MECS
Modern Energy Cooking Services

Overview of the MECS Programme in East Africa

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Loughborough University

ESMAP
Energy Sector Management Assistance Program

UKaid
from the British people

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

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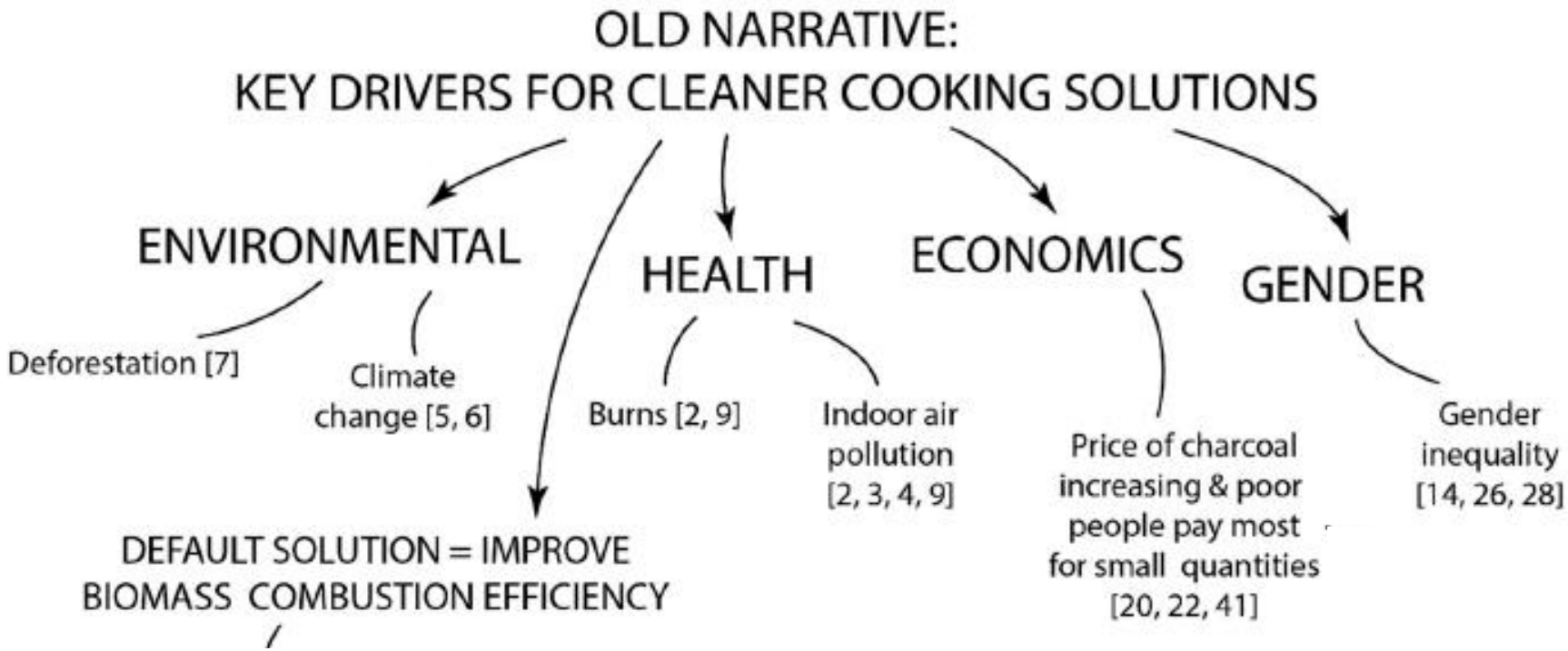


Batchelor et al (2019)

