Session 1 Track A: Clean Cooking

10:30-12:30
Room A
Moderator

Jillene Belopolsky
Clean Cooking Alliance
Part 1: E-cooking

Simon la Cour

Karlijn Groen

Pesitho

SNV
Cooking with Renewable Energy in Displaced Settings
The ECOCA from PESITHO - Off grid Solar Electric Cookstove

1 ECOCA for 1 family
3 meals a day
No costs for wood or charcoal
A source of light
USB for charging of phones

Help enable the livelihood of families in vulnerable areas
Implementing E-cooking in displaced settings in Uganda

Refugees from South Sudan and local Host Community

Refugees from DRC (Community Kitchens and Institutional Kitchen)

Willingness-to-Pay Study:
Refugees in Bidibidi, Yumbe (340)
Host community, Bidibidi, Yumbe (135)
Coffee Farmers in Rakai (100)

Coffee Farmers in Rakai
Willingness to Pay for Solar Electric Cooking

<table>
<thead>
<tr>
<th>Modalities</th>
<th>Up front</th>
<th>1 YEAR</th>
<th>2 YEARS</th>
<th>3 YEARS</th>
<th>5 YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment per month</td>
<td>$0</td>
<td>$16</td>
<td>$8.5</td>
<td>$6</td>
<td>$4</td>
</tr>
<tr>
<td>Total: $175</td>
<td>Total: $192</td>
<td>Total: $204</td>
<td>Total: $216</td>
<td>Total: $240</td>
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Reference: Forum, Maj; Caritas Denmark; February 2022; ECOCA willingness-to-pay pilot - Willingness-to-Pay among Vulnerability Groups in Uganda - Learning Study

ECOCA impact on household energy expenditures

Total monthly savings: Refugees: $23 | Host: $26 | Coffee Farmers: $34

+ Income generating activities.
ECOCA Ressource Centre

- Employs hosts & refugees
- Located at the settlement
- Independent cooperative
- Scalable for demand

750 per month
Expanding reach with retailers using established VSLA’s

2 VSLA’s, 15 retailers, 3 groups

Pay-As-You-Go & Carbon Credits, increasing affordability & accessibility

Paid on commission up to 5 years for sales & tracking
Thank You!
Piloting Electric Pressure Cookers in Kalobeyei (PEPCI-K)

Speaker: Karlijn Groen (SNV)
Piloting Electric Pressure Cookers in Kalobeyei (PEPCI-K)

Pilots the use of Electric Pressure Cookers with 75 households and 25 SMEs connected to the solar mini-grids in Kalobeyei integrated settlement (Kenya) to gain insight in:

- the potential for cooking with EPCs for mini-grid users for household and commercial use in a refugee/very low-income setting;
- the requirements and potential barriers to developing a market for EPCs in a refugee and other very low-income mini-grid settings.

Kalobeyei Integrated Settlement, Kenya
- Part of Kakuma refugee camp with 40,000 residents
- A 60 KW (120 kWh storage) solar mini-grid commissioned by Renewvia Energy provides electricity to 506 customers
- Will be expanded to 541 kW PV (1104 kWh) connecting other villages (+2500 customers).
## Key pilot activities

<table>
<thead>
<tr>
<th>Date</th>
<th>Activities</th>
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</thead>
<tbody>
<tr>
<td>Nov ‘21</td>
<td>Partner onboarding &amp; product identification</td>
</tr>
<tr>
<td>March</td>
<td>Product testing: Testing of 20 EPCs with 15 HH and 5 eateries</td>
</tr>
<tr>
<td>April</td>
<td>Product distribution: Commercial distribution of 80 EPCs</td>
</tr>
<tr>
<td>March-Aug</td>
<td>Product distribution: Developing and testing payment product</td>
</tr>
<tr>
<td>Throughout</td>
<td>Data collection &amp; Analysis (pre and post EPC uptake): Cooking practices</td>
</tr>
<tr>
<td></td>
<td>Data collection &amp; Analysis (pre and post EPC uptake): EPC uptake and payment products’ performance</td>
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<tr>
<td></td>
<td>Data collection &amp; Analysis (pre and post EPC uptake): Electricity consumption</td>
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<td>Learning &amp; knowledge dissemination</td>
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Key baseline study findings

