



INFORSE EAST AFRICA ZOOM WEBINAR
E-Cooking in East Africa? -Electric Pressure Cooker
as a Clean Cooking Option for East Africa
FRIDAY 27TH NOVEMBER 2020 , 11:00 – 12:30 HRS EAT



Overview of the MECS Programme in East Africa

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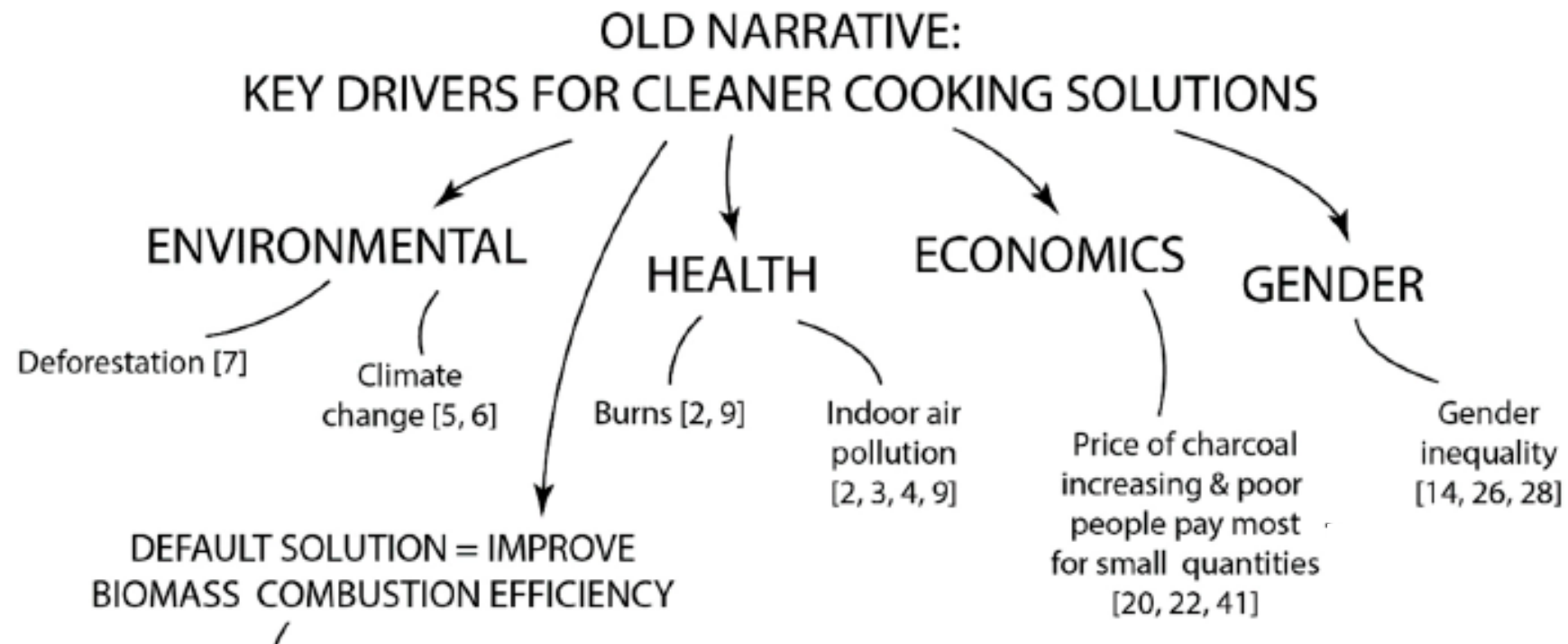




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What is MECS?

- Modern Energy Cooking Services
- 5 year, £40 million UKAid-funded research & innovation programme
- Lead by Loughborough University
- Designed to change the narrative in the clean cooking & electrification sectors



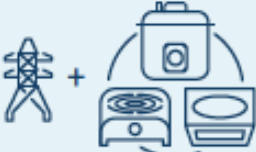



Batchelor et al (2019)

The evolving landscape of eCooking

- New opportunities opening up
 - Falling costs of solar PV & battery storage
 - Rising cost of biomass fuels
 - Energy-efficient appliances
 - Induction, infra-red, rice cooker, Electric Pressure Cooker (EPC)...

