



eCAP Synthesis Report

eCooking Capacity Building & Market Development Programme

JULY 2024

Supported by:



Implemented in partnership with:



Acknowledgements

The eCooking Capacity Building & Market Development programme (eCAP) was implemented in 2023 as a partnership between Kenya Power and two UK-Aid-funded programmes, MECS and UK PACT. eCAP was managed collaboratively by Kenya Power and MECS via the STEER (Sustainable Transitions in Energy, Environment and Resilience) Centre at Loughborough University and Gamos East Africa.

Kenya Power owns and operates most of the electricity transmission and distribution system in the country and sells electricity to over 9 million customers. Kenya Power's Pika na Power (Cook with Electricity) campaign aims to stimulate demand for electricity and increase the social and environmental impacts of electricity access.

Modern Energy Cooking Services (MECS) and United Kingdom Partnering for Accelerated Climate Transitions (UK PACT) are UKAid-funded programmes with the shared vision of supporting Kenya to transition from unsustainably harvested biomass to renewably-generated electricity.

eCAP aims to accelerate the uptake of eCooking in Kenya by building the capacity of key market actors and driving forward the development of a sustainable eCooking sector by:

- Developing institutional capacity within Kenya Power
- Designing and implementing a pipeline of scalable activities in parallel with the Kenya National eCooking Strategy (KNeCS)
- Identifying pathways for scaling up the Pika na Power campaign
- Bringing together Kenya's clean cooking and electricity access sectors to empower a network of eCooking Champions
- Generating evidence on the role of eCooking as a tool for stimulating demand and increasing the social impact of electricity access to inform decision-making by Kenya Power's Board of Directors

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For more information on eCAP, including the full technical reports from each of the 12 projects, visit www.MECS.org.uk

Disclaimer: This research material has been developed through the collaborative efforts of Kenya Power and its partners with financial support from UK Aid and the UK government. The views expressed do not necessarily reflect the official policies of Kenya Power, the UK government or any of the partners.

Foreword



A stylized, handwritten signature in blue ink, appearing to read 'Joseph Siror', positioned above a horizontal line.

Dr. (Eng.) Joseph Siror,
MD & CEO, Kenya Power

Kenya Power is taking significant strides and supporting programmes toward transforming the cooking landscape through the promotion of electric cooking (eCooking) solutions. With the successful rollout of the Last Mile Connectivity program and enhanced grid access, the Company is well-positioned to shift public perception and usage of electricity for cooking from a perspective where it is viewed as a costly option to an affordable and efficient alternative.

In Kenya today, only 6% of the population use e-cooking appliances as their primary, secondary or tertiary solution for cooking, heating or preparing hot beverages. This situation indicates that there is a substantial opportunity to highlight the cost-saving benefits and convenience of transitioning to eCooking. The introduction of modern appliances like the Electric Pressure Cooker and induction stoves offers promising solutions that can indeed make cooking more accessible and efficient for the average Kenyan household.

When I first joined the Company in 2023, I was introduced to new appliances that make cooking easier, quicker and most importantly more affordable for our customers. The cost of these appliances may still pose a challenge, but leveraging innovative financing models like pay-as-you-go can help mitigate these barriers and encourage faster adoption.

Our target of increasing eCooking users from about 90,000 to over 500,000 in just three years is ambitious yet achievable. However, we cannot do this alone, but we hope to work through strategic partnerships with appliance distributors, financiers, development partners, national institutions and other key organisations. Our intention is to play a coordinating role, supporting the growth of Kenya's emerging eCooking sector as part of our demand stimulation programme. These partnerships can help streamline distribution, provide financial solutions, and ensure that more consumers are educated about the benefits of eCooking.

The eCooking Capacity Building and Market Development (eCAP) program's focus on training our employees and strengthening our partnerships indicates a commitment not only to market development, but also to capacity-building within our organisation. This dual approach will ultimately enhance the overall value proposition of electricity access for consumers.

By prioritising the communication of these benefits and addressing the common misconceptions about the cost of electric cooking, Kenya Power can significantly increase interest and participation in the eCooking initiative. Our efforts in fostering awareness, education, and supporting infrastructure is crucial in driving this transformative change in cooking practices across the country.

The eCAP Synthesis Report contained in this document demonstrates our commitment to supporting the programme that has enabled us to train our employees, strengthen partnerships and learn more about the role that eCooking can play in growing electricity unit sales, while at the same time increasing the value that electricity access offers to our customers.

Figure 1: Kenya Power Chairperson, Board of Directors, Joy Brenda Masinde, showing just how easy cooking with modern energy-efficient appliances can be.



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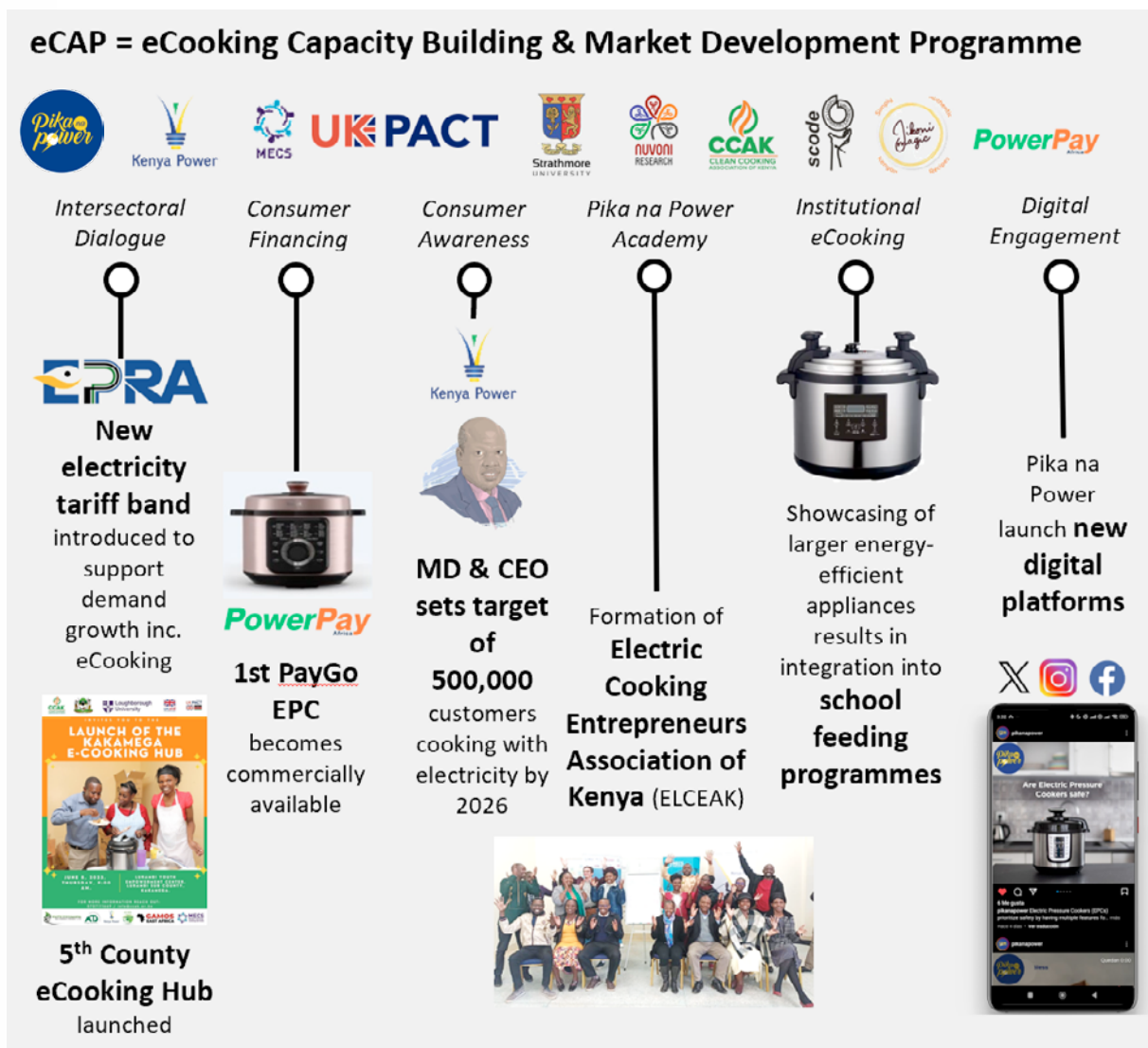
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Executive Summary

Kenya Power partnered with two UK Aid-funded research and innovation programmes to accelerate the uptake of electric cooking (eCooking) in Kenya: Modern Energy Cooking Services (MECS) and UK Partnerships for Accelerating Climate Transitions (UK PACT). The collaboration ran in parallel with the development of the Ministry of Energy & Petroleum’s Kenya National eCooking Strategy (KNeCS) and involved support for twelve individual projects designed to build capacity within Kenya Power and develop a sustainable eCooking sector in Kenya. The results reveal new opportunities for Kenya Power to catalyse the growth of Kenya’s emerging eCooking sector, which has the potential to not only stimulate demand for electricity, but also to increase the social and environmental impacts of electricity access.

Figure 2: Key outcomes from the eCAP programme.





Project	Overview	Findings	Key recommendations
Consumer Financing for eCooking Appliances – Stima Loan (implemented by PowerPay Africa)	Utility-enabled financing for eCooking appliances (& eMobility) explored using PowerPay's interoperable IoT to enable PayGo sales of Electric Pressure Cookers (EPCs) & remote monitoring of electricity consumption for cooking.	Achieved 48% conversion rate for EPC marketing activities & 95% of 200+ purchasers paid on time. Average Revenue Per User (ARPU) increased by 20kWh/month & emissions reduced by 260kgCO2/year/customer.	<ul style="list-style-type: none"> • Develop larger scale PayGo appliance project, with data sharing between appliance distributors and utility. • Draw up generic agreement to facilitate data sharing with appliance distributors.
Digital Engagement (implemented by Jikoni Magic)	Multiplatform engagement with food bloggers & everyday cooks highlighted the aspirational nature of cooking with modern energy-efficient appliances. KPLC customers learned how they can cook their favourite foods with new appliances, enabling them to save time & money in the kitchen.	Mixed-media content developed with leading food bloggers, inc. eCooking competition & digital eCookbook. Pika na Power launched a new web site & X/Instagram accounts. Engagement & following growing rapidly, but content needs continually updating to retain interest.	<ul style="list-style-type: none"> • Continue to grow Pika na Power digital platforms by creating innovative new evidence-based content showcasing eCooking as an aspirational, yet achievable solution for everyday cooks. • Strengthen & broaden collaborations with Kenya's vibrant food blogging scene to tap into each content creator's network & diversify messaging.



Project	Overview	Findings	Key recommendations
Intersectoral Dialogue (implemented by Clean Cooking Association of Kenya, CCAK)	Bridging the gap between Kenya's electricity access and clean cooking sectors by bringing stakeholders together.	The eCooking Community of Practice (CoP) WhatsApp group grew to 350+ members; Kakamega County eCooking Hub launched; 3rd Clean Cooking Week attracted over 400 participants; & lobbying by CoP members resulted a new tariff band to support the eCooking sector.	<ul style="list-style-type: none"> • Strengthen intersectoral integration with clean cooking sector as: member of CCAK; sponsor of Clean Cooking Week; & co-convenor of eCooking CoP/ County eCooking Hubs. • Pilot an eCooking tariff to increase revenue by stimulating additional demand.
Kenyanising International Appliances (implemented by Jikoni Magic)	Utilising insights from everyday Kenyan cooks, this project gave international eCooking appliance manufacturers an insight into Kenyan cooking culture to increase usage of their products by redesigning & effectively communicating their functionality.	A typology of foods enabled matching of popular Kenyan recipes with appropriate appliances. A guide enabled matching of functions designed for international menus with Kenyan counterparts.	<ul style="list-style-type: none"> • Enable products to evolve around Kenyan cuisine by sharing outputs with appliance manufacturers. • Increase utilisation of energy-efficient appliances by showcasing top tips for Kenyan cuisine to KPLC customers via digital platforms & live demos.



Project	Overview	Findings	Key recommendations
Kitchen Energy Audits (implemented by SCODE)	A methodology for supporting households to understand the potential impacts of electrifying their kitchen was developed and piloted to offer consumer advice on the costs/benefits of transitioning, including safety issues.	Checklist on current cooking practices, expenditures on cooking fuels & readiness of household wiring developed to calculate monthly net savings on cooking fuel vs. electricity. Savings balanced with costs of appliance & kitchen wiring upgrades to estimate payback period.	<ul style="list-style-type: none"> Utilise kitchen energy audit methodology as part of a demand stimulation toolkit for new & existing customers. Refine methodology through iterative implementation & develop myPower app integration.
Urban Informal Settlements (implemented by Nuvoni Centre for Innovation & Research)	This market scoping study aimed to gather data on new opportunities for eCooking in households and food businesses to inform a future potential market development programme in urban informal settlements in Nairobi.	eCooking could support formalisation of electricity connections, reducing power theft & increasing safety. Accelerate adoption via motorbike & mobile-enabled distribution; innovative financing; partnerships with womens'/youth groups & 'orodha' second-hand appliance dealers.	<ul style="list-style-type: none"> Explore demand stimulation partnerships with private firms recently granted local distribution licenses in informal settlements. Collaborate with development partners to set up a market development programme for eCooking in urban informal settlements.



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Project	Overview	Findings	Key recommendations
Scalable Feedback Mechanisms (implemented by KPLC IESR)	Develop Kenya Power's understanding of the contribution of eCooking to demand stimulation to enable more accurate demand forecasting & evidence-based decision making.	<ul style="list-style-type: none"> • Data collection mechanisms: • Customer billing data analysis. • Institutional appliance import volumes datasets (KEBS, KRA, KNCCI). • Appliance availability survey with retailers. • Aggregating data feeds from smart-metered appliances. 	<ul style="list-style-type: none"> • Align future data collection with LCPDP demand forecasting. • Utilise smart-metered appliances to disaggregate data on cooking loads. • Formalise partnerships with national institutions & appliance distribution companies to enable regular access to latest datasets.
Institutional eCooking (implemented by KPLC IESR)	Larger scale eCooking appliances were installed in the institutional kitchen at Kenya Power's Institute for Energy Studies and Research's (IESR). These included imported 40 & 25 litre EPCs & 16 litre rice cookers; & a prototype institutional cooker manufactured in Kenya.	LPG consumption in IESR kitchen reduced substantially & Controlled Cooking Tests (CCTs) showed substantial cost and time savings. Cooking long boiling dishes such as githeri with the large EPCs offered the biggest savings.	<ul style="list-style-type: none"> • Demo. larger appliances to inst. cooking stakeholders by: • Showcasing IESR kitchen. • Set up demo kitchens in schools, prisons & hospitals. • Expand range of appliances to fully electrify IESR kitchen. • Electrify kitchens in other Kenya Power facilities.



Project	Overview	Findings	Key recommendations
Mobile Demonstration Kitchen (implemented by KPLC)	A mobile demo kitchen was constructed to enable the Pika na Power team to deliver live cooking demos across the country & include last mile customers in eCooking awareness campaigns.	A new truck was customised with a full complement of modern energy-efficient eCooking appliances. The serving hatch & mirrored ceiling panel allow visitors to watch the entire cooking process, including live readouts of energy consumption.	Support attendance at events & a series of roadshows with the new mobile demo kitchen that will raise awareness of eCooking & boost sales for Kenya Power's appliance distribution partners in regions where KPLC has surplus power.
Consumer Awareness for Utility-enabled Financing (implemented by KPLC)	Raised awareness on convenience, cost & time savings of modern energy-efficient appliances with live cooking demos. Supported piloting of utility-enabled financing with co-marketing activities & also raised awareness of eCooking internally within KPLC management.	Co-marketing boosted PowerPay's sales by leveraging KPLC's existing customer relationships & brand awareness. Demos with staff across all 10 KPLC regions & management at Stima Plaza, resulted in target of 500,000 customers eCooking by 2026.	<ul style="list-style-type: none"> • Develop co-marketing plan to support a range of appliance distribution partners to sell to its utility customers. • Develop a corporate strategy for achieving the 500,000 by 2026 target and align with the Kenya National eCooking Strategy (KNeCS).

Project	Overview	Findings	Key recommendations
Appliance Comparisons (implemented by Strathmore University, Jikoni Magic & KPLC)	Data from a series of Controlled Cooking Tests (CCTs) with a wide range of cooking devices across a set of typical dishes from the everyday Kenyan menu enabled an apples-to-apples comparison of the relative costs & versatility of different energy-efficient appliances.	No clear winner across all meal types highlighted value of fuel/appliance stacking. EPC had lowest running costs, but cannot cook all dish types; induction could & has comparable efficiency for frying & short boiling dishes.	<ul style="list-style-type: none"> • Develop consumer-facing knowledge products (flyers, web site content, video recipes etc.) to inform purchasing decisions. • Focus awareness & co-marketing campaigns on EPCs & induction stoves, which balance energy-efficiency with versatility.
Pika na Power Academy (implemented by KPLC-IESR)	The Pika na Power Academy brought together expertise from clean cooking & electricity sectors to empower eCooking Champions from across the country to establish sustainable eCooking initiatives in their local area.	15 last-mile distributors attended 5-day business & technical training. 7 received seed funding to implement innovative ideas. Academy participants established the Electric Cooking Entrepreneurs Association of Kenya (ELCEAK).	<ul style="list-style-type: none"> • Institutionalise the Pika na Power Academy as an annual training course at IESR. • Formalise engagement with ELCEAK to enable a sustainable & diversified marketplace for eCooking appliances in the last mile.

