29 September 2020

RBFF webinar series: #3 of 4

Accelerating the off-grid appliance market with RBF – e-cooking and energy efficiency

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2. If your internet connection is poor, switch to audio-only call
3. Ask questions in chat box, answers provided at end
   Please indicate name/organisation and who it is addressed to
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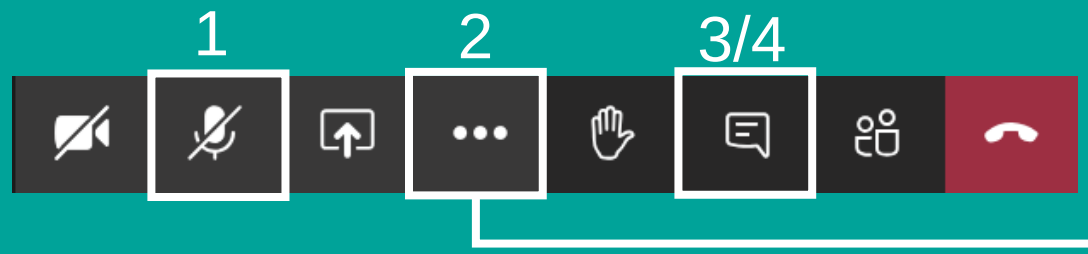

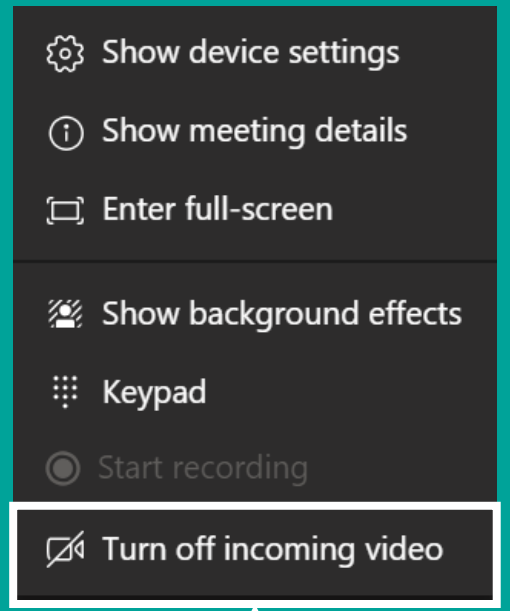

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Agenda

Time	Agenda item	Presenter
10:30 – 10:40	Welcome remarks and rationale	Philip Mann – UK Aid (FCDO) Barbara Richard - EnDev HQ (GIZ)
10:40 – 10:50	Energy access through energy-efficient off-grid appliances: Lessons learnt through implementing Global LEAP + RBF	Nya Abagi – EnDev Kenya (CLASP)
10.50 – 11.00	Q&A off-grid appliances	
11:00 – 11:10	Exploring market barriers and emerging opportunities for cooking with electricity	Dr Jon Leary - Loughborough University
11:10 – 11:20	RBFF Pilot: Preliminary insights from accelerating the Uptake of Electric Pressure Cookers in Kenya	Abigail Kuria – EnDev Kenya (CLASP)
11:20 – 11:30	Q&A e-cooking	
11:30 – 12:00	Discussion and Conclusion	

Today's Presenters

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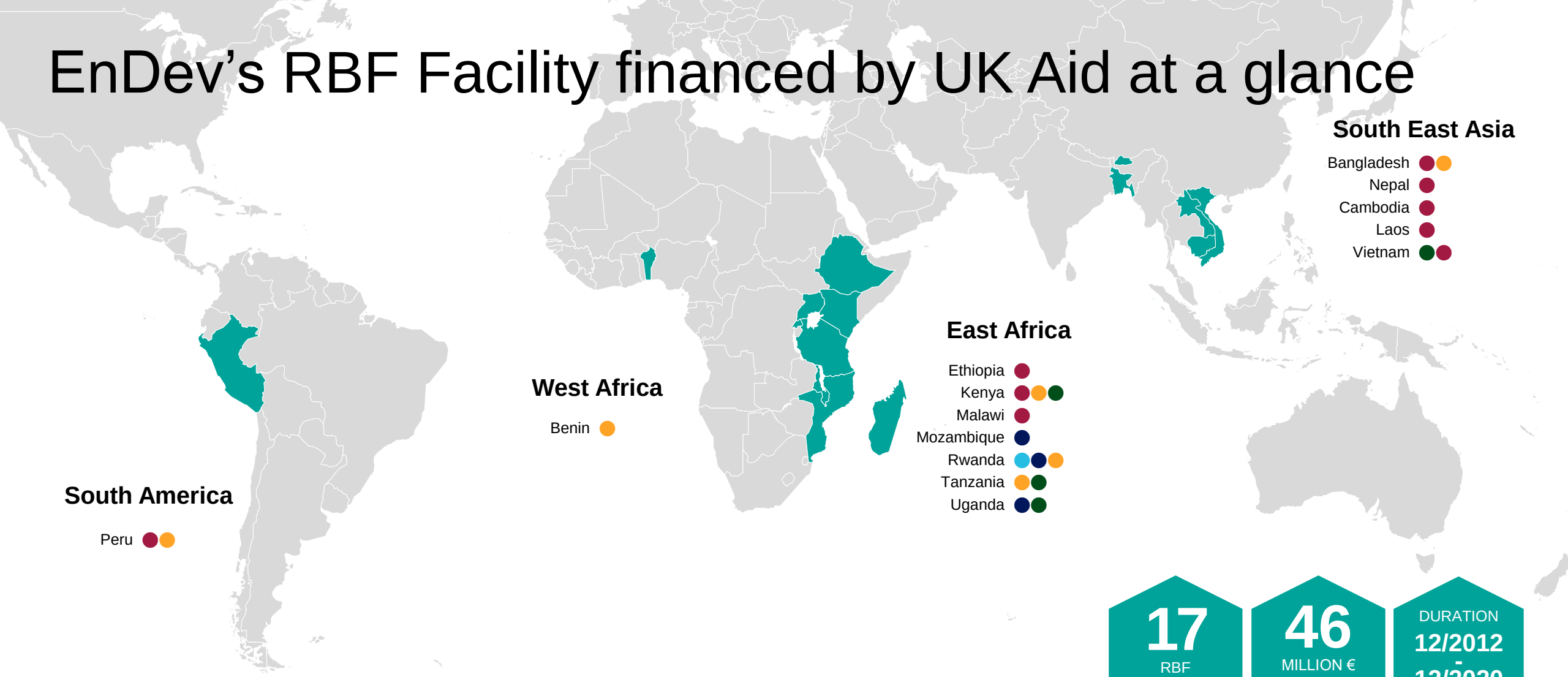
EnDev’s RBF Facility financed by UK Aid at a glance



