

# WEBINAR: SUSTAINABLE ENERGY FOR HOUSEHOLD COOKING NEEDS

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**28 NOVEMBER**  
**10:30 AM -12 PM CET**

# Webinar Series: Sustainable Energy in Humanitarian Settings

## PAST WEBINARS

- JUNE 2019: [State of Play: Sustainable Energy in Humanitarian Settings](#)
- SEP 2019: [Sustainable Energy for Essential Humanitarian Services: Outline of Energy Solutions and a Case Study on Solar Pumping](#)
- Nov 2019: [Sustainable Energy for Powering Household and Community Lighting Needs in Humanitarian Settings](#)

## Upcoming Webinars

- Stay tuned for our webinars in Jan 2020.

A dark green, irregularly shaped graphic with a splatter effect, containing white text. The graphic is centered on a white background and has a rough, hand-painted appearance with some lighter green splatters around its edges.

Tell us about you!  
- Poll -



- Agenda -

# Presenter



## **Christa Roth, FOODandFUEL Consultant**

As FOODandFUEL consultant Christa Roth advocates for the sustainable utilization of solid biomass as food and/or fuel in appropriate end-user devices for different thermal energy needs. Christa points out that ‚clean burning‘ is not stove-property but a result of a cooking energy system where the user, the fuel quality and the ventilation setting matter sometimes more than the stove. She shares her extensive field experience in Food and Biomass Fuel Security e.g. in ‘Stove Camps’ around the world to enhance sustainable access to renewable household energy solutions for the target groups in need. She is the main author of the [GIZ-HERA manual microgasification](#).

Webinar Series on  
Sustainable Energy in Humanitarian Settings

**Cooking solutions and Fuels for  
Humanitarian Settings 101**

Intro by Christa Roth  
28<sup>th</sup> November 2019



# What is the priority in your context?

- Environmental resource conservation?
- Human health?
- Protection? (reducing fuel gathering etc.)
- Cost efficiency? (and for whom? Who pays?)
  - Agency pays: Consider Procurement, Transport, Distribution etc.
  - User pays: consider affordability, livelihoods,



