLEI Africa is working with local partners in Freetown and Kampala to implement tailored clean cooking

interventions for households and small businesses (predominantly those engaged in cooked-food vending), in target informal settlements. The current phase of the project aims to provide clean cooking access to up to 3000 households and businesses, while creating sustainable jobs, building capacity and improving the livelihoods of the community dwellers.

Through ENACT, wholesalers and retailers of charcoal and firewood within the community are being converted to become retailers and marketers of the clean cooking products being introduced. Cooked-food sellers also receive

training on how to effectively use the clean cooking products to save time and money, thereby empowering them to enhance profitability in their businesses.

To amplify the impact, influential members of the community are recruited as "clean cooking champions" and are remunerated for their services. This multifaceted approach showcases how ENACT is not only promoting clean cooking, but also creating economic opportunities and empowering local communities in the process.



SIERRA LEONE & UGANDA
ICLEI Africa is working to give 3,000 households and businesses access to clean cooking





PART TWO

Clean Air Requires Clean Cooking

► Air pollution has become the second-largest cause of death in Africa, due in part to rapid urbanization and on overwhelming reliance on polluting fuels and stoves for cooking. Scaling clean cooking solutions must be central to a coordinated approach to tackling air pollution and climate change that improves the health and resilience of urban populations.

CLEAN COOKING REDUCES URBAN AIR POLLUTION, IMPROVING HEALTH AND CLIMATE OUTCOMES.

According to the World Health Organization (WHO), air is unsafe to breathe if concentrations of fine particulate matter, or PM2.5, exceed 10 micrograms per cubic meter of air ($\mu\text{g}/\text{m}^3$). Read the full [WHO Global Air Quality Guidelines](#).

People are breathing unsafe air in over 80% of cities globally. This number rises to 97% in low- and middle-income countries.⁵⁶ Each year, 3.2 million people die prematurely from illnesses attributable to the household air pollution caused by the incomplete combustion of solid fuels and kerosene used for cooking.⁵⁷ Death rates from air pollution are four times as high in LMICs as in high-income countries, reflecting and exacerbating structural inequalities.⁵⁸ There are significant environmental costs, too. Black carbon and many other air pollutants both contribute to and worsen the impacts of climate change. Accelerating the adoption of clean cooking solutions, biogas, ethanol, LPG, and electric cooking devices by drawing from renewable

energy sources is an immediate and cost-effective way to tackle these intertwined challenges.⁵⁹

The African continent endures the worst air pollution in the world, at great cost. In 2019, air pollution, driven by rapid urbanization and industrialization, was the second-leading cause of death across Africa after HIV/AIDS, contributing to 1.1 million deaths. Some 63% of those deaths were linked to indoor air pollution from burning solid fuels for household cooking and heating.⁶⁰ Household air pollution resulting from traditional cooking methods leads to high levels of fine particulate matter (PM2.5), carbon monoxide, nitrogen dioxide, and other short-lived climate pollutants, such as black carbon and methane.⁶¹ Exposure to household air pollution from burning wood,

charcoal, coal, and kerosene is a leading risk factor for diseases, including childhood pneumonia, chronic obstructive pulmonary disorder, ischemic heart disease, stroke, and lung cancer.⁶² In Accra, Ghana, Africa's fastest-growing city, between 15% and 42% of PM2.5 concentrations can be attributed to household biomass burning and 18% of premature deaths due to air pollution were children under 5 years of age.⁶³

A recent analysis of air pollution in Africa's fastest-growing cities, conducted by the Clean Air Fund, suggests that on the current path, the financial costs of air pollution could increase more than sixfold, to US\$ 115.7 billion, by 2040. But there is a viable alternative. These cities—namely Accra, Cairo, Johannesburg, and Lagos, as well as others like them—could unlock billions of dollars with policies and planning that enable green growth and deliver multiple co-benefits such as fewer deaths, lower emissions, and reduced poverty. By implementing policies to reduce air pollution, including clean cooking solutions, these four cities could raise US\$ 20.4 billion, prevent 126,000 premature deaths, and reduce greenhouse

gas emissions by up to 20% by 2040 (avoiding over 0.47 gigatons of CO₂e).⁶⁴

Clean air is not named as a goal of the African Union's Agenda 2063, the UN's Agenda 2030 for Sustainable Development, or the United Nations Framework Convention on Climate Change's Paris Agreement, yet it is critical to achieving targets relating to health, cities, environmental sustainability, energy transition, inequality, and climate change.⁶⁵

