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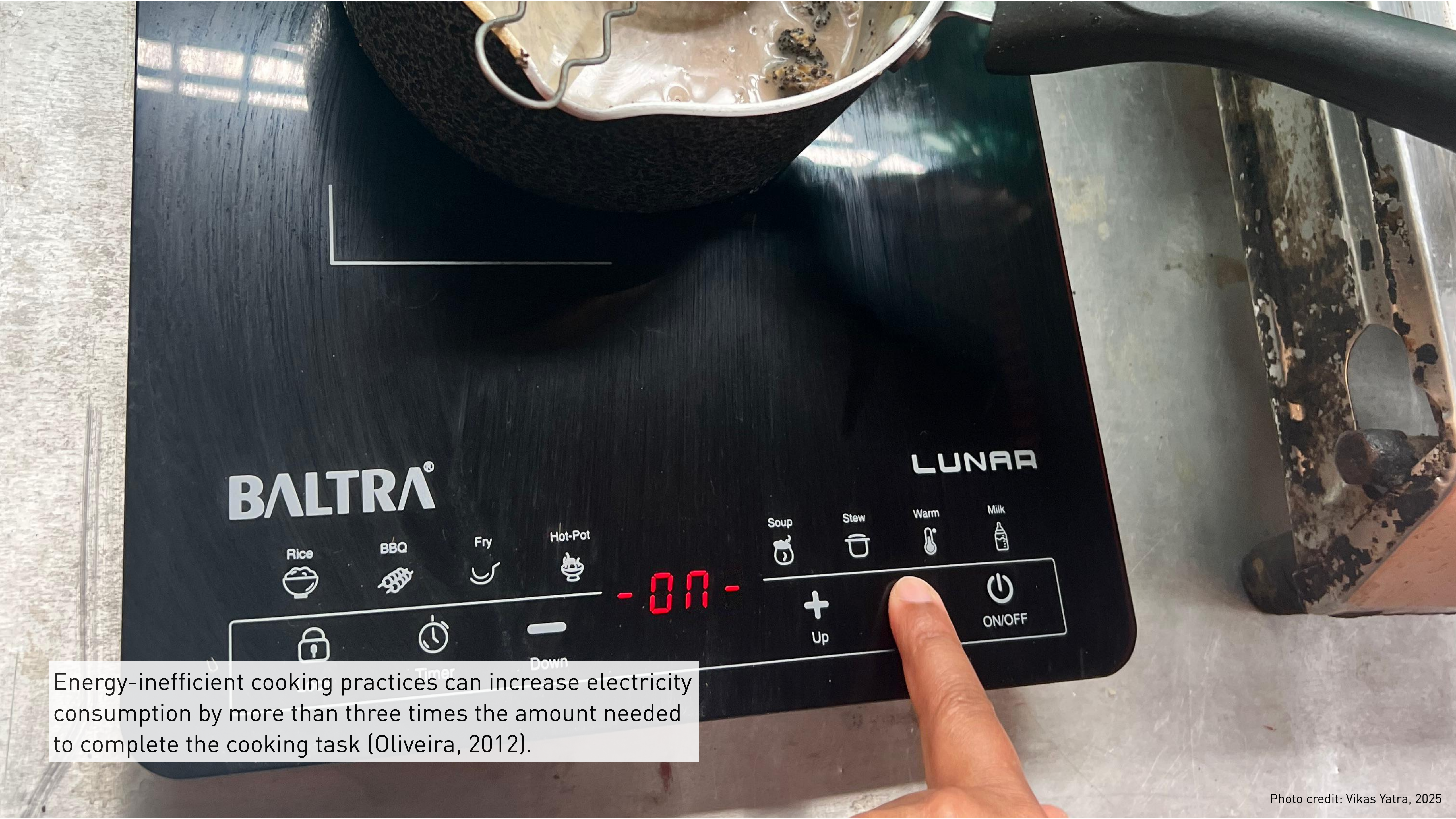
Webinar series
Putting users at the heart of clean cooking
#2 episode

**Kitchen behaviours in eCooking
across households in Ghana,
Kenya, Nepal, and Uganda**



Key takeaways

- Data collection through rapid ethnography
- Reasons for choosing eCooking
- Household cooking spaces
- **Electricity-wasting and -saving behaviours**
- Reasons for fuel stacking
- Requirements for eCooking appliances
- Behaviour change determinants



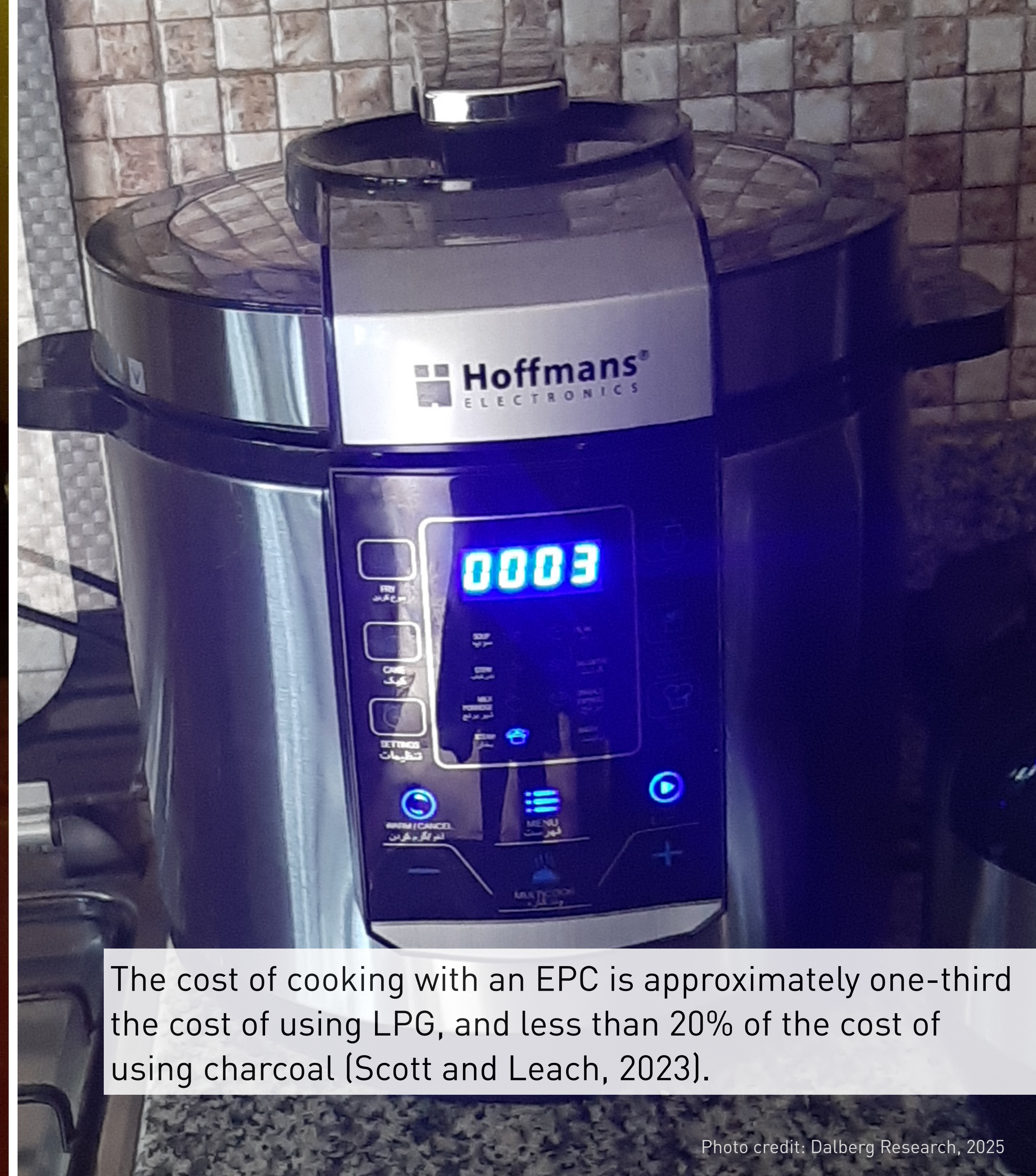
Energy-inefficient cooking practices can increase electricity consumption by more than three times the amount needed to complete the cooking task (Oliveira, 2012).