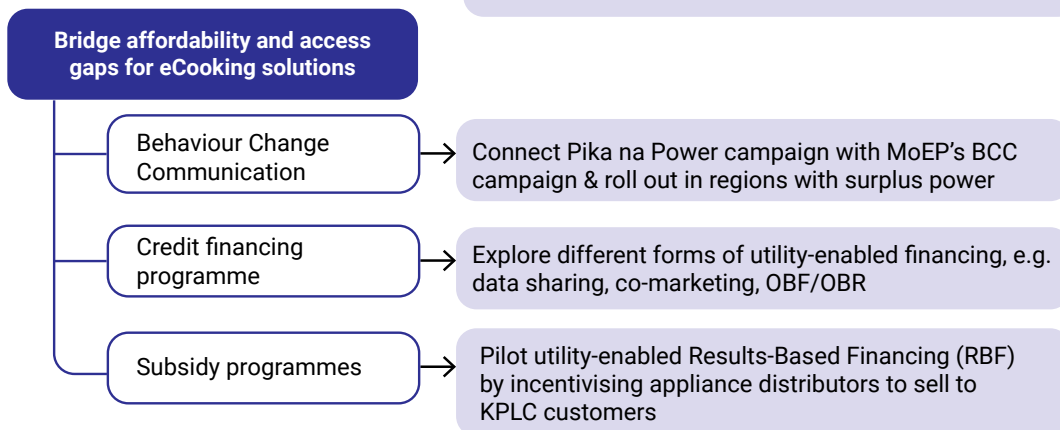
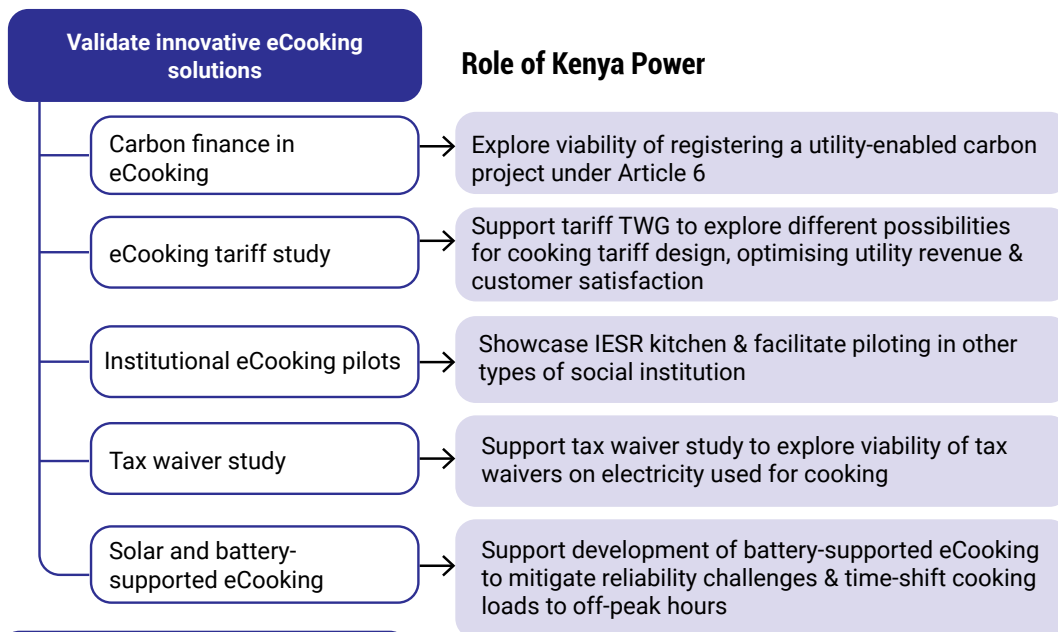
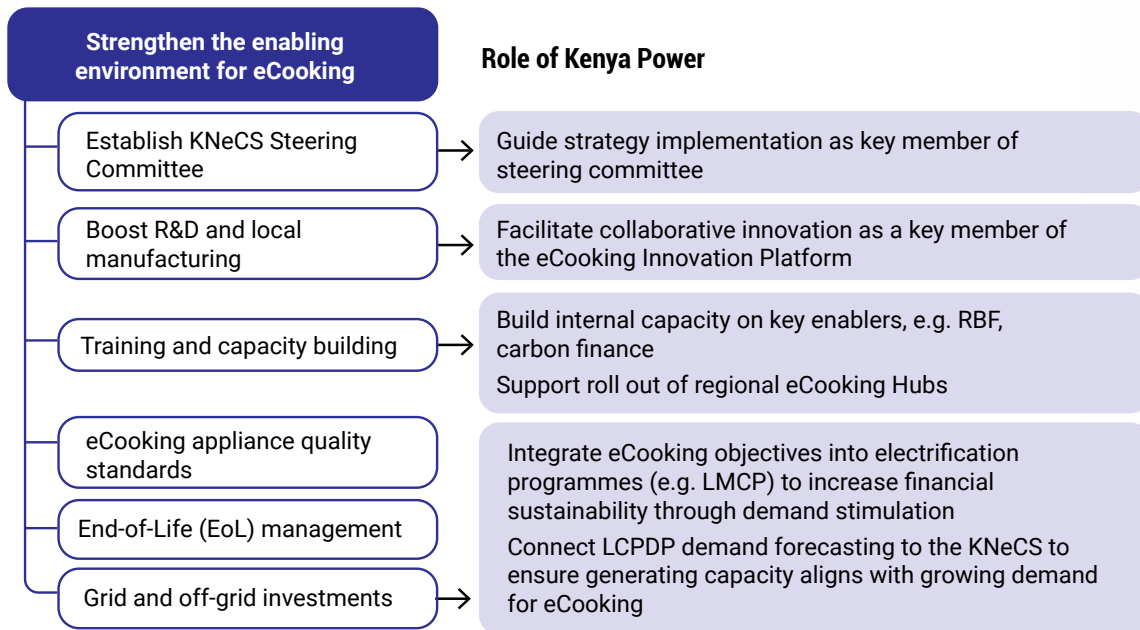


What happens next? Kenya Power’s role in the Kenya National eCooking Strategy (KNeCS)



The KNeCS 2024-2028 provides a roadmap for building the foundation for a sustainable eCooking marketplace in the next five years, which can then enable an accelerated scale-up over the next two decades to facilitate the Net Zero transition. The KNeCS makes a strong contribution towards the achievement of Sustainable Development Goal (SDG) 7, the Ministry of Energy & Petroleum’s (MoEP’s) ambitious target of universal access to clean

cooking solutions by 2028 and ensuring the financial viability of the power sector through demand stimulation. The KNeCS was co-created by a Technical Working Group (TWG) co-chaired by the MoEP and MECS, and comprising key national institutions and associations. Kenya Power has been an active member of the TWG and the utility’s role in implementing each of the strategic initiatives is outline below:





New opportunities identified by the eCAP programme

As a result of the awareness raising activities carried out with the Kenya Power management during the eCAP programme, the company has now set an ambitious goal of enabling 500,000 customers to cook primarily with electricity by 2026. The most viable opportunities emerging from the eCAP projects that could be adopted by Kenya Power to rapidly scale the adoption of electric cooking are:

- Scale up utility-enabled financing pilots
- Pilot an eCooking tariff with smart-metered appliances
- Leverage the KNeCS to drive forward Kenya Power's corporate strategy for demand growth from cooking
- Closely monitor demand growth from cooking to ensure electrical infrastructure evolves to meet the additional load
- Expand awareness campaigns to reframe eCooking as an aspirational yet achievable solution for modern Kenyan cooks
- Strengthen private sector partnerships to foster the growth of a sustainable and diversified eCooking marketplace
- Explore innovative partnerships with local power distributors to reduce losses and increase safety in informal settlements
- Support the electrification of cooking beyond households by rolling out eCooking in Kenya Power facilities and other key types of institution
- Continue to build bridges with the clean cooking sector

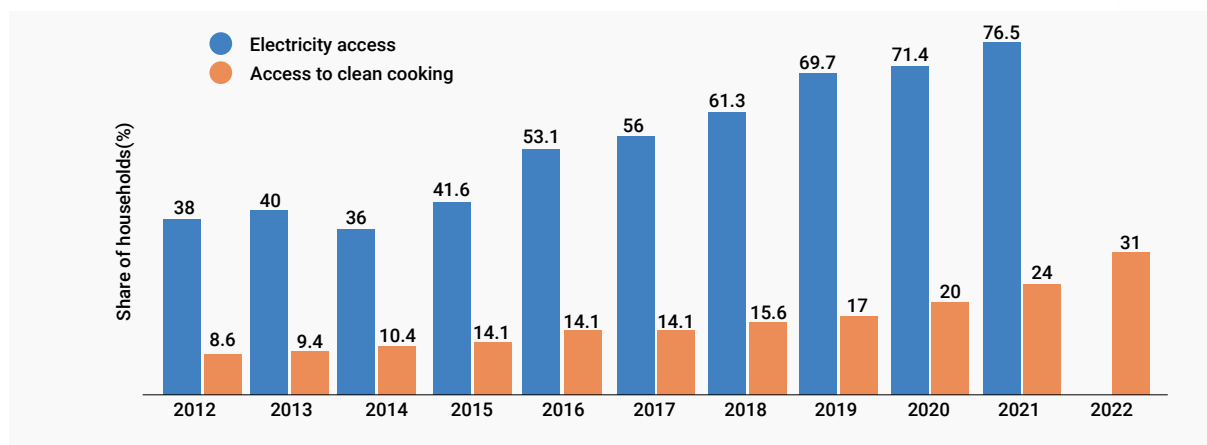


01 | The case for eCooking in Kenya

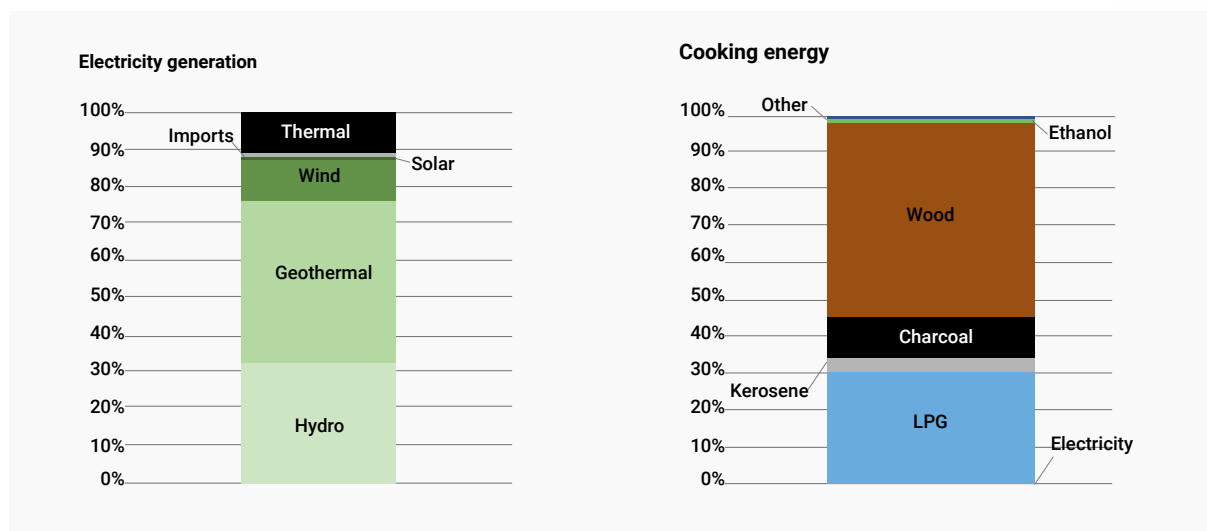
The following section shows why the time is now right for eCooking in Kenya. For many Kenyans, the words electricity and cooking do not sit well together. Historically, the perception that electricity is 'too expensive' for cooking, low rates of access to grid electricity and a limited choice of relatively inefficient appliances have constrained the use of electricity in the kitchen. However, with innovations happening both globally and here in Kenya, new possibilities have opened up. In this ever-evolving landscape, new technologies and business models are unlocking the transformative potential of electric cooking.

Importantly, eCooking is no longer the preserve of the wealthy, with innovative financing models breaking down the high upfront costs; energy-efficient appliances dramatically reducing the amount of electricity needed to cook popular foods; and energy storage coupled with DC appliances able to make cooking with electricity reliable even for those with intermittent supply, or indeed no grid access at all. This section presents the key trends and catalytic innovations that are making electric cooking one of the most dynamic sectors in Kenya right now.

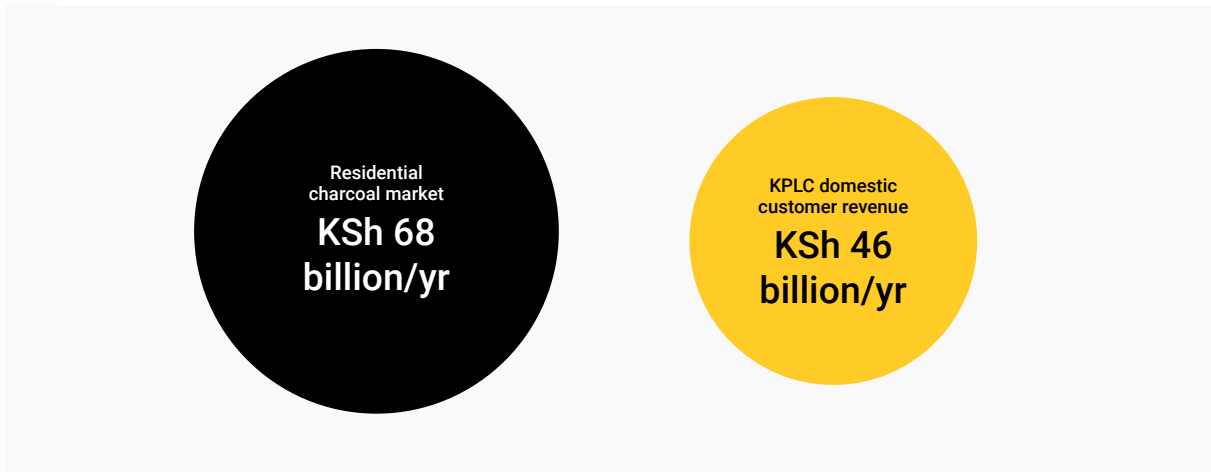
Rapid progress in electrification offers a transformative new opportunity to tackle the clean cooking challenge (MoEP, 2024a)



A transition from unsustainably harvested biomass and imported fossil fuels to locally generated renewable electricity holds enormous potential for climate emissions reduction and energy security



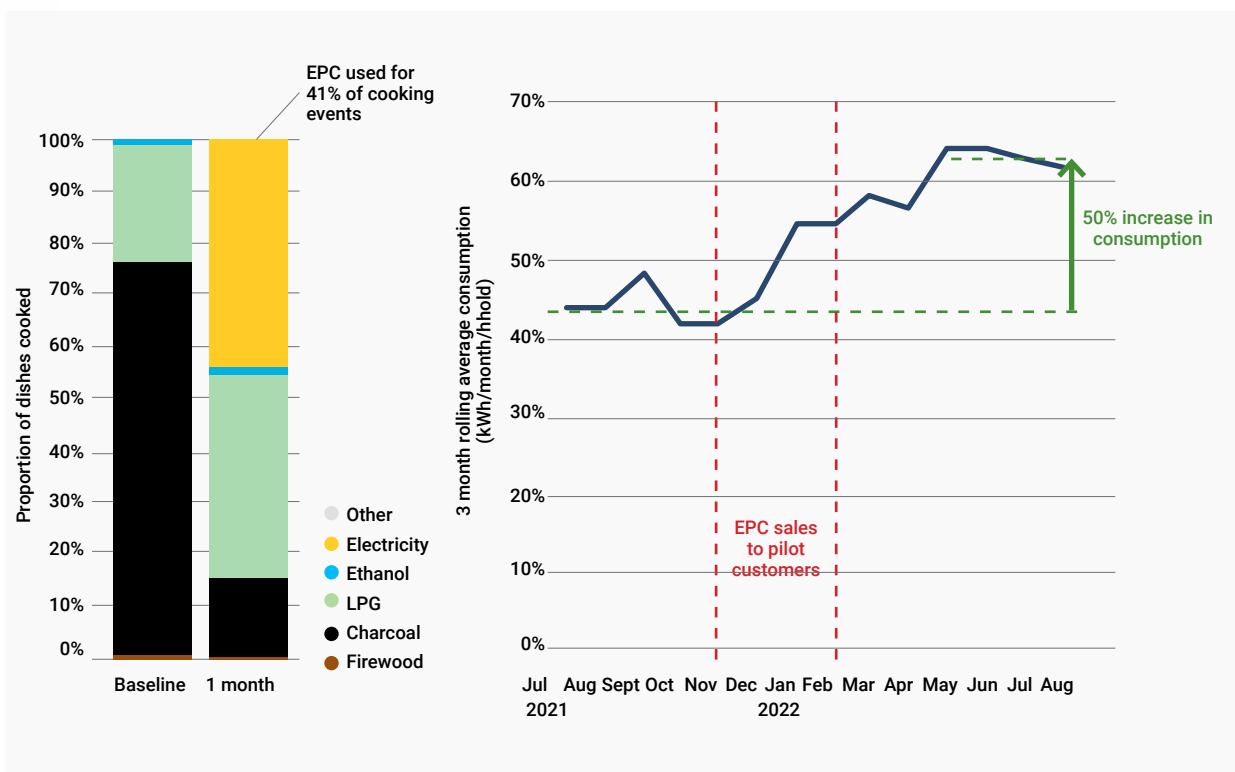
Converting existing expenditures on polluting fuels such as charcoal into electricity unit sales offers a lucrative additional revenue stream for KPLC



“Data on weekly charcoal expenditure collected from responding households indicates that the **annual market value of charcoal** consumed by the residential sector alone is **KES 68 billion*** almost **40% more than what all domestic customers paid to Kenya Power in 2018** (according to Kenya Power’s annual report)” (MoE, 2019) (MoE, 2019)

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eCooking has the potential to become one of KPLC’s most important revenue streams