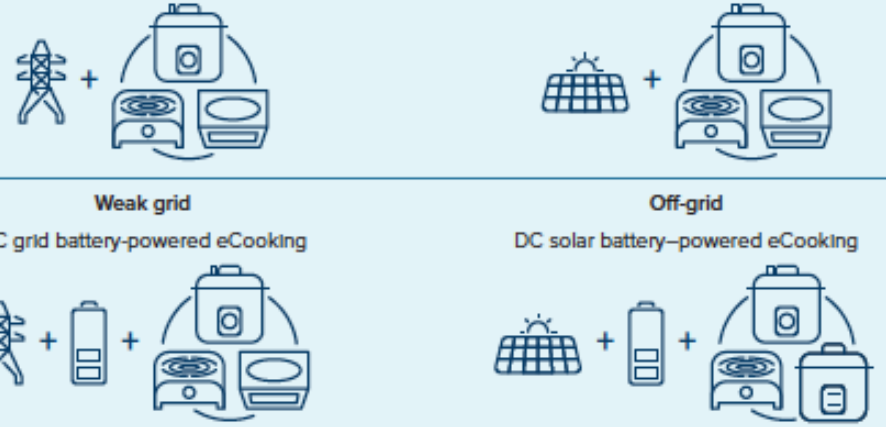
The evolving landscape of eCooking

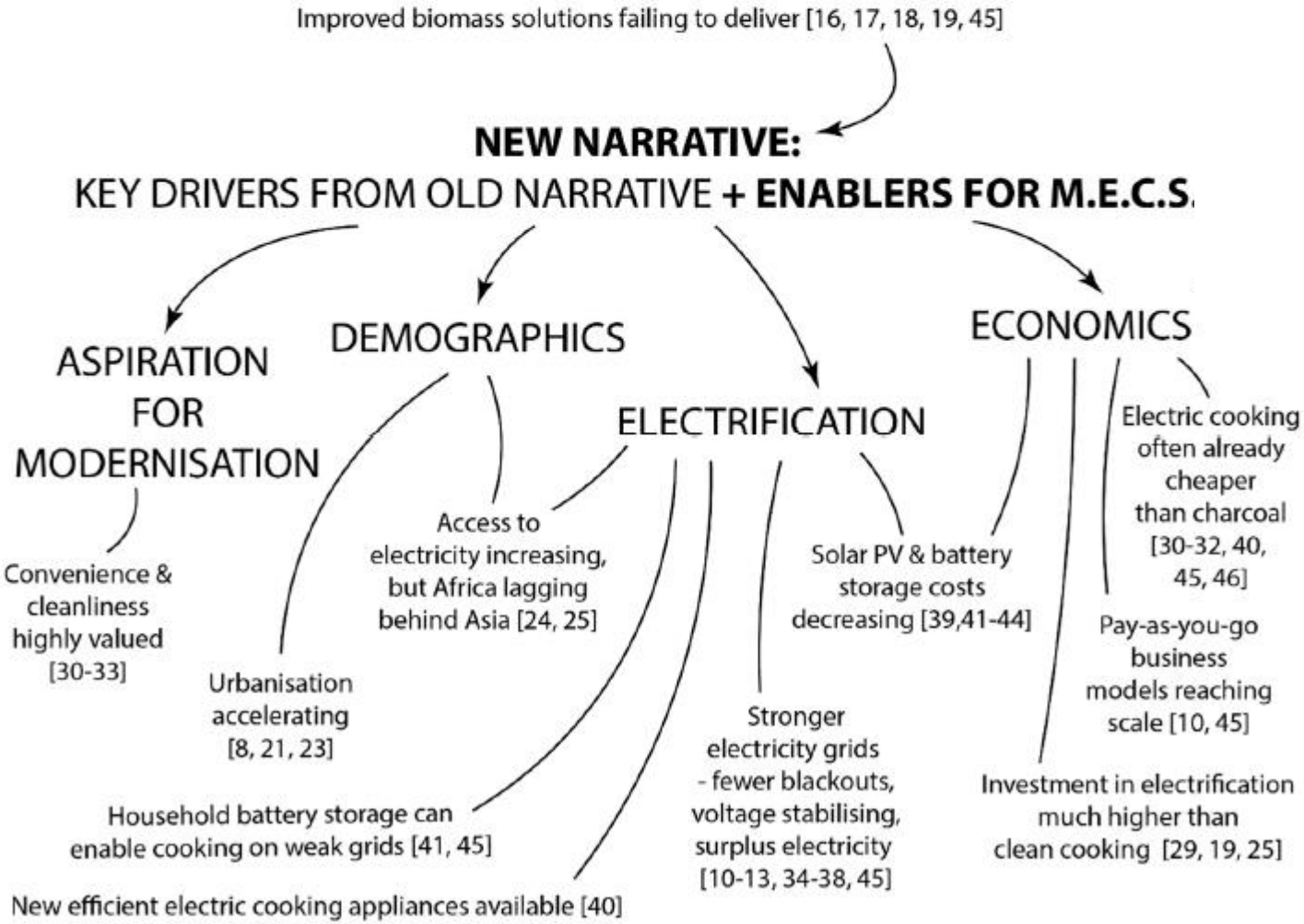
- New opportunities opening up
  - Falling costs of solar PV & battery storage
    - Rising cost of biomass fuels
  - Energy-efficient appliances
    - Induction, infra-red, rice cooker, Electric Pressure Cooker (EPC)…

ESMAP (2020)