Many governments acknowledge the detrimental health effects of air pollution and have mitigation plans in place, though these plans are implemented and enforced at varying scales and efficacies.⁶⁶ Air pollution mitigation plans often focus on larger ambient air pollution sources, such as power generation, industry, and transport, underestimating the contribution and impact of household air pollution from the use of polluting fuels and stoves for cooking. Until recently, the scale and magnitude of household air pollution's contribution to ambient air pollution was underrecognized and poorly characterized.^{67,68} However, recent studies have shown that, in Africa,

the contribution of household air pollution to ambient air pollution is high, and ambient air quality standards may not be attainable without a transition to clean household cooking solutions such as LPG, ethanol, and electric cooking devices.^{69,70,71}

In African urban centers where the burden of disease related to household air pollution is significant, government policies are aiming to support widespread adoption of clean cooking technologies.

In Lagos, Nigeria, sub-Saharan Africa's biggest city and home to 15 million people, burning of biomass fuels accounts for one-fifth of PM2.5 concentrations.⁷² The Nigerian government has set a maximum ambition target through its updated NDC to transition 65% of the national population to using clean fuels by 2030. Achieving this target would avoid 32,000 premature deaths by 2030, including saving the lives of 16,000 children under the age of 5, and it would avert 10.5 million tons of CO₂e emissions (without considering effects from deforestation).⁷³

GHANA'S CAPITAL BECOMES A CLEAN AIR LEADER THROUGH HEALTH SECTOR ENGAGEMENT⁷⁴

In Ghana, where more than 28,000 people died from air pollution in 2016,⁷⁵ initiatives encouraging the adoption of LPG as a clean cooking solution have demonstrated significant reductions in household air pollution, which has led to a notable decrease in respiratory illnesses among households using clean cooking methods.

Since 2017, the Climate and Clean Air Coalition (CCAC) has supported Ghana's capital city of Accra—where air pollution levels were five times as high as the WHO guidelines—to transform its urban planning by engaging the health sector on the benefits of reducing air pollution while demonstrating the power of cities to fight climate change and create cleaner skies.

CCAC's [Urban Health Initiative](#), led by WHO with co-funding from the Norwegian government, worked closely with Accra's public health professionals and municipal government officials to highlight the linkages between air pollution, premature deaths, health care costs, and climate change, and to provide local health care workers, city planners, and citizens with the information they

needed to demand and implement climate change and clean air policies in the household energy, transport, and waste sectors. Accra is using the improved capacity created by the program to measure and integrate cost-benefit analyses of the health and economic impacts of air pollution into urban planning policies.

“Air pollution is a silent killer because people don't see it, which means they think it doesn't affect them negatively. So, when the health impacts are introduced, it makes the links clearer to everyone—what you think doesn't impact you actually does. It's one of the advantages of framing the problem around air pollution rather than just climate change, because it's individualized. It's easier for people to understand that they may get cardiovascular disease whereas climate change can feel larger, more systemic, and removed.”

DESMOND APPIAH

Chief Sustainability Advisor
at the Accra Metropolitan Assembly

Critically, the Urban Health Initiative has increased and improved data and monitoring capacity to understand air pollution sources and inform policy interventions. Ghana's Environmental Protection Agency (EPA) can now continuously monitor particulate matter and black carbon in multiple areas of the city and produce reliable, high-quality data to more accurately identify sources of air pollution. This has helped Ghanaian authorities identify the most effective interventions for improving air pollution in the city, including using cleaner cooking methods, ending the burning of waste, and elevating fuel and vehicle standards. It has also led to Accra's becoming the first role model city in Africa under the [BreatheLife Campaign](#).