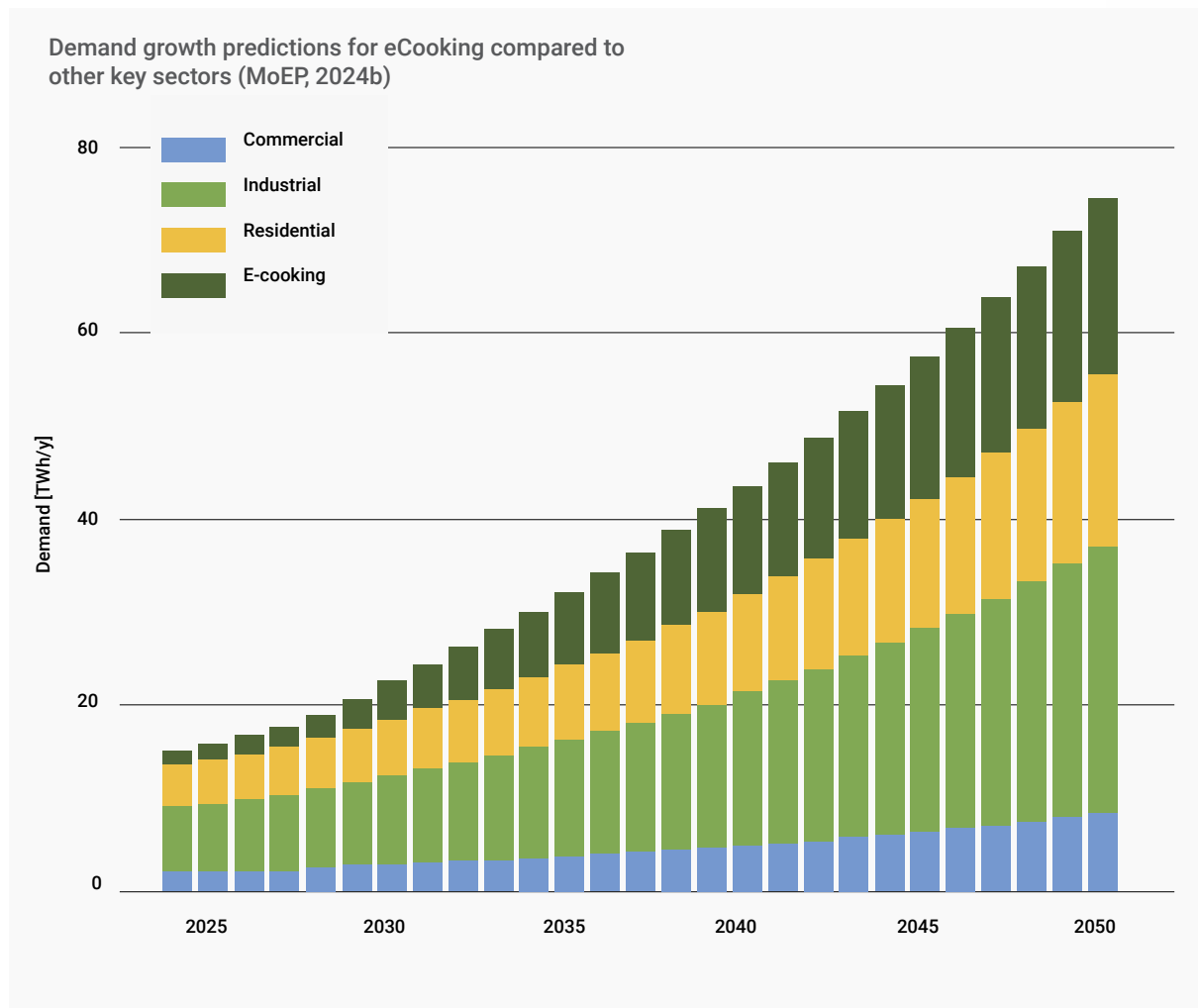
1 KPLC DC Customer Revenue: 38 billion KSh/yr in 2017/18 rising to 46 billion KSh/yr in 2021/22 (Kenya Power, 2022)

KPLC customer billing data cross-referenced with appliance purchase and usage data in recent pilots (Burn, Shell Foundation & MECS, 2023)



The Kenya National eCooking Strategy (MoEP, 2024) aims to build the foundation for a sustainable eCooking marketplace over the next 5 years. The strategy has set an ambitious target of 10% of the population cooking primarily with electricity by 2028. This firm foundation can then enable Kenya's net-zero transition with electricity expected to become the cooking fuel of choice for the majority of Kenyan households by 2050.

The strategy has set an ambitious target of **10% of the population cooking primarily with electricity** by 2028.



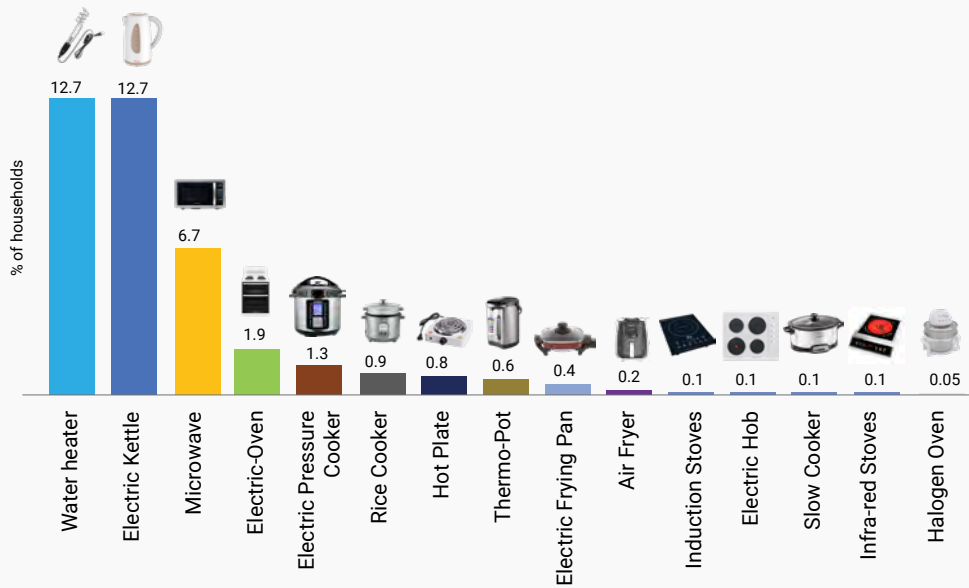
The KNeCS Baseline Study (MoEP, 2023) confirmed that the use of electricity as a primary cooking fuel is low, but it also showed that eCooking is already playing an important role within the domestic fuel stack:

Less than **1% of Kenyan households** use electricity as their primary cooking fuel.

6% of Kenyans currently using eCooking appliances as their primary, secondary or tertiary solution for cooking/reheating food and/or preparing hot beverages.

25% own an appliance that can be used for cooking, predominantly task-specific appliances, such as water heaters, kettles and microwaves.

Proportion of Kenyan households owning each type of eCooking appliance (MoEP, 2023)



To scale the adoption of eCooking as a primary cooking fuel, increased sales of appliances that can cook a wider range of popular foods are needed. Induction stoves and EPCs are particularly promising as they balance upfront cost, versatility and energy-efficiency.

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Induction stoves

Greater versatility:

- Any shape/size utensil, so can cook almost all popular dish types.
- Highly responsive manual heat control.
- Heats cookware directly, so more efficient than a hotplate, but less efficient than an EPC & requires steel cookware

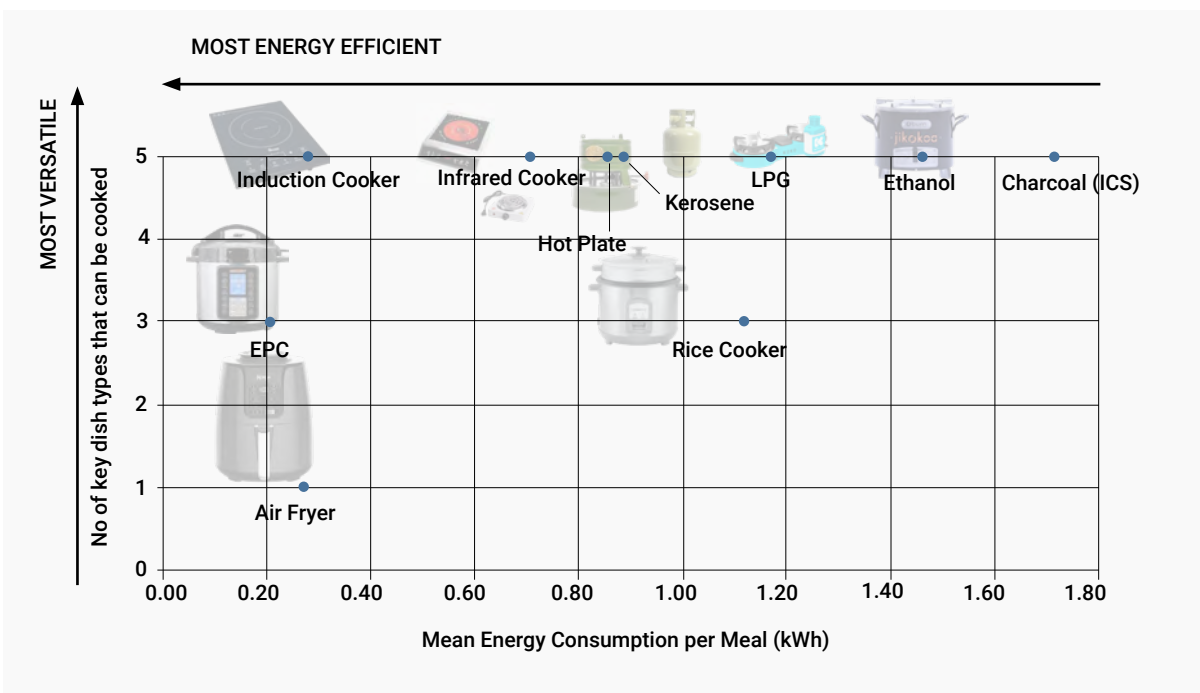


Electric Pressure Cookers (EPCs)

Greater energy-efficiency:

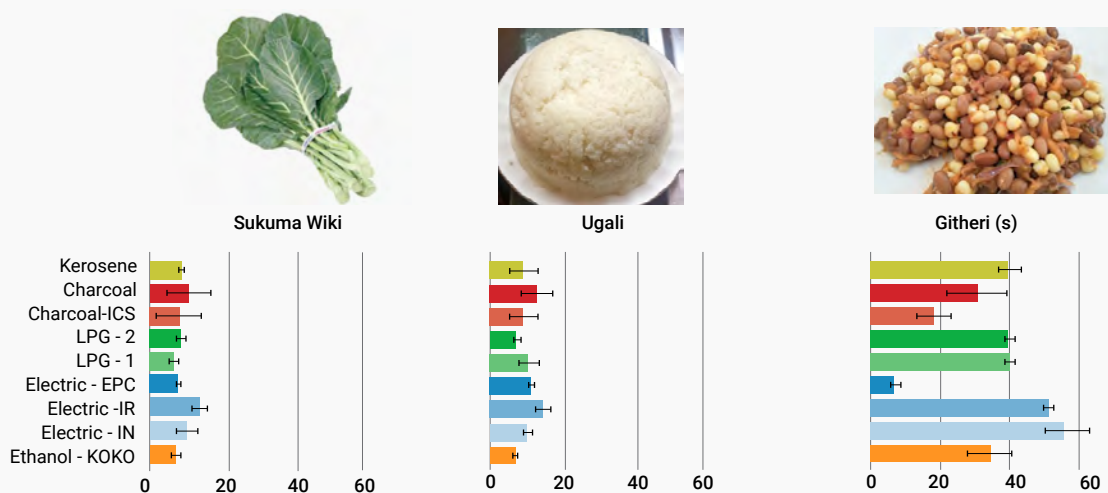
- Combines 3 key energy-efficiency mechanisms: pressurization, automation & insulation.
- Big cost & time savings for 'heavy foods'.
- Difficult to cook foods that require a shallow pan or manual heat control (e.g. chapati).

Figure 3: Energy-efficiency vs.versatility (bottom). Data Source: eCAP Appliance Comparisons project.



eCooking can be both the cheapest and the most expensive way to cook, depending upon the foods you are cooking, the energy-efficiency of the appliance and the relative cost of different fuels at that time and place.

Results of Controlled Cooking Tests (CCTs) for popular food types in Kenya. Data source: Perros et al (2023)

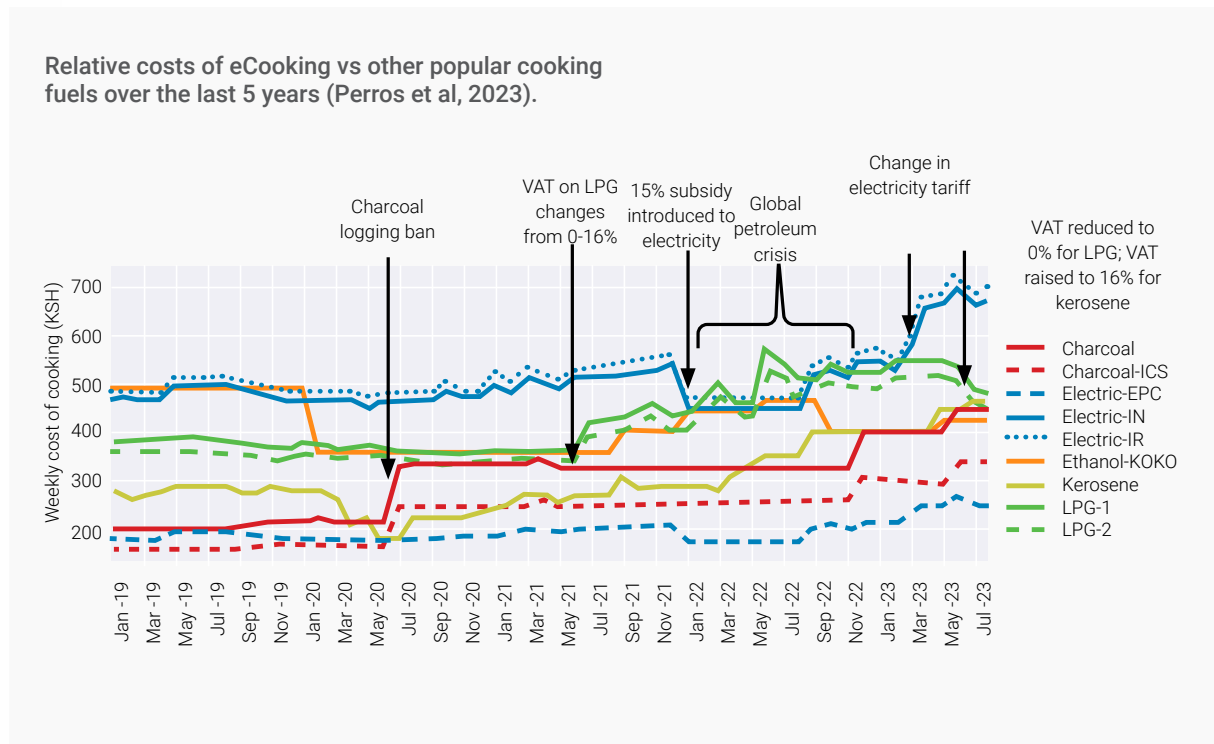


Quick fried dishes like sukuma wiki or fried eggs are a similar price across fuels and appliances, but the induction & infra-red stoves allow the cook to use a shallow pan and manually control heat levels.

Boiled staples such as ugali or rice has a similar cost across fuels and appliances. The induction & infra-red stoves allow different sized pots, but the EPC's non-stick pot certainly makes washing up easier.

Heavy foods like githeri or matumbo are much cheaper and quicker on the EPC due to the combination of pressurisation, insulation and automation.

Cooking all your food with an EPC would be the cheapest way to cook. Induction and infra-red are currently the most expensive, but offer versatility to cook the whole menu. Using both together can balance affordability with versatility.



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The digitisation of appliances enables PayGo business models, the generation of high-integrity carbon credits and dedicated tariffs for electricity used specifically for cooking.

A growing number of companies are now selling smart-metered eCooking appliances in the Kenyan market:

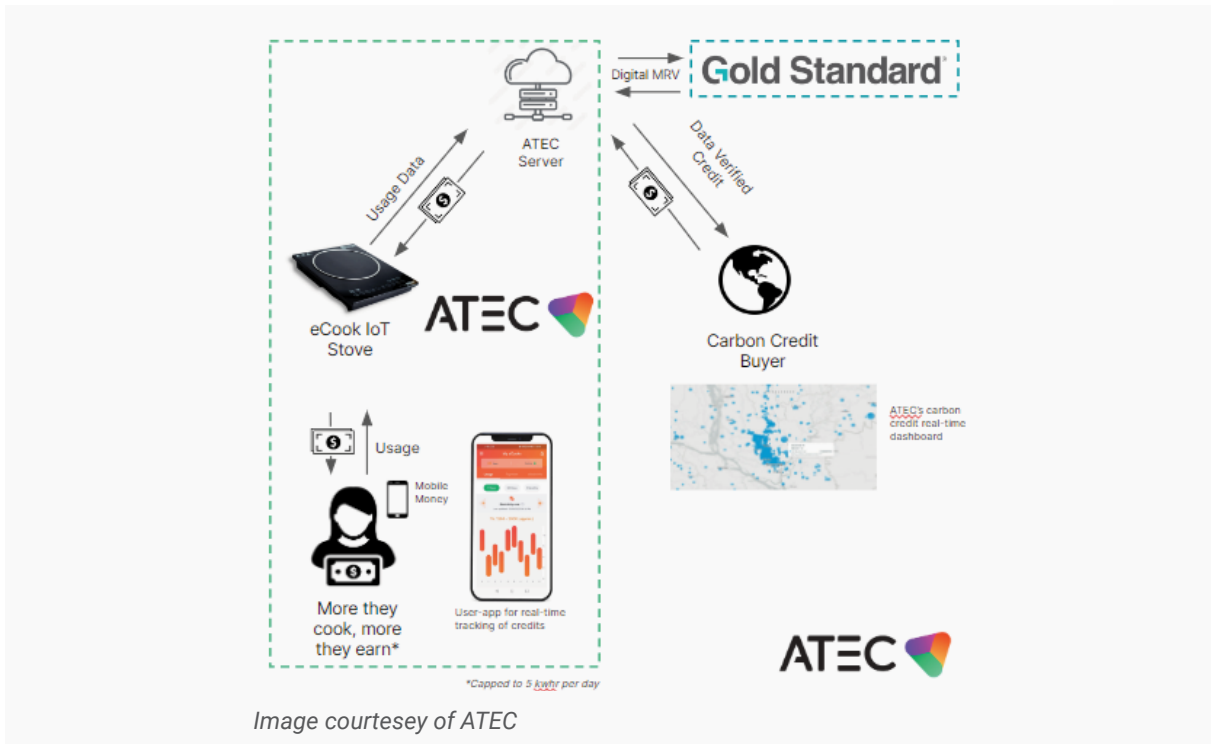
PowerPay
ATEC
burn life-saving stoves
POWERUP Clean Tech For Everyone

- Interoperable IoT platform can digitise any appliance
- Cook-to-earn
- 1st company to use GS metered methodology
- Local assembly -> local manufacture in Kenya
- Designed in Uganda
- Live kWh readout on LCD

Data from smart-metered appliances can enable more efficient verification of usage patterns, resulting in better prices for higher integrity carbon credits.