# User centered approach

## Cooking – Systems

**User**



**Ventilation  
Exposure**

**Food**

**Fuel**

**Stove**

If the intervention does not suit the user, there will be no impact

# User centred cooking solutions – start with the fuel

## Increase access to ,clean fuels‘

- Biogas
- LPG
- Electricity
- Ethanol
- Natural Gas

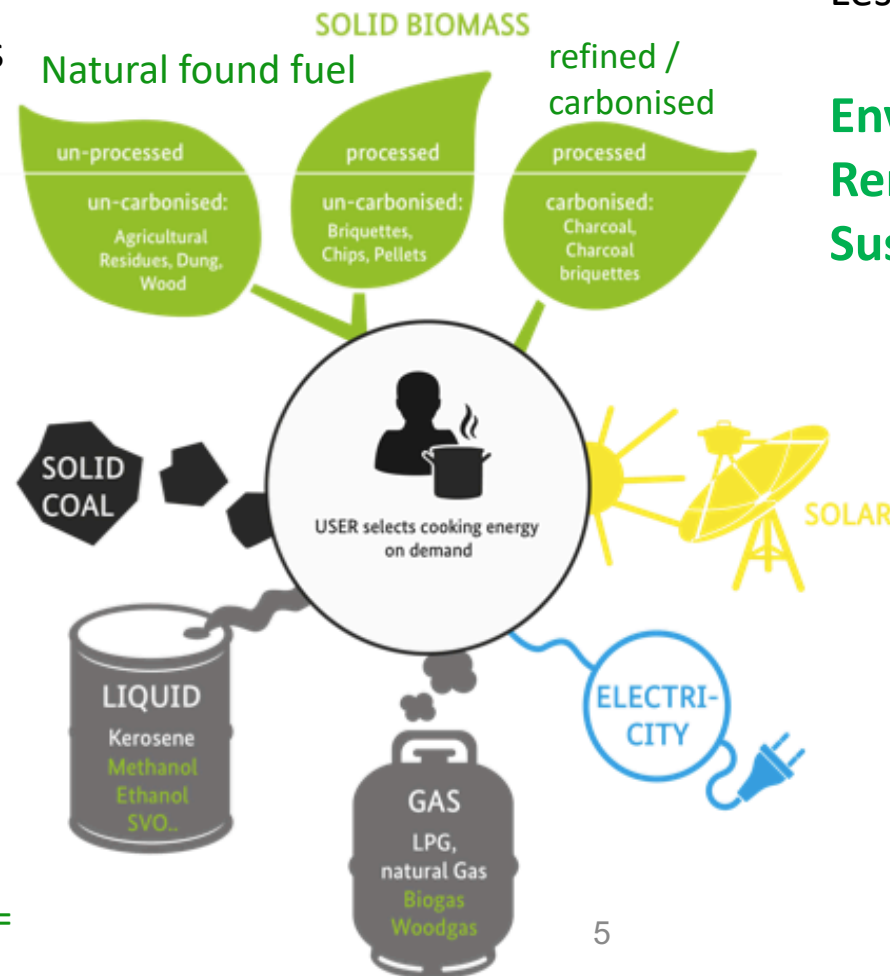
## ,cleaner‘ cooking

- with available solid biomass fuels
- Improved combustion by better fuel preparation and appropriate stoves
- Less exposure by better ventilation

**Environmental & climate focus:**  
**Renewable fuels**

**Sustainable biomass production**

Stove design starts with the fuel. Clean burning depends on state of refining of fuel



Legend:

Renewable fuel =  
Climate relevant

## ,Energy shelf‘

One size does not fit all  
= User decides for ,Stacking‘:  
Parallel usage of multiple fuels  
and devices depending on the  
task and availability of fuel

Fuel stacking = Stove stacking

**,Clean the stack‘**

# Quick decision process: user-centred cooking solutions

Decisions on type and brand of devices come last after assessment of needs



What is  
available?

What is available where?

What is suitable for the cooking tasks?

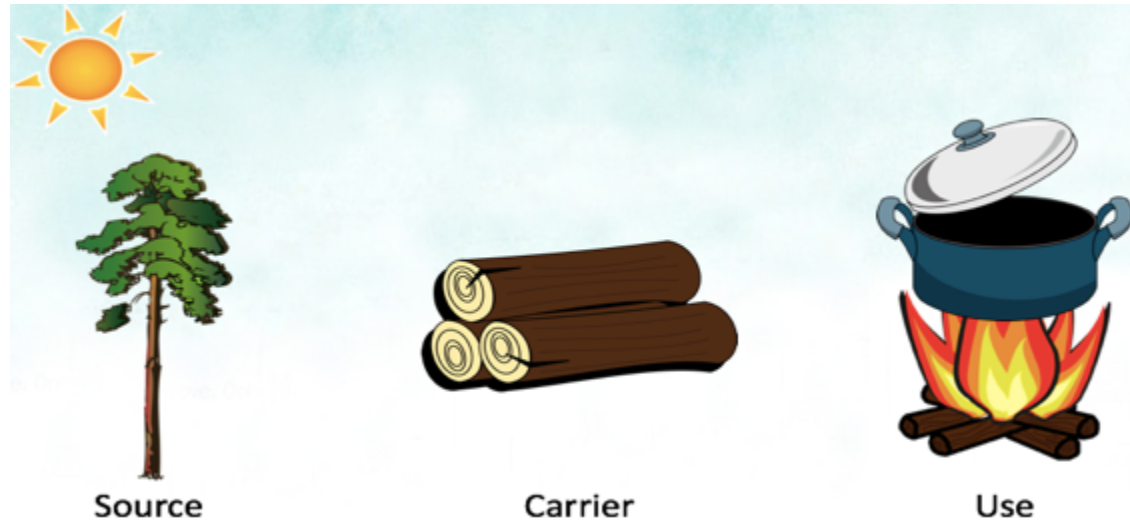
What fuels is the target group familiar with?

What would their preferred cooking fuel be?