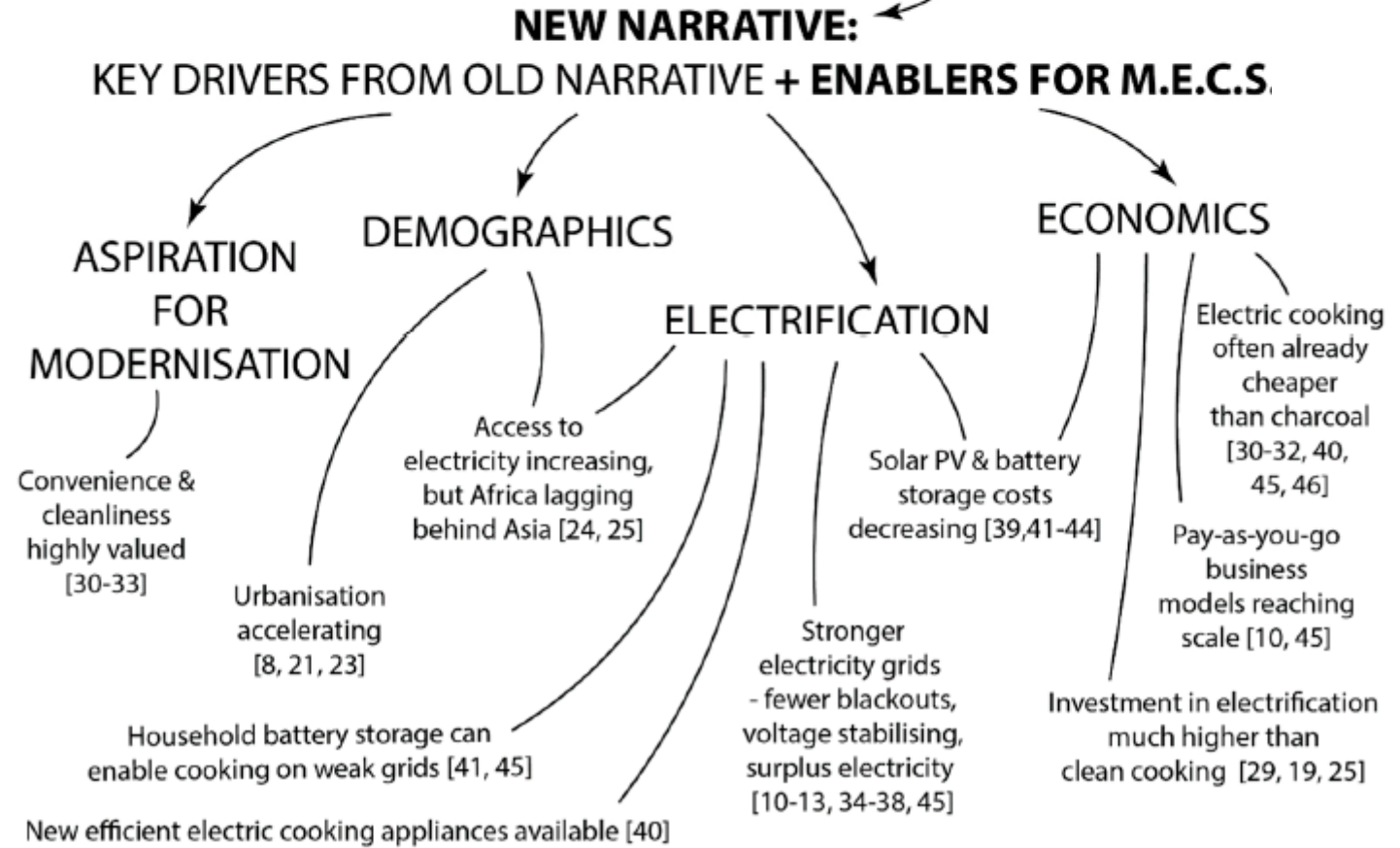
ESMAP (2020)

TABLE 2.2 Simplified typology of eCooking devices for strong, weak, and off-grid settings

USE OF BATTERY	GRID OR MINI GRID	SOLAR HOME SYSTEM
Without battery	<p>Strong grid AC grid eCooking</p> 	<p>Off-grid DC solar eCooking</p> 
Battery-supported	<p>Weak grid DC grid battery-powered eCooking</p> 	<p>Off-grid DC solar battery-powered eCooking</p> 