Hypothesis

The affordability of cooking with electricity depends not only on the efficiency and characteristics of appliances but also on the daily behaviour of their users.



Photo credit: Dalberg Research, 2025



The cost of cooking with an EPC is approximately one-third the cost of using LPG, and less than 20% of the cost of using charcoal (Scott and Leach, 2023).

Photo credit: Dalberg Research, 2025

Background

Cooking behaviours can increase the household's electricity bill, discouraging cooks from continuing to use eCooking appliances and even prompting a return to traditional fuels.

Aim of the study

To observe cooking behaviours that lead to increased electricity consumption in households and how cooks respond to this issue.

To define determinants for behaviour change interventions and eCooking product improvements.

To support more energy-efficient cooking practices and enhance the adoption and sustained use of eCooking appliances among the users in the Global South.

Sample

103 grid-connected households

25 in Ghana

25 in Kenya

28 in Nepal

25 in Uganda

With equal representation of low-, middle-, and high-income cooks,
from a range of rural, peri-urban, and urban areas.

High- and middle-income households



Photo credit: Dalberg Research, 2025



Photo credit: Dalberg Research, 2025



Photo credit: Qualiquant Services, 2025

Low-income households



Photo credit: Vikas Yatra, 2025



Photo credit: Miji Africa, 2025



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Study locations and research partners



Ghana: Asawasi, East Legon in Accra, Bantama and Oyibi, the villages of Danfa and Old Tafo.



Kenya: Nairobi, Mathare informal settlement, Ruiru, Juba, Gatukuyu.



Nepal: Sindhuli district in Bagmati Province and Mahottari district in Madhesh Province.

Dalberg Research

Uganda: Entebbe, Busiro, Makindye-Ssabagabo, Kampala, Kira, and Nansana municipalities.

**A mixed-method
approach, with
consistent methods
in each country**

1. Semi-structured entry interviews with participating cooks to unfold perceptions.
2. Rapid ethnography: one day of participant observation attending at least two cooking events.
3. One week of energy monitoring and self-reporting via WhatsApp.
4. Semi-structured exit interviews with participating cooks.



Terms of Reference: the role of
user cooking behaviour in
household energy consumption

E- COOKING ETHNOGRAPHY DIARY



E- COOKING ETHNOGRAPHY DIARY



For participants without access to mobile phones, pen-and-paper diary templates were provided as an alternative

A checklist of electricity-saving behaviours to observe during the rapid ethnography

- Using energy-saving appliances and functionalities
- Tracking of cooking time
- Using an appropriate heat setting
- Switching the appliance off before food is fully done (letting residual heat complete the cooking)
- Staying close to the appliance during use
- Matching cookware to burner size
- Using lids on pans or pots to retain heat
- Preparing ingredients in advance to reduce the time the appliance is on
- Chopping ingredients in small pieces before cooking
- Cooking in batches to minimise repeated appliance use
- Using other fuels
- Using alternatives to cooking: e.g., using precooked ingredients; eating raw vegetables; eating cold food without reheating it; etc.

A checklist of electricity-wasting behaviours to observe during the rapid ethnography

- Using inefficient, old and/or faulty appliances
- Allowing cooking time to go unmonitored
- Using higher-than-necessary heat setting
- Leaving the appliance on when not in use
- Leaving working appliances unattended to do other tasks
- Choosing pots and pans that do not match burner size
- Frequent peeking by opening lids and oven doors, not using lids
- Turning the appliance on too early, allowing unnecessary warming time
- Using oversized pots and pans for the amount of food being cooked.
- Reheating food unnecessarily
- Using multiple appliances at the same time without necessity
- Using energy instead of time: e.g., defrosting in a microwave; cooking beans without soaking; etc

FINDINGS

Electrification rates in studied countries

The study by MECS (2022) found that up to 84% of urban cooks use eCooking appliances at least once a week

	Population (2023)	Access to electricity (2021)	Use of clean cooking fuels (2021)	Use of electricity as a primary cooking fuel (2023)
Ghana	33.79 mln	86.3%	30%	0.5%
Kenya	55.34 mln	76.5%	31.5%	0.53%
Nepal	29.69 mln	92.2%	44.3%	0.5%
Uganda	48.66 mln	47.1%	6%	1.4%

Sources: IEA; World Bank; NPHC 2021; Kenya National Electric Cooking Strategy, 2024; Ramirez et al., 2024; MECS, 2022

Cooking appliances owned by households

15

different types of eCooking
appliances were observed in
households across the four
countries

eCooking appliances owned by study participants

	Ghana	Kenya	Nepal	Uganda	Total
Electric kettle	11	17	11	17	56
Microwave	13	15	2	13	43
Hot plate/coil stove	4	12	0	17	33
Induction cookstove	0	3	28	1	32
Electric pressure cooker (EPC)	7	4	3	10	24
Rice cooker	6	0	5	3	14
Infrared cookstove	6	0	0	5	11
Electric oven	0	2	0	4	6
Toaster	1	3	0	1	5
Air fryer	1	0	0	2	3
Multicooker	2	0	0	0	2
Deep fryer	0	0	0	1	1
Hallogen oven	1	0	0	0	1
Fufu cooker	1	0	0	0	1
Immersion water heater	0	1	0	0	1



