



Experiences of Electric pressure cookers in East Africa?

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# Cooking with wood or charcoal as fuel is hugely damaging to health and the environment

## 以木材或木炭为燃料烹饪对健康和环境造成巨大破坏

3 bn families cook with biomass in the developing world:

在发展中国家，使用生物质做饭的30亿家庭：

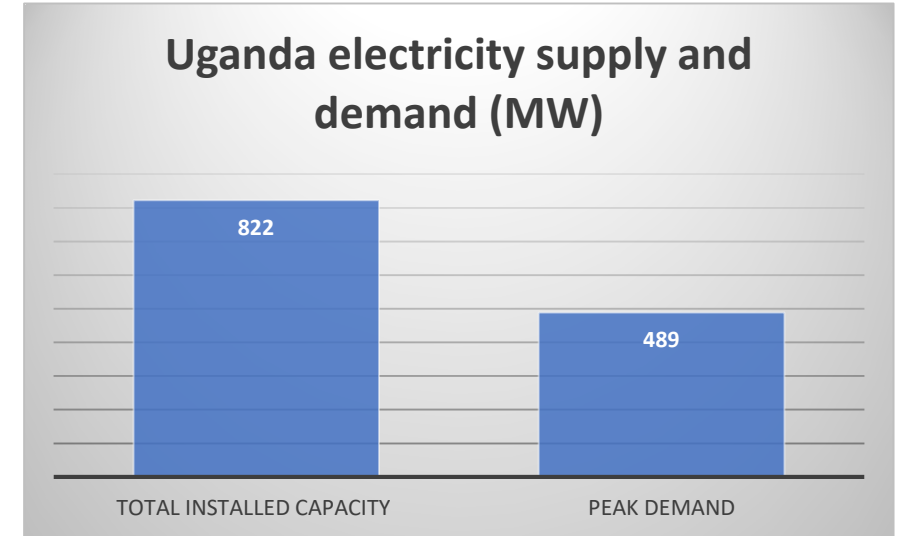
- 2 bn people have electricity but do not cook with electricity.
- 有20亿人用电却不用电做饭。
- 1 bn people in rural areas do not have access to effective electricity.
- 十亿无法获得有效电力的国家。

Diversity of improved cook stoves





- In many countries, the generation of grid electricity is now greater than demand.
- 在许多国家，电网发电现在大于需求
- To deliver energy through mini-grids you need to expect a load that delivers a return on investment to potential investors.
- 为了通过微型电网提供能源，您需要期望能够为潜在投资者带来投资回报的负荷





	Electricity access – total, urban	Blackout frequency & duration (SAIFI, SAIDI)	Electricity tariff (USD/kWh)	Lifeline tariff & allowance (USD/kWh, kWh/month)	Generation mix (% renewable)
<b>Ethiopia</b>	44% (urban 97%)	n/a	0.09 \$/kWh	0.01 \$/kWh 50 kWh/month (0.03, 100 0.06, 200 0.07, 300 0.08, 400)	100%
<b>Kenya</b>	64% (urban 81%)	13/yr, 60hrs/yr	0.23 \$/kWh	0.17\$/kWh, 100 kWh/month	87%
<b>Tanzania</b>	33% (urban 65%)	47/yr, 21hrs/yr	0.15 \$/kWh	0.04 \$/kWh 75 kWh/month	34%
<b>Uganda</b>	22% (urban 57%)	42/yr, 59hrs/yr	0.20 \$/kWh	0.06 \$/kWh 15 kWh/month	93%
<b>Zambia</b>	40% (urban 75%)	5/yr, 50hrs/yr	0.09 \$/kWh	0.02 \$/kWh 200 kWh/month	97%





## Growing interest in changing cooking from biomass as fuel to using electricity or gas.

### 人们越来越有兴趣推动烹饪方法从使用生物质作为燃料向使用电或气的转变

- Universally reduce the harm and costs that result from cooking with biomass
- 普遍减少使用生物质烹饪带来的危害和成本
- In urban areas, **create additional demand for electricity** where there has already been investment which provides opportunities for increased revenue generation.
- 城市地区，在已经有投资的地方创造更多的电力需求，这为增加创收提供了机会。
- In rural areas, **increase the viability and revenue potential from electricity provision** by adding a valuable “anchor load” for electrification programmes.
- 在农村地区，通过为电气化计划增加宝贵的“锚固负荷”来增加电力供应的可行性和创收潜力。