South East Asia

- Bangladesh
- Nepal
- Cambodia
- Laos
- Vietnam

East Africa

- Ethiopia
- Kenya
- Malawi
- Mozambique
- Rwanda
- Tanzania
- Uganda

West Africa

- Benin

South America

- Peru

17 RBF PROJECTS

46 MILLION € VOLUME

DURATION **12/2012 - 12/2020**

Hydro | Grid extension | Cooking energy | Solar | Biogas

Nyamolo Abagi, CLASP

Energy access through efficient off-grid appliances: lessons learnt through implementation of Global LEAP+RBF

Efficiency for Access Coalition Overview

EFFICIENCY FOR ACCESS

Donors & Funding Partners

Investor Network

Programme Partners

Co-Secretariat

Efficiency for Access is a global coalition working to promote high performing appliances that enable access to clean energy for the world's poorest people. CLASP serves as co-secretariat for the coalition.

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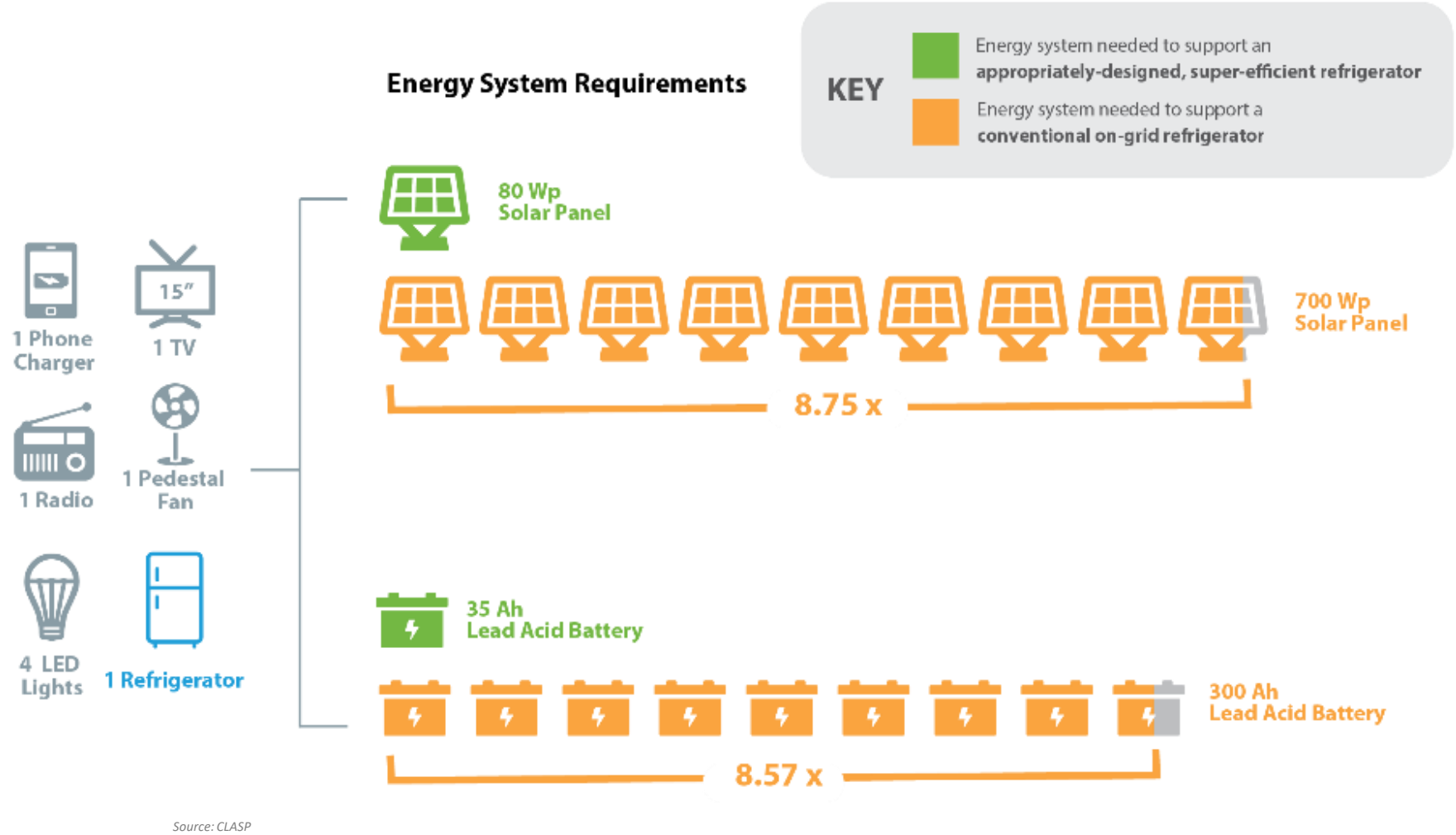
Energy efficiency maximizes energy service delivery