Ecoa by BURN (Kenya)

Photo credit: Miji Africa, 2025



Dual-fuel stove (Kenya)

Photo credit: Miji Africa, 2025



1500 W Halogen oven (Ghana)

Photo credit: Qualiquant Services, 2025



1400 W Oven / Air fryer (Ghana)

Photo credit: Qualiquant Services, 2025

Handmade coil stove (Kenya)



Photo credit: Miji Africa, 2025

Handmade coil stove (Uganda)



Photo credit: Dalberg Research, 2025

Kitchen spaces

- Middle- and high-income households typically had dedicated kitchen spaces.
- In low-income households, cooking was often done in the same space used for other household activities.
- Cooking activities were frequently timed to avoid overlapping with other household chores.
- Some adapted spaces included verandas, metal containers, part of the living room, balconies, and hallways.
- Kitchen utensils and other materials were stored in stackable containers or in rooms separate from the cooking area.



Dedicated kitchen spaces in Uganda and Ghana

Photo credit: Dalberg Research, 2025



Photo credit: Qualiquant Services, 2025



In low-income households, cooking was often done in the same space used for other household activities, which limited the separation between cooking and other daily tasks.



Due to the restricted size of their kitchens, many users prefer to own a single multifunctional appliance rather than multiple specialised ones.



Why do household cooks choose eCooking?

- Consistent fuel availability
- Low cost of cooking
- Speed of cooking
- Advanced appliance features
- Increased confidence
- Versatility of meals
- Modernising kitchens



After buying an induction cookstove, Ruby Khatun from Nepal no longer has to refill LPG cylinders at the local shop, a task that was difficult without a male family member



Photo credit: Dalberg Research, 2025



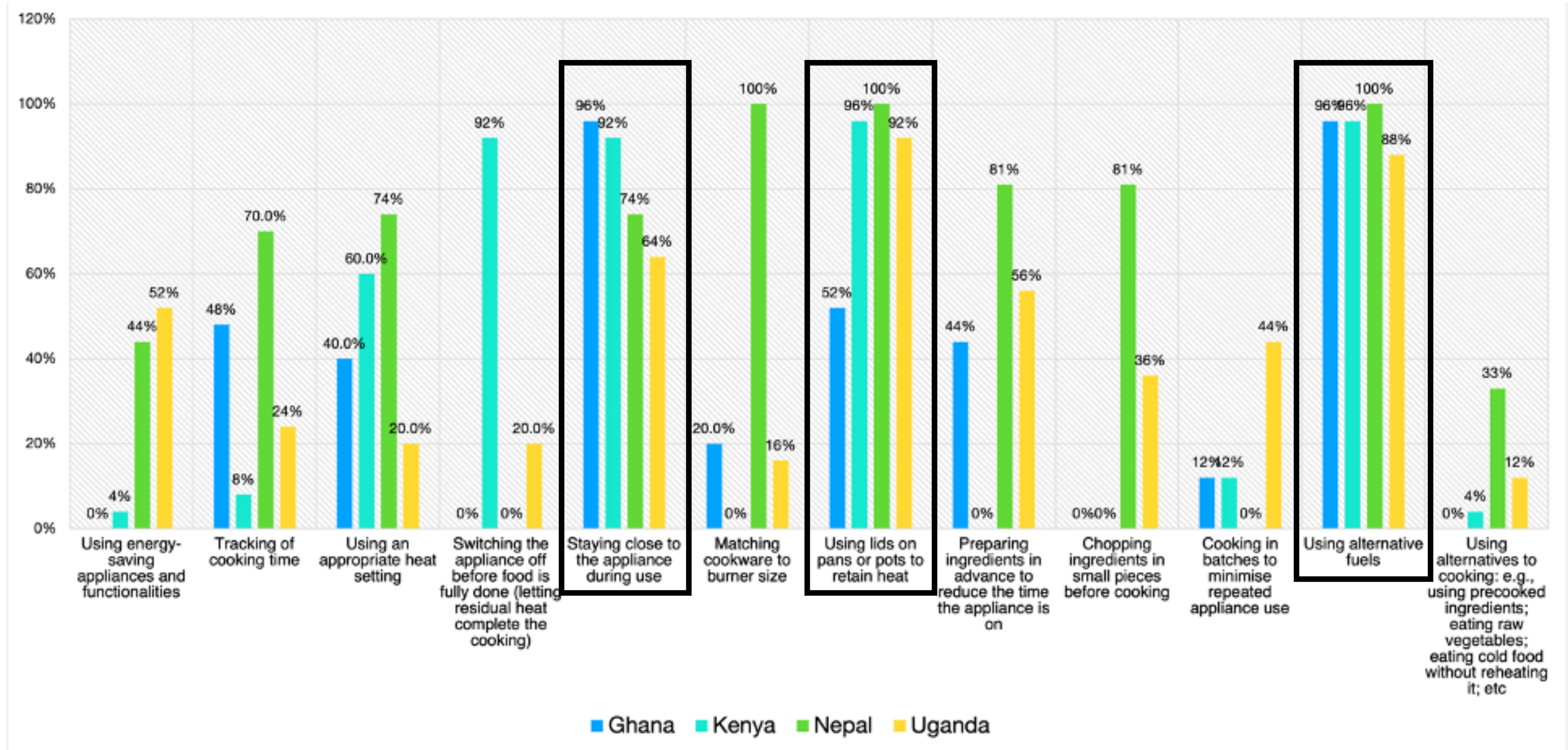
Photo credit: Dalberg Research, 2025



Electricity enables various cooking methods that are difficult or not possible with other fuels