**MECS**  
Modern Energy  
Cooking Services

## Uninsulated cooker

D) Evaporation losses from steam escaping

B) Convective & radiant losses from lid of pan

C) Convective & radiant losses from side of pan

A) Convective losses from heat source, i.e. the cooker, up the side of the pan & conductive losses to the cooker housing

'Cooker' – a heating element or gas flow that uses energy to heat up the pot

## Insulated cooker

D) Minimise evaporation losses by having a lid and a thermostat to stop excessive conversion of water to steam.

B) Insulate the lid too!

C) Significant insulation on the side to stop radiant & convection losses

A) Encase the heater in the box to stop conduction & convection losses from the heater



# Cooking Diaries study

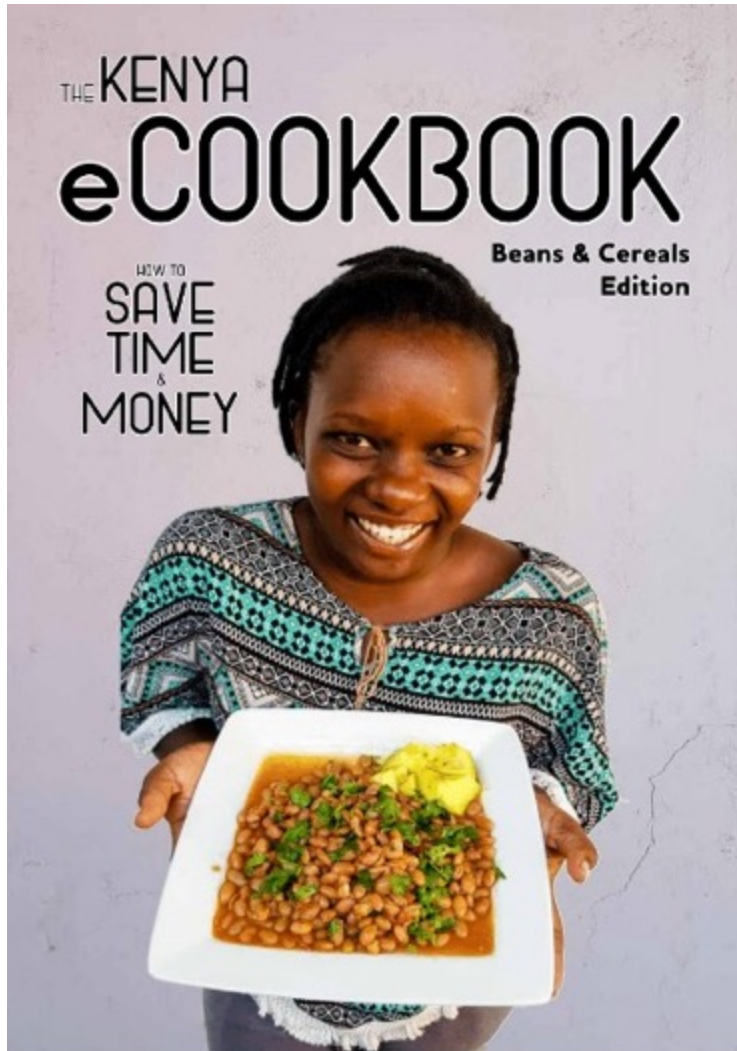
我们工作的关键部分是进行烹饪日记研究，以深入了解不同国家的烹饪要求

- Kenya, Zambia, Myanmar, Tanzania
- 肯尼亚，坦桑尼亚，赞比亚，缅甸





# eCookbook



**DIY-6005\***  
**YELLOW BEANS**  
 with GREEN PEPPERS, ONIONS and TOMATOES

**method**

500g  
 2 hrs  
 1 onion (finely sliced)  
 2 tomatoes (sliced)  
 1/2 green pepper (finely sliced)  
 1 tsp salt  
 2 tsp red hot sauce  
 5 tbsp vegetable oil

pressure cook for as long as possible without opening as cooking time & cost increases with every depressurisation