Source: CLASP

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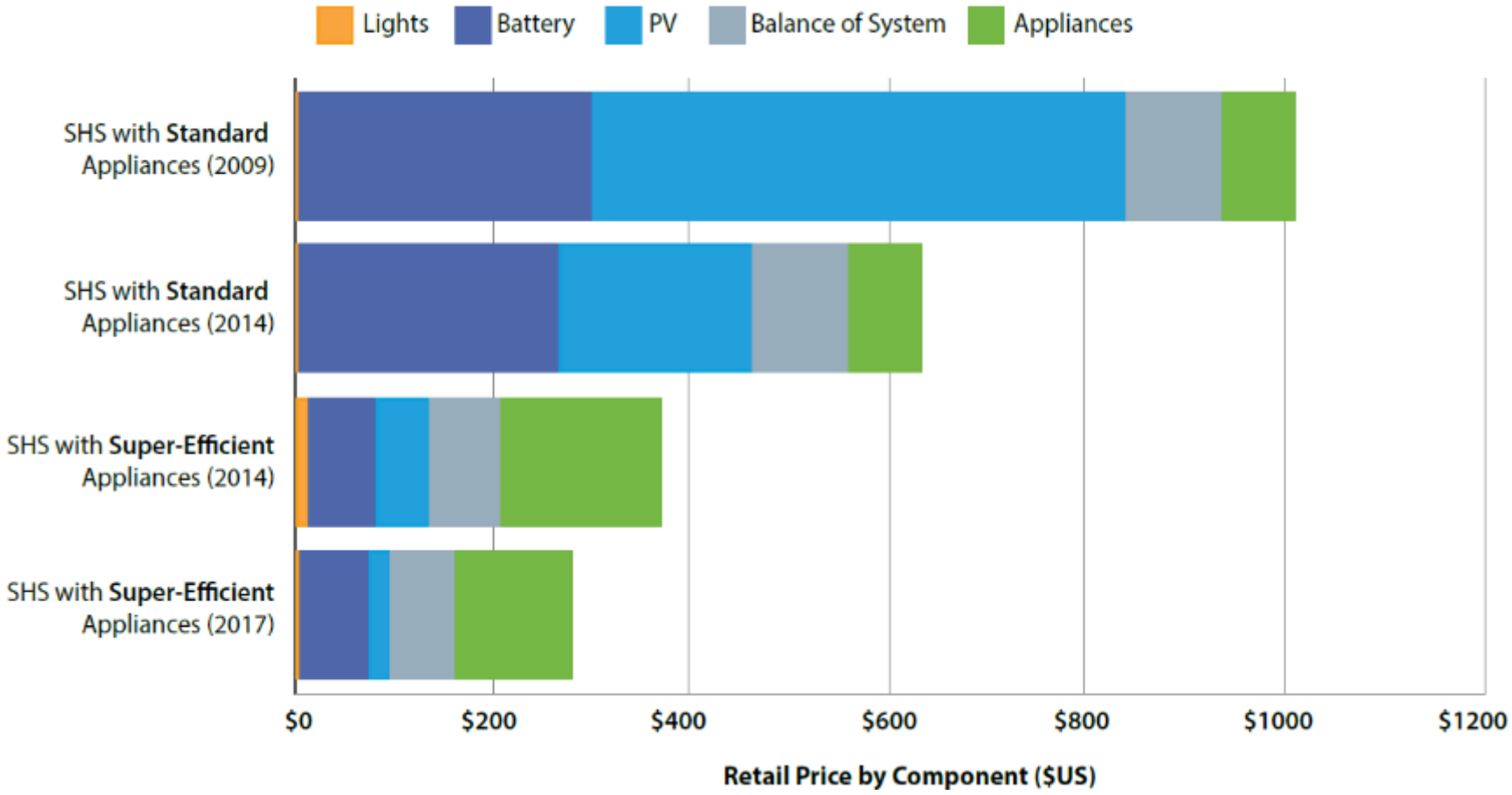
Energy efficiency drives down total system costs



Source: Phadke et al., 2015.

Barriers to Appliance Market Development

Global clean energy access markets need a complementary market of high-quality, super-efficient appliances to reach its full potential, but significant barriers inhibit that market's development

Energy Service Companies struggle to identify and source super-efficient, high-quality, and affordable appliances

Appliance Manufacturers often are not familiar enough with the marketplace to design and market their products effectively

Investors & MFIs lack reliable benchmarks against which to target investment or evaluate and incentivize appropriate appliance procurement

Policymakers lack the market and product performance data to target and scope market transformation policies or programs

These barriers inhibit growth in the global clean energy access market and exclude underserved communities from the socioeconomic, health, and environmental benefits of improved and expanded modern energy services

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Awards + Procurement Incentives

Global LEAP+RBF takes a holistic approach to scaling early-stage appliance markets:

1. Identify Best-In-Class Consumptive + PUE Products

- Identify and promote leaders in early stage product markets & encourage new entrants
- Develop technical foundation for long-term market growth (e.g., test methods.)