Photo credit: Dalberg Research, 2025

Electricity-saving behaviours





Households in Ghana go a step further in saving energy by using lids

Photo credit: Qualiquant Services, 2025

Photo credit: Qualiquant Services, 2025



Cooking multiple dishes in the same appliance / bulk cooking

Photo credit: Qualiquant Services, 2025



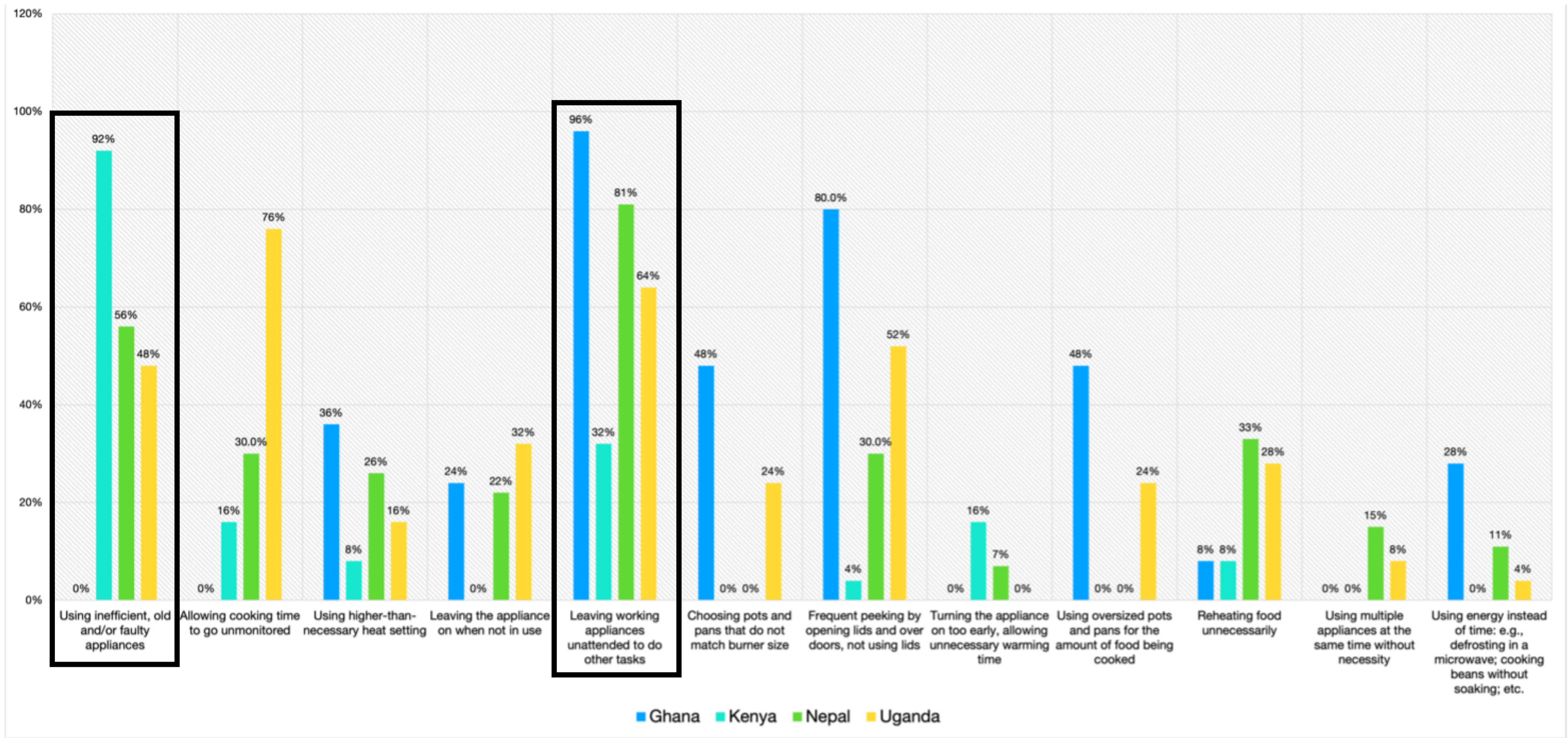
Preparing ingredients and chopping them in small pieces before turning the appliance on

Photo credit: Qualiquant Services, 2025



Users keep sockets switched off and only turn them on immediately before using an appliance

Electricity-wasting behaviours



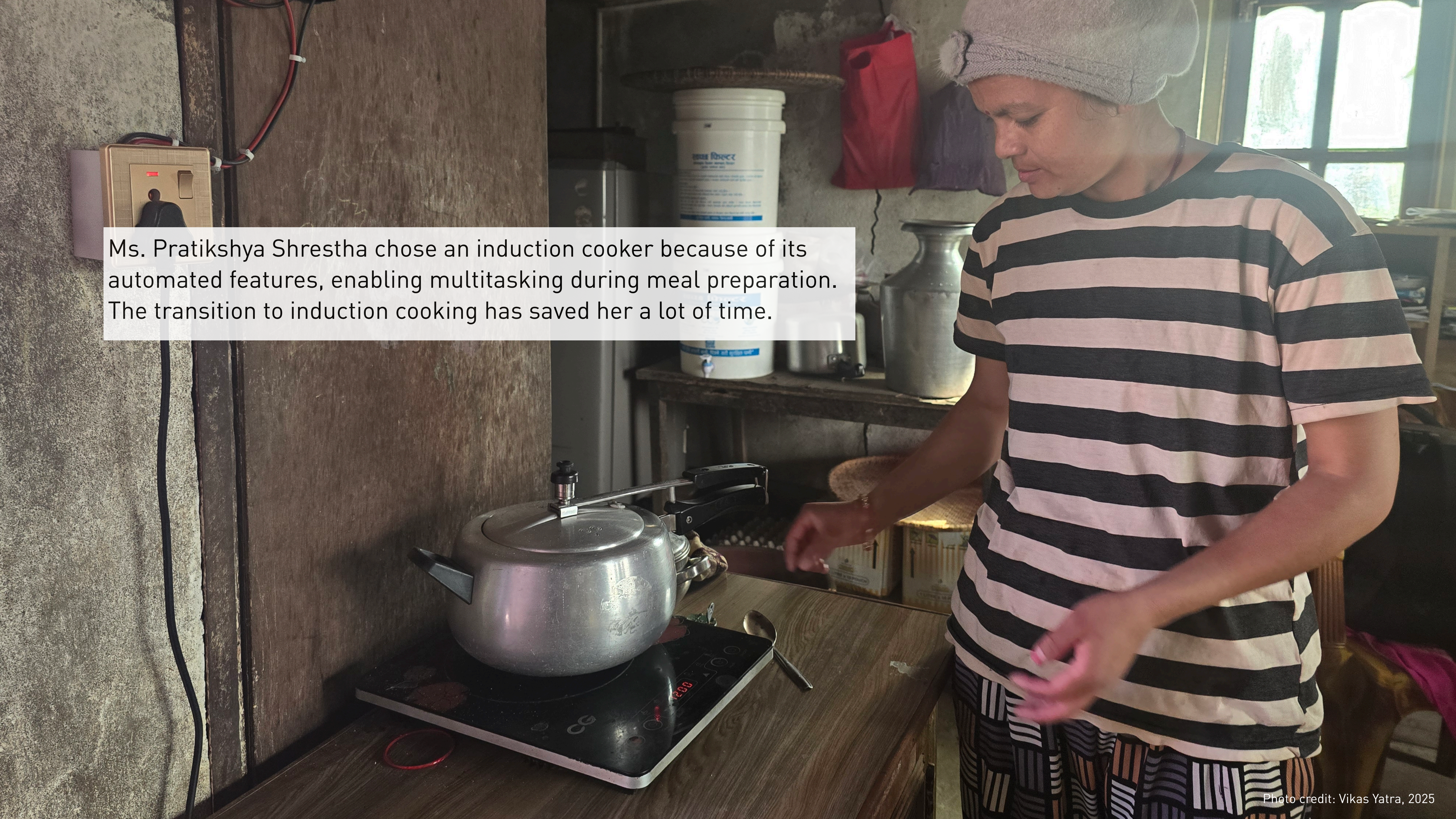


Many households in Ghana, Kenya, and Uganda were using old and inefficient electric cooking appliances