10 mins  
 5 mins  
 10 mins

"I used to cook beans on charcoal because I thought it was the cheapest option. I was so surprised to find out that cooking beans on the electric pressure cooker was faster and cheaper!"  
 - Damaris

**where is the money going?**

11.5 KSh  
 2hrs 5mins  
 0.51 units

**when using charcoal...**

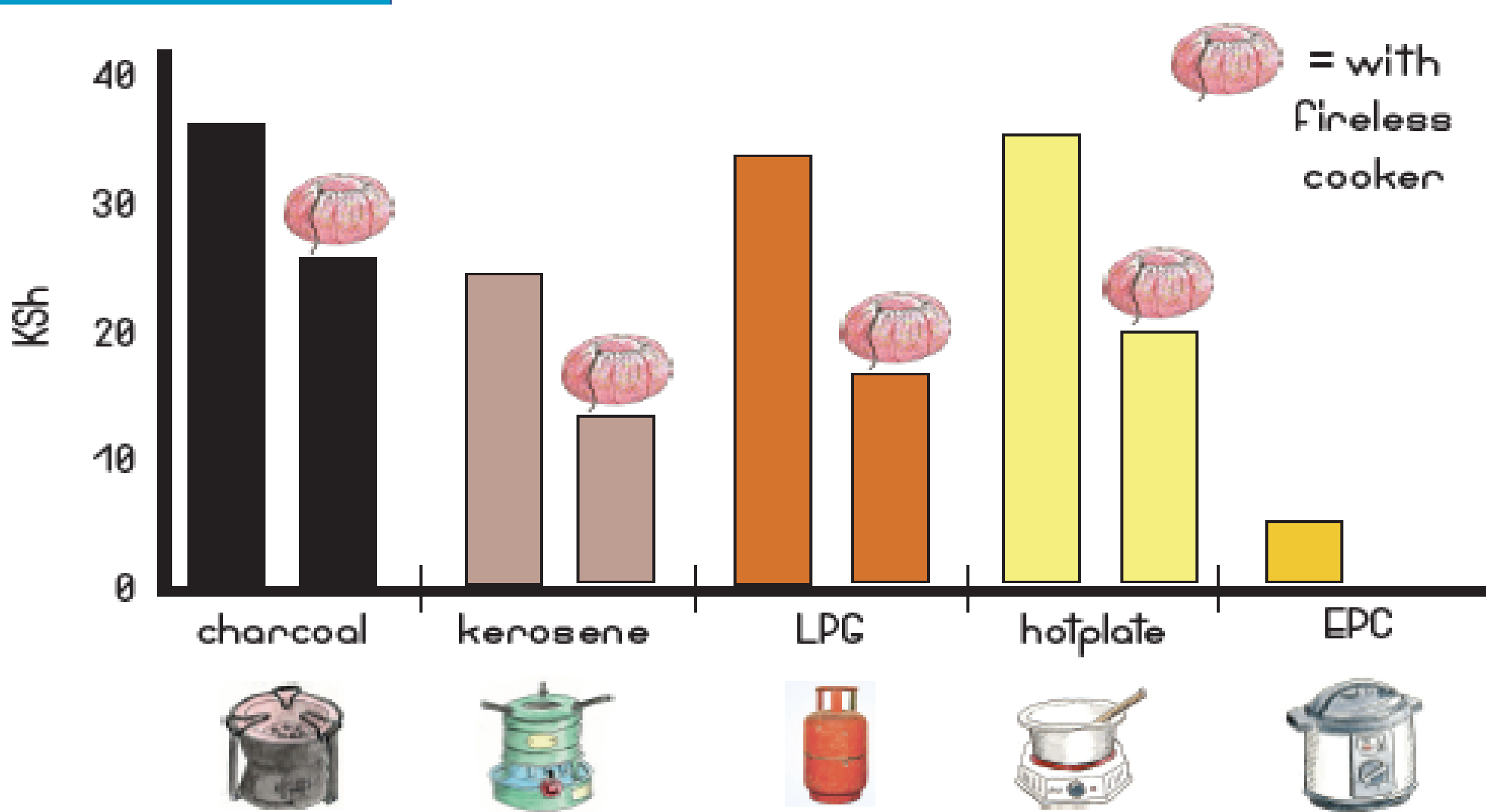