Collaboration has been key to the program's success, with Ghana's EPA, the Ghana Health Service, the Ghana Education Service, the City of Accra, and academics all pulling together to work with international organizations.



Evans Ahorsu / Clean Cooking Alliance

GHANA

Households using clean cooking methods have a notable decrease in respiratory illnesses





Nick Wambugu / Clean Cooking Alliance

Tackling the intertwined challenges of air pollution and climate change is a pressing challenge for Africa's cities, yet just 0.01% of global air pollution funding is currently spent in Africa.⁷⁶ The new

Integrated Assessment of Air Pollution and Climate Change for Sustainable Development in Africa, launched at COP 27, identifies clean cooking solutions as one of the key measures for African leaders to address to fight climate change, prevent air pollution, and protect human health.⁷⁷ Essential to this action is understanding the scope and scale of the problem.

Cities need access to the best available data on the sources

of emissions and pollutants, and detailed knowledge of who is affected and how to ensure the deployment of context-specific solutions.

To achieve this, greenhouse gas emission and air quality assessments are needed, based on a robust network of air quality monitoring stations and the development of evidence-based greenhouse gas emissions inventories. Yet, today, localized air quality data and understanding of the problem are very poor. The United Nations Children's Fund (UNICEF) has shown that only 6% of children in Africa live near a reliable air quality monitoring station, compared to 72% of children across Europe and North America.⁷⁸ In addition,

access to health data and associated socioeconomic data (such as hospital admissions, death rates, and hospitalization costs) for conducting cost-benefit analyses will enable cities to better study the impacts of air quality changes in their local populations. By collecting refined spatial data, cities will get a better understanding of how the impacts are distributed and can ensure equity of benefits and costs. This is a significant barrier for cities that are often constrained in capacity and resources to implement monitoring and data collection. That said, the number of resources and initiatives providing support to cities seeking to improve air quality is growing, as shown in the following table.

Technical Assistance and Knowledge-sharing Resources on Air Pollution Management for Cities

The [Urban Health Initiative](#), run by the Climate and Clean Air Coalition (CCAC) and the World Health Organization (WHO), is generating tools and guidance materials for cities worldwide to realize climate, air quality, and health co-benefits through measures including clean cooking.

[CDP-ICLEI track](#) offers a range of tools, including the greenhouse gas inventory tool ClearPath and the CDP-ICLEI unified reporting system, that enable cities to report on their climate action plans and performance against emission reduction and air quality targets.

The [BreatheLife Campaign](#) is a comprehensive initiative that harnesses the synergy of public health and climate change expertise to combat air pollution while advancing global development goals. It serves as a vital platform for cities to exchange best practices and showcase their progress toward achieving WHO air quality targets by 2030, acknowledging that shifting to clean cooking fuels and stoves can have a domino effect of benefits, from reducing black carbon emissions to decreasing the time spent by women and girls in gathering fuel.

[C40 Cities' Clean Air Accelerator](#) is supporting mayors from 37 cities around the world to slash air pollution and work toward meeting WHO's air quality guidelines, while the [C40 African Cities for Clean Air program](#) is assisting city efforts to improve air quality and public health while reducing carbon emissions.

ICLEI's [GreenClimateCities \(GCC\) Program](#) offers cities a proven process methodology for walking step by step toward climate neutrality, including how to improve air quality and decrease carbon emissions, all via a tried and tested measuring, reporting, and verification framework.

The United States Environmental Protection Agency's [Megacities Partnership](#) provides national and local policymakers with a framework to develop and implement comprehensive action plans that address air quality and improve public health in cities around the world.

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CITIES ARE BECOMING MORE IMPORTANT IN THE GEOPOLITICAL SPACE. SOMEONE HAS TO PROVIDE LEADERSHIP. I AM WILLING TO DO SO. IN OUR PART OF THE WORLD, AIR POLLUTION IS NOT PRIORITIZED AS A HEALTH CONCERN, EVEN IN THE WAY WE COOK. BUT THE STATISTICS ARE SO STAGGERING THAT WE HAVE TO WAKE PEOPLE UP TO TAKE ACTION. WE HAVE TO TALK ABOUT IT LOUDLY SO THAT IT BECOMES PART OF OUR DISCOURSE IN THE URBAN POLITICAL SPACE."