Carbon finance can be used to support the roll out of eCooking in a variety of ways, including:

- lower the upfront cost of appliances and cookware;
- expand distribution networks across the country;
- reduce the cost of electricity for cooking through rebates;
- provide after-sales support to ensure customers are able to keep using their appliances as much as possible for as long as possible;



The World Bank's Multi-Tier Framework (MTF) categorises electricity connections according to 7 critical factors that enable or constrain the user's experience. Customers with a Tier 3 connection can cook with electricity but would need to fuel stack or rely on household energy storage during power outages. Customers with Tier 4 connections may still need to fuel stack occasionally, but Tier 5 could cook all their food with electricity.



Over **2/3 of the population** now have an electricity connection that could enable them to cook at least part of their food with electricity.

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World Bank MTF classification of electricity access. Source: Village Infrastructure Angels.

	Tier 0	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5
Capacity	No electricity	1-50W	50-500W	500W-2000W	>2000W	
Duration	<4hrs	4-8hrs		8-16hrs	16-22hrs	>22hrs
Reliability	Unscheduled Outages				No Unscheduled Outages	
Quality	Low quality			Good quality		
Affordability	Not affordable		Affordability			
Legality	Not legal			Legal		
Health & Safety	Not convenient				convenient	



Task lightning
+
Phone charging
or radio



Tier 1
+
General lighting
+ air circulation +
television



Tier 2
+
Light
appliances



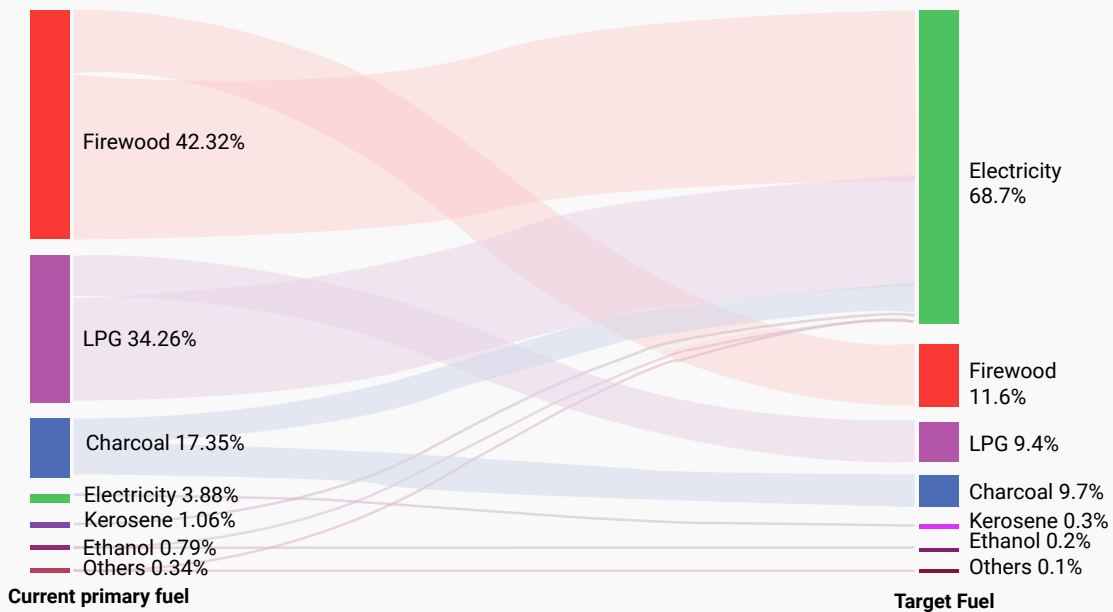
Tier 3
+
Medium or
continuous
appliances



Tier 4
+
Heavy or
continuous
appliances

Data from the household survey (n=2432) carried out for the Kenya National eCooking Strategy (KNeCS) showed that 69% of Kenyans can already cook with electricity, as they have access to Tier 3+ connections.

Transition pathways to eCooking based upon MTF
Tier 3+ electricity access (MoEP, 2023)



Key milestones in the development of the eCooking Sector

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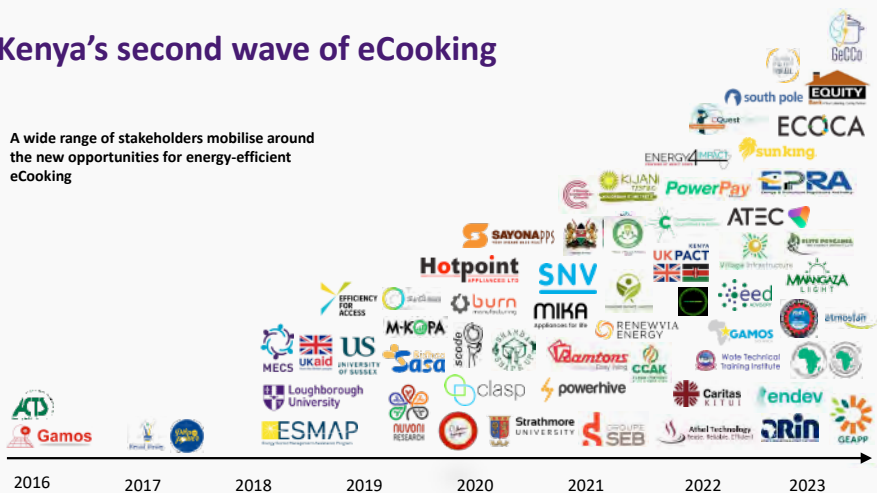
Kenya's first wave of eCooking

Global and local appliance distributors bring in high end task-specific luxury appliances for the urban elite (microwaves, coffee makers, toasters etc.) and low-cost appliances for the urban poor (kettles, water heaters, hotplates/coils, etc.)



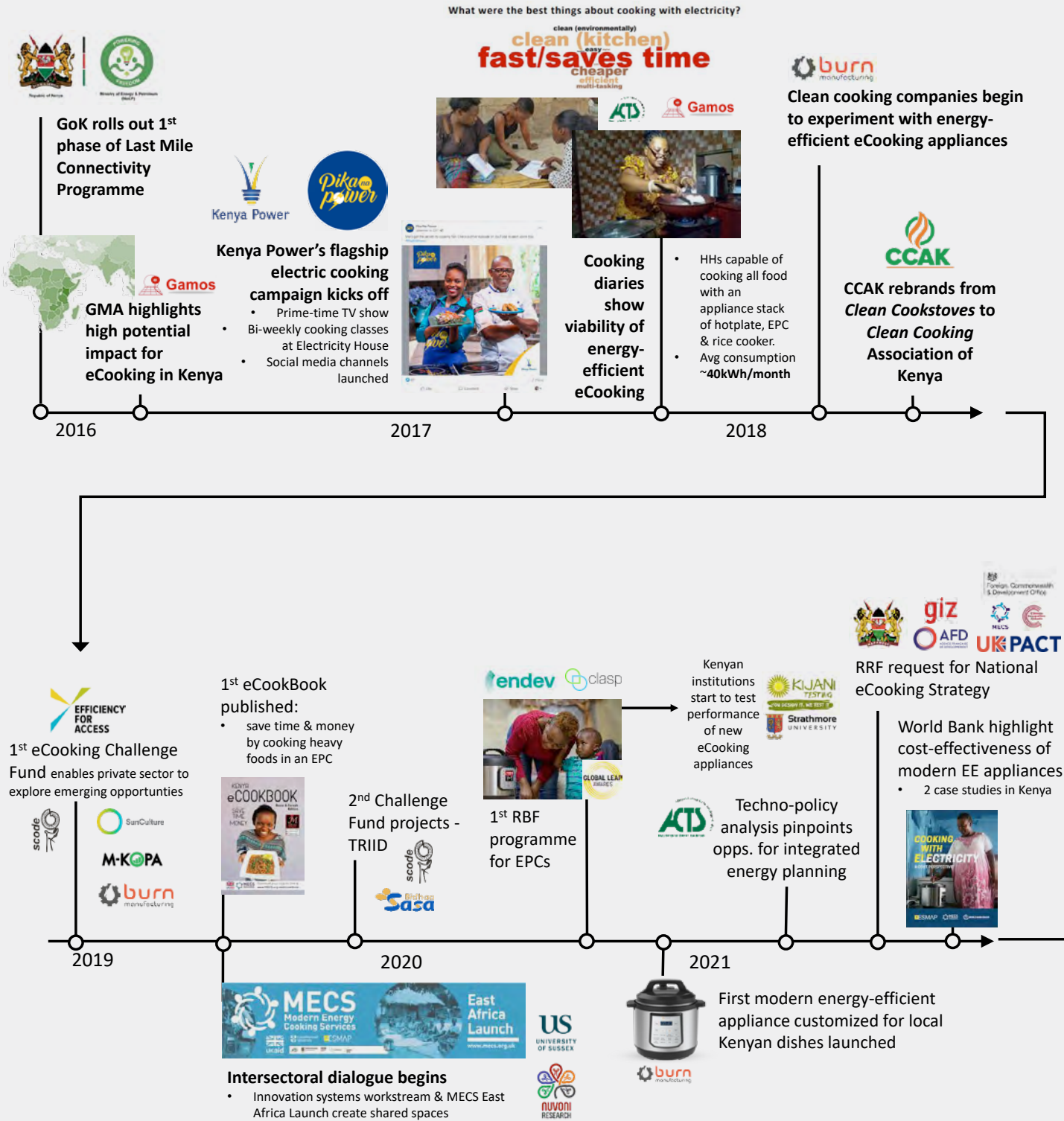
Kenya's second wave of eCooking

A wide range of stakeholders mobilise around the new opportunities for energy-efficient eCooking

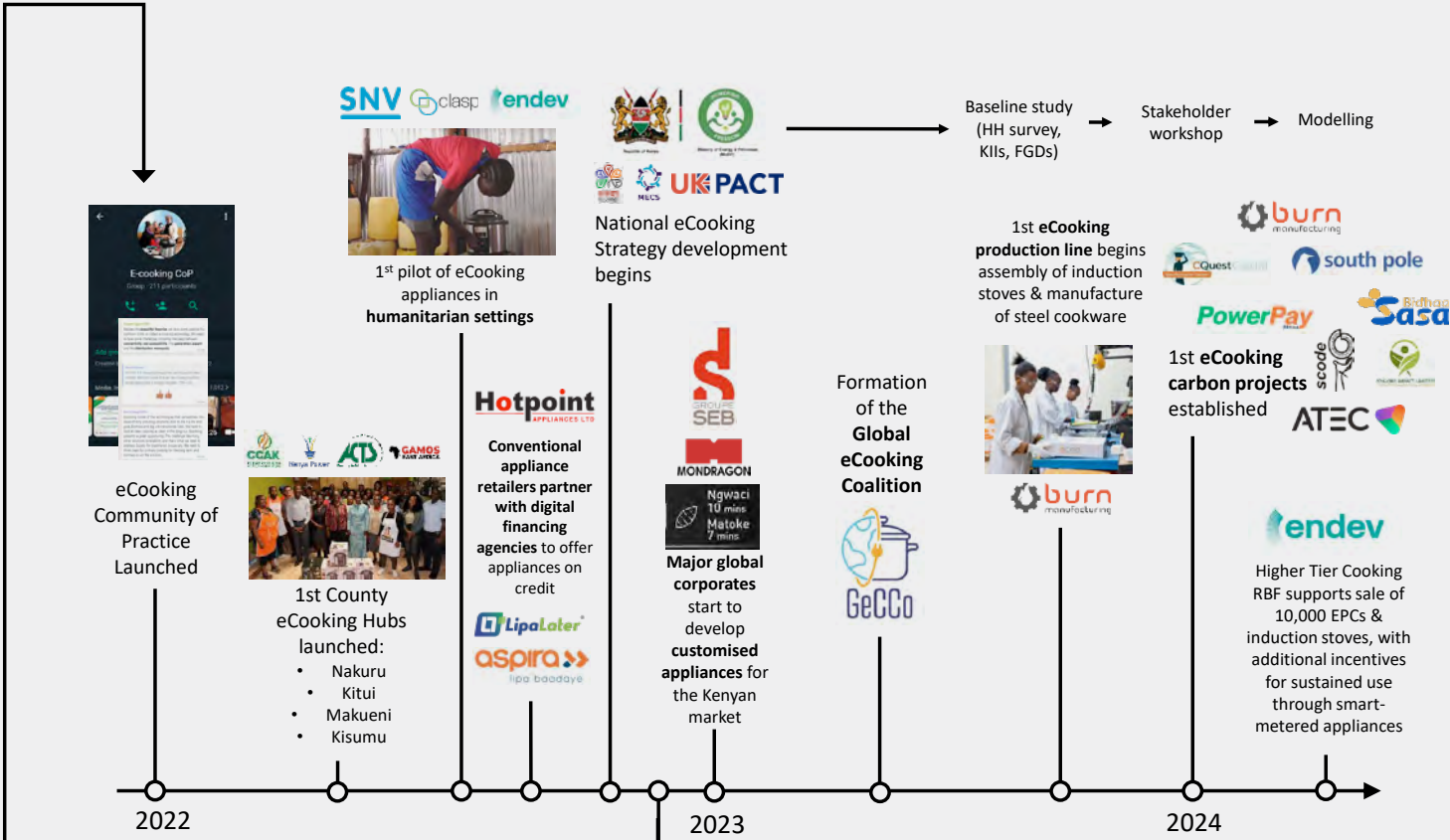




Key milestones in Kenya's second wave of eCooking include:



eCAP has enabled Kenya's emerging eCooking sector to achieve a range of important milestones on its journey of innovation:



eCAP = eCooking Capacity Building & Market Development Programme

Partners: Duka Pwani, Kenya Power, MECS, UK PACT, Strathmore University, Pwani Region, CCAK, scode, PowerPay

- Intersectoral Dialogue:** EPRA New electricity tariff band introduced to support demand growth via eCooking
- Consumer Financing:** 1st PayGo EPC becomes commercially available
- Consumer Awareness:** MD & CEO sets target of 500,000 customers cooking with electricity by 2026
- Pika na Power Academy:** Formation of Electric Cooking Entrepreneurs Association of Kenya (ELCEAK)
- Institutional eCooking:** Showcasing of larger energy-efficient appliances results in integration into school feeding programmes
- Digital Engagement:** Pika na Power launch new digital platforms

5th County eCooking Hub launched

Pika na Power

Pika na Power is Kenya Power's flagship campaign that aims to creating awareness of cooking with modern energy-efficient electric appliances. Pika na Power seeks to demystify the common perception that cooking with electricity is 'too expensive for cooking'.



The Pika na Power seeks to **demystify** the common perception that **cooking with electricity is 'too expensive for cooking'**.

Eng. Isaac Kiva, OGW Secretary Renewable Energy, Ministry of Energy and Petroleum, State Department of Energy.

Tweets from @PikaNaPower



Kenya Power's cooking with electricity awareness program first started in 1967 as part of a broader campaign on electric appliances known as Mke Nyumbani, a partnership between KBC and Kenya Power. The program was executed through demonstration centres in Nairobi and Mombasa. The agenda back then was to introduce the African customers to electric appliances with facilitators demonstrating how to use and care for electric appliances at home. Mke Nyumbani was recorded at the Mombasa demonstration centre and was aired nationwide to enable many Kenyans to safely adopt electric appliances in their homes. These demonstration centres were closed in the year 2000 when it was decided they had achieved their purpose.