**“We use the solar cooker as an ice breaker.  
Foreigners tend to get excited when they see it, and stop by to chat.”**

# Energy from solid biomass

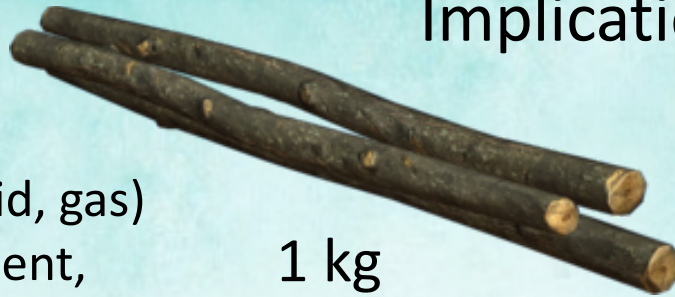


Graph by Dan Sweeney

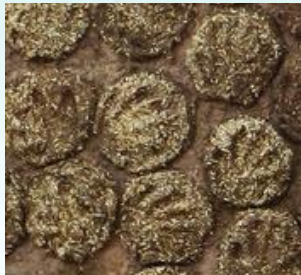
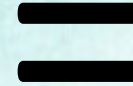
- **Solar energy** stored by a plant through photosynthesis
- Renewable & climate neutral (with sustainable management)
- Available on demand (unlike other energy sources)
- Safe and easy to store, no disposal issues (unlike batteries)
- High calorific value (1kg=0.4kg LPG or 0.7kg ethanol, ideal source of thermal energy for any food preparation, drying, heating or productive use) 8

# Implications of cooking fuel choices

- Bulk volume
- Calorific values
- State (solid, liquid, gas)
- Costs (Procurement, Transport, Distribution) etc.



1 kg



1.5 kg



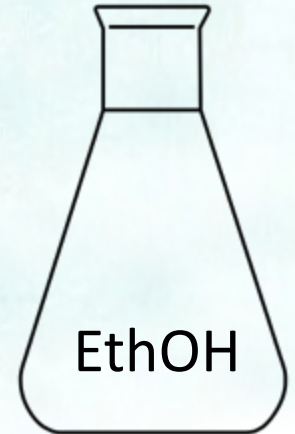
1.2 kg



0.9 kg



0.7 kg



0.7 kg



0.6 kg



0.4 kg



0.4 kg



0.4 kg

# Quick decision process: cooking

Decisions on type and brand of devices come last after assessment of needs



What is available?

Who needs to cook what how?

Example Somali Injera



- Type of food often depending on food rations
- Cooking time /duration of cooking
- Type of cooking (boiling, frying, roasting, baking etc.)
- Heat type required
- Shape and type of cooking vessel (round bottom, handle, material, size, etc.)

# Stove types for different solid biomass fuels

**Substance:**

Uncarbonised, natural

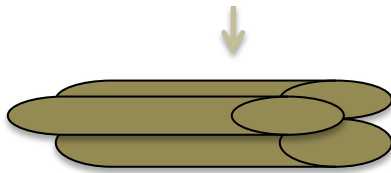
carbonised

**Shape:**

**Log-shape**  
pushed from side

**Small size Lumps / Chunks**  
cannot be pushed but poured into a container

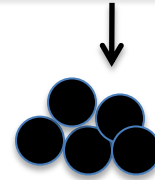
Fuel: e.g.  
FIREWOOD



Design principle:  
Continuous  
side feed e.g.  
Almi stove



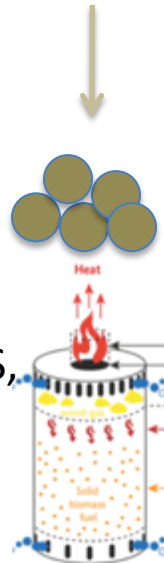
Fuel: e.g.  
CHARCOAL



Design principle:  
Batch fed  
Charcoal stove  
e.g. Almi stove  
with charcoal  
grate



Fuel: e.g. NUTSHELLS,  
WOODCHIPS,  
PELLETS etc.



