

COOKING DIARIES KENYA POLICY DIALOGUE REPORT

Summary of Key Outcomes

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Background

The Modern Energy Cooking Services (MECS) programme aims to identify scalable pathways for enabling the adoption and sustained use of modern energy for cooking services for those currently cooking with biomass. ACTS is coordinating MECS activities in Kenya.

ACTS convened a webinar to share findings of cooking diaries studies on eCooking in Kenya. The webinar included presentations, a panel discussion and a question and answer session. Participants included policy makers drawn from government ministries and agencies and the manufacturing sector. This report summarises the key outcomes

Recent research has highlighted cooking with energy-efficient electric appliances as a highly attractive pathway for Kenya (Batchelor *et al.*, 2019; Leary, Fodio Todd, *et al.*, 2019; ESMAP, 2020). The analysis in each of these studies is underpinned by a set of detailed empirical data collected using cooking diary studies.

Kenya Power is already promoting cooking with electricity (eCooking) to stimulate demand for electricity (KPLC, 2019). In particular amongst the customers recently connected through the Last Mile Electrification Programme and similar initiatives, many of whom have very low electricity demand, bringing in limited revenue, yet the cost of establishing and maintaining this more dispersed grid infrastructure is substantially higher, resulting in financial losses for Kenya Power (Barasa, 2020).

What is more, an emerging array of new technologies can enable eCooking for households with unreliable grid connections or with no grid-connection at all. The price of battery storage and solar panels has decreased dramatically in recent years, resulting in the development of world leading solar home system and solar mini-grid industries. MECS Challenge Fund Winners, such as MKopa and SCODE are now experimenting with a range of new off-grid eCooking solutions in Kenya.

What is a cooking diary study?

Cooking diary studies involve recording what is cooked, how it is cooked and how much energy is consumed over a period of several weeks or months. Baseline data is first collected using current fuels and cooking devices. Participants are then asked to trial selected electric cooking appliances. Contrasting these two sets of data can give insight into how well these new appliances fit local cultural cooking patterns by comparing cooking practices, energy consumption and expenditures before and after.

This report is based on a virtual workshop organized by African Centre for Technology Studies on 3rd November 2020. The target audience was Kenya's policy makers. The workshop brought a diverse group of policy makers from the government, private sector, public & private institutions and so on. This event is part of an ongoing policy dialogues in Kenya in the Energy sector lead by ACTS, MECS country partner.

BOX 1: SPEAKERS

- *Dr. Jon Leary, Loughborough University*
The Emerging Opportunities for Cooking with electricity in Kenya
- *Ms Mourine Chepkemoi, Research Fellow, African Centre for Technology Studies (ACTS)*
Cooking Diary Survey
- *Dr. Joanes Atela, Programme Director, African Centre for Technology Studies (ACTS)*

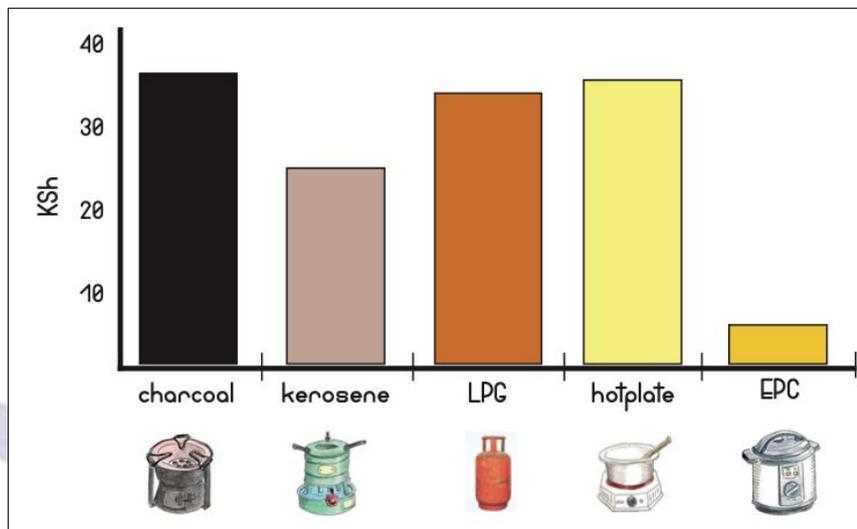
Aim

The aim of this policy dialogue was to seek input from policy makers on their key research questions regarding cooking with electricity to inform the design of the upcoming cooking diaries study in Kenya.

What have we already learned from cooking diary studies in Kenya?