- Opportunity to maximize use of the available electricity resource benefiting both end user (in terms of fuel expenditure, cooking time and water savings) and mini-grid operators
- Consistent and sufficient supply of electricity is critical
- There is willingness to cook to with electricity and pay a portion of their (limited) income to purchase and use an EPC
- EPC payment models need to tap in to limited income levels and (informal) community based saving groups (SACCOs, chamas and VSLAs)
Initial end user feedback (20 test participants)

- All participants are satisfied with the EPC and cook with it on average 1-2 times a day (electricity allowing)
- *Early findings* indicate primary fuel use reduced by 1-2 times
- All participants note a reduction in the amount of water used for cooking ranging 3-40L per day
- Least favourable attribute for the EPC is the small pot size (6-8L) and that it only has 1 pot
- No indication of significant increase in electricity expenditure*

*The analysis for electricity consumption/expenditure is not yet available*
Road to success

Determining short-term successes
Knowledge and learning through data and observation
- How are EPCs being used?
- What is needed to drive uptake?
- What is needed to drive usage?
- How do the EPCs impact the grid?

Understanding of market barriers and requirements
- Which products are a good fit?
- What capacity building is needed? For users? For distributors?
- Are further subsidies needed?

Determinants to drive scale
Financial:
- Appropriate finance mechanisms
- Capacity and willingness of distributors to implement
- Favourable electricity tariffs

Technical:
- Mini-grid capacity to absorb EPCs and sustain electricity supply

Socio-economic:
- Products match end-user needs
- Distributors are effective in marketing and awareness raising and driving uptake and usage
Thank you!

Karlijn Groen - SNV
Energy Advisor
karlijngroen@snv.org
Discussion and Audience Q&A

E-Cooking
Part 2: LPG and Biogas

Cecilia Ragazzi
Mercy Corps

Geophrey Owino Oyugi
International Organisation for Migration (IOM) and NORCAP Energy Expert
Welcome
ALHERI
Expanding choices for quality, modern, affordable clean cooking technologies in displacement settings

Location: Maradi, Niger

End Users:
- 31,400 refugees in three Villages d’Opportunite
- 8,800 members of the surrounding host communities
- Infrastructure and value chain accessible to the entire refugee and host community population
- Main fuel: wood and charcoal, current spent of avg 3 USD/week
- 95% households use three-stone fires, 5% ceramic cookstoves
- 5h/week to collect fuel
- 100% are interested in more modern forms of cooking (cleaner, more effective, viable in the rainy season, less smoke)
Deep Dive on Clean Cooking: Learning from Past and Looking into the Future

**ALHERI**

**Objective:** Uptake of LPG cooking technology, inclusive of depot and 3 refilling stations outside each Village d’Opportunité

**Facilitation:**
- Mercy Corps conducted *market research, segmentation of prospective end-users* to identify *most vulnerable* to be associated with *starter kit distribution* and *6-month vouchers* for refill
- Selected LPG company ready to make *direct financial investment*, *designed market activation campaigns* inclusive of demonstrations and safety awareness, implemented vouchers scheme, *quality assurance*

**Financing mechanism:**
- **Blended financing:** BPRM grant, attracted *direct investment* from national LPG national provider to build the needed infrastructure and set up the retailing network
- Ongoing 6-month voucher scheme: 1.5 6-liter bottle/month = $6.60 USD vs. current avg $12USD/month
- Foreseen LPG uptake post-project: *70%*
ALHERI
Expanding choices for quality, modern, affordable clean cooking technologies in displacement settings

Looking forward:

- Expand offer of cooking technologies through strengthening technology value chains in Tillaberi to create healthy competition and increase dignity of choice. Value chains we're looking at:
  - Solar electric cooking
  - Third party Tier 2 stoves (quality certified)
- Supporting sector to replicate process from project learnings - Creation of blueprint for how to partner with cooking suppliers and build value chains, with checklist and training tools to be socialized with humanitarian energy community through the GPA
Thank You!
CLEAN COOKING INITIATIVE IN IOM WASH, SOUTH SUDAN

BIOGAS PILOT PROJECT IN MALAKAL SOUTH SUDAN
OVERVIEW OF ENERGY SITUATION IN S.SUDAN

• South Sudan ranks lowest in Africa in terms of electrification rates. Only 6.7% of South Sudan population had electricity access in 2019. (World Bank, 2019).