Design principle:  
Batch-fed  
TLUD gasifier  
(char-making)



# Quick decision process: cooking

Decisions on type and brand of devices come last after assessment of needs



What is  
available?

Who needs to  
cook what how?

Where do  
people cook?

# Human health relevance of Cooking Energy Systems

Factors that influence exposure to smoke

## user

Behaviour (leaving kitchen, cooking outside..), etc.

## stove

Choice of stove and techniques



## ventilation

Air exchanges (enclosure, openings, extraction, cross-ventilation)

## Fuel

Quality, moisture

# Quick decision process: cooking

Decisions on type and brand of devices come last after assessment of needs



What is available?

Who needs to cook what how?

Where do people cook?

Which pots? Which type of operation could be acceptable by most users?

Example Somali Injera:  
Stove needs to accommodate the mitad or it won't work



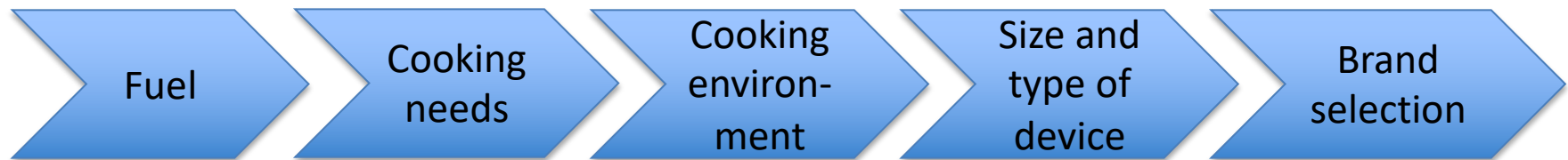
**Give users appropriate options that they need AND want so they are likely to use it regularly.**

**A stove not used has no impact!**



# User centred programme design: Summary cooking

Decisions on type and brand come last after assessment of needs



What is available?

Who needs to cook what how?

Where do people cook?

Which pots? Which type of operation could be acceptable by most users?

Examples which other stakeholders to consult

Protection  
Environment  
Shelter

Local  
government

Nutrition  
Health  
Livelihoods  
Education  
Gender

Shelter  
Nutrition  
Health  
Education  
Gender  
WASH

Nutrition  
Health  
Education  
Gender  
WASH

- Resources for decision making processes:

<https://www.safefuelandenergy.org/about/history.cfm>

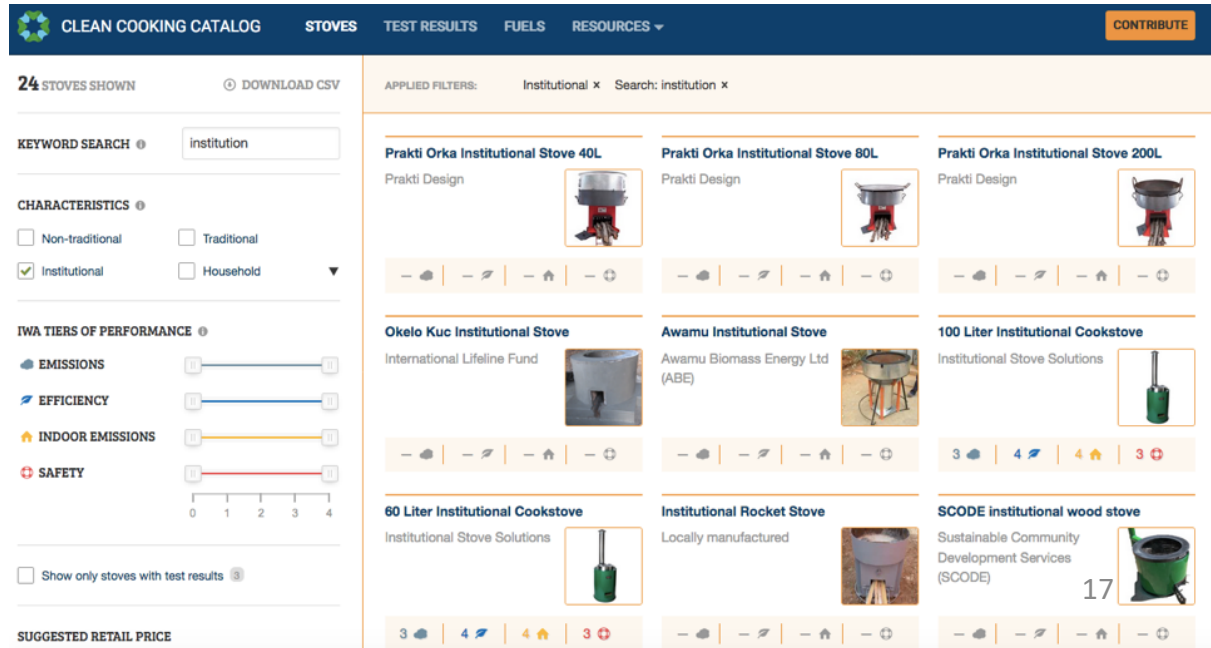
<https://docs.wfp.org/api/documents/WFP-0000023279/download/>