The cooking diary studies carried out in Kenya have highlighted the compatibility of specific energy-efficient appliances with Kenyan cuisine (Leary, Fodio Todd, *et al.*, 2019; Leary, Scott, *et al.*, 2019). In particular, the Electric Pressure Cooker (EPC) can cook the most energy intensive foods (heavy foods, such as beans or matumbo, that require boiling for more than an hour) in half the time and at a fraction of the cost (Figure 1). They showed that the costs of cooking all foods with a range of electric appliances are similar to LPG, but that the cost of cooking heavy foods with an EPC is seven times cheaper.

Figure 1: Cost of boiling beans with an EPC compared to popular fuels in Nairobi in 2018 (Leary, Fodio Todd, *et al.*, 2019).



The most recent Kenya Cooking Diaries study showed that the average 4-person household consumes around 40kWh/month to cook all their food with electric appliances and an average of just 13kWh/month to cook half their food with an EPC (Leary, Scott, *et al.*, 2019). Kenya Power currently offer a lifeline tariff for the first 100kWh/month, which is sufficient to enable poorer households who are likely to own few other appliances, to cook with electricity. However, the tariff is only discounted by 25% (17KSh/kWh from 23KSh/kWh), meaning that this electricity is still quite expensive. Moreover, Kenya Power are planning to increase the lifeline tariff by KSh2.50/kWh and the regular retail tariff by 4Ksh/kWh (Business Daily, 2020). Cooking with electricity could be made much more attractive for poorer households by offering a more substantial discount on the first 100kWh/month (or even the first 50kWh/month), which could be financed by cross-subsidies from the regular retail tariff. Coupled with broader social marketing campaigns for cooking with electricity and supply chain development for electric cooking appliances, this could help achieve Kenya Power’s aim of stimulating demand for electricity amongst newly connected households.

Discussions

The Kenya national energy policy that provides a road map highlights that the government should support provision of clean, reliable and affordable energy to all Kenyans but the policy is silent on cooking. However, there are several strategies that have been developed;

- i. *The National Energy Efficiency and Conservation Strategy*
- ii. *The Bioenergy Strategy*
- iii. *The KOSAP project*
- iv. *Sustainable Energy For All Action Agenda and Investment Prospectus*

Kenya Power and Lighting Company (KPLC) are supporting cooking with electricity and acknowledged that they have 29% excess power available. KPLC noted there is a challenge in having growth in supply as compared to demand. They have a program on national television and a demonstration center in Nairobi that showcases cooking local cuisines with a variety of electric appliances, including the EPC, the induction cooker, the infrared cooker, roasters and air fryers. KPLC is currently refurbishing other demonstration centers in Mombasa, Nakuru and Kisumu and plans to roll out into other counties thereafter.

Participants also noted that KPLC should develop policies that increase the adoption and use of EPCs, look for ways of partnering with other businesses and empowering women in the counties to help raise awareness amongst local people, create more retail outlets and job opportunities. Decentralization and active outlets in the counties can drastically increase the adoption rate.

“It is difficult to get space to work with KPLC because of the bureaucracy making it hard for KPLC promote women participation in clean energy promotion. This is one opportunity for women to participate. KPLC can bring more women to partner with women in other regions to help educate other people. It can help empower women and provide jobs in the clean energy using the electric pressure cookers. Partnering with KPLC is difficult because everything has to be done in Nairobi and it delays the adoption of the clean cooking products.”

Awuor Otieno, Nyalore Impact

“There is a buy-in for the staff to make them believe it is cheaper to cook with electricity, teaching people and measuring what is cooked. Interestingly, the people who are taking it up are the geographical bachelors, who are living alone in the cities, and like to eat road runner chicken.”

Irene Wanjohi, KPLC

BOX 2: PANELISTS

- **Paul Mbuti** – Director, Directorate of Renewable Energy, Ministry of Energy and Petroleum
- **Nixon Bukachi** – Energy and Petroleum Regulatory Authority (EPRA)
- **Irene Wanjohi** – Kenya Power and Lighting Company (KPLC)
- **Heloise Pichot** – Burn Manufacturing Co

Affordability, reliability and perception towards different cooking options are important aspects that would enable policy makers to know what to emphasize and create awareness. Their mission is to provide affordable cooking options, but for electricity we need know because of the perception that it is expensive. They acknowledged the fact that the studies are indicating otherwise and that its important for the next cooking diaries to look into elements that are important like affordability and the perceptions that people have because sometimes the ease of use and convenience are important. Getting indicators of consumers' perceptions would be very helpful.

"One is the aspect of cost and how to demystify the cost of acquiring the EPC and the operational cost."

Nickson Bukachi, EPRA

Given the increasing amount of intermittent renewable energy (e.g. solar and wind) being added to the grid, the energy regulators raised the possibility of incentivizing the use of off-peak electricity for cooking, especially amongst institutions, which are metered differently to households.