• Traditional biomass is largely used for cooking in South Sudan with only 2% of the population using non-solid fuels for cooking. Charcoal used in South Sudan amounted to 8 kilo tons equivalent of oil in 2015 (UNEP, 2015).

• Population displacement in South Sudan compounds energy access challenges mentioned above, given the complex operational dynamics in displacement contexts.
MALAKAL PILOT BIOGAS PROJECT

*Female IDP cooking with biogas produced from anaerobic digestion of faecal sludge in Malakal PoC © Geophrey OYUGI/ IOM 2022*
# MALAKAL PILOT BIOGAS PROJECT

## LOCATION
- Malakal PoC is in the upper Nile state of South Sudan and has a population of 31,178 IDPs. (DTM- IOM, 2022)
- It has 0% access to electricity while traditional biomass (charcoal/firewood) and paraffin is used to provide cooking and lighting energy, respectively.

## END USERS
- Each household has an average family size of 5 individuals.
- Livestock rearing, particularly breeding of cows is common due to their value as bride price during marriage ceremonies.
- Most of the population is unskilled and largely rely on trading of goods for sustenance.

## AREA OF ENERGY INTERVENTION
IOM commissioned a pilot biogas project in Malakal PoC by installing two anaerobic bio-digesters to evaluate feasibility of technology to provide on site sanitation of faecal sludge and cooking and lighting energy to beneficiaries.

- A single digester treats approximately 214l of faecal sludge per day, producing 3-4 $m^3$ of biogas per day.
- Produced biogas met the cooking energy demand of 8HH per day which translates to around 40 people per day.
- In addition, produced biogas powers a biogas lamp which provides illumination for 2 hours in the shared biogas kitchen in the evening.
- Cooking using biogas saved about 7.9 tonnes of firewood p.a and abated GHG emissions by about 12.7teCO2e in the recording year (May 2021-May 2022).
- Use of biogas saved each HH approximately 345 SSPs per day in purchase of firewood, which translates to 125,925 SSPs p.a. This is equivalent to 280 USD saved per HH p.a.
**FINANCING MECHANISM**
- The project was financed through grants from the following donors: FCDO, USAID's Bureau of humanitarian assistance and DG ECHO.

**KEY CHALLENGES & LESSONS LEARNED**
- Lack of technical capacity in anaerobic digester design, operation and maintenance amongst beneficiaries. To solve this challenge IOM trained two male beneficiaries in O&M of installed biogas digesters.
- IOM also built practical capacity of 12 WASH staff by conducting a 4-day technical workshop on anaerobic digester design, operation and maintenance.
- Improper use of toilets by beneficiaries.
- Safety risks on components of biogas unit.
- Poor road infrastructure and insecurity lead to overreliance of expensive air transport.
- Monitoring of anaerobic fermentation process was key to the success of the biogas pilot project.

**LOOKING FORWARD**
- Borrowing on the success of the pilot project and proof of concept, IOM South Sudan is now seeking opportunities to sustainably scale up this technology.
  - Only 214 litres of faecal sludge is treated per day against produced 38,061 litres of faecal sludge, presenting a huge potential for expansion of technology within Malakal PoC.
  - Widespread breeding of cows, present a huge potential for expansion of technology to individual homes outside Malakal PoC.
MALAKAL PILOT BIOGAS PROJECT

Biogas unit in Malakal PoC © Geophrey OYUGI/IOM 2021
MALAKAL PILOT BIOGAS PROJECT