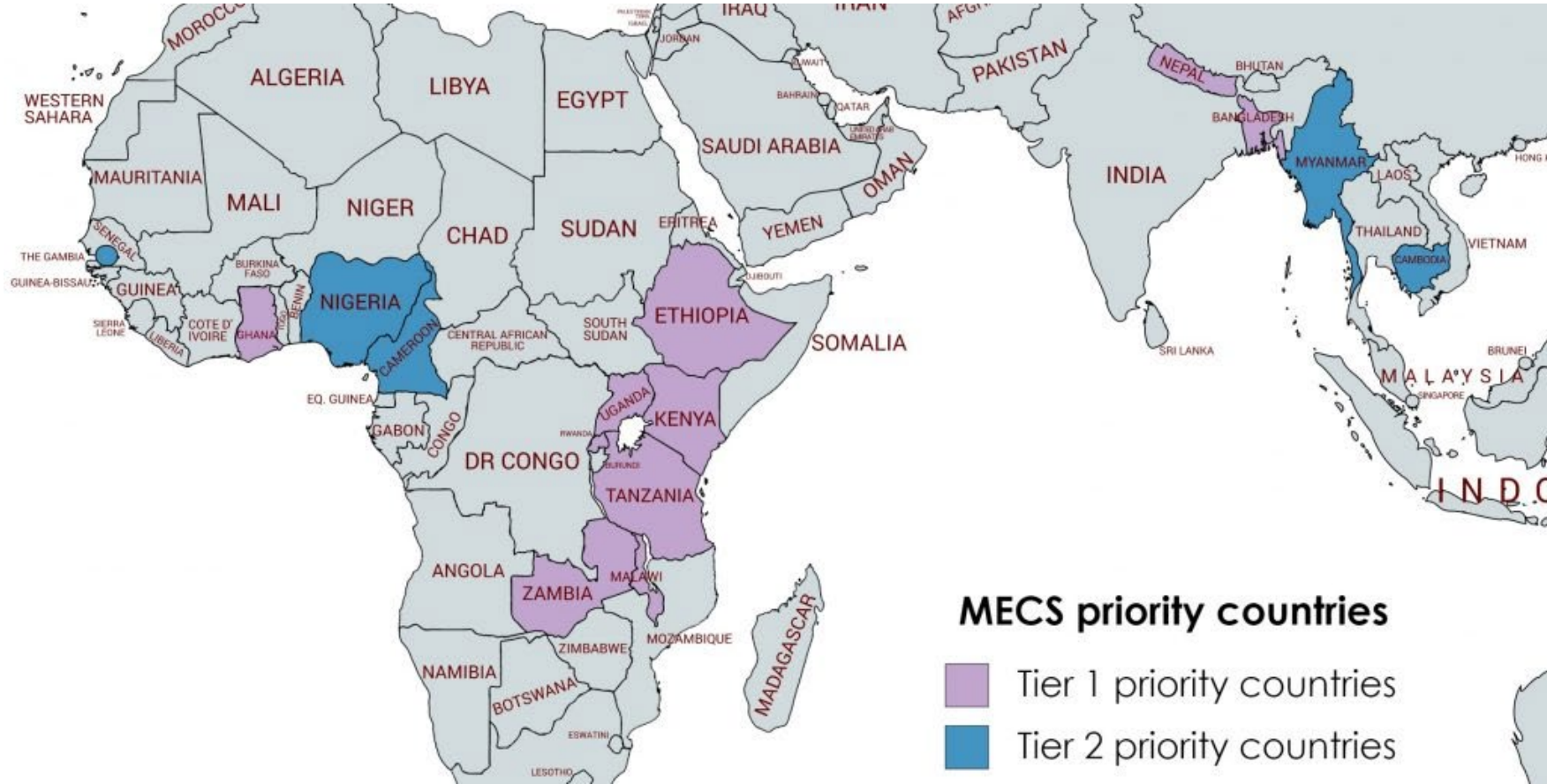


Improved biomass solutions failing to deliver [16, 17, 18, 19, 45]