Photo credit: Dalberg Research, 2025



Photo credit: Dalberg Research, 2025

A woman wearing a grey beanie and a black and white striped t-shirt is standing in a kitchen. She is looking down at a silver pressure cooker that is sitting on a black induction cooktop. The cooktop is on a wooden countertop. To the left of the cooktop, there is a wooden wall with a light switch and some wires. In the background, there is a white bucket and a red bag hanging on the wall. A window with a metal frame is visible on the right side of the image.

Ms. Pratikshya Shrestha chose an induction cooker because of its automated features, enabling multitasking during meal preparation. The transition to induction cooking has saved her a lot of time.

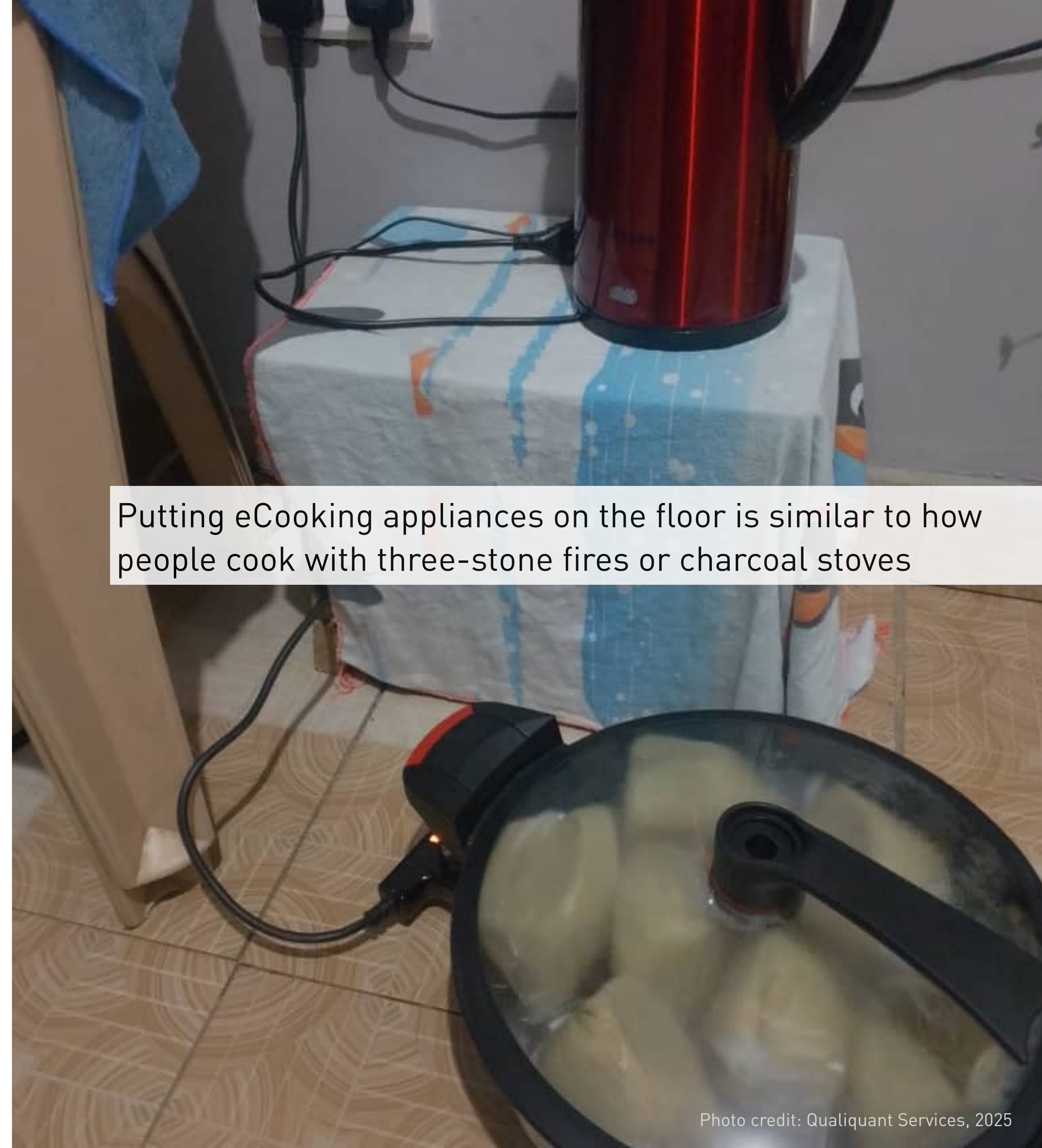
Behaviours brought from traditional cooking

Cooking on an open fire or with charcoal was valued for its long, slow cooking process, which was believed to enhance the flavour of food.

This behaviour has carried over to eCooking, where many cooks leave appliances unattended to tend to other tasks, allowing cooking time to go unmonitored.



Photo credit: Qualiquant Services, 2025



Putting eCooking appliances on the floor is similar to how people cook with three-stone fires or charcoal stoves