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

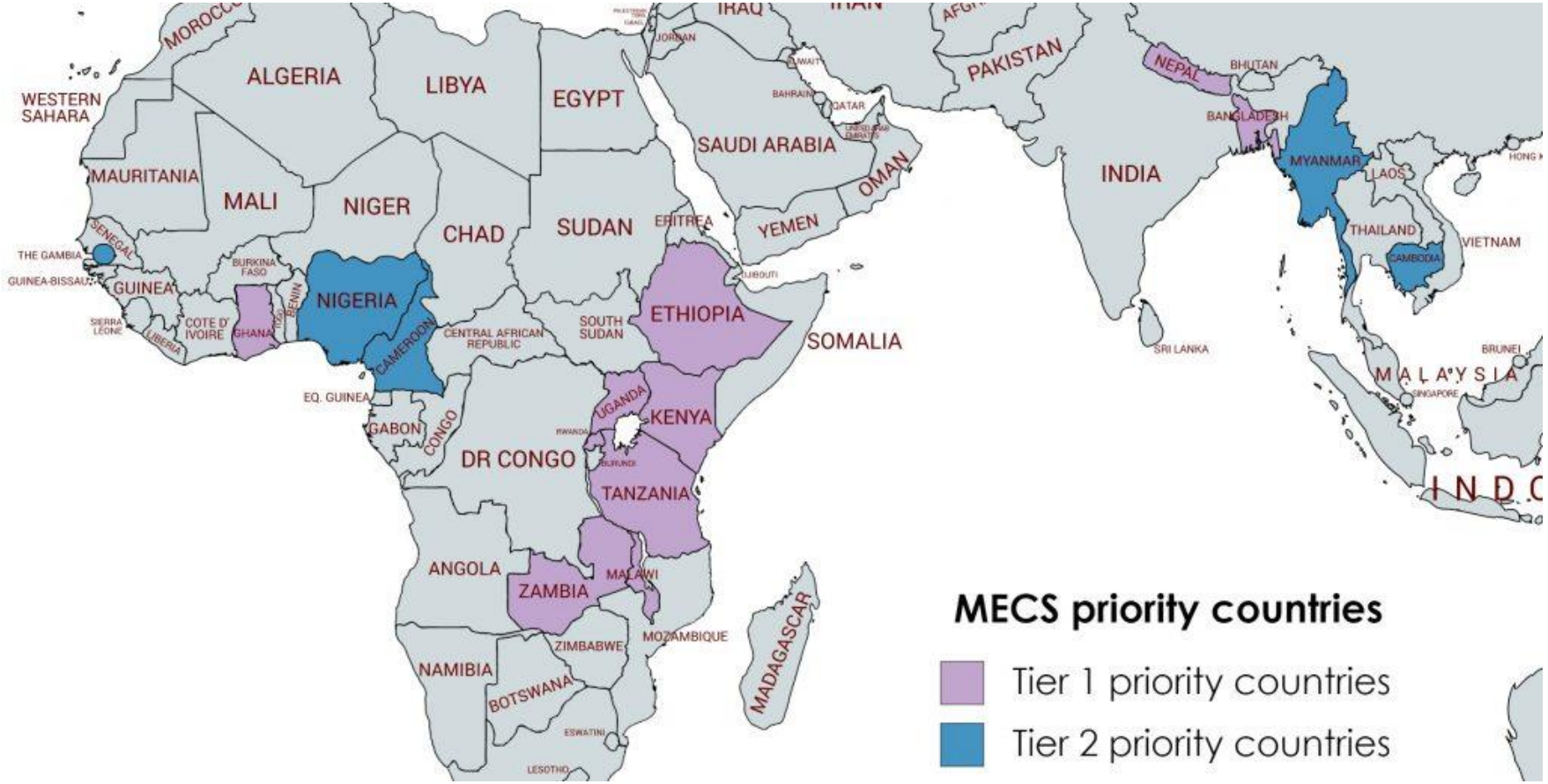
USE OF BATTERY	GRID OR MINI GRID	SOLAR HOME SYSTEM
Without battery	Strong grid AC grid eCooking	Off-grid DC solar eCooking
Battery-supported	Weak grid DC grid battery-powered eCooking	Off-grid DC solar battery–powered eCooking





Batchelor et al (2019)

East Africa's strategic role in MECS



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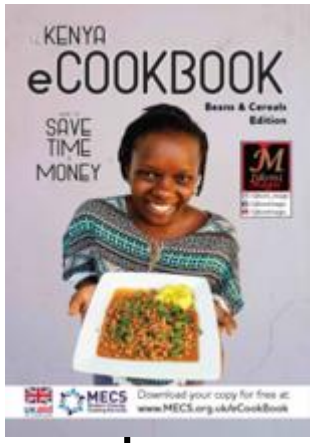
MECS in East Africa

Innovate



LCT

Challenge funds

PowerGen

Jikoni Magic

Bidhaa Sasa

PESITHO

Pereybere Energy

SunCulture

M-KOPA

EnerGrow

PAYGO ENERGY

MALAWI-MADE-SOLAR

scode

Country partners

CREEC
CENTRE FOR RESEARCH IN ENERGY AND ENERGY CONSERVATION
Energy for generations