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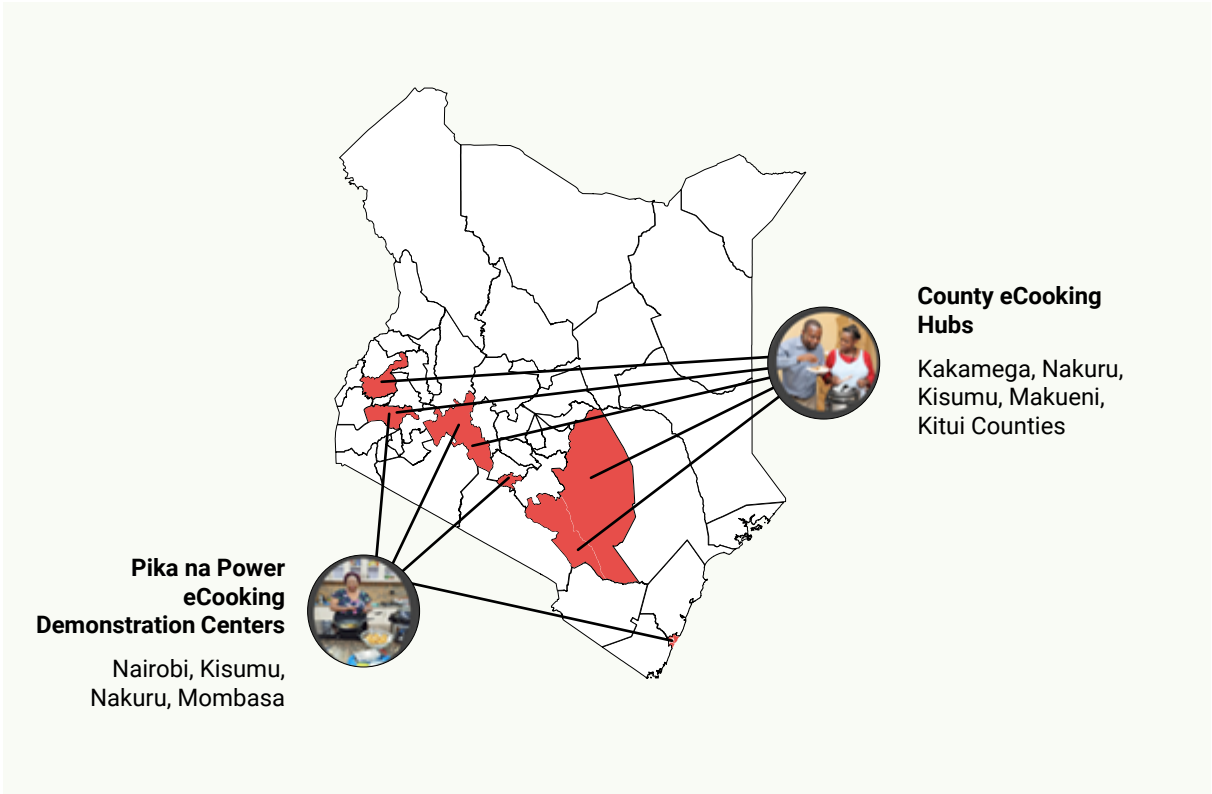


The Last Mile Connectivity Project (LMCP) facilitated a rapid expansion of the power grid through grid extension in rural areas and densification in urban informal settlements, increasing the customer base from 2 to 9 million domestic customers in just 10 years. However, many new customers have very low demand, bringing in limited extra revenue for the utility. To transform these customers into profit making customers, demand stimulation became a necessity.

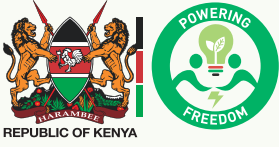


In 2017, the need for a specific electric cooking campaign was identified and the demonstration centre in Nairobi was refurbished, re-opened and rebranded Pika na Power. The new agenda was raising awareness of the energy-efficient appliances that are cheaper to use, safer, faster and more reliable. Successful uptake of such appliances would lead to higher unit sales for Kenya Power and to

a better quality life for the customer. In the following years, the demonstration centres in Mombasa, Nakuru and Kisumu were also reopened and KPLC partnered with ACTS (African Centre for Technology Studies), CCAK (Clean Cooking Association of Kenya) and MECS to launch a series of County eCooking Hubs designed to catalyse the electrification of cooking across the country.



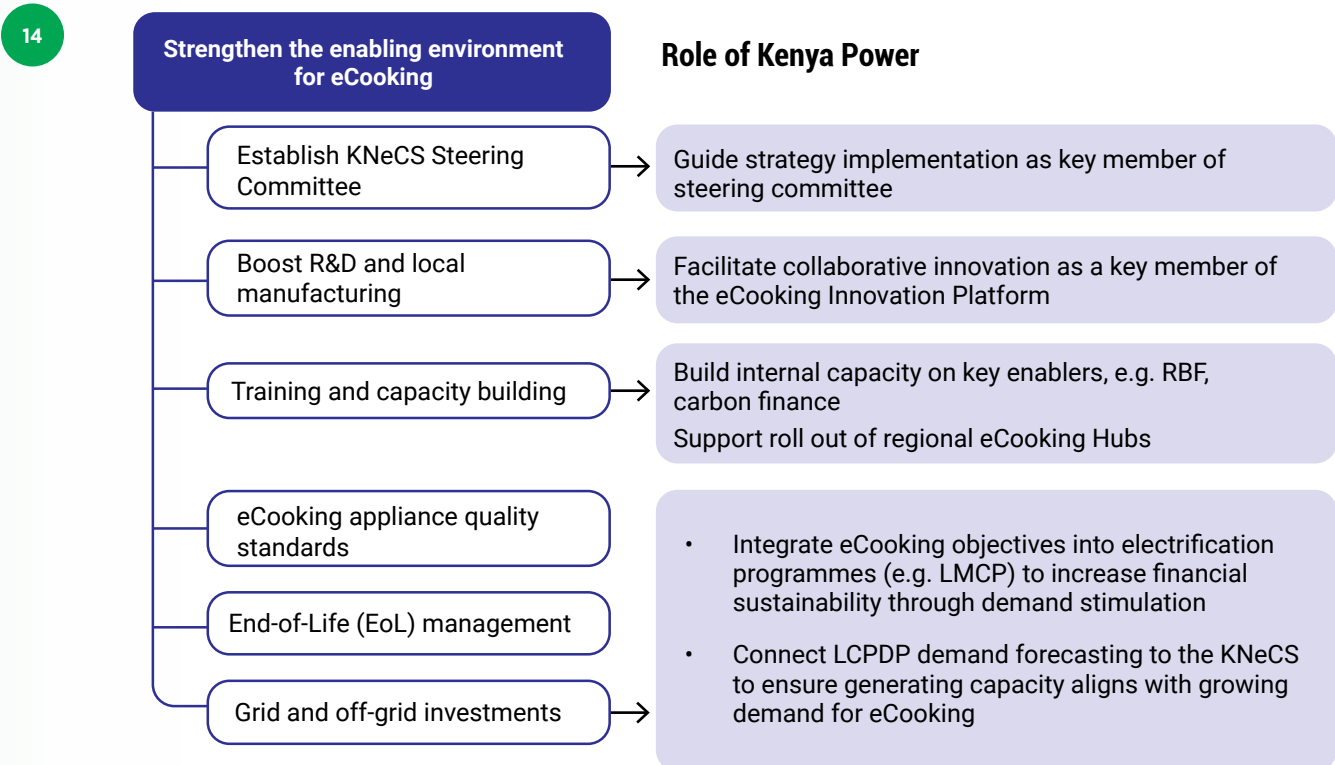
02 | Kenya National eCooking Strategy (KNeCS)

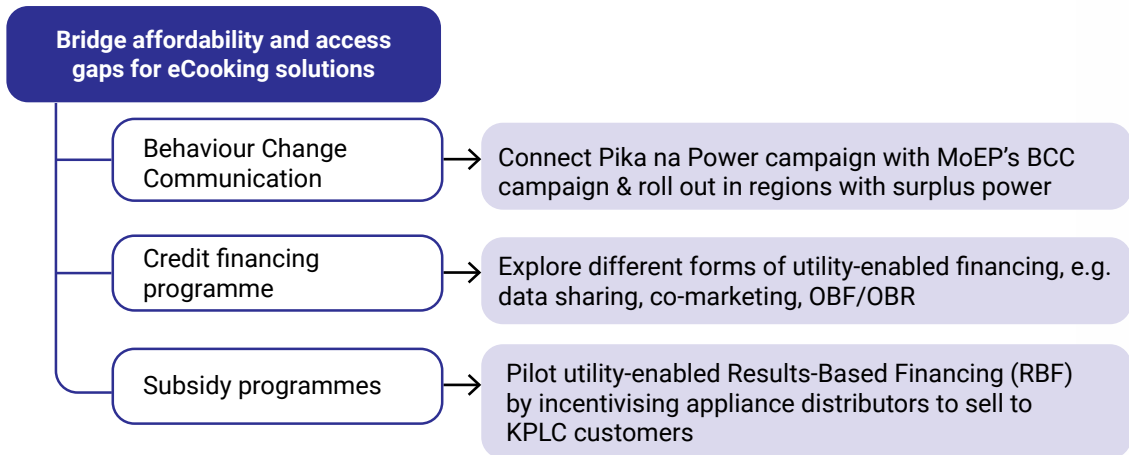
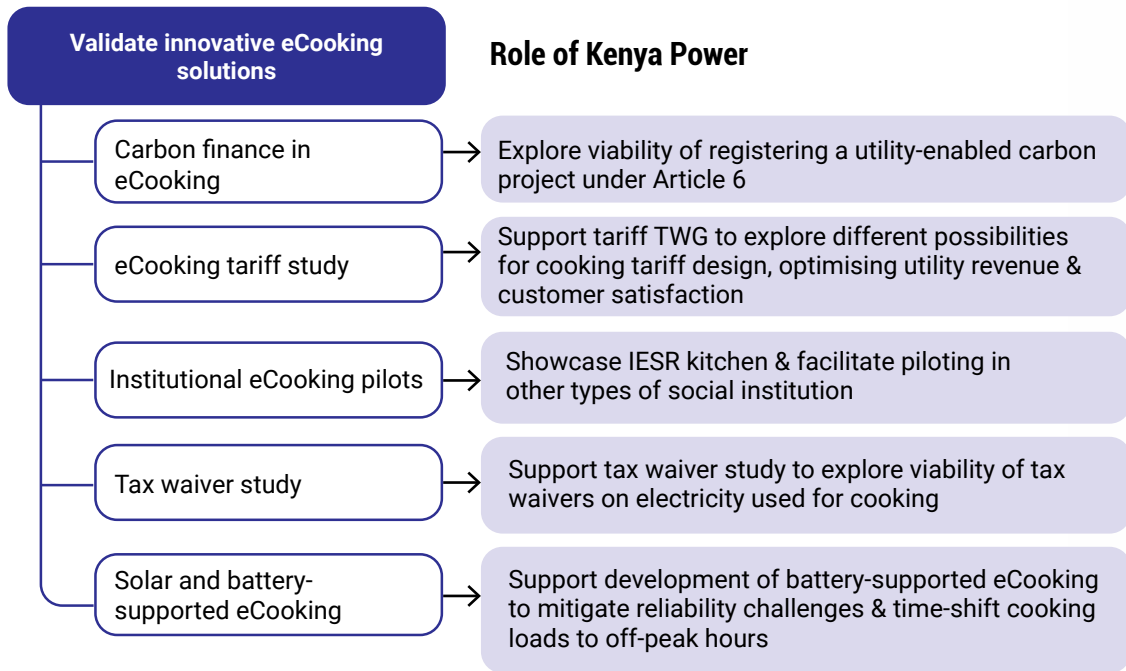


The Kenya National eCooking Strategy (KNeCS) 2024-2028 provides a roadmap for building the foundation for a sustainable eCooking marketplace in the next five years, which can then enable an accelerated scale-up over the next two decades to facilitate the Net Zero transition. The KNeCS makes a strong contribution towards the achievement of Sustainable Development Goal (SDG) 7, the Ministry of Energy & Petroleum’s (MoEP’s) ambitious target of universal access to clean cooking solutions by 2028 and ensuring the financial viability of the power sector through demand stimulation.

Kenya Power’s role in the KNeCS

The KNeCS was co-created by a Technical Working Group (TWG) co-chaired by the MoEP and MECS and comprising key national institutions, associations and institutions. Kenya Power has been an active member of the TWG and the utility’s role in implementing each of the strategic initiatives is outline below:





03 | The eCooking Capacity Building & Market Development Programme

Running in parallel to the National Strategy development, eCAP was designed to build capacity within Kenya Power and other key sectoral players to be able to deliver on the ambitious goals of the strategy. The following section distils out the key findings from each of the 12 projects implemented under the eCAP programme.

Figure 4: eCAP implementation partners identifying interlinkages between projects during the kick-off meeting at Stima Club.



Consumer Financing for eCooking Appliances

► Implemented by PowerPay

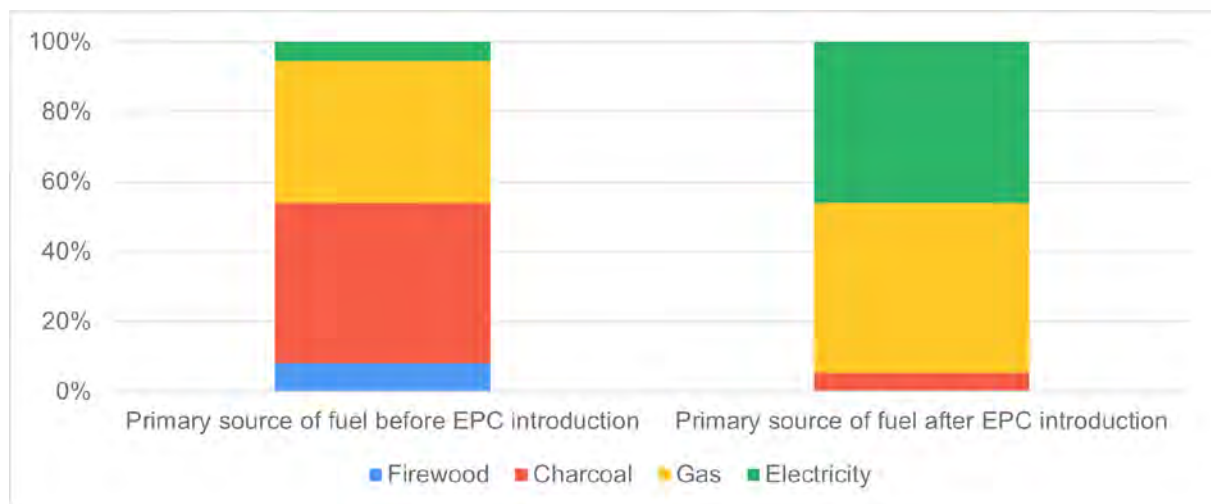
Approach: The project developed and tested a consumer financing product to mitigate the high upfront costs of acquiring EPCs and electric motorbikes. The project utilized PowerPay Africa’s innovative interoperable IoT hardware, which is a key enabler for Kenya Power and other companies, who would like to utilise PayGo (rent-to-own), ESCO (Energy Service Company) or on-bill financing business models. This gives the utility (or appliance distributor) flexibility to offer a range of delivery models by separating metering and remote lock out for individual electric devices from the household as a whole. The loan product was tested over the 5 months with 200 EPCs and 2 electric bikes.

Kenya Power has had outstanding success in expanding its national grid, with over 9 million customers now connected. However, electricity consumed by LMCP

beneficiaries has remained low even 2-3 years after connection to the grid. To unlock demand growth, there is a need to address the upfront cost barrier associated with acquiring electric devices. Previously, Kenya Power awarded loans for connection fees through the Stima Loan and LMCP. Whilst Stima Loan had high repayment rates (91%) as customers were carefully selected, LMCP repayment rates were much lower (23%) as credit was offered to all customers.

This project sought to enhance the design of the loan product for eCooking appliances and electric bikes learning from the StimaLoan and LMCP experiences. The study used a mixed-methods approach, comprising a literature review, stakeholder engagement to explore potential partnerships and action research to test specific hypotheses around loan product design.

Figure 5: Primary sources of cooking fuel before and after the project.

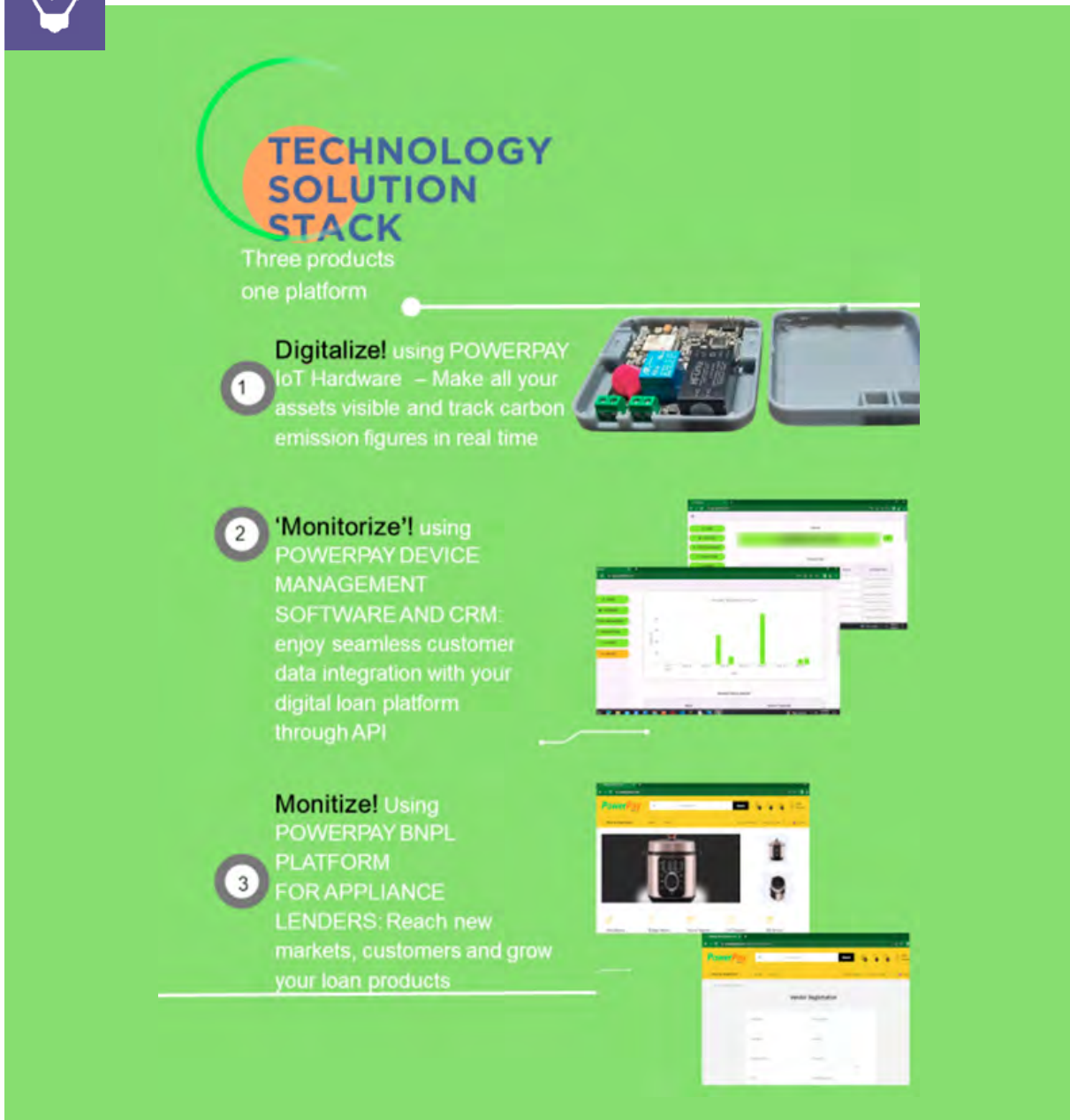


Findings: To date, a total of 401 potential customers were reached in various joint marketing and awareness forums set up collaboratively by PowerPay Africa and Kenya Power. Of these, 193 bought an EPC, resulting in a 48% conversion rate. The PayGo element also increased the uptake of the appliances, as 72% of loanees needed >2 months to pay for the product. At the close of the study, >95% of loans were being repaid on time and

only 2.2% were classified as receivables at risk. Average consumption of electricity from the EPCs observed was 0.675kWh per day, or 20.25kWh/month. On average, each household reduced emissions by 0.714kgCO₂e/day, or 260kgCO₂e/year. From a survey conducted at the end of the project, customers are saving a mean of KES 1,359 per month by cooking with electricity and at least KES 3,612 per month by driving electric motor bikes.