Biogas lamp illuminating the shared biogas kitchen © Geophrey OYUGI/IOM 2021
Discussion and Audience Q&A

LPG and Biogas
Part 3: Biomass

Judith Joan Walker
African Clean Energy

Brian Onyango
Usafi Green Energy

Rebecca Apicha
International Lifeline Fund (ILF)
Market Based Approach to Cooking Solutions in Uganda
Market Based Approach

PROSPERS

Promoting Solar Powered Energy Efficient Stoves in Kyangwali Refugee Settlement

In collaboration with:

Funded by: RELIEF ALLIANCE
User Referral Bonus (URB) Model

1 Referral = 1 Month’s repayment discount

Reduction of up to 9 payments (half the total cost)
Monitoring and Evaluation
Key Results

700 Households
511 Referrals
70% Refugee Households
1.7 Hours average daily cooking
2.7 Hours average electricity usage
Thank you

Judith Joan Walker - COO African Clean Energy

judith@africancleanenergy.com
Invasive prosopis juliflora (18,000 hectar) | Dry firewood as main fuel | Briquettes as clean fuel

unclean cooking model | Alternative clean cooking solutions | Modern Social Cookstoves
KEY HIGHLIGHTS

- Sold over 10,000+ silver bora cookstoves since 2022-
- Kakuma camp have different nationalities that as well defines cooking nature at the camp
- Partner with NGOs/Private partners on clean cooking
KEY HIGHLIGHTS

- Average sales per week 500 (currently)
- Payments methods: PAYGO and Bi-Weekly credit to our authorized vendors
- Online digital platform on tracking cookstoves and briquettes consumptions
IMPACT ON OUR DISTRIBUTORS
- Train over 100 vendors in our system to place orders via the digital online platform
- Monitor the behavior change and use of our products (SNV)
- We have so far produced and sold over 10,000 silver bora stoves the households since 2020

CHALLENGES FACED AT THE CAMP
- Logistic challenges
- Modern equipment's for operations
- Water storage capacity.
- Less Cash flow (Economic imbalance)
CALL TO ACTION

LET US RECIPROCATE THE BEST PRACTICES AND MOST CONSISTENCE MODEL OF ENERGY ACCESS SYSTEMS IN THE HUMANITARIAN SETTLEMENTS

PARTNERS
IMPROVED INSTITUTIONAL COOKSTOVES

Rebecca Apicha
Senior Program Officer – Environment
May 16, 2022
Humanitarian Energy Conference
OVERVIEW

- International Lifeline Fund
- Improved institutional cookstoves
- Challenges – Is there a kitchen?
- Opportunities
INTERNATIONAL LIFELINE FUND

- Founded in 2003
- Experience in Uganda, Haiti, Burundi, Kenya, Sudan, South Sudan, Ethiopia, and Tanzania
- Programs in Water and Environment
- Environment programs include:
  - Household cookstoves
  - Institutional cookstoves
  - Solar nano-grids
IMPROVED INSTITUTIONAL COOKSTOVES

- Biomass with 50% fuel savings, 10-year lifespan
- Purchased by institutions or through partnerships
- Constructing in Uganda and Haiti since 2008
- Providing technical support to WFP in Burundi since 2014 led to 678 stoves being constructed in 193 schools
- Partnered with Babington Technology to pilot innovative multi-fuel burner
CHALLENGES – IS THERE A KITCHEN?

- High cost barrier
- Lack of awareness
- Poor program design
- Mismatched technology
- Lack of ownership
- No training or follow-up
- Not a focus of the sector
OPPORTUNITIES

Repayment potential (fuel savings)

Carbon markets (risk reduction)

Financial institutions (business opportunity)

Three market segments:
- Humanitarian – philanthropy-based
- Public institutions – emerging market opportunity
- Commercial (private) – market-based

The sweet spot
Our greatest opportunity to boost market demand and reduce dependency on external funding
Rebecca Apicha
Senior Program Officer – Environment
rebecca.apicha@lifelinefund.org
Discussion and Audience Q&A

*Biomass*
Thank you for attending the Clean Cooking Deep Dive session at #HEC2022!