TaTEDO

ACTS
African Centre for Technology Studies
Knowledge for Better Livelihoods

RBF & Global LEAP

clasp

2017 2018 2019 2020 2021 2022 2023

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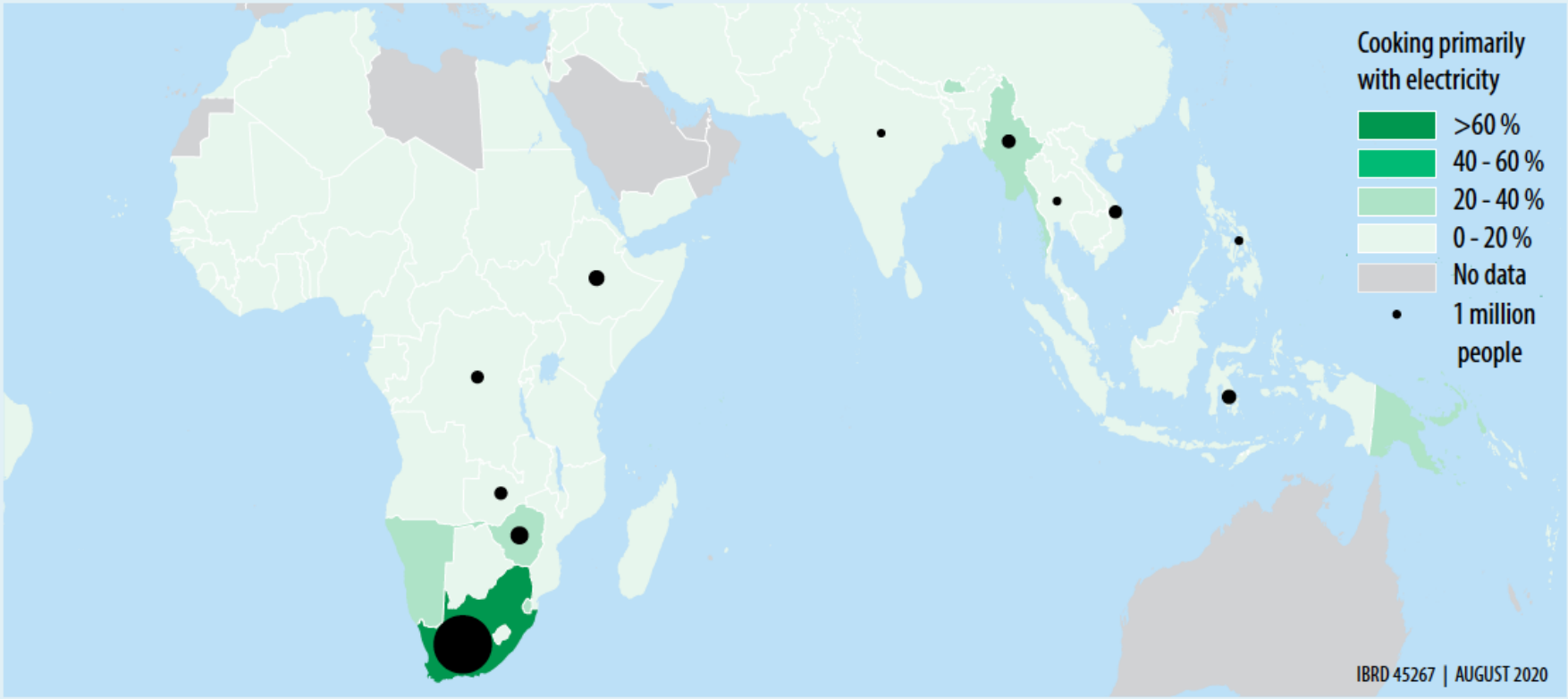
eCooking is already popular in Southern Africa

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).