80 KSh  
 3+ hrs  
 1 tin of charcoal

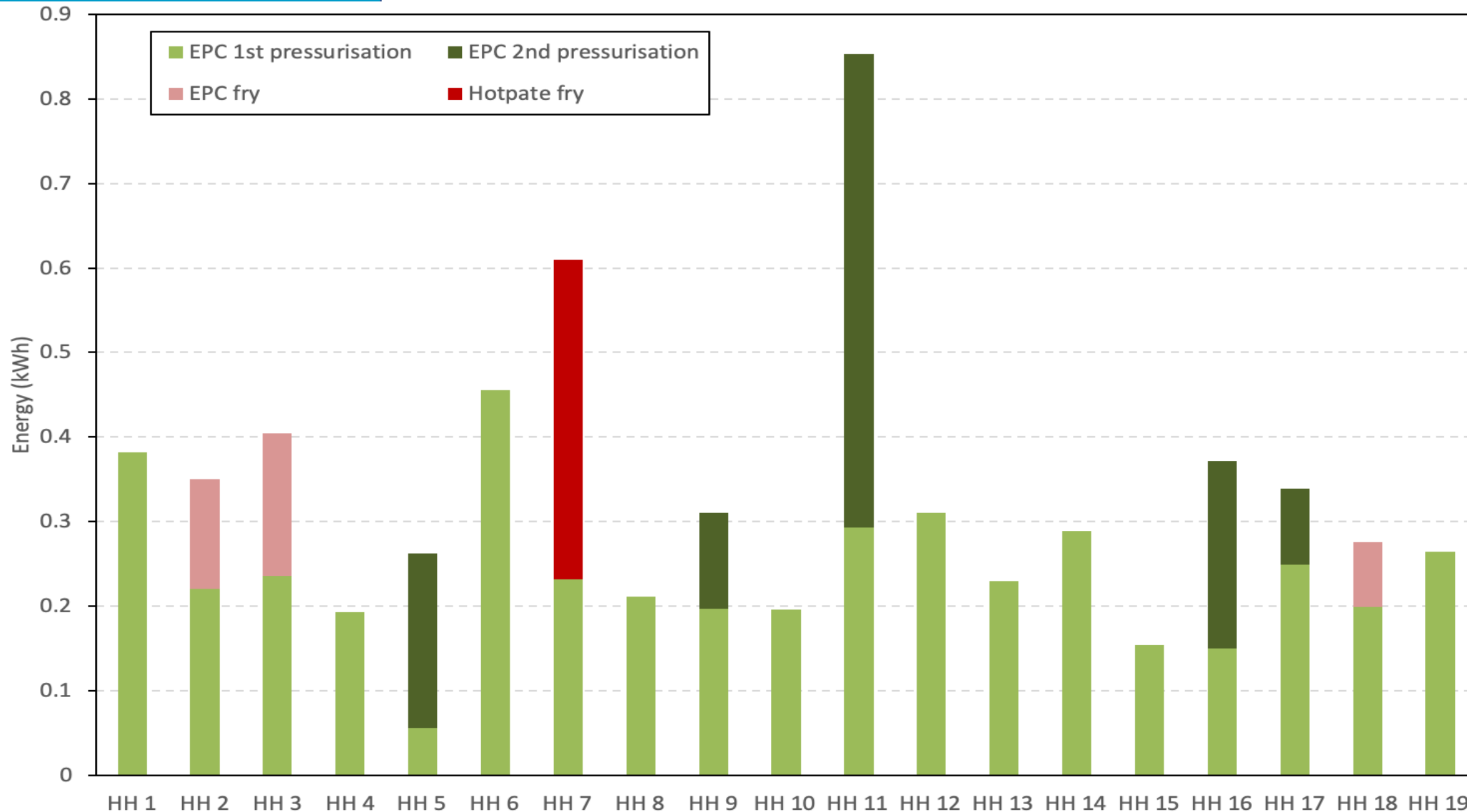
Damaris used roughly the same amount of energy pressure cooking for 10 mins, for 30, and for 100 mins. Each time the lid is opened on an EPIC it adds at least 5 mins to the cooking time, and can increase the total cost by up to 50%.