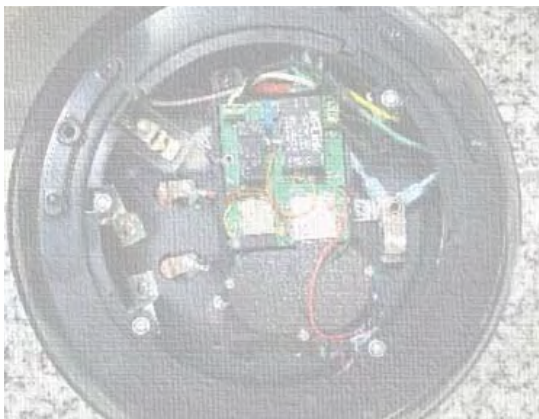


PowerPay Africa IoT digitalization technology and software platform



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Figure 6: A digitalized EPC carrying PowerPay embedded IoT hardware. Photo Courtesy of Powerpay.



PowerPay's hardware agnostic IoT platform enables digitalization of electronic appliances for device management, monitoring and financing to be possible. PowerPay IoT is designed to help businesses reach last mile consumers through digitalization of electric appliances.

The IoT platform provides a range of tools including embedded hardware and firmware, web-based software, and cloud connectivity that help accelerate adoption and uptake of appliances. PowerPay IoT makes remote devices visible and monitorable. You can monitor runtime hours, power consumption, carbon emission reduction and device location; improve customer relationship management making appliance loan management and financing easy and cost effective.

Digital Engagement

► Implemented by Jikoni Magic (Kisambara Ventures)

Approach: The main aim of this project was to dispel the misperceptions that surround electric cooking and to position it as an aspirational solution for everyday Kenyan cooks. This was achieved through the use of multiplatform engagement with food bloggers & everyday cooks. The key message was to very clearly show that eCooking appliances can cook the same delicious food people have always known, but save both time and money in the kitchen. In this project, popular food bloggers Jikoni Magic (Kisambara Ventures) collaborated with Leo Tunapika and Cooking with Nimoh across multiple platforms to position eCooking as a desirable modern solution for everyday Kenyan cooks. A cooking competition, #pikanapowerpikaushinde, featured 6 competitors, who showcased their culinary

pro prowess across 4 energy-efficient appliances (induction cooker, air fryer EPC & rice cooker) at the Pika na Power Demonstration Center.

Findings: Whilst Kenya Power itself has a very healthy following on social media (1.4m followers on Twitter/X), the new Pika na Power accounts needed to broaden their reach. Between June and August, the recently reactivated Pika na Power Facebook page grew by 281 followers, while the new Instagram account gained 374 followers. The paid campaign for the project was able to reach 13,160 accounts, enabling much broader engagement with the clean cooking message that Kisambara and Pika na Power put out.

Figure 7: Pika na Power Facebook and Instagram analytics report for June to August showing the spike of activity during the Pika Ushinde competition.

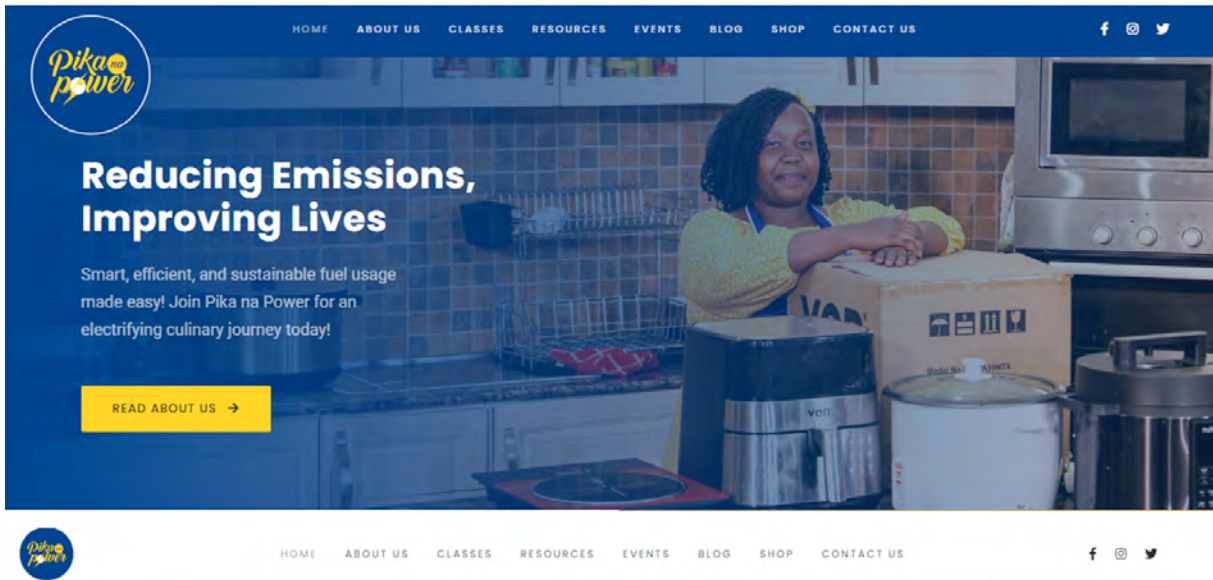
Facebook Analytics



A new web site was created for Pika na Power to provide easy access to information on eCooking, featuring recipes and introducing new appliances as they enter the market. The website was created collaboratively by Strathmore

University, Jikoni Magic and Kenya Power and will serve as a dynamic hub, connecting people with valuable resources and fostering collaboration with partners in the eCooking space.

Figure 8: Screenshot from the new Pika na Power website, which will be embedded within the main KPLC.co.ke site.



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Figure 9: Screenshot from Pika na Power YouTube page of the 6 competitors as Agnes Kalyonge of Jikoni Magic explains how an induction cooker works.



Intersectoral Dialogue

► Implemented by the Clean Cooking Association of Kenya (CCAK)

Approach: This project facilitated knowledge exchange on eCooking through a series of Intersectoral Dialogues. This involved organizing eCooking demonstrations at county and national events, co-convening webinars, hosting stakeholder meetings on emerging topics (e.g. eMobility/eCooking knowledge exchange) and establishing a new eCooking hub in Kakamega County. The Intersectoral Dialogues were facilitated through the eCooking CoP, a platform comprising more than 350 individuals from the clean cooking and electricity sectors in Kenya and beyond.

Findings: In 2022, CCAK, KPLC, Gamos East Africa, ACTS, and various other partners collaborated to set up eCooking Hubs in four counties to share experiences and empower local champions actively promoting eCooking in their respective regions. During this project, CCAK launched the 5th eCooking Hub in Kakamega and conducted a field visit to the hubs to evaluate their progress, explore opportunities for collaboration and record a set of impact stories (Nakuru Hub, Makueni Hub, Kitui Hub).

Figure 10: This project aimed to create a bridge between Kenya's electricity access and clean cooking sectors to foster the growth of the emerging eCooking sector that is forming at their intersection.



Figure 12: eCooking champions demonstrating energy-efficient appliances at the Pika na Power during the Clean Cooking Week.



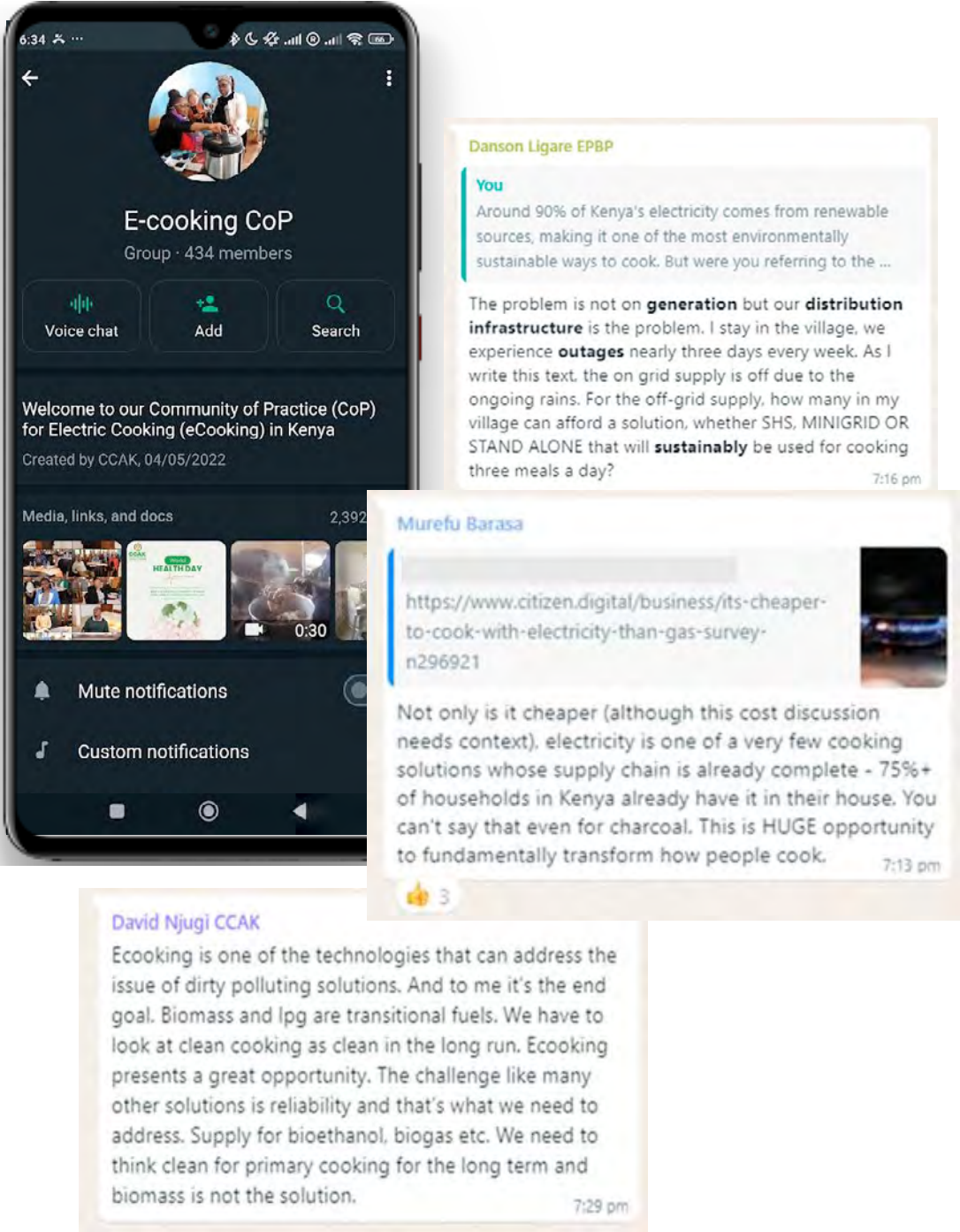
Figure 11: The launch of the Kakamega eCooking Hub. Photo credit: Okova Sophie/KPLC.



During the 2023 Electricity Tariff Control Period, CCAK coordinated formal requests to EPRA in pursuit of an eCooking tariff. While the eCooking tariff wasn't immediately granted, a new tariff band was created to support the growth of the eCooking sector, with a recommendation of collecting additional data on eCooking over the next 3 years.

CCAK partnered with MoEP to organise the third Clean Cooking Week from 28th November to 2nd December 2022, which was attended by over 400 people and aimed to create an enabling environment for the adoption of clean cooking fuels and technologies through a sustainable market environment.

Figure 13: The eCooking CoP WhatsApp group is a vibrant space for stakeholders from the clean cooking and electricity to explore the emerging opportunities for eCooking together



Consumer Awareness

► Implemented by KPLC-Sales Growth

Approach: Regional cooking demonstrations were conducted, targeting not only urban customers, but also the last-mile customers using minimal units per month. Collaboration with PowerPay Africa extended the reach to tea and coffee farmers, a crucial customer segment that Kenya Power is keen on educating to increase their electricity usage. Additionally, partnerships with other companies in the eCooking space facilitated awareness campaigns in various regions.

Demonstration sessions with Kenya Power customers as part of a co-marketing campaign with PowerPay Africa in Tharaka Nithi, Mombasa, Nakuru and Kilifi (clockwise from top left)



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Findings: The partnership with PowerPay for financing of appliances presented a mutually beneficial opportunity. PowerPay's IoT allows for pay-as-you-go sales if customers express interest in purchasing EPCs. By supporting PowerPay and other external organisations with co-marketing activities, Kenya Power can benefit from increased electricity demand with minimal financial risk.

Awareness raising sessions carried out with Kenya Power staff in Nairobi (top left), Eldoret (top right and bottom left) and Kisumu (bottom right).



The project also focussed on engaging Kenya Power staff, both senior management in Nairobi and regional managers in all ten Kenya Power regions. During the course of this project, strategic demonstrations were held with Kenya Power's management team, which were very successful in changing their mindset towards eCooking. Many have now become vocal advocates for eCooking, in their own homes, amongst friends and to the utility's broader customer base. Due to this change of mindset amongst the management, eCooking is now a strategic priority for the company and Kenya power has a target of increasing the adoption of eCooking to over 5% of its 9 million customers in the next 3 years.

Figure 14: As a direct result of awareness activities carried out during this project, Kenya Power's new CEO and MD, Joseph Siror, changed his perception of eCooking. He became a vocal advocate for eCooking, speaking out about its cost effectiveness on national TV and issuing a press release stating the company's intention to scale eCooking to half a million of its customers over the next 3 years. Picture (top) by Okova Kagi, KPLC.




Kenya Power
PRESS RELEASE

KENYA POWER UNVEILS PLAN TO ACCELERATE ELECTRIC COOKING

Nairobi, Thursday, 7th September 2023... Kenya Power is actively promoting the adoption of electric cooking (e-cooking) among its 9.2 million customers with a target to increase uptake from approximately 90,000 current users to over 500,000 users in three years.

This was disclosed by the Company's Managing Director & CEO, Dr. (Eng.) Joseph Siror, during the launch of the Global eCooking Coalition (GeCCo) during the Africa Climate Week in Nairobi.

Figure 15: The work of the eCAP project team within Kenya Power in changing his mindset was publicly recognised by the CEO & MD during the Africa Climate Summit: "I was new to eCooking a few months ago, but I have a wonderful team who really convinced me." Photo credit: Jon Leary, MECS.



Pika na Power Academy

► Implemented by KPLC-IESR

Approach: The Pika na Power Academy is dedicated to advancing capacity and fostering the growth of the eCooking sector. This transformative initiative equipped last-mile entrepreneurs with the essential knowledge and skills required to establish and operate successful eCooking enterprises. The academy solicited applications from individuals with a passion for eCooking, a fundamental understanding of the technical aspects, and an entrepreneurial mindset. The call for applications was widely disseminated within the eCooking Community of Practice (CoP) and through the KPLC social media channels, attracting a diverse pool of 30 applicants. Through a competitive process, 15 participants were selected for the inaugural cohort, with consideration given to gender/regional diversity.

The curriculum encompassed both business and technical dimensions of eCooking, including: consumer financing; international supplier negotiation and

importation; business models; stakeholder negotiation; electrical installation; energy-efficiency; and appliance maintenance. The academy spanned 5 days and featured a combination of in-person and online sessions with subject matter experts; practical cooking demonstrations; and networking opportunities.



The Pika na Power Academy is dedicated to advancing capacity and fostering the growth of the eCooking sector through in **equipping individuals** with the **essential knowledge** and **skills** required to **establish and operate successful eCooking enterprises** in Kenya.

Figure 16: Participants of the inaugural Pika na Power Academy



Findings: Post-training feedback from participants was overwhelmingly positive, with >70% rating the training as highly effective. Participants expressed satisfaction with the curriculum, course facilitators, and training materials. However, participants emphasized the critical importance of post-training support. The Academy also resulted in the establishment of the Electric Cooking Entrepreneurs Association of Kenya (ELCEAK). This association, conceived and nurtured by the participants, holds the potential to enable a just transition within Kenya's eCooking sector by enabling last mile distributors to work together and compete

with the established market players. Additionally, a seed funding program supported 7 proposals, offering graduates the opportunity to collaboratively develop and pilot promising solutions.