2. Bring Those Products To Market At Scale

- Create clearer path to market for Global LEAP Awards Winners and Finalists
- Reduce financial risks associated with large-scale appliance procurement

How it Works

Global LEAP+RBF differs from many other RBF schemes in the off-grid sector in the following ways:

Intervention Point	Upstream, designed to catalyze wholesale markets & large-scale procurement
Geographic Scope	Multi-country/regional focus
Allocation of Funds	Competitive auction-based process
M&E Process	Dynamic platform for consumer, market, and impacts research

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Outcomes to Date of the RBF

Since 2016, EnDev has supported the administration of three increasingly successful rounds of results-based financing facilities for off-grid appliances.

>$4M
disbursed

101
participating companies

265,000+
products sold

1,160,000+
end-users

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Projects 3rd round ends October 2020

Impact of Off-Grid Fans in Bangladesh

2016 Global LEAP+RBF in Bangladesh supported sales of 194,000+ off grid fans

81% of surveyed customers (n =1600) believed their lives had improved after purchasing the super efficient off grid fan. Specifically four areas of impact included:

- Households reported significant **productivity gains** after purchasing a solar fan**.**
- Fans reduce **exposure to pollution and disease-carrying insects**, leading to improvements in **health and well-being**.
- Fans increase energy access, **reduced the cost of electricity**, broadened **energy reliability**, and enabled the **use of other appliances**.

From the retailer's perspective, fans help build markets for energy-efficient solar appliances.

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Impact of SWPs in East Africa

Preliminary insights from 2019-20 Global LEAP+RBF for Solar Water Pumps

- **46%** are commercial farmers, **38%** are hybrid, **16%** are subsistence farmers
- **67%** of customers said they couldn't easily find a good alternative to this solar water pump, **26%** thought they could
- This was the first solar water pump purchase for **85%**;
  - **44%** used a fuel/generator pump before,
  - **21%** used buckets,
  - **13%** didn't irrigate land,
  - **10%** used a manual pump
- **62%** plan to use the pump for irrigation/agriculture use only, **33%** for domestic use too, **4%** for only domestic use
- **37%** of customers had already had a challenge using their pump, with **38%** of them not having had it resolved

n=168. Final report to be published at the end of 2020

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Impact of Refrigerators in East Africa

Preliminary insights from 2019-20 Global LEAP+RBF for Off-grid Refrigerators

- **86%** of customers live in a village or the countryside, the rest in town
- **73%** purchased the product for use in business rather than home
- **82%** of business users ran some kind of shop.
- **13%** of customers owned a refrigerator before this purchase
- **89%** of those who didn't own a fridge before didn't have a way to keep things cool before - the other **11%** mostly used ice they bought
- The main motivations for purchasing the fridge (in order) were: **to sell cold drinks, reliable product, business growth, could offer new services**, **convenience, good quality product, to preserve food**

n=91. Final report to be published at the end of 2020

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Exploring market barriers and emerging opportunities for cooking with electricity

Dr Jon Leary, Prof Ed Brown, Besnik Hyseni, Prof Matt Leach, Dr Simon Batchelor

Loughborough University

RBF WEBINAR SERIES 2020
Webinar 3: Accelerating the off-grid appliance market with RBF – e-cooking and energy efficiency
29 September 2020