clean (environmentally)  
 clean (kitchen)  
 easy digital  
**fast/saves time**  
 cheaper  
 efficient  
 multi-tasking



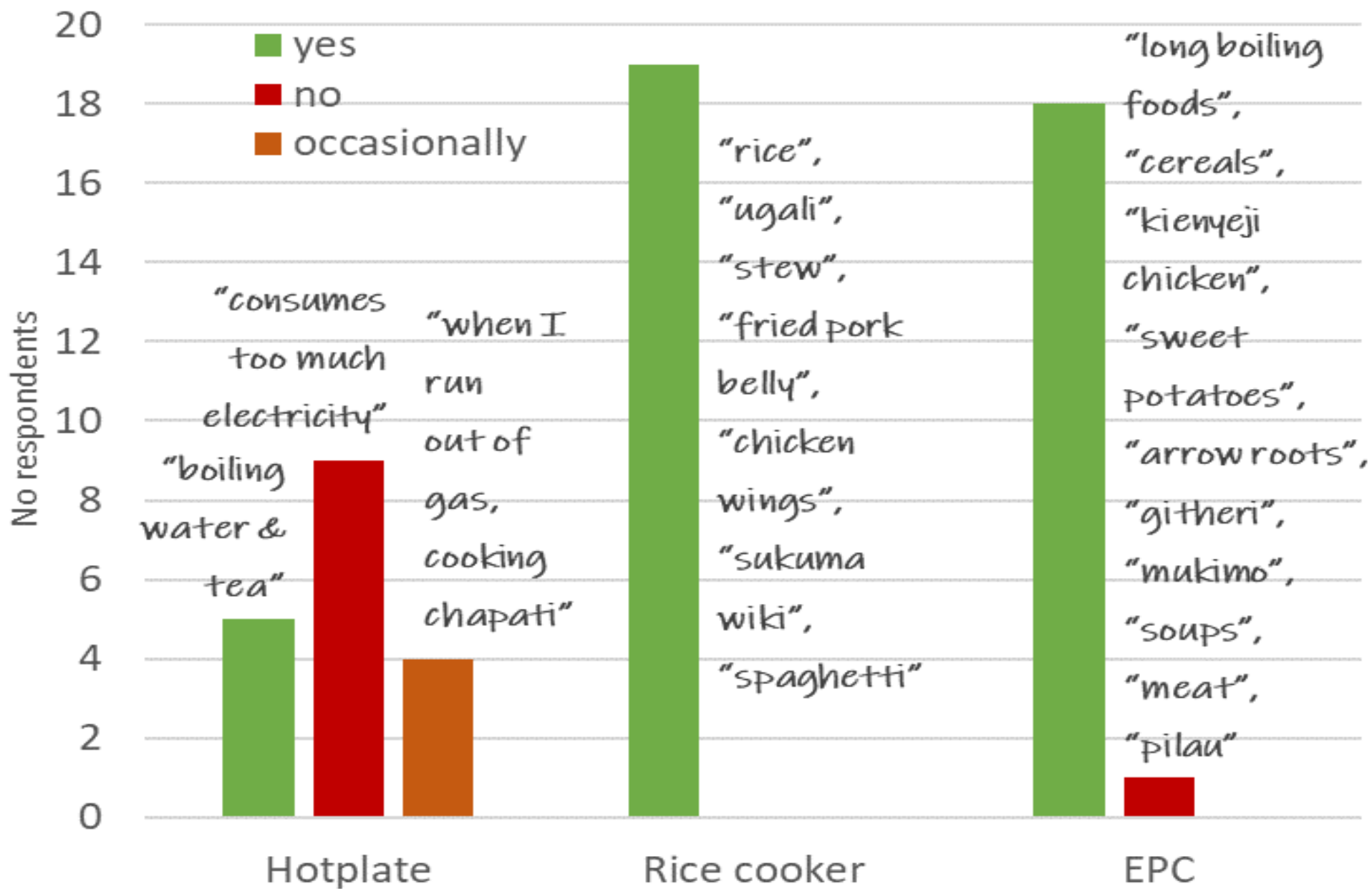








	No. complete days of data	Median daily energy consumption (kWh/household/day)	Household size (no. ppl)	Median per capita daily energy consumption (kWh/person/day)
<b>ZAMBIA</b>				
100% electricity measured, median	99	1.63	7.9	0.21
Total consumption if EPC at 90% of menu		1.1		0.14
<b>TANZANIA</b>				
100% electricity measured, (with EPC proportion modelled)	423	2.06	4.2	0.49
Total consumption if EPC at 90% of menu		1.44		0.34
<b>KENYA</b>				
100% electricity measured, (with EPC proportion modelled)	431	1.4	3.1	0.46
Total consumption if EPC at 90% of menu		0.96		0.30

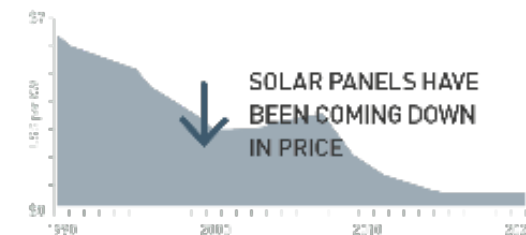
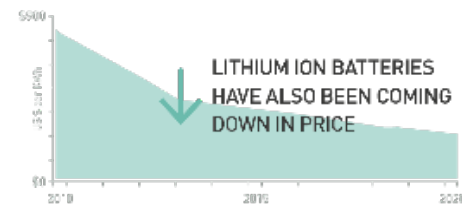






# eCooking is increasingly viable 而且它变得越来越可行

- Advances in solar photovoltaics, new battery technologies and innovative ‘pay as you go’ business models are opening up new opportunities for transitioning the way people cook.
- 太阳能光伏技术的进步、新的电池技术和创新的“现收现付”业务模式为转变人们的烹饪方式提供了新的机遇
- By 2020 the monthly discounted cost of an eCook system could be of the same order as household expenditure on purchased charcoal.
- 到2020年，eCook系统的每月折扣成本可能与购买木炭的家庭支出相同。



where is the money going?

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2hrs 5mins  
0.51 units