Conclusion: The positive feedback, the innovative funded projects and the establishment of ELCEAK by the program graduates all support the goal of establishing equitable marketplace for eCooking appliances in Kenya with an array of geographically and culturally diverse players.

Figure 17: Pika na Power Academy participants celebrating the formation of the ELCEAK, which will provide a platform for them to collaborate and collectively advocate for a favourable enabling environment for last mile entrepreneurs.



Kenyanising International Appliances

► Implemented by Jikoni Magic (Kisumuru Ventures)

Approach: There is now a proliferation of energy efficient cooking appliances in the Kenyan market in response of the growing interest by the Kenyan populace in modern cooking. However, these appliances are often not suited for the local consumer because they tend to have menus and functionalities designed for other markets. The aim of this project was to enable the international appliance manufacturers to develop and produce appliances that are well adapted to the Kenyan cooking culture by enabling them to understand what Kenyans cook and how they can effectively communicate their products' functionality to consumers in this new market. This project produced 3 interrelated outputs:

Findings:

- 1. Appliance modifications:** A set of tips to enable manufacturers to produce products with menus and functionalities tailor made for the Kenyan market, based upon consumer responses to a questionnaire and testing of different popular Kenyan foods against generic functions on popular energy-efficient appliances.

Table 1: Key recommendations for EPCs, air fryers, rice and induction cookers.

Use of pictorials	Eliminate confusion from different languages and local dish names.
Have a local menu	Replace redundant generic functions with popular Kenyan foods. A set of stickers could be printed in each county to cover the generic foods with local equivalents.
Add more functionalities to rice cooker	Having more functionalities other than keep warm or cook was found to be desirable for more versatility (e.g. fry).
Have beginners' manual	A manual and recipe book should be supplied as soft copies downloadable via a QR code.
& recipe booklets as QR codes	A manual and recipe book should be supplied as soft copies downloadable via a QR code.
Full insulation for safety and energy efficiency	Manufacturers should fully insulate their appliances to keep users safe and offer peace of mind whenever they use them.
Extra inner pot	Extra inner pots should be available, but as an optional additional accessory to give the consumer additional choice.

- 2. Typology of Kenyan Cuisine:** A typology of Kenyan cuisine was developed listing the most popular Kenyan foods and categorising them according to their recipes, in particular their dominant cooking processes. Popular international dishes that follow similar cooking processes to Kenyan foods were identified and the compatibility with different types of energy-efficient appliances highlighted.
- 3. Brand-neutral social media content:** Unbranded content was produced for the Pika na Power social media platforms to show both the Kenyan consumers and the international manufacturers how local popular foods can be cooked across different energy-efficient cooking appliances.



Table 2: Typology of Kenyan cuisine, highlighting compatibility of different dish types with energy-efficient appliances.



Cooking Process	Sub- Process/ duration	Typical Kenyan Dishes	EPC	Rice cooker	Induction	Air Fryer
Fry	Stir fry	Green leafy vegetables, cabbages, eggs	Green	Green	Green	Red
	Deep fry	Mandazi (donut), fried chicken, chips/ bhajia	Yellow	Red	Green	Red
	Shallow fry	Sausages, chicken, fish, bacon	Yellow	Red	Green	Green
	Dry fry	Peanuts, simsim, kumbe kumbe (termites)	Yellow	Red	Green	Red
Fry, boil & simmer	Short	Tomato egg stew	Green	Green	Green	Red
	Medium	Short cook cereals(kamande, ndengu), roots (nduma, potatoes), matoke, pilau	Green	Green	Green	Red
	Long	Beans, matumbo (tripes), meat dishes, matumbo, githeri, kuku kienyeji	Green	Green	Green	Red
Boil & simmer	Short	Tea, porridge, minji, spaghetti, eggs	Green	Green	Green	Red
	Medium	Ndizi mzuzu (plantain), potatoes, peanuts, nzenga (crushed maize), rice	Green	Green	Green	Red
	Long	Peanut sauce	Yellow	Yellow	Green	Red
Roast/ grill	Medium/Long	Roasted maize, fish, mutura, mbuzi choma	Green	Green	Green	Green
Steaming		Ngwaci, green maize, nduma, green bananas	Green	Green	Green	Red
Flat bread	Short	Chapati, pancakes, vibibi	Yellow	Yellow	Green	Red
Shallow fry	Medium	Vitumbua	Red	Red	Yellow	Yellow
Trad, Baking		Mkate wa sinia (rice and coconut cake)	Yellow	Yellow	Yellow	Green

Legend

■ Fully compatible
 ■ Partially compatible
 ■ Not compatible

Table 3: Selected videos from the set of brand neutral clips for social media.

Dish Name & Key Cooking Process	Description	User Experience
Chapati– Pan-Fried Flatbread 	Flat bread is made using wheat flour and is often shallow fried on a flat pan.	The chapatis from the induction cooker were soft, flaky just the way Kenyans love them. This was the best suited appliance for cooking chapatis.
Beans - Long Boiling / Stewing 	These are legumes that are usually boiled and then finished off in a tomato-based stew or as a mixture with maize known as githeri.	It was a simple process in the EPC and the best suited because it was fast and efficient on time, cost and energy consumed.

Dish Name & Key Cooking Process	Description	User Experience
<p>Mbuzi Choma- Grilled</p> 	<p>This is goat meat which can either be grilled, stewed or dry fried.</p>	<p>The goat was cooked very well in the air fryer, and it gave us well cooked, crispy mbuzi.</p>
<p>Spinach - Stir Fry</p> 	<p>Large green, leafy vegetables. They are often stirring fried and eaten with ugali or a starch of choice.</p>	<p>The rice cooker and induction cooker were fast and best suited in this test.</p>



Kitchen Energy Audits

► Implemented by SCODE

Approach: This project developed a streamlined version of the energy audit methodology that could be applied to everyday kitchen environments to enable household cooks to understand the potential costs and benefits of changing the way they cook.

The methodology enables consumers to calculate how much they would typically save each month on cooking fuel by adopting eCooking, taking into account increases in their electricity bill. Data collection and analysis tools were developed, including a wiring assessment tool,

which reviewed the readiness of household wiring to support eCooking and the cost of any essential upgrades to be able to cook safely. Together with the upfront cost of the appliance, the expected payback period for transitioning to eCooking could then be calculated.

Findings: Cost-benefit analysis was extrapolated to include common combinations of foods so that the financial implications of cooking particular dish combinations using the different fuels could be compared to using the EPC (see Table 2).

Table 4: Cost comparison for cooking typical means with biomass vs. the EPC.

	Charcoal		Firewood		EPC	
	Cost (Ksh)	Time (Mins)	Cost (Ksh)	Time (Mins)	Cost (Ksh)	Time (Mins)
Rice, Vegetables	52	80	21	55	10.3	47
Rice, Meat	45	125	28.5	116	8.69	65
Rice, Meat, Vegetables	79	174	34.5	141	13.49	84
Ugali, Vegetables	56	88	12	46	15.53	83
Ugali, Meat, Vegetables	83	182	25.5	132	18.71	120
Ugali, Meat	49	133	19.5	107	13.91	101

Specific bottlenecks were identified by the wiring assessment tools. Table 2 highlights typical components that may need to be added/upgraded to support eCooking appliances.

Table 5: Components of household wiring that may need upgrading to support eCooking.

* Indicates the most common upgrades.

Component	Unit Cost (Ksh)	Quantity	Cost
Meter Box	1000	1	1000
CCU	2000	1	2000
*RCD	300	2	600
Submeter	1000	1	1000
*Kitchen Sockets	300	1	300
AVS	4500	1	4500
*2.5mm2 Cable	160	5	800

Considering the cost of the eCooking appliance (e.g. Ksh 12,091 for Pawapoti EPC), the typical cost of upgrading kitchen wiring (Ksh 1,400), and the expected cost savings (Ksh 1,482 per month), the typical payback period was found to be approximately 9 months.

Conclusion: While data collection and analysis in this first iteration of the kitchen energy audits methodology was carried out using a simple checklist with the right questions and relevant advice depending upon the answers given, this process could be streamlined with an app to allow everyday cooks to assess their own kitchens. This could be a separate app, or an integration into KPLC's myPower app.

Figure 18: E-cooking Demo during Baseline Data Collection Exercise (source: SCODE 2023)



Urban Informal Settlements

► Implemented by Nuvoni Centre for Innovation Research

Approach: This study aimed to assess the potential for eCooking in urban informal settlements by examining current cooking practices and the factors influencing energy choices to identify barriers and leverage new opportunities. The study also evaluated market interventions to stimulate demand for eCooking in households and food businesses, whilst at the same time tackling issues of safety and power theft resulting from informal connections.

In Kibra, Mukuru and Mathare, the study employed a mixed methods approach, incorporating qualitative and quantitative methodologies, including questionnaires for households and fuel/cookstove vendors, Key Informant Interviews (KIIs) and Focused Group Discussions (FGDs). In Mathare, a detailed mapping and survey with 350 households was carried out alongside action research involving 15 households and food businesses using a cooking diaries approach, comparing current cooking practices with those after introduction of an energy-efficient appliance.



The study also evaluated **market interventions to stimulate demand for eCooking in households and food businesses**, whilst at the same time **tackling issues of safety and power theft** resulting from informal connections.

Figure 19: Electric coil used by many of the survey respondents (left). Photo credit: Ann Njuguna. Cooking demonstration (centre) and appliance distribution to participants (right) as part of the action research component of this study.



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Findings: In Mathare, informal electricity connections (86%) greatly exceed formal connections (14%), with a strong correlation between the legality of connection and wealth (786 vs. 314 KSh/month average expenditure for formal vs. informal connections). Structured market systems cater to affordability needs, but substandard wiring installations pose risks, such as appliance damage, fires and injuries. Collaboration between KPLC and local electricity vendors is being piloted in selected informal settlements to formalise connections. Local electricity vendors could engage in demand stimulation via eCooking appliance distribution and after-sales services amongst their customers.

LPG (59%), kerosene (23%), charcoal (9%) and ethanol (4%) were preferred primary cooking solutions; with kerosene (19%) and electric coil (14%) as secondary.

Boiling and stewing dominated household cooking techniques, implying that cooking practices in Mathare are amenable to energy-efficient eCooking.

This was confirmed by the cooking diaries, as 70% of the cooking events were electric after introduction of the EPC. Cooking solution distribution channels encompassed manufacturers, wholesalers, distributors, retailers and street vendors, with 'Orodha' markets specializing in second-hand appliances. Many also venture outside the settlement to purchase from supermarkets and specialized stores.

Conclusion: To overcome appliance distribution challenges, innovative distribution methods that cater to the unique needs of households and businesses in informal settlements include motorbike and mobile

phone-enabled distribution; partnering with women/youth groups; and innovative financing solutions (e.g. combining appliance financing with maintenance or extended warranties). In addition, KPLC's new

partnerships with formalised local electricity distribution entities could also offer an innovative new opportunity to devolve demand stimulation activities for mutual benefit.

Figure 20: A research participant recounting stories of change from her kitchen after introducing an EPC to her cooking routine. Photo credit: Jacob Fodio Todd (MECS)



Scalable Feedback Mechanisms

► Implemented by KPLC-IESR (Institute of Energy Studies and Research)

Approach: Understanding demand growth trends is important for revenue modelling and infrastructure planning to ensure the delivery of affordable and reliable power to customers. This study piloted innovative mechanisms to streamline and scale data collection from both primary and secondary sources. Data was collected on both electricity consumption and appliance sales volumes, focusing on EPCs and induction stoves as the two key anticipated drivers of demand growth.

Findings:

Electricity consumption	<ul style="list-style-type: none"> A meta-analysis concluded that households adopting EPCs or induction stoves are likely to increase their electricity consumption by 20-80 kWh/month. This broad range encompasses different household sizes, cooking patterns, fuel stacking, relative efficiencies of each appliance and other factors. If the eCooking sector grows to reach KPLC's target of 500,000 customers by 2026 (up from 90,000 currently), this would indicate an increase in demand of 8-32 GWh/month, or 98-393 GWh/year and additional revenue of KSh 1.6-6.5 billion/year, representing a 1-4% increase in revenue for the company as a whole.
Appliance sales volumes	<ul style="list-style-type: none"> The National eCooking Strategy (MoEP, 2024) indicated that in Feb 2023, 1.3% and 0.1% of Kenyan households already own an EPC or an induction stove (respectively), corresponding to approximately 174,000 and 13,000 units. IESR conducted an online survey in Oct 2023, targeting 7 major e-commerce platforms, with Jumia emerging as the leader. The survey revealed 287,122 electric pressure cookers and 5,542 induction stoves in stock. Prices ranged from Ksh 2,999-31,500. An appliance availability survey conducted by IESR covering 13 stores in Nairobi indicated 4x more EPCs available than induction stoves. Majority of EPCs observed were 6-liter, 1000W models, with Ramtons the dominant brand.

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Conclusion: Collaboration with key organizations and primary data collection provided new insights into the electric cooking landscape, including availability, pricing, and consumer preferences for EPCs & induction stoves. Table 1 details specific recommendations for further development of each feedback mechanism tested during this project. Future data collection efforts should be aligned with the timeline of the demand growth forecasting for the Least Cost Power Development Plan (LCPDP).

Table 6: Evaluation of key mechanisms for monitoring the growth of the eCooking sector explored during this study

Mechanism	Progress made during this study	Key challenges encountered	Key Recommendations
Data dashboards connected to IoT-enabled eCooking appliances	IESR partnered with A2EI to set up an Appliance Demand Platform (ADP) to monitor additional electricity demand created by 7 new eCooking appliances installed in the IESR institutional kitchen.	Data privacy concerns prevented connection of ADP with KPLC's customer billing database & IoT-enabled appliances.	<ul style="list-style-type: none"> Pilot ADP with EnDev in upcoming Higher Tier Cooking Results Based Financing (HTC RBF). Establish MoUs with appliance distributors to connect IoT-enabled appliances via APIs. Raise awareness of ADP within KPLC IT dept., highlighting built in data security measures. Explore viability of developing a carbon project using ADP to collect data on appliance usage.

Mechanism	Progress made during this study	Key challenges encountered	Key Recommendations
Interrogating the customer billing database	36 customer records reviewed. Demand growth estimated at 93% (70 kWh/customer/month) after appliance acquisition.	Customers reluctant to share meter number. Long delays for data requests.	<ul style="list-style-type: none"> - Utilise HTC RBF to develop streamlined process for acquiring meter numbers, customer consent and access to corresponding data.
Strategic partnerships with national institutions	Groundwork laid with KEBS, KRA & KNCC for appliance import volume data collection.	Institutions either not responsive or sent unusable data.	<ul style="list-style-type: none"> - Follow up with KRA, KEBS & KNCC to build relationships with key contacts & gain access to import data.
Strategic partnerships with wholesalers	Streamlined questionnaire on sales volumes for selected eCooking appliances deployed.	Appliance wholesalers reluctant to share sales volumes.	<ul style="list-style-type: none"> - Explore strategic partnerships with CEOs with assurance of confidentiality. - VAT records at KRA may show sales volumes.
Appliance availability survey with retailers	An appliance availability survey was carried out with online retailers and selected retail outlets in Nairobi.	Good data on brand & price, but stock/sales volumes less consistent.	<ul style="list-style-type: none"> - Repeat survey annually to track market growth via range & affordability of key appliances. - Implement survey alongside awareness campaigns to ensure local supply chains expand to meet growing demand.



Figure 21: Appliance Demand Platform (ADP) dashboard for the appliances installed in the IESR kitchen showing metrics for individual EPCs and the energy used to prepare the meals being served.



Appliance Comparisons



► Implemented by Strathmore University, Jikoni Magic & KPLC

Approach: A series of Controlled Cooking Tests (CCTs) were conducted to compare performance between different fuels/devices. The study examined fuel/energy consumption, cooking time, cost and user experience. Dish types included long-boiling foods (beans, beef), quick fried vegetables (spinach), and starch staples: boiled (rice, ugali), pan fried (chapati) and deep fried (chips). The 7 dishes were prepared using an air fryer, hotplate, induction, infrared, rice cooker, EPC, ethanol, improved charcoal stove (ICS), LPG and kerosene.

Findings: The EPC and induction stove excel in energy efficiency, ease of use, versatility, and cost-effectiveness (Figure 21). Their ability to cook a range of foods quickly and efficiently offers a cost-effective and convenient solution. Appliances with higher purchase prices generally had lower operating costs, offering significant long-term cost savings. Conversely, popular fossil fuel and biomass options (kerosene, charcoal & LPG) have low financial barriers to entry, but higher running costs.

Table 7: Key findings on each appliance

Appliance	Key Findings
	<p>Most efficient, user-friendly & cost-effective appliance.</p> <ul style="list-style-type: none"> + Most efficient & cost-effective way to cook beans, rice, and spinach (combines pressurization, automation & insulation). + Highest score for ease of use. Automation enables multitasking - Quickest way to cook rice & beans. - High upfront cost. - Could only cook 3 of 5 meal types.
	<p>Balances energy-efficiency with versatility & usability.</p> <ul style="list-style-type: none"> + 3rd most efficient appliance (heats pot directly with electromagnetic radiation). + Quick & responsive high-power cooking. + Cooks all 5 meal types. + Lowest energy/cost & shortest cooking time for chapati & chips. - Moderate upfront costs, but also need to purchase compatible steel cookware. - 2nd most energy & time-efficient appliance for beans (but still twice as long as EPC).
	<p>Task-specific low-cost appliance for boiling & light frying with moderate energy-efficiency.</p> <ul style="list-style-type: none"> + Lower upfront cost than EPC but lacks efficiency gains of pressurization. + Cooked spinach with the least energy/cost & time. + Can cook more than just rice. - Only cooked 3/5 meal types. - Consumed twice as much energy/cost to cook rice than the EPC. Energy/cost-intensive when cooking beans.
	<p>Task-specific appliance for frying & baking with moderate energy-efficiency.</p> <ul style="list-style-type: none"> + Relatively efficient (fan-assisted hot air circulating in an insulated chamber), but limited to fried/baked dishes + Vastly reduces oil consumption for deep-fried dishes. + More energy/cost & time-intensive than hot plate, induction or infrared to cook chips. - Could only cook one meal type. - Highest upfront cost.