East Africa's strategic role in MECS





MECS in East Africa



Innovate



LCT

2017

2018

2019

2020

2021

2022

2023

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Challenge funds



SunCulture



EnerGrow



PAYGO ENERGY



Country partners

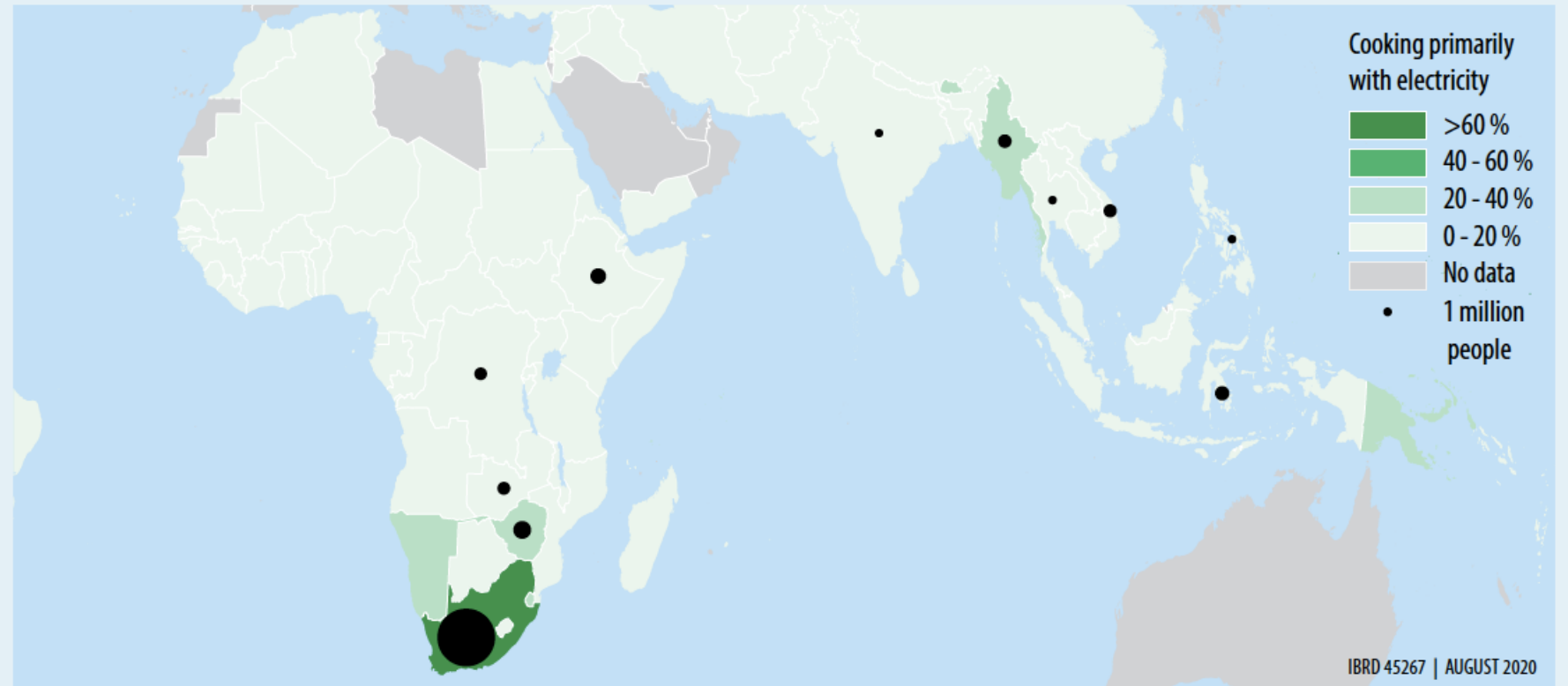


RBF & Global LEAP



eCooking is already popular in Southern Africa

FIGURE 3.2 Percentage of households cooking primarily with electricity in Sub-Saharan African and South/Southeast Asian countries