Photo credit: Qualiquant Services, 2025

1 week of energy monitoring



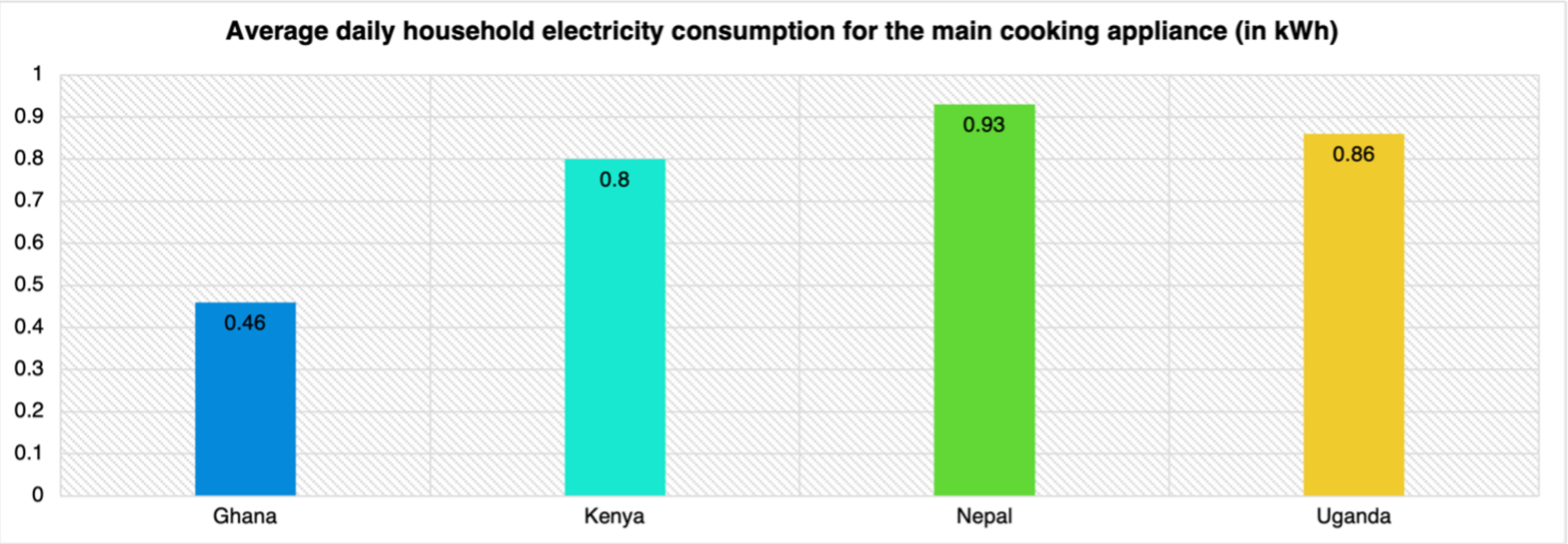
Photo credit: Dalberg Research, 2025



The main cooking device was monitored for energy usage by plugging it into an energy meter for one week

Photo credit: Dalberg Research, 2025

Energy monitoring



While some users were aware of their household's total electricity consumption (particularly those in Ghana and Uganda with prepaid energy meters), they were often unaware of the proportion used for cooking

Energy monitoring: an eye-opening experience

- Energy monitoring helped cooks understand the link between time and energy: the longer an appliance is in use, the more energy it consumes.
- In Uganda, 60% of participants reported choosing to cook more with electricity after seeing how little energy their appliances consumed.
- In Kenya, participants praised the energy monitoring exercise for revealing that electricity is relatively inexpensive.
- In Nepal, induction cookstove users were the least surprised by the meter readings, having already observed that their eCooking appliances consume little electricity and do not significantly increase electricity bills.

Energy monitoring: an eye-opening experience

To save electricity, some cooks made immediate changes:

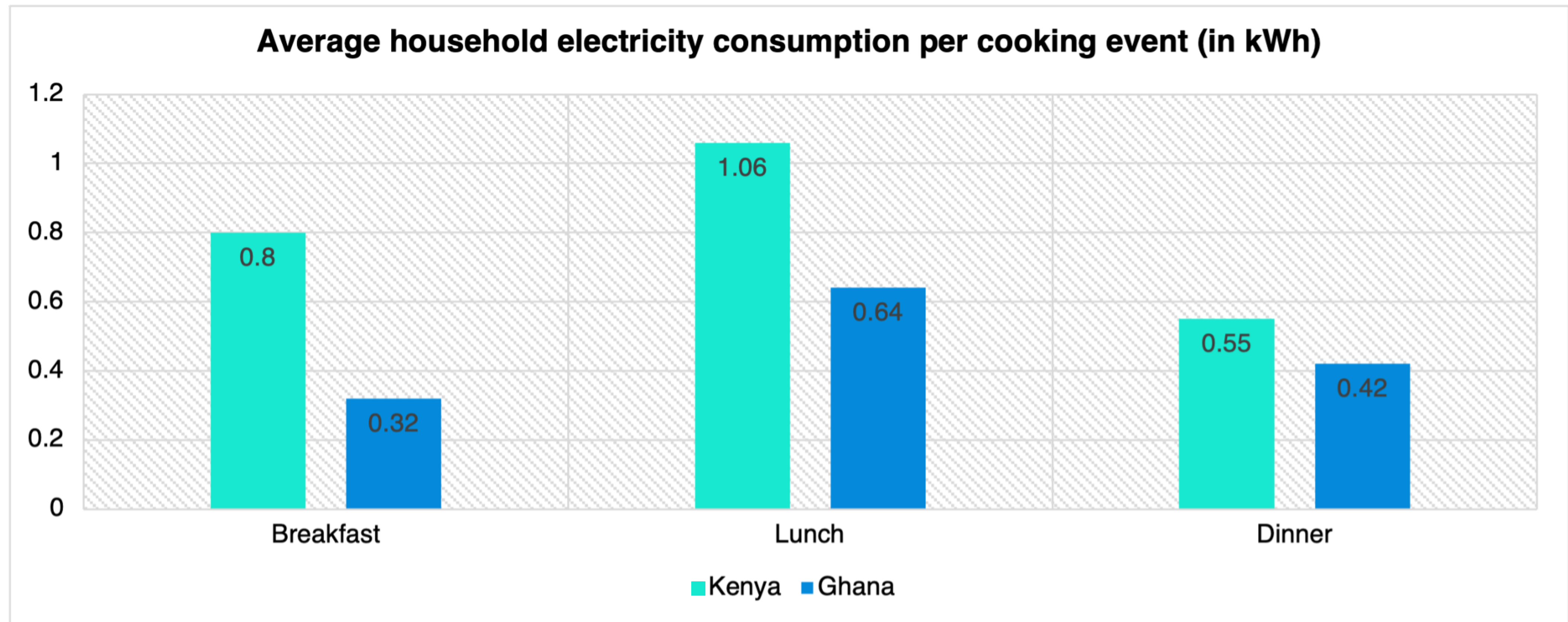
- switched to an EPCs,
- chose faster-cooking foods like rice,
- started preparing ingredients before switching appliances on,
- avoided energy-intensive methods like deep frying,
- used other fuels like charcoal and gas for dishes requiring longer cooking times.

Energy monitoring: an eye-opening experience

One cook in Ghana discovered that keeping the lid on the **rice cooker** allows the steam to cook the food more efficiently.

Participants who used **microwaves** realised that these appliances consume a significant amount of energy, prompting some to switch to **hot plates** for reheating or to use charcoal for warming leftovers.