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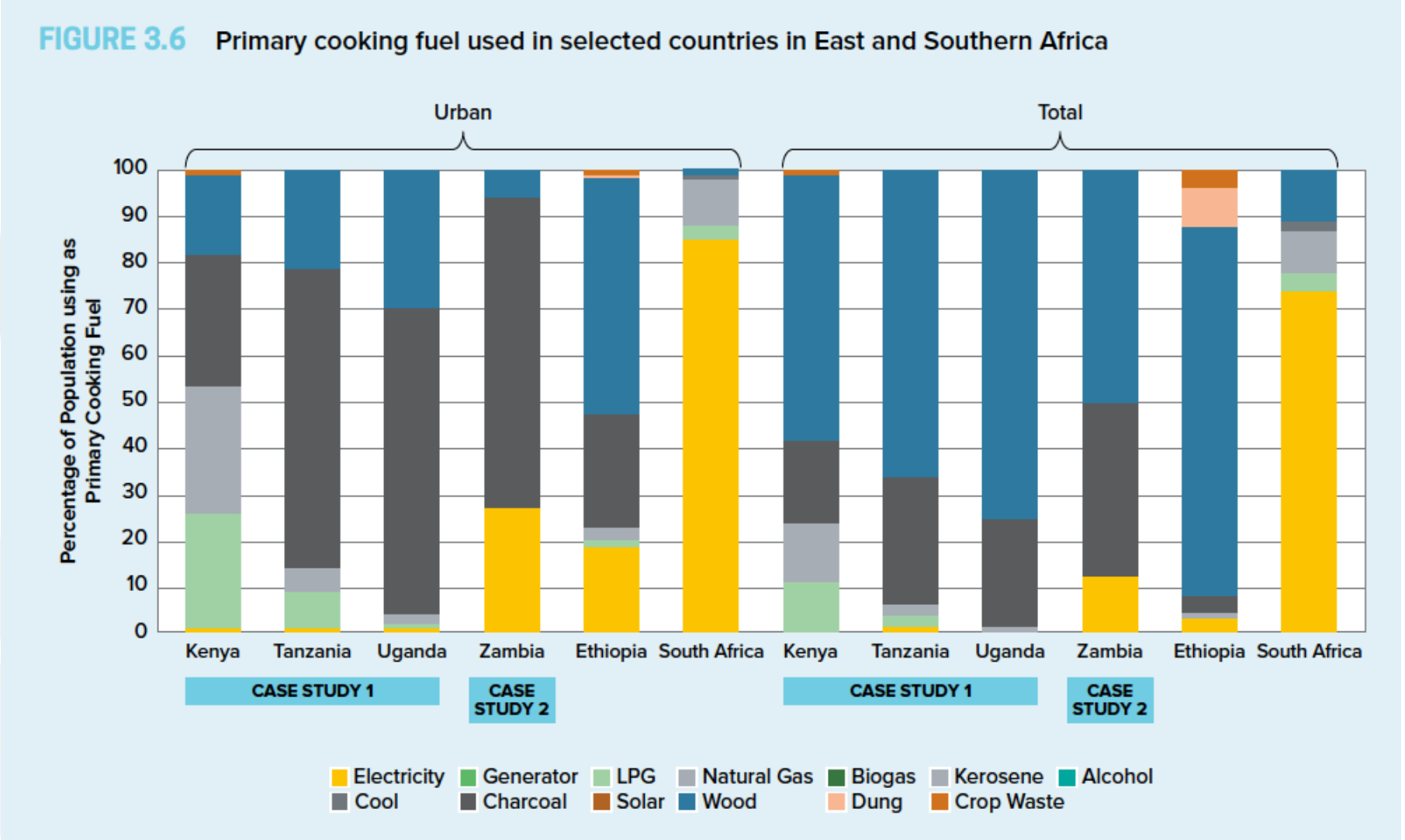
eCooking is starting to enter urban East African markets



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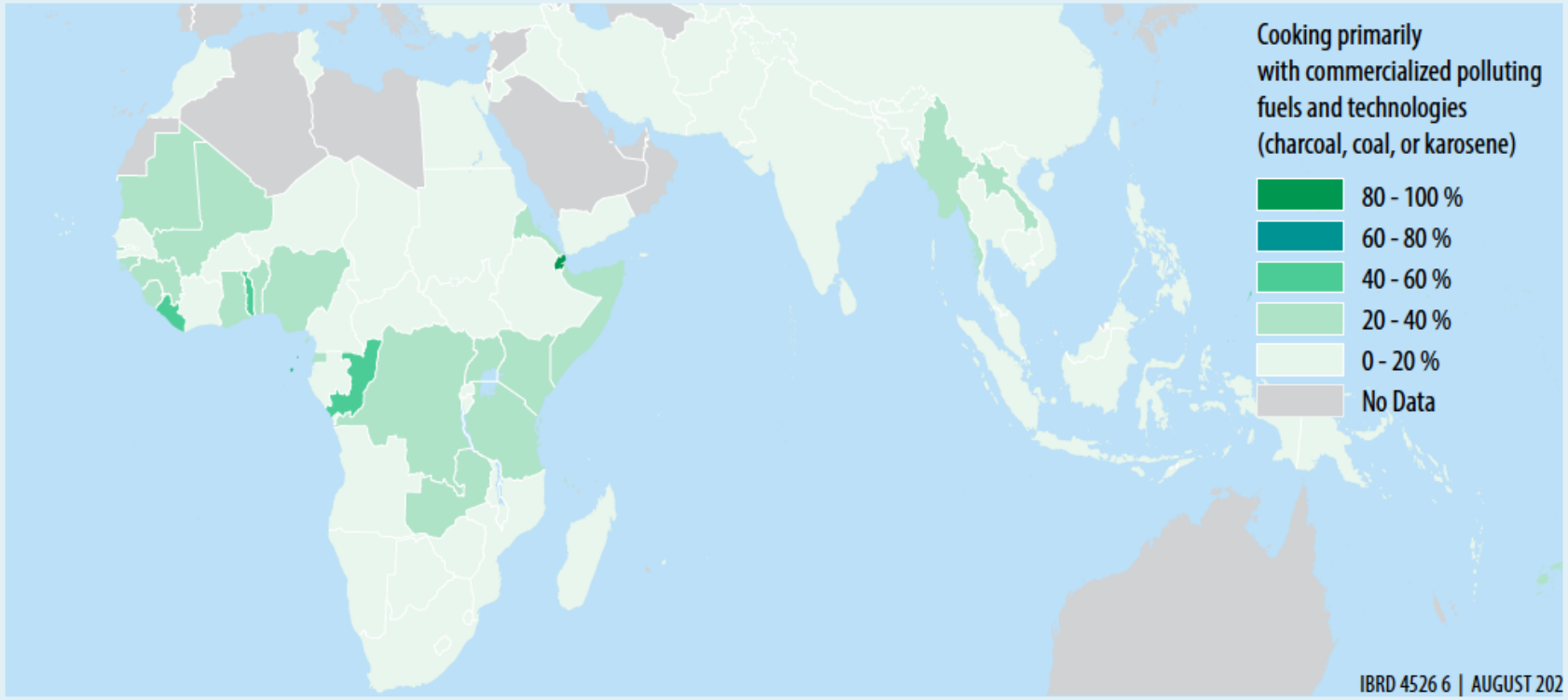
Commer-cialised polluting fuels widely used in East Africa