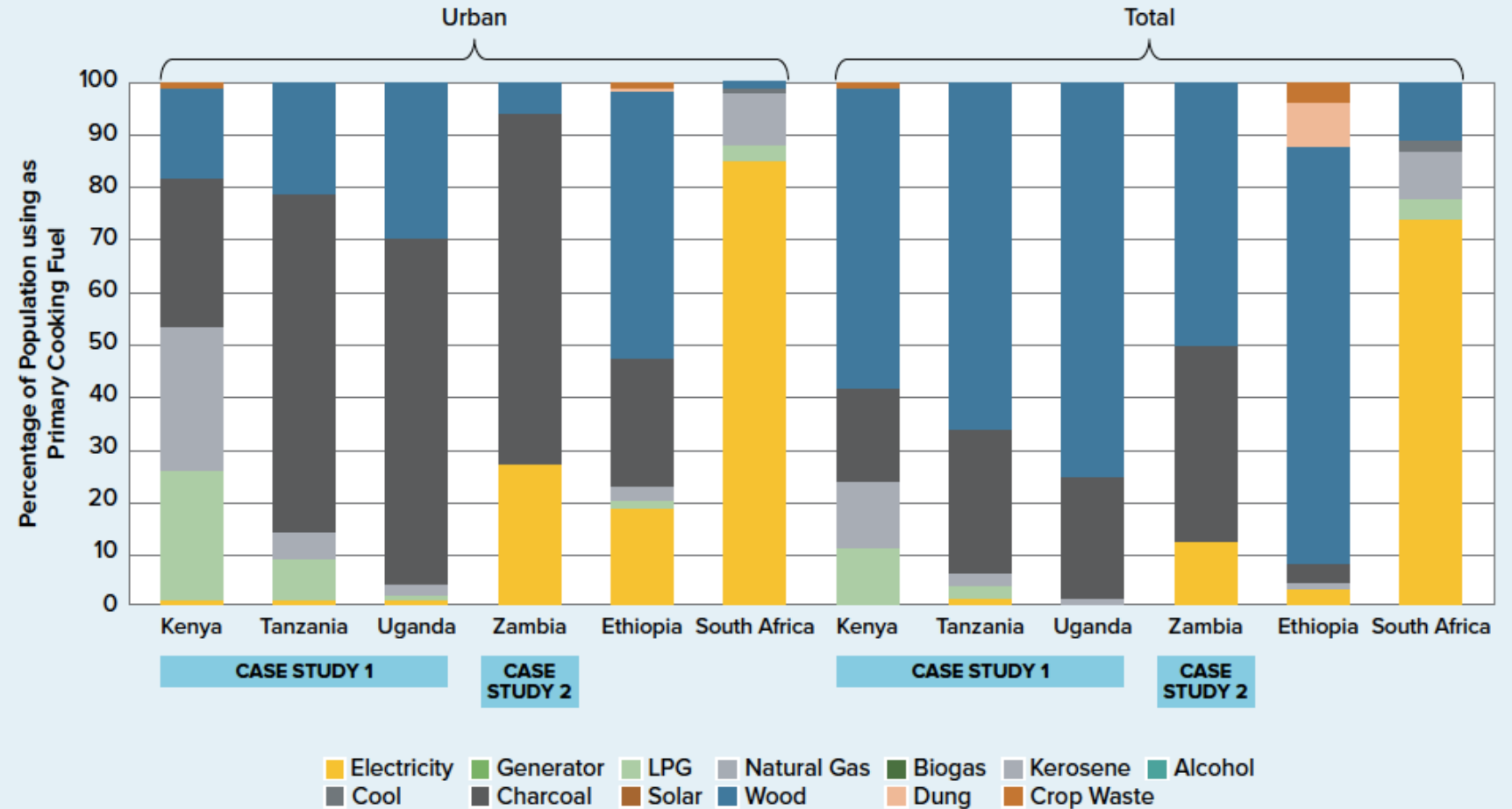
Note: Populations of more than 1 million people cooking primarily with electricity are indicated by black circles, the size of which is proportional to the number of people. See Figure 3.5 for a breakdown of the fuel mix in selected Sub-Saharan African countries.