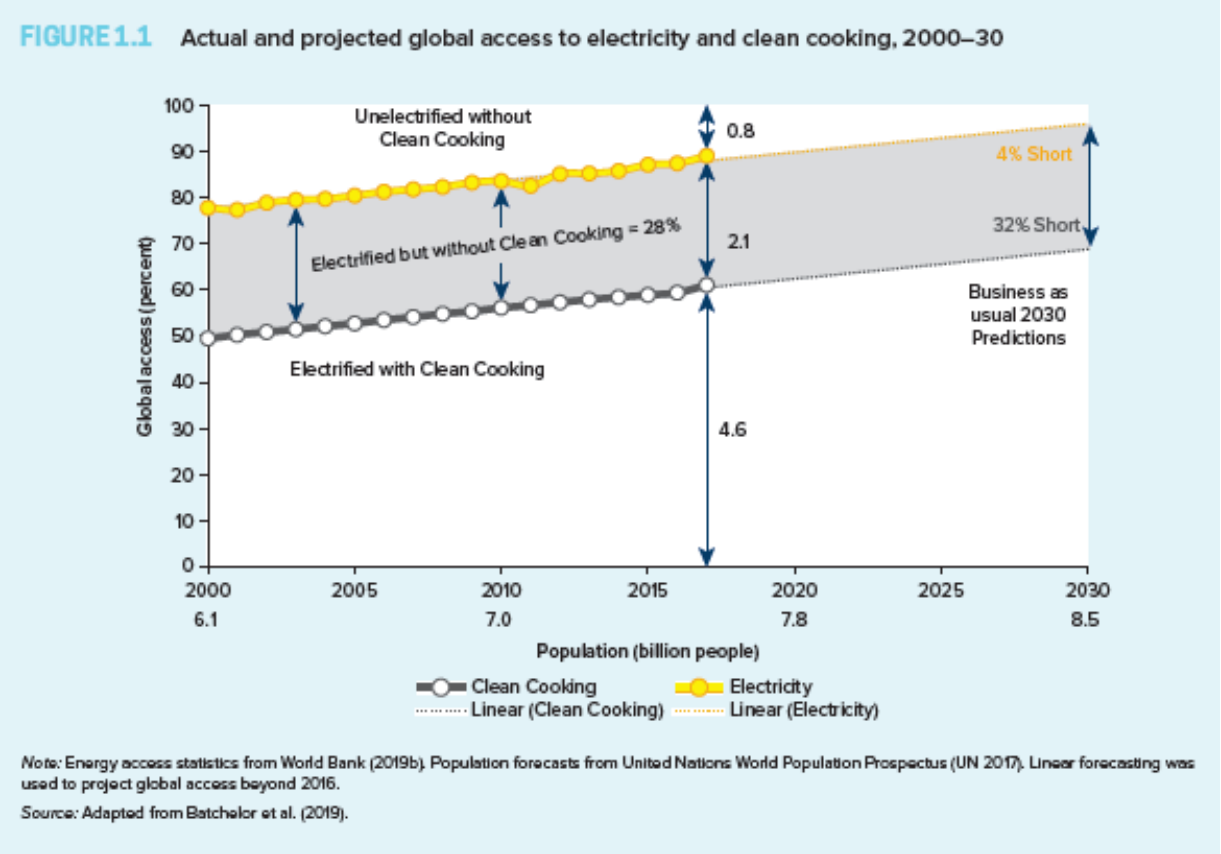
Outline

- Why is eCooking important?
- What does the landscape of eCooking look like?
  - Why EPCs?
- Which market barriers exist for eCooking in Kenya?
  - How might RBF help overcome these?

Why is eCooking important?

- 2.8 billion people still cook with biomass (ESMAP, 2020a)
  - Health: indoor air pollution
    - 4 million deaths annually (WHO, 2016)
  - Environmental: deforestation/forest degradation, climate change
  - Gender equity: drudgery & missed opportunities for women/girls
- Yet just 789 million are now without access to electricity (ESMAP, 2020a)

ESMAP (2020a)



What does the landscape of eCooking look like?

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

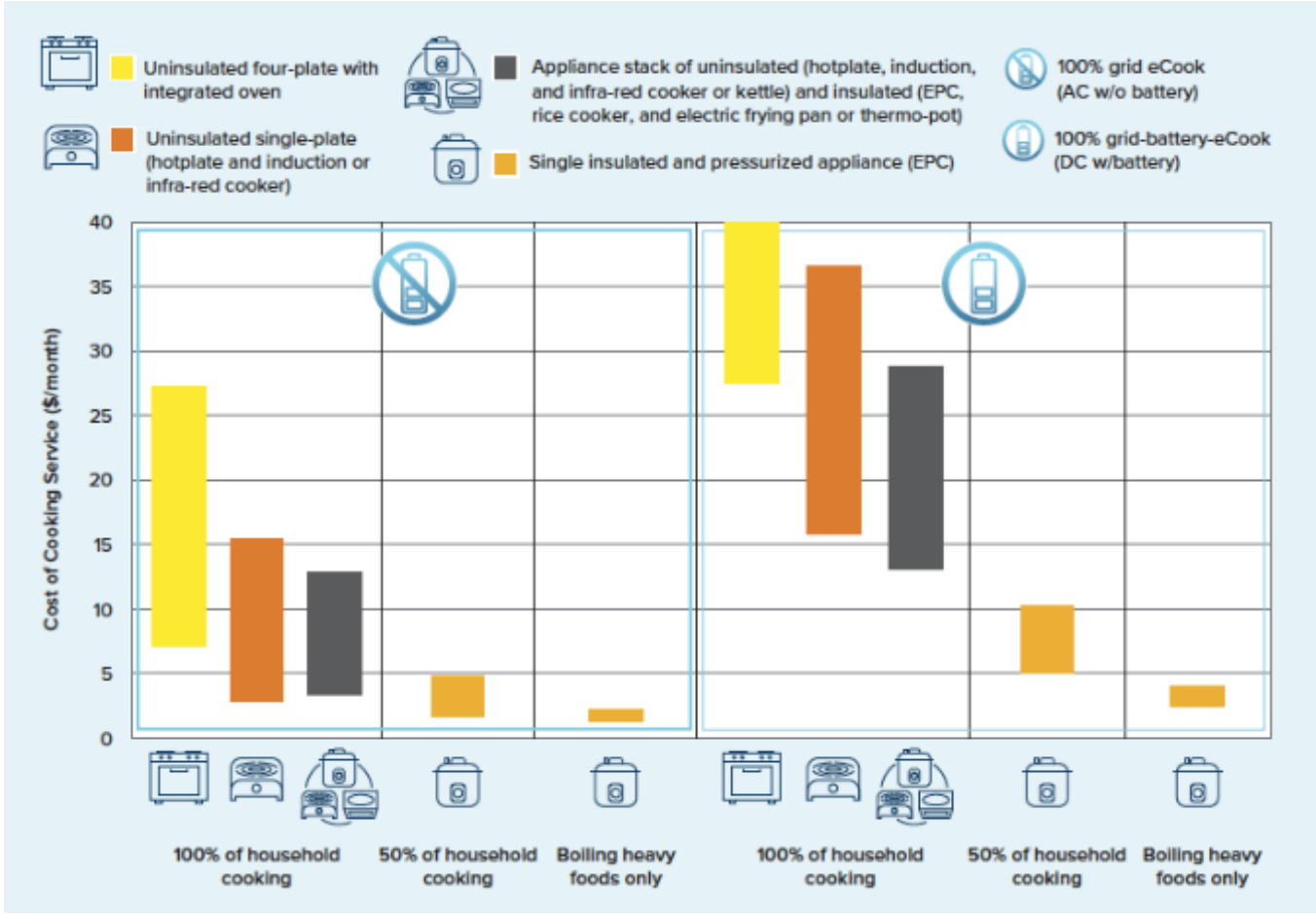
ESMAP (2020a)

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

Why EPCs?

- Entry level appliance that is well targeted to replace charcoal
- Good fit for Kenyan 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



ESMAP (2020a)

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Which market barriers exist for eCooking in Kenya?

- Availability
  - Culturally-appropriate
  - Quality-assured
  - Energy-efficient
  - AC & battery-supported
- Awareness
  - Consumer
    - Perception of relative cost
    - High upfront cost
    - Compatibility with local cuisine
  - Electrification & clean cooking sectors
- LPG
  - Competitor, but also enabler -> clean fuel stack

Thanks for listening!