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).

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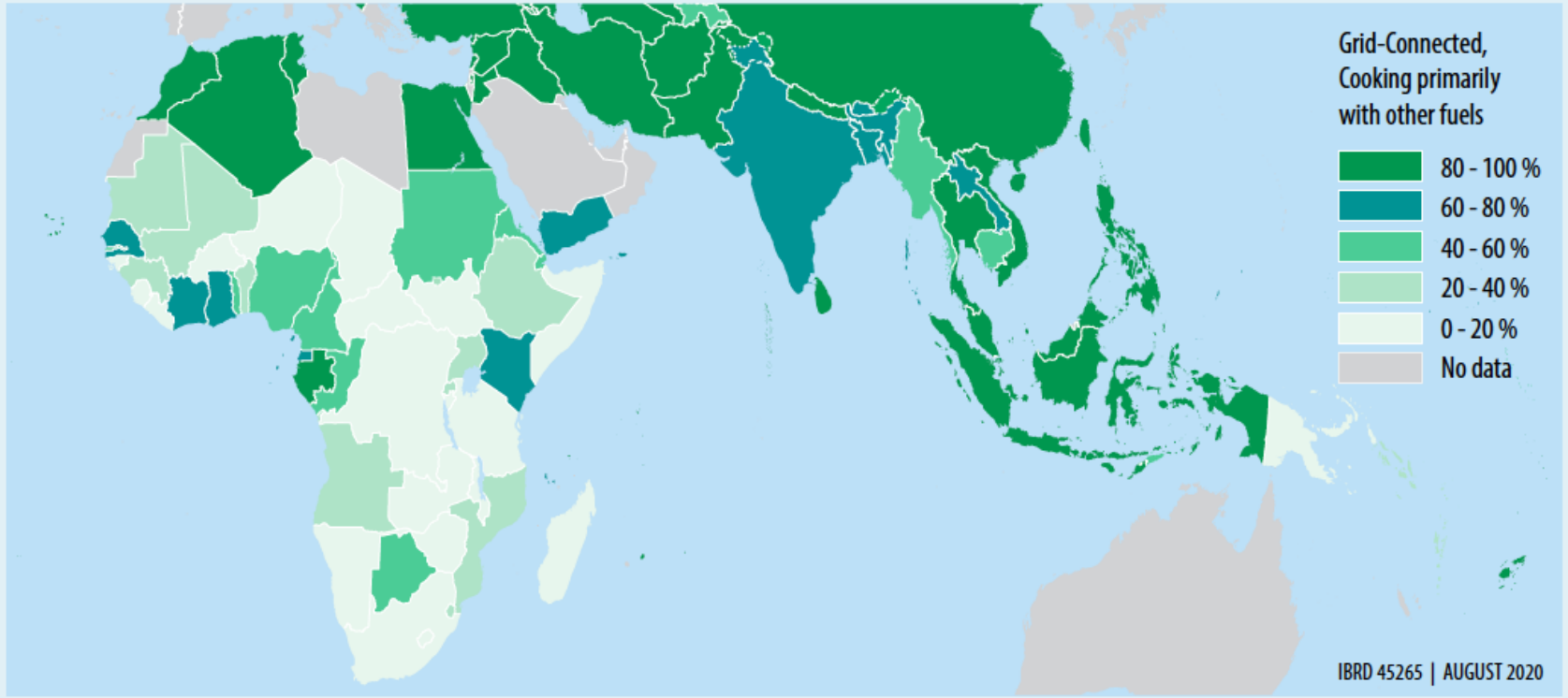
Many East Africans now have access to electricity but don't use it for cooking

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).