Source: Data from WHO (2017).

ESMAP (2020)

eCooking
is starting
to enter
urban East
African
markets

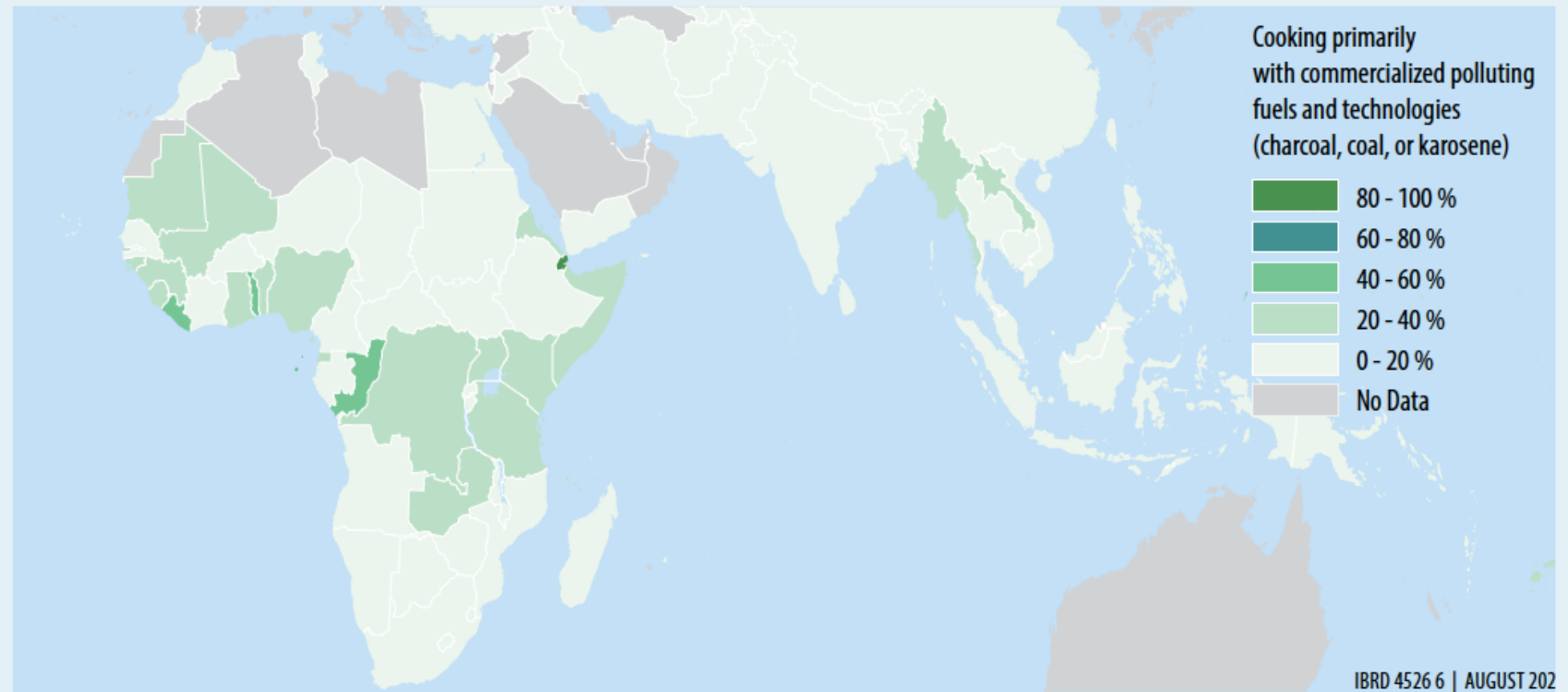
FIGURE 3.6 Primary cooking fuel used in selected countries in East and Southern Africa