<p>Infrared Cooker</p> 	<p>Highly versatile, but energy-intensive appliance.</p> <ul style="list-style-type: none"> + Distributes heat very evenly across pan via infrared radiation (like charcoal). + Able to cook all five meal types & can use all cooking utensils. + More energy-efficient than air fryer for chips & like rice cooker for rice. - Slow response to changes in heat level. - Highly inefficient for boiling heavy foods like beans.
<p>Hot Plate</p> 	<p>Highly versatile low-cost, but energy-intensive appliance.</p> <ul style="list-style-type: none"> + Simple resistive heating element. + Can use all cooking utensils. + Able to cook all five meal types. - Most expensive and time-consuming electrical appliance to cook beans with. - The quickest, but most expensive to cook rice.

Conclusion: There was no clear winner across all categories highlighting the value of fuel/appliance stacking to enable cooks to balance upfront affordability, operational costs and convenience.

Figure 22: Collecting data on fuel consumption during the Controlled Cooking Tests (CCTs).



Institutional eCooking

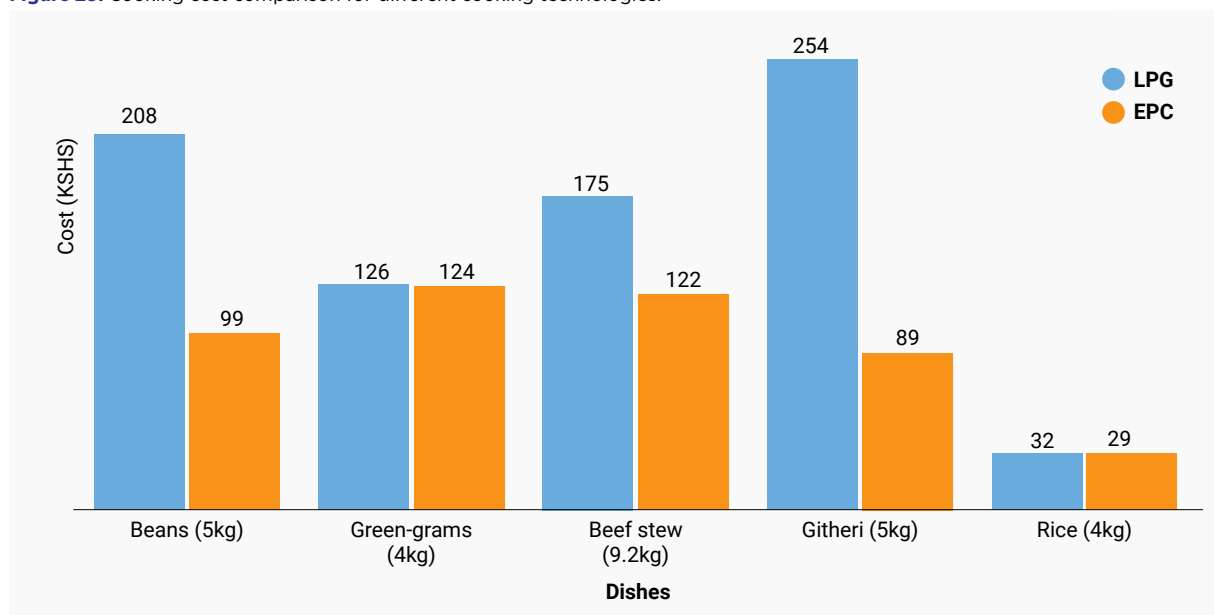
► Implemented by KPLC-IESR

Approach: This project introduced new larger scale eCooking appliances to the Institute of Energy Studies and Research (IESR) kitchen. Three 40-liter and one 25-liter Electric Pressure Cookers (EPCs) and two 16-liter rice cookers were deployed and tested in comparison with LPG across a variety of dishes. Controlled Cooking Tests (CCTs) were used to compare energy consumption, costs, cooking time and efficiency for five popular dishes on the IESR menu: bean stew, green grams, beef stew, rice, and githeri. These dishes are not only popular at the

IESR canteen but are also common meals prepared in other Kenyan institutions, such as schools and hospitals.

Findings: The results of the CCTs demonstrated that EPCs are not only more cost-effective (Figure 9), but also time-saving compared to LPG, making them particularly well suited for dishes with longer preparation times, such as beans and githeri. Meanwhile the rice cookers are best suited for boiled staples with a shorter cooking duration, such as rice or pilau.

Figure 23: Cooking cost comparison for different cooking technologies.



Conclusion: The CCTs provide compelling evidence of the cost-effectiveness and efficiency of larger scale modern energy-efficient electric cooking appliances in institutional settings. To realise this potential, there is a need to demonstrate the viability of larger appliances to stakeholders involved in institutional cooking transitions, both at the IESR kitchen and at other types of institution, e.g. schools, hospitals or prisons.

There is also a need to develop supply chains and promote local production, assembly, and repair capabilities for large-capacity eCooking appliances designed for institutional-level cooking within the country. Despite the success of the new appliances, which have become part of the everyday cooking routine for the IESR kitchen, much of the cooking is still done on LPG, in particular dishes requiring frying. However, by introducing additional appliances such as induction or infrared stoves, the IESR kitchen could be fully electrified. Finally, the success of this pilot provides a blueprint for the electrification of kitchens in other Kenya Power facilities.

Figure 24: Preparing food in the institutional scale EPCs installed at the IESR kitchen.



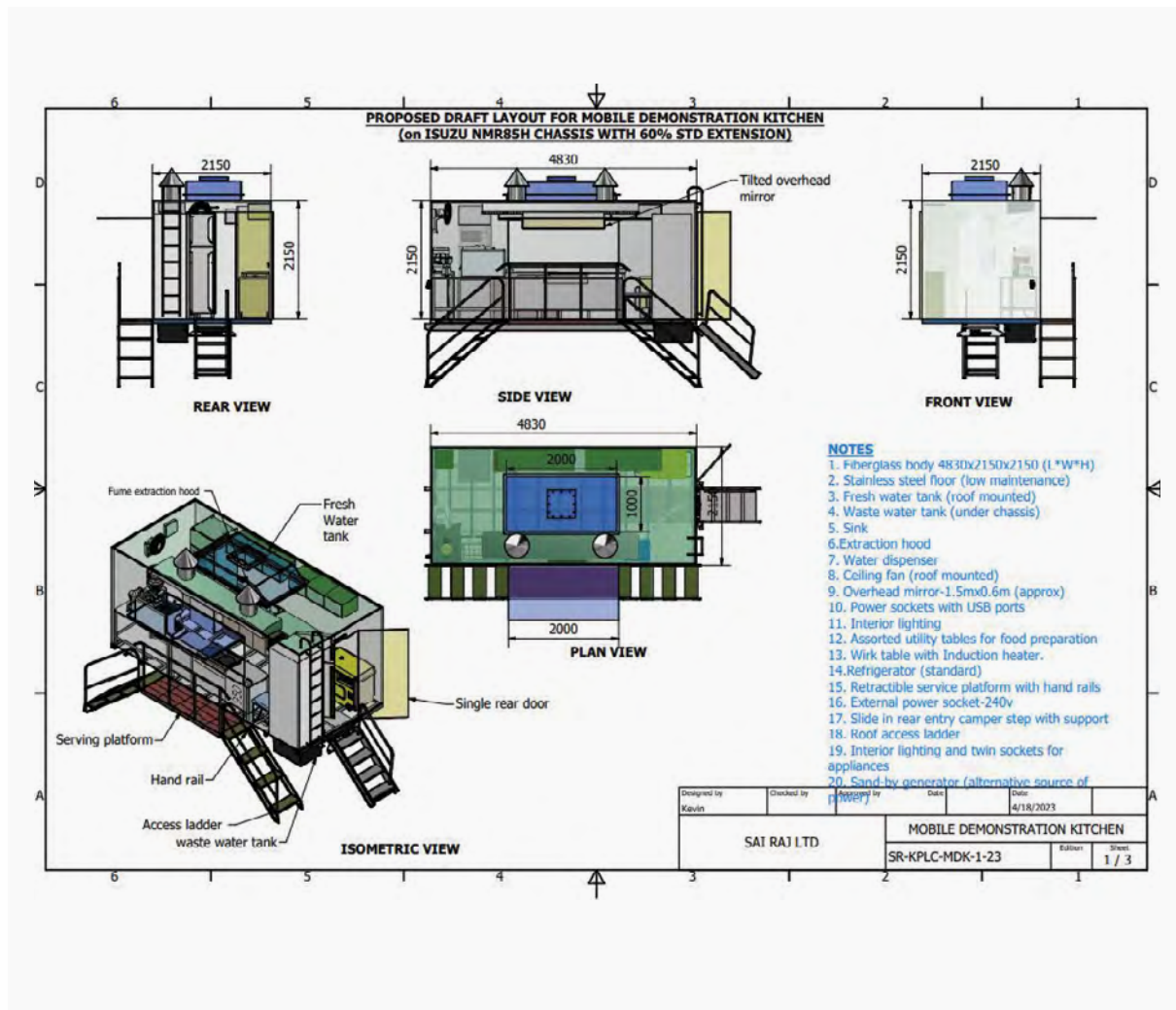
Mobile Demonstration Kitchen

► Implemented by KPLC-Transport

Approach: The mobile demonstration kitchen will give a serious boost to Kenya Power’s Pika na Power campaign. by enabling the Pika na Power team to deliver live cooking demonstrations across the country. From the urban, peri urban and all the way to the very rural areas. The project involved developing a customised Kenya

Power vehicle with a power supply, cooking equipment and kitchen furnishings. The vehicle will give the Pika na Power team a bigger reach enabling them to travel to where the customer is. Currently the customer has to come to Pika na power centre to get to see the live cooking demonstrations.

Figure 25: Detailed designs for the mobile demonstration kitchen.



Conclusion: The mobile demonstration kitchen will be a valuable tool for Kenya Power in creating demand for electricity and boosting unit sales. This vehicle will accelerate eCooking for the last mile customer, who has typically been using less than 15 units per month.

Demand stimulation for this customer would be easy if they saw and believed that cooking with electricity can be beneficial for them. This would improve their lives by improving their health, saving them cooking time and money.

Figure 26: Wairimu Njehia of Pika na Power with the vehicle in the process of transformation into a mobile demonstration kitchen.



Figure 27: The mobile demonstration kitchen with the Kenya Power team in the final stages of refurbishment at the contractors, Sairaj.



Conclusion - What is Kenya Power's role in enabling the growth of Kenya's eCooking Sector?



As a result of the awareness raising activities carried out with the Kenya Power management during the eCAP programme, the company has now set an ambitious goal of enabling 500,000 customers to cook primarily with electricity by 2026. This section distils out the most viable opportunities emerging from the eCAP projects that could be adopted by Kenya Power to rapidly scale the adoption of electric cooking:

▶ **Scale up utility-enabled financing pilots**

Kenya Power is uniquely placed to unlock funding from multilateral development banks, which can enable appliances to be sold to its customers at a subsidised price, as the utility can achieve a return on investment through increased electricity unit sales. Kenya Power can add value to private sector initiatives through co-marketing, data sharing and/or co-financing.

▶ **Pilot an eCooking tariff with smart-metered appliances**

Kenya Power, EPRA and key research institutions should collaborate to gather data on the price elasticity of demand and the effectiveness of Time-of-Use tariffs to create new demand at off-peak

times via IoT-enabled eCooking appliances to develop an optimised pricing structure that maximises utility revenue generation.

▶ **Leverage the KNeCS to drive forward Kenya Power's corporate strategy for demand growth from cooking**

Continue to actively support MoEP's National eCooking Strategy into the implementation phase as part of the eCooking Steering Committee and ensure that Kenya Power's corporate strategy for accelerating the electrification of cooking builds upon this foundation.

▶ **Closely monitor demand growth from cooking to ensure electrical infrastructure evolves to meet the additional load**

Carry out a detailed study of the generation, transmission and distribution network to identify key bottlenecks. Ensure timely collaboration between key research institutions and the Least Cost Power Development Plan (LCPDP) team to ensure sufficient power generation is available for cooking loads.

▶ **Expand awareness campaigns to reframe eCooking as an aspirational yet achievable solution for modern Kenyan cooks**

Employ the mobile demonstration kitchen, Pika na Power digital platforms and kitchen energy audits methodology to drive multi-platform evidence-based engagement with consumers in regions with surplus power. Prioritise the EPC and induction stove as the two appliances most likely to contribute significantly to demand stimulation by balancing energy-efficiency with versatility.

▶ **Strengthen private sector partnerships to foster the growth of a sustainable and diversified eCooking marketplace**

As the country's leading supplier of clean cooking fuel, Kenya Power is uniquely placed to boost the sales of private sector appliance distributors, leveraging its existing customer relationships and strong brand awareness. Kenya Power can diversify its partnerships by institutionalising the Pika na Power Academy and developing generic data sharing and co-marketing agreements.

▶ **Explore innovative partnerships with local power distributors to reduce losses and increase safety in informal settlements**

Utilise eCooking as a tool for driving the formalisation of connections in urban informal settlements by integrating demand stimulation through eCooking appliance distribution and after-sales service into emerging partnerships with local power distributors.

▶ **Support the electrification of cooking beyond households by rolling out eCooking in Kenya Power facilities and other key types of institution**

The successful integration of larger energy-efficient appliances into the IESR kitchen has shown that eCooking can save just as much time and money for institutions as it can for households. Kenya Power should showcase the IESR kitchen to other institutions and enable all Kenya Power catering facilities to acquire similar appliances.

▶ **Continue to build bridges with the clean cooking sector**

Pursue closer collaboration with the clean cooking sector by strengthening the strategic partnership with CCAK. Institutional membership of the association, sponsorship of key events (e.g. Clean Cooking Week) and co-convening of the eCooking Community of Practice can ensure visibility of Kenya Power and by extension, the electricity sector, within the clean cooking space.



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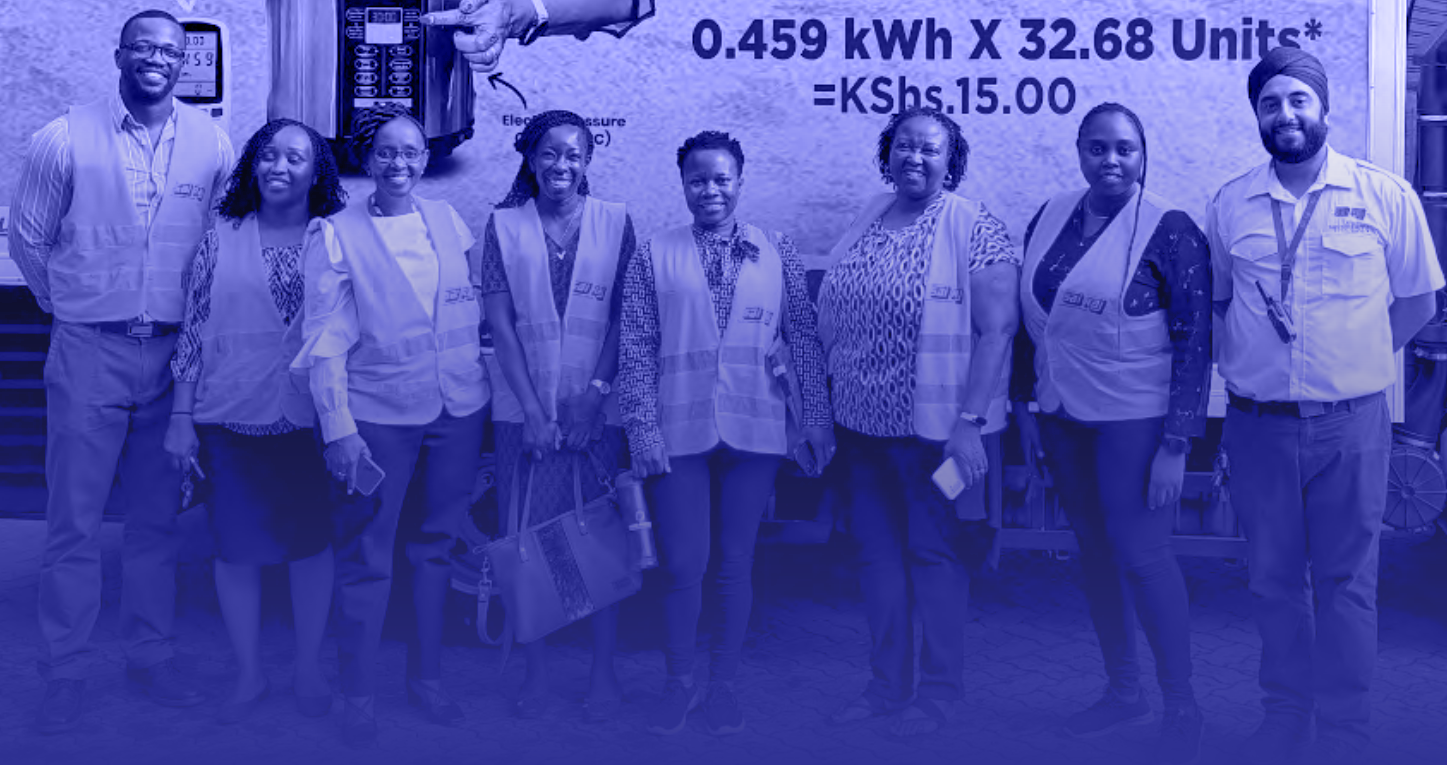


Less than
Pika Githeri na 20 bob tu!



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=KShs.15.00**



Kenya power