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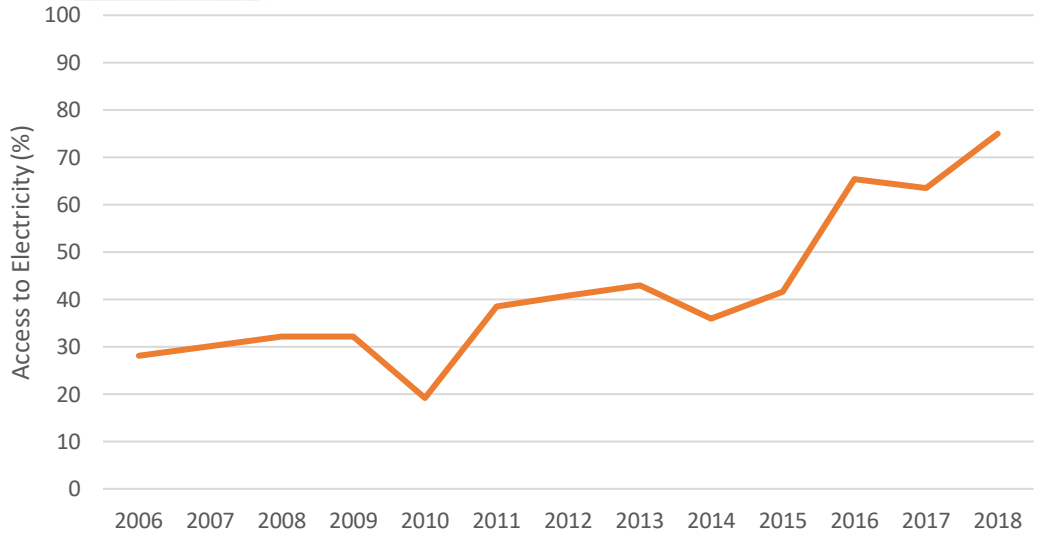

ACTS (2020)

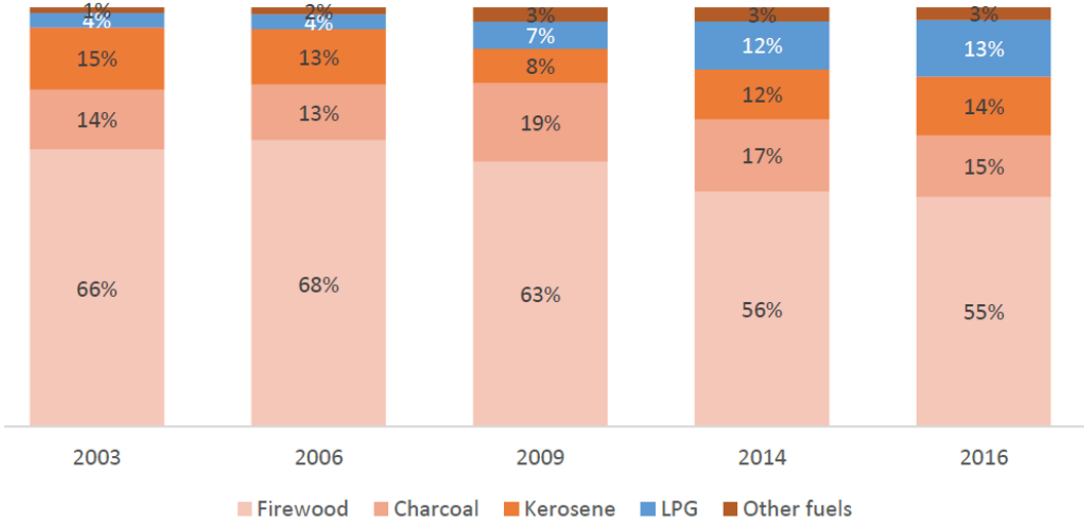

Figure 3: Trends in primary fuel use in Kenyan households (2003-2016). Source: GLPGP (2019)