- Visit MECS.org.uk to read *Cooking with Electricity: A Cost Perspective*
  - Report summary
  - Full technical report

- Jon Leary - J.Leary@Lboro.ac.uk

- Video on opportunities for ecooking in Kenya: https://bit.ly/2S7vHcd

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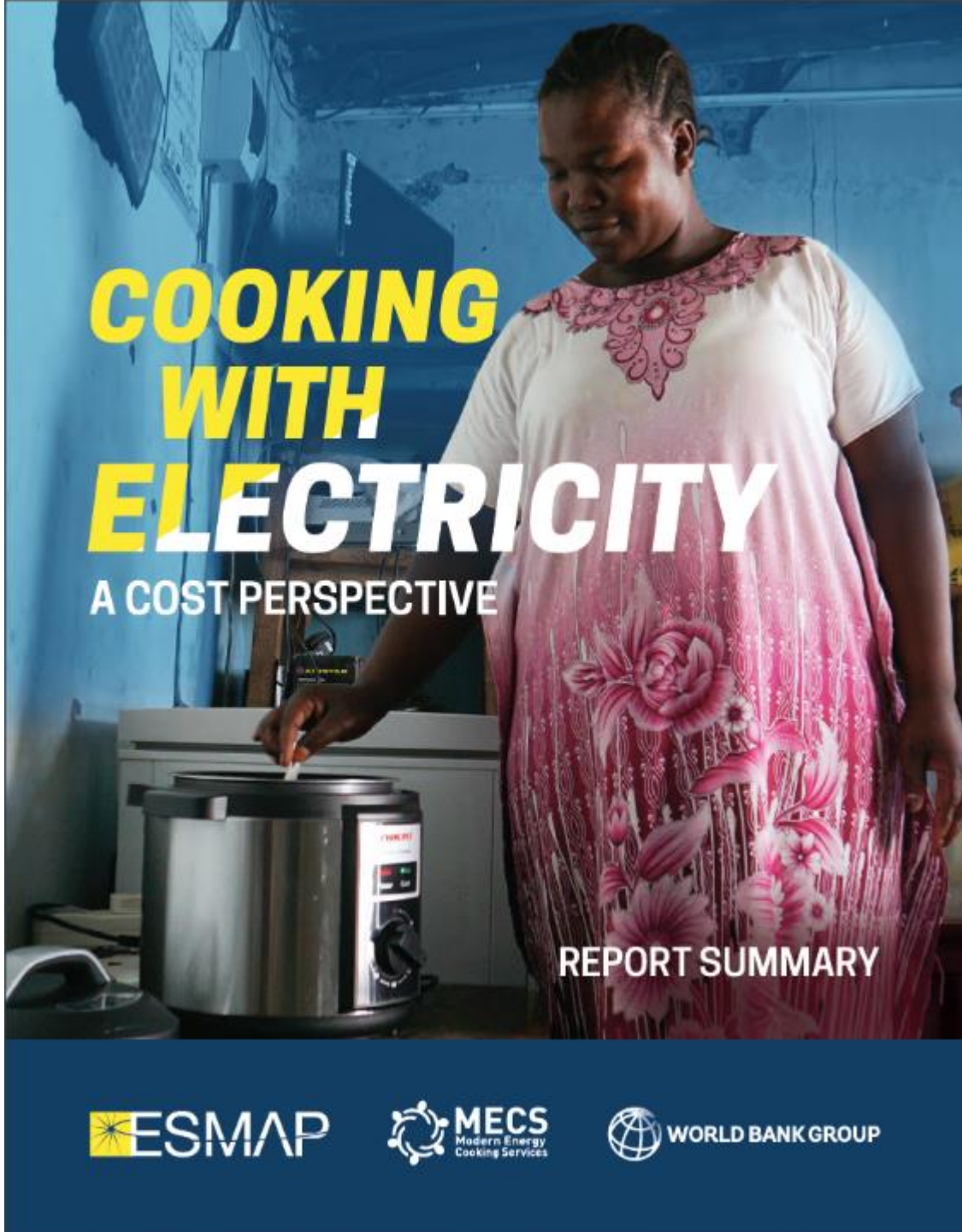

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- ESMAP. 2020b. Tracking SDG 7: The Energy Progress Report. World Bank, Washington DC.
- WHO (2016) Burning Opportunity: Clean Household Energy for Health, Sustainable Development, and Wellbeing of Women and Children. Geneva, Switzerland.

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- Jon Leary @ MECS (slides 6)
- Jacob Fodio Todd @ MECS (slide 2)