Energy monitoring





Breakfast

Photo credit: Qualiquant Services, 2025



Lunch

Photo credit: Qualiquant Services, 2025



Dinner

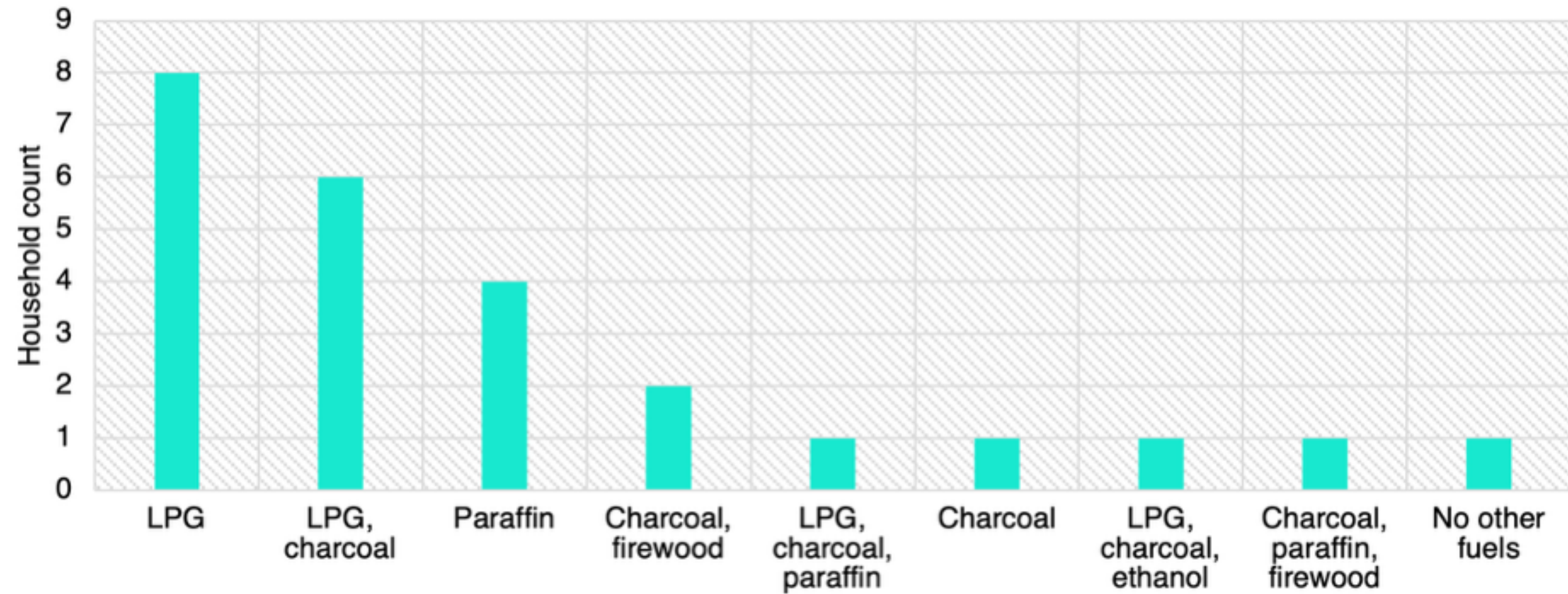
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Fuel stacking:
**> 88% of households use other
fuels in addition to electricity**

Fuel stacking - why do people stack

- High cost of cooking with electricity
- Interrupted electricity supply
- Fuel-dish incompatibility
- Need for simultaneous cooking
- Seasonality
- Cookware incompatibility

Cooking fuels used in addition to eCooking in Kenyan households





LPG is the most common fuel used with electricity in most households

Photo credit: Vikas Yatra, 2025



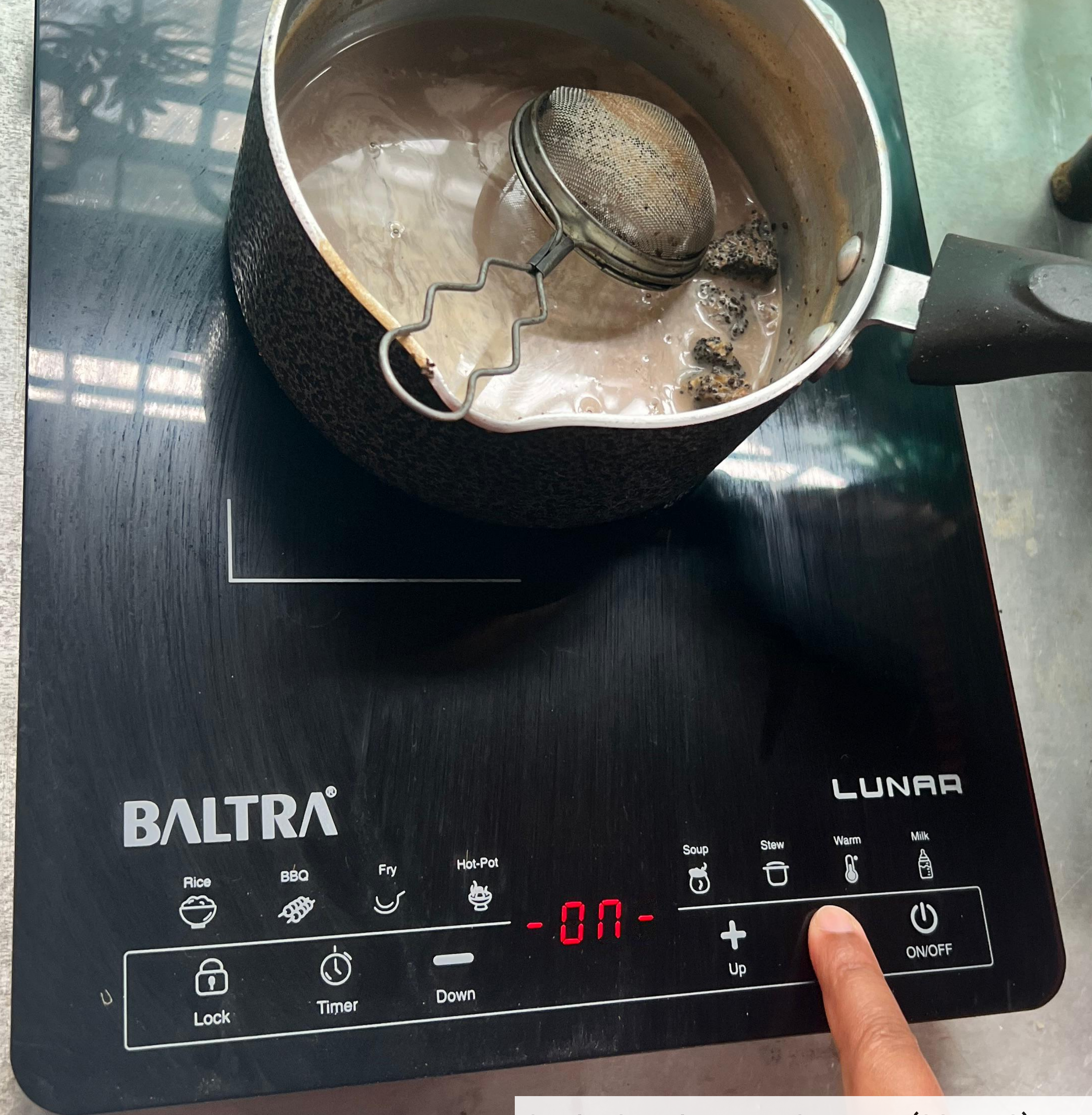
Photo credit: Dalberg Research, 2025



Nepal's traditional kadai pan can be unsuitable for use with induction cookstoves

eCooking adoption challenges

- Unreliable electricity supply
- Lack of awareness of eCooking appliances
- Appliance quality and after-sale support