<https://kumu.io/mariedesatnik/cluster-and-energy>

Resource for stove&brand selection: <http://catalog.cleancookstoves.org/stoves>

Great resource, yet only as good as people populate and update the catalogue!

Many selection options:  
Size (HH/institution),  
Performance tiers, Prices,  
Availability, Fuel Types,  
Materials, etc



# Recap Decision-Making for Cooking

- Cost-effectiveness of commercial cooking fuel options
- Budgetary considerations
- Affordability (user-pays + host community access)
- User preferences
- Logistical considerations
- Policy and regulatory considerations
- Others?

**Short-term:** immediate least-cost and suitable energy mix

**Long/medium-term:** transition approaches towards clean cooking fuels - addressing cooking energy security

# Other Issues to consider

- Free distribution (for new arrivals) vs. market based approach (protracted crisis) in one location
- Cooking energy starts with fuel - where from (grow, bring in through markets, etc.)
- ????
- Advice: GET EXPERTISE before wasting resources
- Questions??



# Presenter



## **Mowdudur Rahman, UNHCR Bangladesh**

Energy and Environment unit is one of latest addition in UNCHR Cox's Bazar operation which is tasked to address the challenges of environmental degradation and bring comfort to life with appropriate energy solution where about 1 million refugees are living in 34 camps and Mowdudur Rahman has been affiliated with this unit since its inception. Before joining UNHCR Mowdudur was associated with energy and environment sector in different capacities for more than six years and now has been serving UNHCR for last one and half year. Having in depth knowledge over the industry and local context he is playing a key role in the unit in planning and implementing various projects including LPG distribution, solar mini grid, pressure cooker intervention and others. Mowdudur achieved his Bachelor degree in Electrical Engineering from Bangladesh University of Professionals in 2011. He completed his Master's in Energy Engineering from Indian Institute of Technology, Bombay under DAAD program. He have achieved training on different technology and intervention from Germany, Malaysia, Indonesia, Sri Lanka and India so far.



Photo: UNHCR

## LPG Distribution at Refugee Camp in Bangladesh

Mowdudur Rahman  
UNHCR, Bangladesh

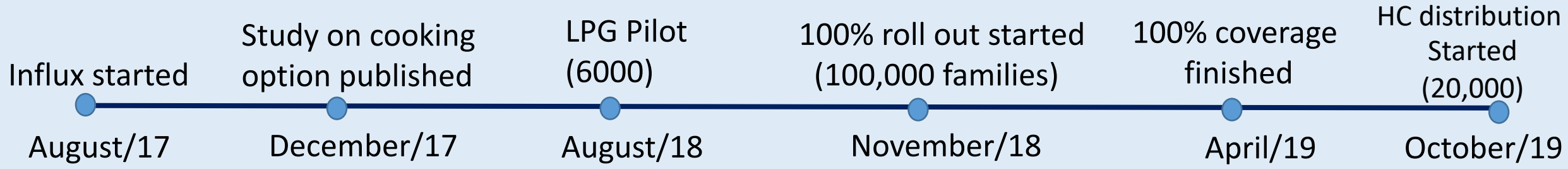


2017

© Philipp Hübner



2018



# Monitoring and Evaluation



| Household category | Current Refill frequency [days] | Earlier Refill frequency [days] |
|--------------------|---------------------------------|---------------------------------|
| 1-3                | 47                              | 45                              |
| 4-5                | 38                              | 36                              |
| 6-7                | 32                              | 30                              |
| 8-9                | 29                              | 26                              |
| 10-11              | 24                              | 21                              |
| 12+                | 21                              | 17                              |