Damas used roughly the same amount of energy pressure cooking for 10 mins, for 30, and for 100 mins. Each time the lid is opened on an EPC it adds at least 5 mins to the cooking time, and can increase the total cost by up to 50%

when using charcoal..

80 KSh  
3+ hrs  
1 tin of charcoal



# Global LEAP Award for Electric Pressure Cookers

## 全球LEAP电压力锅奖 CLASP

- Appropriately designed, highly energy-efficient, cost-effective products and services are essential.
- 设计合理、高效节能、具有成本效益的产品和服务对于以最低成本提供能源服务以及扩大和加快全球能源获取工作至关重要。
- Many off-grid energy generation companies struggle to identify and source outstanding appliances.
- 许多离网能源发电公司都在努力寻找和采购出色的电器



# What is a Global LEAP Award?

## 什么是全球LEAP奖？

- Awards programs use a competition-based approach to drive innovation.
- 奖励计划是采用基于竞争的方法来推动早期产品市场的创。

The Global LEAP Awards is an international competition to identify and promote the world's best off-grid appliances.

- 全球LEAP大奖是一项国际竞赛，旨在识别和推广世界上最好的离网电器。



# Modern Energy Cooking Services (MECS)

## MECS

- The MECS programme is leading this change with £40m from the UK Government
- MECS计划通过英国政府提供的4,000万英镑来引领这一变革
  - research into the requirements for cooking, modelling solutions,
  - 将对烹饪要求的研究、建模解决方案
  - providing challenge funds
  - 研究挑战资金以
  - working with partners that can put in place finance to support scale up.
  - 及与合作伙伴的合作融为一体以支持扩大规模
- In the first instance, the focus will be on urban areas where there is access to increasingly reliable electricity with most having an AC supply while 1.4 billion pay for biomass fuel.
- 首先，重点将放在城市地区，那里可获得越来越可靠的电力，其中大多数都有交流电源，而14亿美元用于购买生物质燃料。