An induction cookstove (Nepal)

Photo credit: Vikas Yatra, 2025



A rice cooker (Ghana)

Photo credit: Qualiquant Services, 2025



Photo credit: Miji Africa, 2025

Many households, particularly in rural areas and informal settlements, have inadequate electrical wiring and low-capacity electricity connection

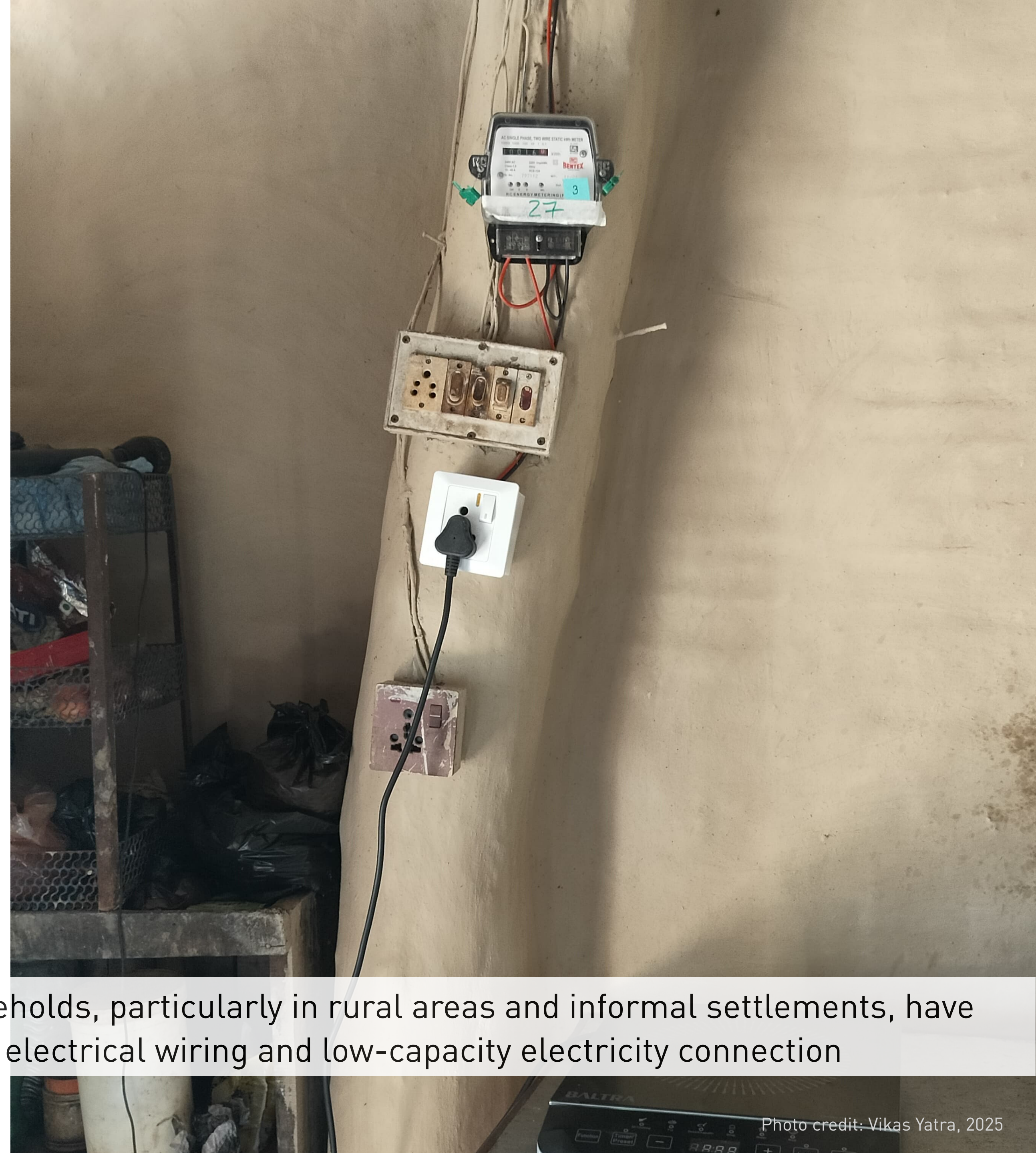


Photo credit: Vikas Yatra, 2025

Key behavioural determinants

The underlying factors that influence **whether**, **how**, and **to what extent** households adopt and consistently use clean cooking technologies or fuels. (Goodwin et al., 2015)

Behavioural determinants

Infrastructural and environmental conditions

- Availability and reliability of grid electricity
- Access to and cost of other fuels
- Layout of household cooking spaces
- Household wiring and socket placement
- Residual heat desired in cooler weather

Technological factors

- Availability of eCooking appliances
- Choice of types, brands
- Automated features: preset cooking modes
- Quality: energy efficiency, durability
- Compatibility with local cooking needs

Economic factors

- Cost of high-quality eCooking appliances
- Access to financing options
- Cost and its perception of cooking with electricity
- Cost of maintenance and repair

Psychological factors and awareness

- Perception of the cost of eCooking
- Perception of appliance safety and ease of use
- Trust in appliance performance and reliability
- Awareness of appliance lifecycle
- Previous experience with technology

Social and cultural factors

- Traditional means for certain dishes
- Traditional and changing gender roles
- Desire for modernity
- Community influence

Product recommendations

- Focus on appliance quality
- Aim for versatility and multi-functionality
- Enable energy planning and monitoring
- Make appliances culturally appropriate
- Promote modernity
- Collect user feedback

Study limitations

- Limited sample size - 103 households
- Non-random sampling
- Overrepresentation of certain eCooking appliance types
- Lack of quantitative measurement of energy-saving behaviours
- Variability in cooking practices during energy monitoring
- Potential observer effect
- Reliance on self-reported data
- Seasonal and environmental constraints

THANK YOU!
Questions?

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