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

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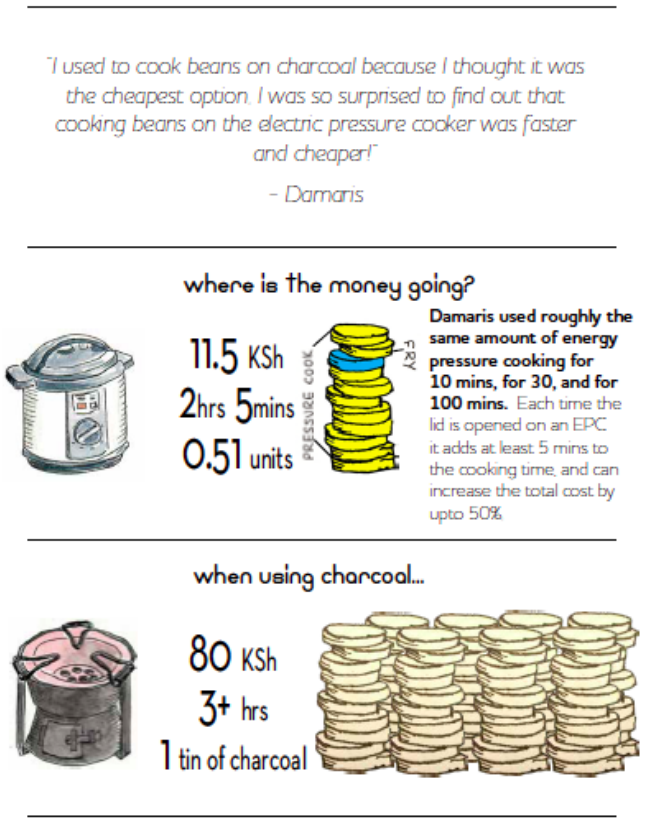
eCooking in Kenya

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



Leary, Fodio Todd et al (2019)

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

Fuel stacking

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

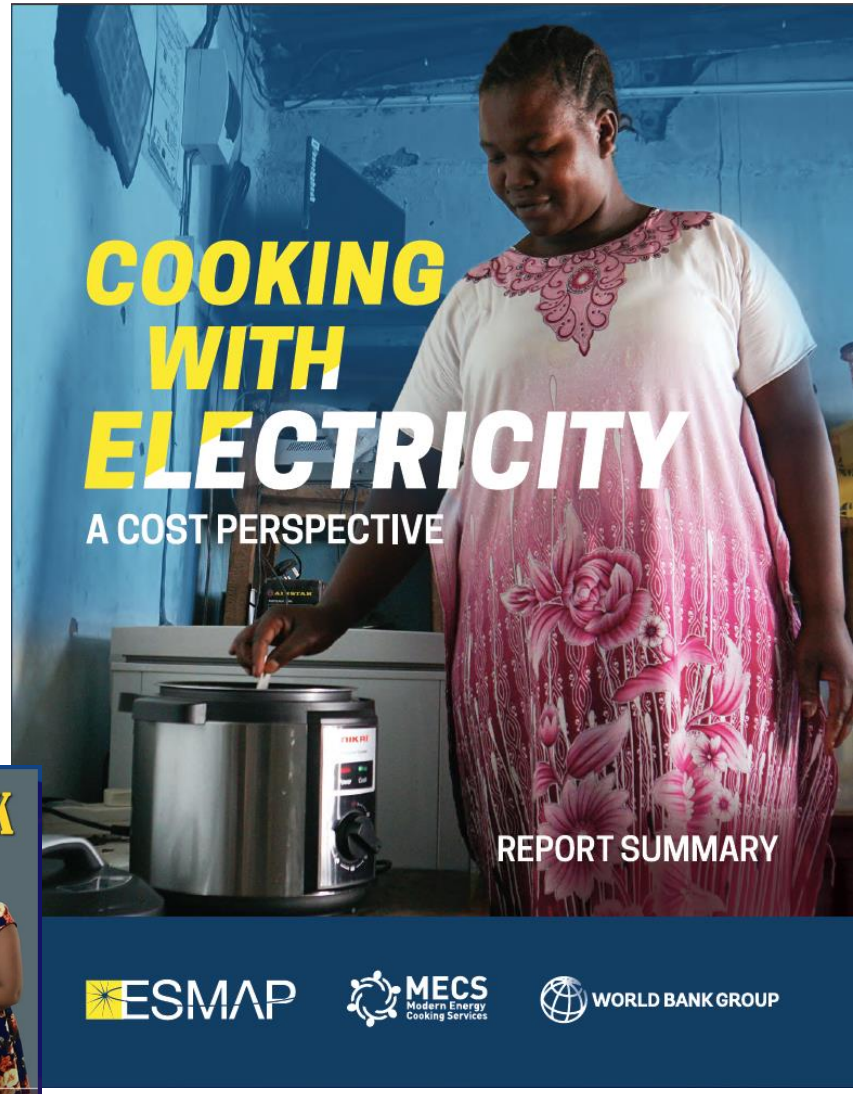
Conclusion

- **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



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- ACTS (2020) Techno-policy assessment of Modern Energy Cooking in Africa: the Case of Kenya. MECS Working Paper.