**MOHAMMED ADJEI SOWAH,
FORMER MAYOR OF ACCRA, GHANA (2017–2022)⁵⁵**



PART THREE

Call To Action: Empower Cities To Scale Clean Cooking Transitions

► Clean cooking must be mainstreamed into sustainable cities and integrated into national and local efforts focused on climate, nature, health, food systems, gender equality, and youth empowerment. To achieve this, a paradigm shift in approach is needed, one that focuses on holistic, system-level partnerships that involve diverse stakeholders. Join CCA and ICLEI Africa in developing a road map to support city-scale clean cooking transitions across the continent.

Evans Ahorsu / XpressGas

PART THREE

RAPID URBANIZATION ACROSS AFRICA PRESENTS THE NEED AND OPPORTUNITY TO INCREASE ACCESS TO CLEAN COOKING SOLUTIONS AT SCALE.

Africa’s cities can accelerate local clean cooking transitions that improve public health outcomes, reduce greenhouse gas emissions, and improve the quality of life for millions of people while contributing to national and international climate and sustainable development goals. Cities are uniquely positioned to catalyze multilevel and multisector collaboration, leveraging their advocacy power as the tier of government closest to citizens, as well as their regulatory authority and purchasing power to incentivize the adoption of clean cooking solutions at speed and scale.

However, today, less than 10% of people without access to clean cooking live in countries that have adequate policies and funding to reach universal access by 2030. The gap is widest in Africa, where clean cooking plans—when they do exist—often lack resources.

Less than a third of clean cooking plans in Africa are funded, and high fuel prices, driven by the global energy crisis, has led to a scaling back of incentives and financial support to households.⁷⁹ Africa currently falls well short of the US\$ 2.8 trillion in climate finance that it needs by 2030, and African cities receive less than 1% of global urban climate finance.⁸⁰

Achieving clean cooking transitions that keep pace with rapidly growing urban populations will require a systemwide approach to improve policy frameworks, increase investment, and enhance collaboration across a wide range of stakeholders, including national and subnational governments, multilateral financial institutions, investors, clean cooking companies and utilities, urban planners, city networks, and local government associations.

Join CCA and ICLEI Africa as we convene this diverse set of stakeholders to identify the critical enablers of city-scale clean cooking transitions, assess key challenges and barriers, and define the concrete opportunities to develop thriving, diverse, competitive urban clean cooking markets that meet the needs of all citizens. We aim to explore the areas of:

To express your interest in joining this effort, please contact partnerships@cleancooking.org

<p>Political Leadership & Multilateral Governance</p>	<ul style="list-style-type: none"> • Build political leadership, at all levels, for clean cooking • Strengthen national and local government capacity to enact enabling policies • Enhance multilevel governance to ensure harmonization between national and municipal governments
<p>Unlocking Finance</p>	<ul style="list-style-type: none"> • Increase sources of climate finance for urban clean cooking transitions through bilateral and multilateral channels • Identify innovative financial instruments that help cities harness potential of private markets • Enhance capacity of city governments to attract and utilize climate and private finance for clean cooking
<p>Systems-level Collaboration</p>	<ul style="list-style-type: none"> • Embed clean cooking in wider national and city agendas, including climate, air pollution, nature, food security, gender, and youths • Foster peer-to-peer learning across cities • Activate city networks and local government associations to provide technical assistance and match supply and demand for finance
<p>User-centered Innovation</p>	<ul style="list-style-type: none"> • Enhance policy, financing, business model, and product innovation to address the needs of urban users in a diversity of contexts • Foster collaboration between city officials, urban planners, utilities, and clean cooking companies • Include all constituencies and groups, including urban poor, women, and youths, in clean cooking planning and project implementation