ESMAP (2020)

Commercialised polluting fuels widely used in East Africa

FIGURE 3.5 Percentage of households cooking primarily with commercialized polluting fuels and technologies (charcoal, coal, or kerosene) in Sub-Saharan Africa and South/Southeast Asia

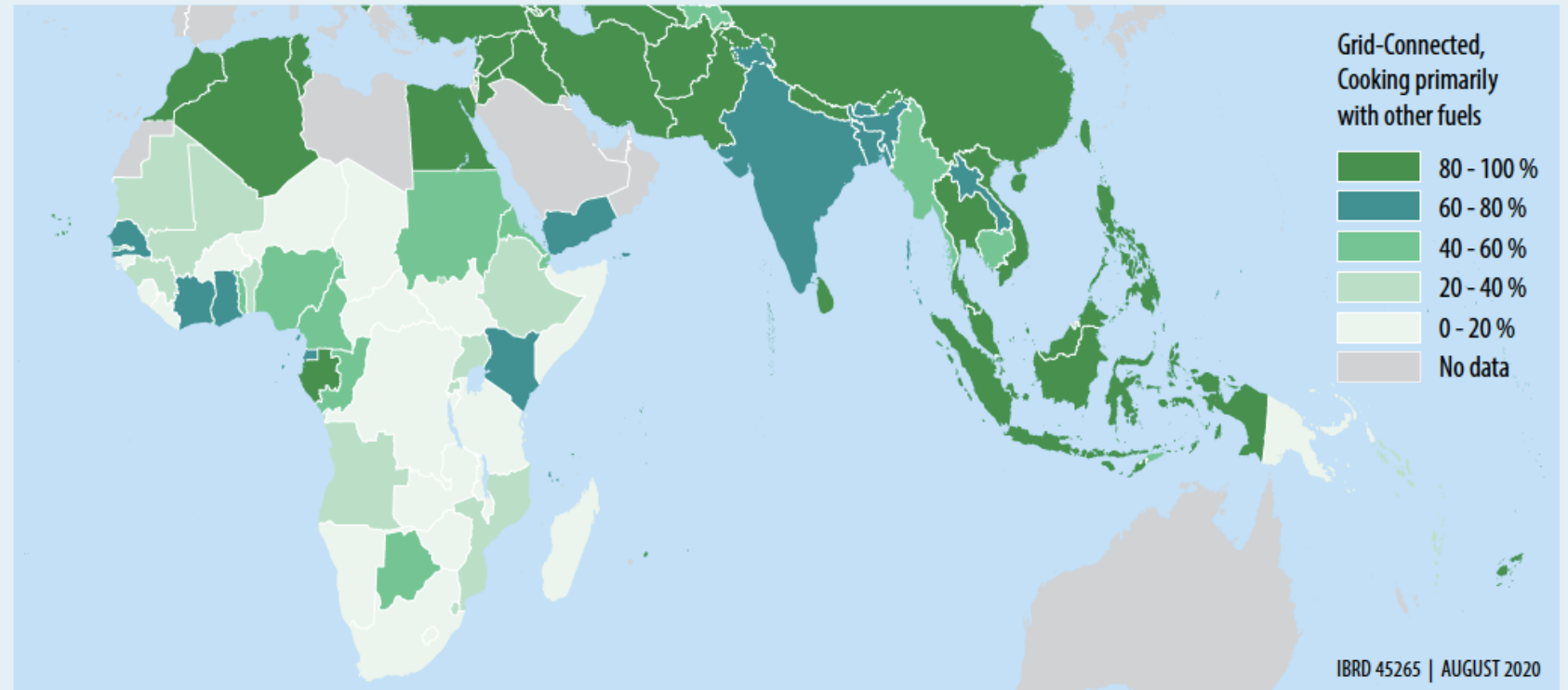


Source: Data from WHO (2017).

ESMAP (2020)

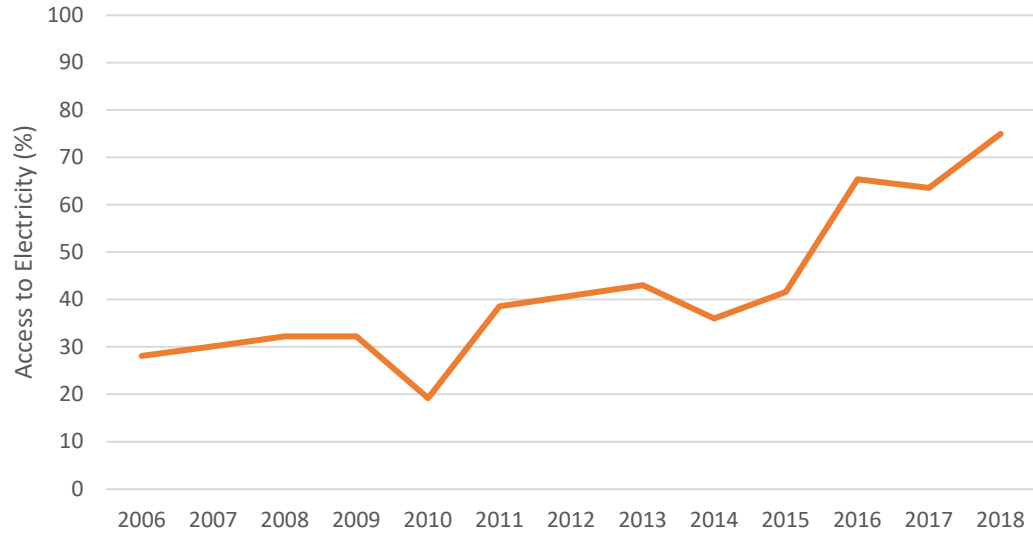
Many East Africans now have access to electricity but don't use it for cooking

FIGURE 3.4 Percentage of households with grid connections that still cook primarily with fuels other than electricity in Sub-Saharan Africa and South/Southeast Asia



Source: Data from WHO (2017) and World Bank (2019c).

ESMAP (2020)



0% Kenyans primarily cook with electricity, yet 73% are now connected

ACTS (2020)