**Action:** Change of refill frequency: 10 → 9.3/ family/year

**Outcome:** Saving Resources, Saving Budget (LPG budget → 1.15 mUSD per month)

## Monitoring and Evaluation



Hose wrapped with cloth



Loosely connected clamp

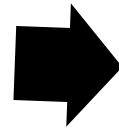
# Monitoring and Evaluation



**Water inside the cylinder**



**Previous option → forest dependency**



## Behavioral Change



Thank You! 😊



# Presenter



## **Vahid Jahangiri, International Lifeline Fund**

Since joining Lifeline in 2006, Vahid has successfully launched multiple operations to include Lifeline programs in Uganda, Kenya, Tanzania, Burundi, Darfur regions of Sudan, Congo, South Sudan and Haiti. Vahid is a key contributor to the SAFE initiative and served on the Strategic Advisory Committee for UNHCR's Global SAFE Strategy. Vahid has extensive knowledge in program implementation, fuel and cookstove technologies, design & manufacturing, technical testing and M&E in both refugee and post conflict settings. Additionally, Vahid has performed consultancy work for several UN agencies such as WFP and UNDP, working to evaluate fuel technology programs, designing implementation strategies and formulating country energy strategies throughout Eastern Africa and in Haiti. Vahid received his B.A. in International Management from the University of Baltimore and holds a Masters Degree in International Public Policy from the Johns Hopkins School of Advanced International Studies (SAIS).

# **Program Design & Implementation in Humanitarian Contexts**

**Case: Uganda 2018-2019**

**Project: An Integrated Response**

**Webinar Series: Sustainable Energy in  
Humanitarian Settings, November 2019**



**Vahid Jahangiri, International Lifeline Fund**

# BACKGROUND

- ▶ Headquartered in US with program offices and stove manufacturing facilities Uganda and Haiti
- ▶ *Mission: Bridge historical gaps in underdeveloped water and energy sectors & markets with scalable and replicable system-oriented models*
- ▶ ILF has implemented humanitarian and market-building programs across sub-Saharan Africa and the Caribbean, including in Northern Uganda, Darfur, South Sudan, Burundi, Haiti, Tanzania, and Kenya.
- ▶ Expertise in R&D, product design, technical testing, production, marketing, distribution, training, and M&E