"For the next diary, it would be important to indicate whether the institutions are being monitored. For example, the schools, restaurants and the small restaurants that boil a lot of things. Are we looking at the units? Is there a change in the electricity used before?"

Paul Mbuti, Ministry of Energy

"Cognizant to the fact that there is perception that cost of electricity is high; how do we incentivize people to use electric cooking during off-peak hours? Is it possible to have a special tariff for people who cook during the evening especially hotels and restaurants to use electric cooking when have least demand? Are we able to incentivize those who use electricity during the day to use electric cookers and have a special tariff for them because during the day our peak is much less than what we would have in the evening? Finally is electricity reliable when I want to cook?" Nickson Bukachi, EPRA

"How do we bring institutions, hotels and have more them using electricity? A comparison if they are using biomass, boilers and the shift to electricity can be done. How much will it cost to shift? In partnership with KPLC, an analysis to establish how much KPLC can make during off-peak if people were able to utilize electricity for cooking at a special rate. Demand can be drawn and how much would they accommodate at the differentiated tariff be determined."

Nickson Bukachi, EPRA

The need to connect the cooking diaries into a policy scenario analysis was raised by the Ministry of Energy:

"What percentage of the population can be realistically converted to electric cooking and how long would it take under the current conditions to achieve it? The best way to synthesize is if the data from the cooking diary can be connected to the policy agenda. If policy makers were to consider implementing some policies then what impact would it have on specific time scales?"

Faith Odongo, Ministry of Energy

Burn Manufacturing are planning to manufacture EPCs in their factory in Nairobi, however many materials need to be imported to do so. Import taxes imposed on these materials trickles down to the

cost of the products themselves. Tax exemption on imports of materials used would help reduce the cost to the consumer significantly.

“Right now, there is still a lot of cost of associated with manufacturing EPC in Africa. We still have to import a lot of raw materials. We feel it would be useful is exemption of tariff in terms of import of materials that would be used to produce and sell on the African market. It would help lower the prices since EPC is still considered an expensive appliance for many households. Any possible to reduce this burden is acceptable. Import and VAT exemption can reduce cost for the customer.”
Heloise Pichot, Burn Manufacturng

Outcomes: Key Research Questions to Explore With Cooking Diaries 3.0

Consumer preferences

Behaviour change was a key point of discussion, with participants keen to understand how end-users perceive e-cooking, including the features of the products, as well as the adjustments they make to their cooking procedures. Comparisons between the taste of food, cost comparisons, convenience are needed with other popular fuels to highlight their relative strengths, weaknesses and complementarities.

Research questions: *Which appliances are most attractive to consumers? How can eCooking support households to move towards a clean fuel stack?*

Policy scenario analysis

The cooking diaries is a key tool for generating evidence to support the development of enabling policy that could facilitate a large-scale transition to e-cooking. However, the findings need to be developed further into a policy scenario analysis that explores the potential impacts of scaled uptake and the mechanisms that could enable it.

Research questions: *What specific policy measures might be able to promote electric cooking and what impact are they likely to have on uptake over what time scale?*

Institutional cooking and off peak tariffs

There is need to survey institutions, hotels, schools to assess the viability of them making transition to cooking with electricity. A comparison of using the different cooking options (improved biomass, LPG, solar thermal, etc.) and electricity. How much will it cost to shift? What are the upfront and ongoing costs? What are the behavioural change barriers? How much KPLC could make if institutions were able to utilize electricity for cooking during off-peak times incentivized by a special rate? A study should

assess likely uptake amongst institutions of specific appliances, then electricity demand calculated and total revenue calculated at the different tariff levels.

Research questions: *How effective is e-cooking as a tool for demand stimulation? How could electric cooking be incentivised amongst institutions such as schools and restaurants? Could an off-peak tariff incentivise the use of surplus electricity for cooking during times of low demand?*

Affordability (upfront and ongoing cost)

Understanding the affordability of cooking with electricity is an important aspect for policy makers as evidence is needed on what to emphasize in awareness raising campaigns, in particular for electricity which has a negative perception already. There is need to compare consumption levels before and after the survey through both appliance-level metering and by accessing customer billing records from the household meter both before and after the adoption of an e-cooking appliance. To do this, Kenya Power would need to know the meter numbers of participating households and to have their consent to access their billing records.

Research questions: *How much does it really cost to cook with electricity and how does it compare to other options such as LPG? Which consumer financing mechanisms are most viable for breaking down the high upfront cost of electric cooking appliances?*

Reliability

It's important to understand the number of times black outs occur during the study and for what period of time, as well as their impact on cooking.

Research question: *Is grid electricity reliable enough for cooking? If not, what can be done to mitigate it?*

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