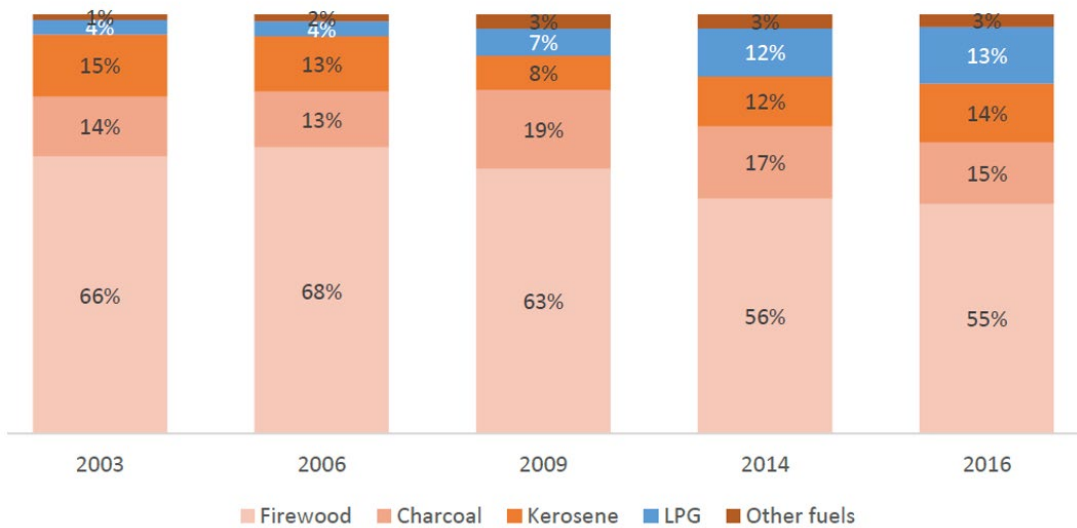


Figure 3: Trends in primary fuel use in Kenyan households (2003-2016). Source: GLPGP (2019)

eCooking in Kenya





Why EPCs?

- Entry level appliance that is well targeted to replace charcoal
- Good fit for East African cuisine
 - Most efficient at cooking the most energy intensive meals
 - 'Heavy foods' such as beans or matumbo (tripe) - boiling >1hr
 - Saves up to 50% on cooking time & 85% on energy/cost
 - Can cook up to 90% of the everyday Kenyan menu
 - Enables cooks to multi-task

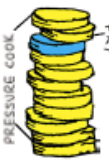
"I used to cook beans on charcoal because I thought it was the cheapest option. I was so surprised to find out that cooking beans on the electric pressure cooker was faster and cheaper!"

- Damaris

where is the money going?



11.5 KSh
2hrs 5mins
0.51 units

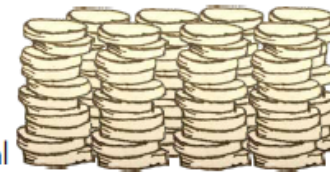


Damaris used roughly the same amount of energy pressure cooking for 10 mins, for 30, and for 100 mins. Each time the lid is opened on an EPC it adds at least 5 mins to the cooking time, and can increase the total cost by upto 50%

when using charcoal...



80 KSh
3+ hrs
1 tin of charcoal



Leary, Fodio Todd et al (2019)





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Are EPCs the 'silver bullet'?

Food category	Typical dishes	Frequency on urban Kenyan menu	Compatibility with EPCs	Energy savings with EPCs
'Heavy foods'	Beans, matumbo, meat stews	32%	Users instinctively use EPCs	High
Staples	Ugali, rice	39%	Users use EPCs if encouraged	Moderate
Quick fry	Sukuma wiki, eggs	20%	Users use EPCs if encouraged	Low
Deep fry	Mandazi, fried chicken, chips	2%	Users cannot currently use EPCs	Low
Long fry	Chapati	4%	Users cannot currently use EPCs	Low



Barriers for eCooking in East Africa

- Availability of eCooking appliances
 - Culturally-appropriate
 - Energy-efficient
 - Quality-assured
 - AC & battery-supported
- Awareness of eCooking
 - Consumer
 - Perception of relative cost
 - High upfront cost
 - Electrification & clean cooking sectors





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Fuel stacking

- ‘Everybody stacks’ (Shankar et al, 2020)
- eCooking has a vital role in shifting people away from biomass towards a clean fuel stack





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Conclusion

- **eCooking is neither a ‘silver bullet’ for tackling biomass cooking in East Africa nor just ‘chasing the wind’?**
 - New opportunities already seeing substantial uptake
 - On-grid eCooking with energy—efficient appliances
 - Emerging technologies & business models likely to make eCooking accessible to many more people
 - eCooking on mini-grids
 - Battery-supported eCooking – weak-grid & off-grid
 - Direct solar eCooking
 - On-bill financing
 - Peer-to-peer women-led business models

Thanks for listening!

Find out more:

- j.leary@lboro.ac.uk
- www.MECS.org.uk
- www.MECSplus.org





References

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- ESMAP. 2020. Cooking with Electricity: A Cost Perspective. Washington, DC: World Bank.
- Batchelor, S., Brown, E., Scott, N. & Leary, J. (2019) Two Birds, One Stone—Reframing Cooking Energy Policies in Africa and Asia. *Energies*, 12, 1591; doi:10.3390/en12091591
- Leary, J, Fodio Todd, J, Batchelor, S, Chepkurui, K, Chepkemoi, M, Numi, A, Hanlin, R, Scott, N, Brown, E (2019) The Kenya eCookBook: Beans & Cereals Edition. MECS, ACTS, Loughborough University, Gamos and University of Sussex.
- ACTS (2020) Techno-policy assessment of Modern Energy Cooking in Africa: the Case of Kenya. MECS Working Paper.