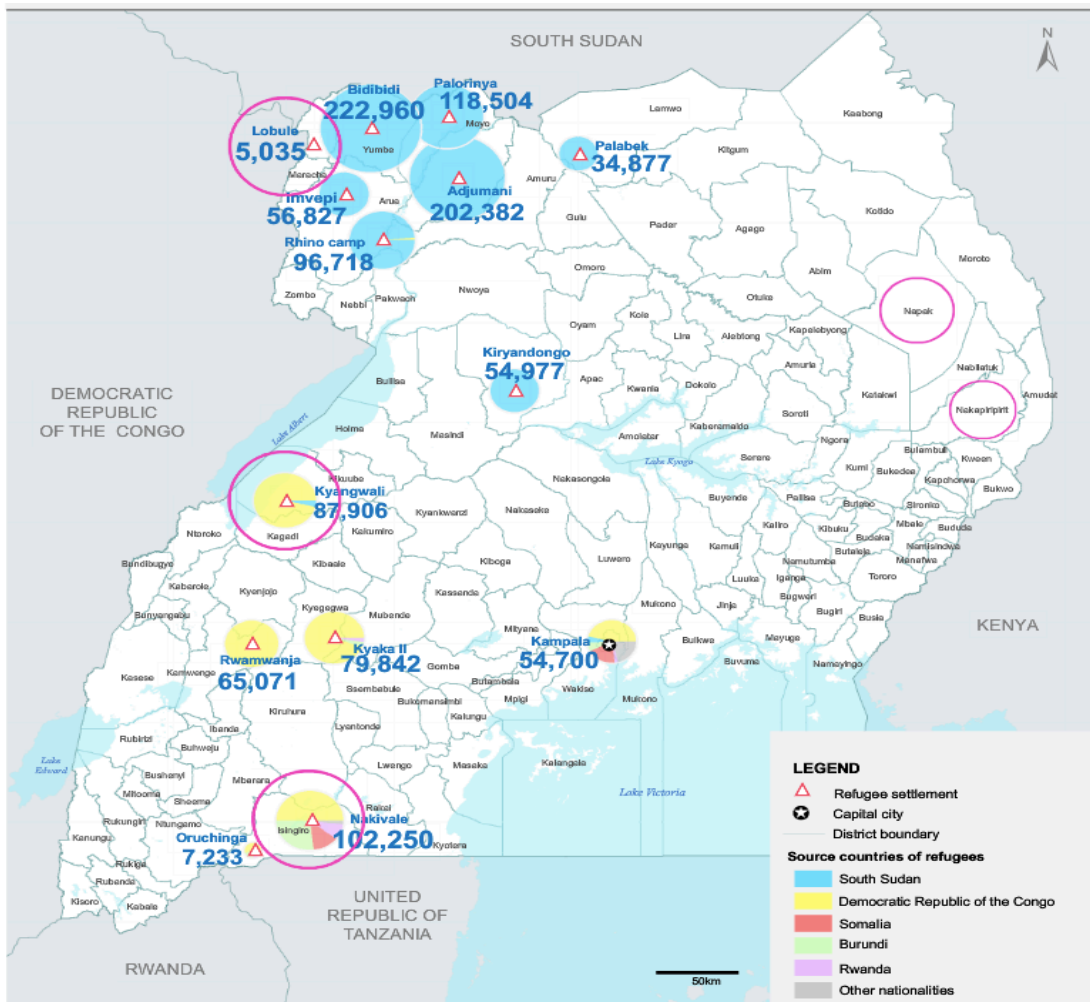


# Project Title: Safe Access to Fuel & Energy

## Objectives:

1. *Improve livelihoods & resilience throughout the target communities by both reducing fuel costs and creating opportunities for local employment;*
2. *Develop community assets that can be leveraged for long-term economic growth;*
3. *Reduce biomass dependency to mitigate deforestation*
4. *Nurture markets for affordable energy-efficient household stove technologies in Karamoja, West Nile, and South West regions of Uganda; and,*
5. *Utilize stove training sessions as opportunities to provide refugee women with psychosocial support.*





The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

## Target communities across Uganda:

3 Refugee & Host Communities in: Lobule, Kyangwali & Nakivale settlements;  
2 Districts in Karamoja: Napak and Nakapiripirit

# Deliverables

**2,000 households using ILF's EcoSmart Wood Stoves (1,081 refugee, 419 host community, and 500 rural community)**

*72 refugees and community members engaged as SAFE Community Trainers to conduct stove user trainings, provide after-program support, and serve as local project ambassadors*

**23 efficient institutional stoves and 12 improved kitchen structures built in 3 refugee reception centers and 20 schools to support refugee and school feeding programs (12,000+ beneficiaries)**

*158 cooks, administrators, and school parents trained on stove use*

**26 local government officials from 5 districts trained in the comprehensive EcoSmart program model blending environment, livelihood & resilience, gender, and local capacity building**

**3 Energy Kiosks established in Lobule, Kyangwali, and Nakivale to support the sale of efficient energy technologies**

*24 kiosk staff trained for income generation*

**2 community kilns constructed at technical training institutes in Napak and Nakapiripirit to enable the local production of efficient energy products**