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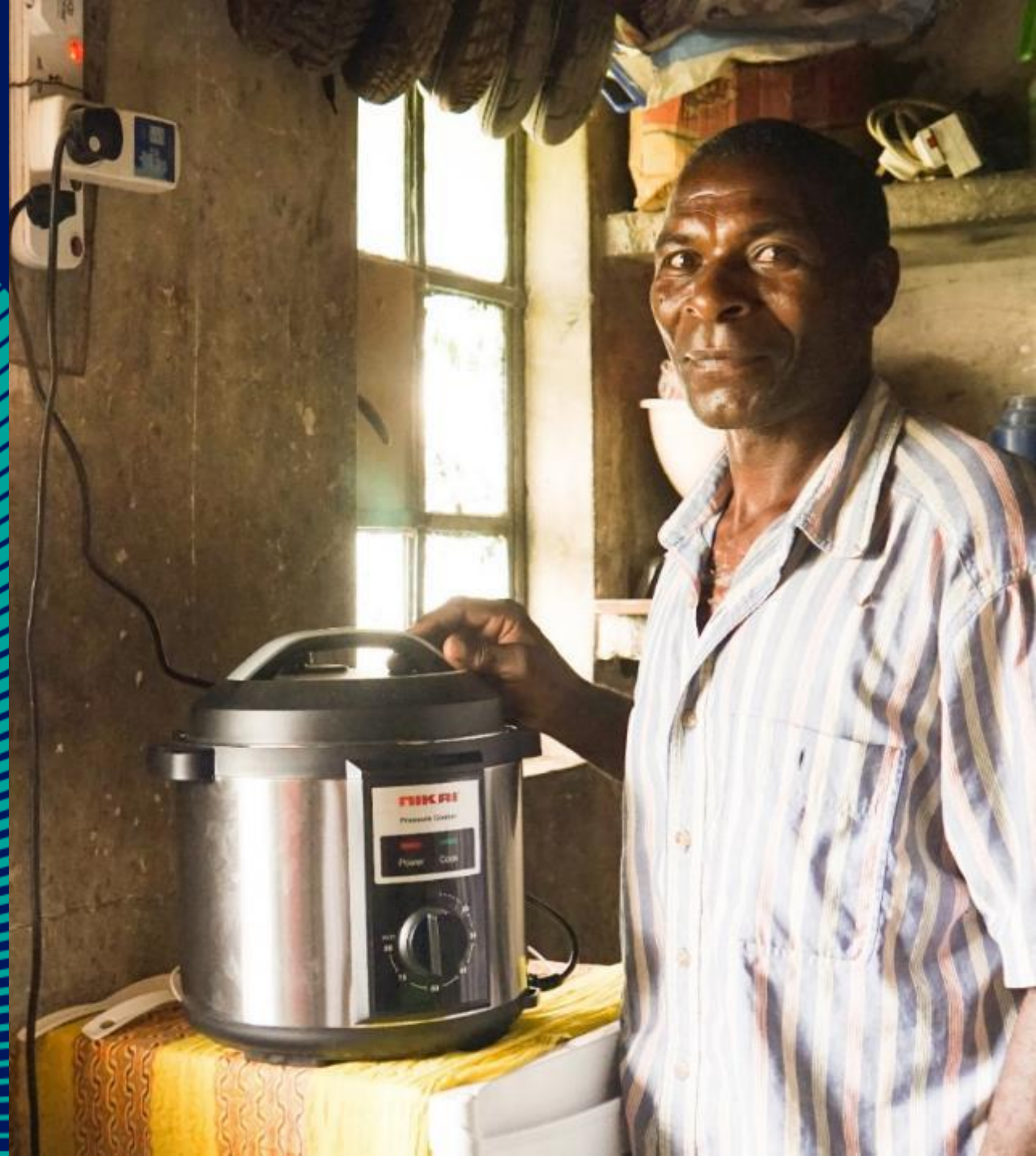
Abigail Kuria, CLASP

RBF Facility Pilot: Preliminary insights from accelerating the Uptake of Electric Pressure Cookers in Kenya



The Opportunity for E-Cooking

"In light of the substantial cost savings, using high-efficiency electric cooking appliances has the potential to lead to a similar 'inflection point' as the emergence of LED lighting technologies on the off-grid solar sector."

Source: [1] Beyond fire: *How to achieve electric cooking,* World Future Council. Hivos, 2019. https://www.worldfuturecouncil.org/wp-content/uploads/2019/05/Beyond-Fire_-How-to-achieve-electric-cooking.pdf

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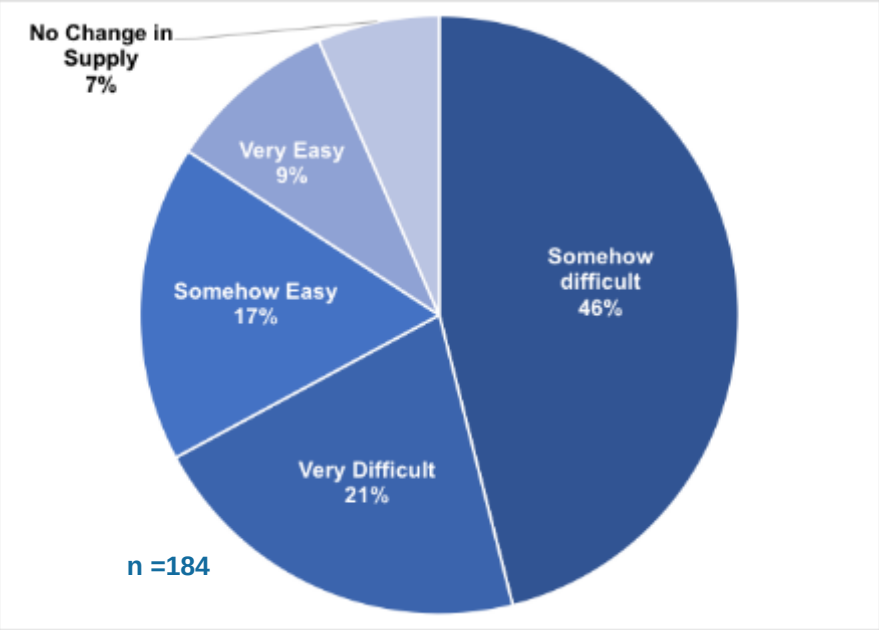
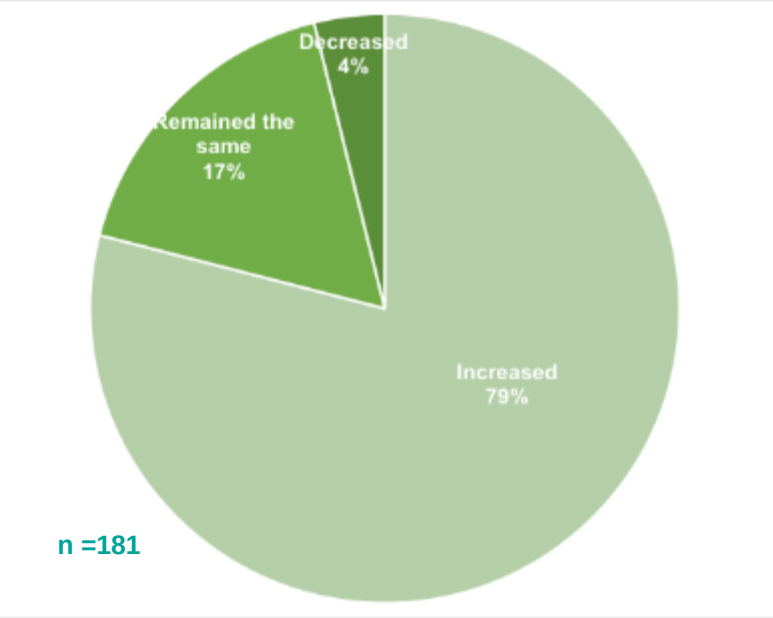
Cooking Landscape in Kenya