Appendix

Africa's largest cities can help drive progress on national climate goals by accelerating access to clean cooking.^{81,82}

City	Country	Predicted population (2050)	Current urban clean cooking access rate	Specific reference(s) to clean cooking in nationally determined contributions (NDCs)
Kinshasa	Democratic Republic of Congo	35,000,000	10%	<p>Action: Development of alternatives to wood energy to protect the forest (solar, gas, improved stoves, and other solutions)</p> <ul style="list-style-type: none"> Estimated cost: US\$ 0.17 million
Lagos	Nigeria	32,630,000	33%	48% of population (26.8 million households) using LPG and 13% (7.3 million households) using improved cookstoves by 2030
Kano		10,440,000		
Khartoum	Sudan	15,995,000	77%	<p>Measure: Biomass savings through improved cookstoves for over 300,000 rural households (REDD+ ERP)</p> <ul style="list-style-type: none"> Impact: 338,686 Units: m³ of firewood saved Emission reductions in 2030 (tons CO_{2e}): 699,139 Cost: US\$ 5 million <p>Measure: LPG as substitute for biomass/charcoal in 10% of urban population</p> <ul style="list-style-type: none"> Impact: 55,100 Units: m³ of firewood saved Emission reductions in 2030 (tons CO_{2e}): 113,741 Cost: US\$ 11 million <p>Measure: Improved cookstoves as replacement for traditional inefficient wood stoves for 20% of rural population</p> <ul style="list-style-type: none"> Impact: 941,728 Units: m³ of firewood saved Emission reductions in 2030 (tons CO_{2e}): 1,943,979 Cost: US\$ 41 million
Dar es Salaam	Tanzania	15,973,000	16%	Expanding the use of natural gas for power production, cooking, transportation, and thermal services through improvement of natural gas supply systems throughout the country.
Luanda	Angola	14,301,000	77%	Combustible firewood continues to be one of the most used forms of energy in rural Angola for heating and cooking. The uncontrolled use of this resource has created some problems of deforestation, although limited to the peripheries of small towns and villages in rural areas. Charcoal, which is mostly used in urban areas, is normally produced unsustainably, since the felled trees are not replaced.

City	Country	Predicted population (2050)	Current urban clean cooking access rate	Specific reference(s) to clean cooking in nationally determined contributions (NDCs)
Nairobi	Kenya	14,246,000	51%	Mitigation measure: "Clean, efficient and sustainable energy technologies to reduce overreliance on fossil and non-sustainable biomass fuels"
Addis Ababa	Ethiopia	13,212,000	27%	<p>Policy intervention: Reducing residential biomass use</p> <ul style="list-style-type: none"> Fuel switch: Shift from unsustainable biomass energy demand to electric stoves, renewable biofuels (e.g., residues) Biomass efficiency: Improved cookstoves <p>Indicator (unit):</p> <ul style="list-style-type: none"> Energy demand shifted (terajoule) Number of improved cookstoves distributed and used (received by women/men) Biomass use per household (tons) (female-headed/male-headed) <p>Lead institution(s) (responsible):</p> <ul style="list-style-type: none"> EFCCC; Ministry of Water, Irrigation, and Electricity
Abidjan	Côte d'Ivoire	10,709,000	61%	In addition to methane and hydrofluorocarbon reductions that contribute to overall greenhouse gas mitigation, emissions of air pollutants such as black carbon, nitrogen oxides, and fine particulate matter can be significantly reduced through the implementation of measures mitigation including switching to cleaner fuels for cooking, transportation, power generation, and industries
Kampala	Uganda	9,432,000	2%	<p>Mitigation action: Energy-efficient wood fuel and charcoal stoves</p> <p>Description and impact: The measure aims to promote clean cooking solutions and biomass energy use efficiency technologies for wood fuel and charcoal stoves among households and institutions (education, hospitals, prisons, and industries, among others). The measure will reduce emissions by approximately 6.89 MtCO_{2e} by 2030.</p>

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Peter Irungu / Clean Cooking Alliance

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