Biomass (charcoal and firewood) is used as a primary fuel source by 75% of Kenyan households[1]. COVID-19 pandemic resulted in disruptions in supply chains for charcoal resulting in increased prices.

Accessing Charcoal



Price of Charcoal



Source: Burn Manufacturing, April 2020

[1]Kenya Household Cooking Sector Study: Assessment of Supply and Demand of Cooking Solution at the Household Level, Clean Cooking Association of Kenya. 2019. https://www.eedadvisory.com/wp-content/uploads/2019/11/moe-2019-cooking-sector-study-.pdf

Global LEAP+RBF
Electric Pressure Cooker Pilot

Global LEAP + RBF pilot for Electric Pressure Cookers launched in May 2020 aimed at kick-starting the Kenyan domestic market for e-cooking devices.

Incentive Structure

		EPCs
Quantities	Minimum	25
	Maximum	2,000 units per company
Max Incentive levels (as percentage of Retail Price)		50%

- Eligible products must have satisfactorily completed one of several existent EPC safety & performance testing protocols
- Incentives were allocated through a reverse auction process
- Project runs through to October 2020

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MECS Modern Energy Cooking Services

Global LEAP+RBF Electric Pressure Cooker Pilot

Nearly $200,000 of incentives expected to be disbursed to support procurement of approximately 5000 EPC products in Kenya.

Building on the tried-and-proven Global LEAP+RBF programmatic framework, and leveraging the work done by MECS in identifying quality products already available locally, the pilot aims to garner learnings that could inform the future roll-out of a larger RBF programs for EPC products and other future e-cooking interventions.

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MECS Modern Energy Cooking Services

Preliminary Insights from Global LEAP+RBF Pilot

71% of customers are connected to the electricity grid, **24%** have a solar home system and **3%** are connected to a mini-grid

- **7%** of customers owned a pressure cooker before this purchase
- Prior to using the electric pressure cooker, customers were using the following energy sources for cooking:
  - Wood **(48%)**
  - Charcoal **(41%)**
  - LPG **(39%)**
- Customers were motivated to use the EPC for the following reasons:
  - To save time **(80%)**
  - To cook different foods **(30%)**
  - To reduce spending **(27%)**
  - To reduce exposure to smoke **(26%)**
  - To generate income **(2%)**

n=84. Final report to be published at the end of 2020

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Global LEAP Awards
Electric Pressure Cooker Competition

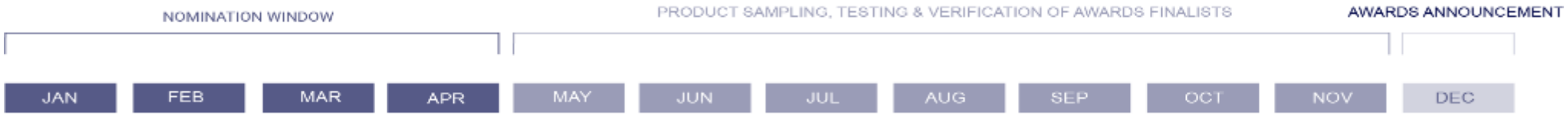
In 2020, the Global LEAP Awards launched the first-ever Electric Pressure Cooker Competition to identify highly energy-efficient electric pressure cookers suitable for use in off-and weak-grid settings.

40 Product Nominations

15 Companies

8 Countries

Winners and Finalists of the competition will be eligible for up to **$200,000 USD prize money**, based on innovation as demonstrated during laboratory and usability testing



Resources

Electric Pressure Cookers

- Learning agenda from the RBF pilot available early 2021 as a compliment to the Global LEAP Awards EPC Competition Winners + Finalists announcement
- Electric Pressure Cooking: Accelerating Microgrid E-Cooking through Business & Delivery Model Innovations

Refrigerators

- Global LEAP Buyer's Guide for Outstanding Off-Grid Refrigerators (2017 and 2019)

Solar Water Pumps

- Global LEAP Buyer's Guide for Outstanding Solar Water Pumps (2019)

General

- VeraSol and VeraSol Product Database

Thank you for your attention!

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Discussion

Accelerating the off-grid appliance market with RBF – e-cooking and energy efficiency

→ Please ask questions in the chat box.
→ Indicate name/organisation and who it is addressed to.

Conclusion

Thank you for joining us today!

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Websites:
https://endev.info/content/Main_Page
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