*38 kiln operators trained (32 students, 6 instructors)*

**Consumer Awareness & Demand Stimulation**

*Radio adverts & talk shows, 5 community events held, cooking demos*

*5 new independent/vendors, 350 first round stove sales by new vendors*

*Kiosks ordered first round of 330 stoves after the initial in-kind capital provided through the project*

# Key Factors of Success & Challenges

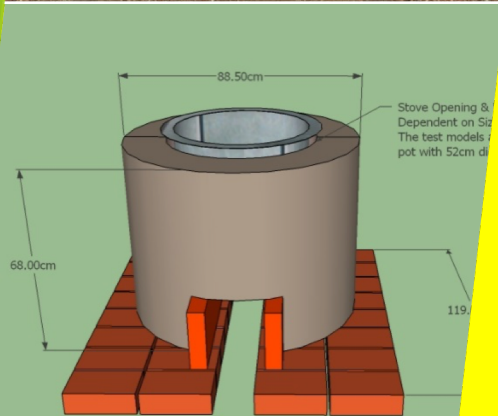




# Trust Building

- WHO is the Community?
- What do they Exactly Need?
- What is the Culture?
- Local leadership
- Stakeholder Dynamics
- Communication Ladder
- Local Ambassadors





# Technology **MUST** Work

Design  
Criteria:

- ▶ Fit
- ▶ Form
- ▶ Function



# ADAPTION (97%)



# Training is KEY



# Gender Roles, Power dynamics, decision making, Risks



# DONOR Feedback

*I think the most important message is that the [ILF stove] is a great success within the refugee context ...*

*However we also wanted to provide you the feedback from the field that lots of stoves are not being used or not efficiently being used. **This is often due to a lack of end-user training by the disseminating NGO.** Their activities are of course often not within your hands. But maybe when they purchase the stoves you could offer them to add some end user training on site.”*

- Oct. 2017 donor feedback from Rhino and Imvepi camps,  
Uganda

# Monitoring During Project Implementation

- ▶ Helps in tweaking your project
- ▶ Get updated about changes at the field level
- ▶ Course Correction
- ▶ Updating the local leadership and get their support early
- ▶ Updating the donor
- ▶ Early conflict resolution

**Example: Training the  
wrong individuals**



Consult a representative sample of the beneficiary population, UN agencies, camp management, local government officials, agency partners on the ground, refugee representative groups, women's groups, cooperatives, and men and women from host community **to avoid collecting one-sided data.**

**One Stove is never ENOUGH.**

**How many cooking  
appliances do you have?**





# Early Impact was Visible





# The Bridge to improving Livelihoods & Building resilience & **The Challenges**

The Market? Distribution? Willingness To Pay?

# Common Humanitarian Program Challenges

1. Rush to Respond without proper context analysis especially to cooking

Result: Inappropriate program/technology design for the context results in program failure or limited lasting impact

Ex. Donor requirements take priority over beneficiary needs/desires

Ex. Cost-effectiveness relative to long-term goals

2. Training is absent

3. Logistics is underestimated

4. Overlapping interventions and duplicate efforts in camp zones

Ex. Failure to communicate and coordinate with camp management can lead to multiple FES interventions in the same camp zone

# Best Practices to Address Program Challenges



- ▶ Engage relevant stakeholders at every step from preliminary assessment to project close out
- ▶ Prioritize beneficiary needs and desires in program/tech design to improve user adoption
- ▶ Monitor frequently and document results
- ▶ Communicate early and honestly with donors and peers

# Presenter



## **Dr Anh Tran, Modern Energy Cooking Services (MECS)**

Anh is the Humanitarian International Liaison Manager for the MECS programme. A daughter of Vietnamese refugees, she is passionate about empowering refugees and local host communities to access modern energy cooking services and to enable them to thrive and not just survive. Anh has a BEng (Hons) and PhD in Chemical Engineering from the University of Queensland, Australia.



**MECS**  
Modern Energy  
Cooking Services

# Humanitarian Modern Energy Cooking Services & Challenge Fund Opportunities

Dr Anh Tran  
Humanitarian International Liaison Manager  
A.Tran@lboro.ac.uk



# Section One: The Need for Action



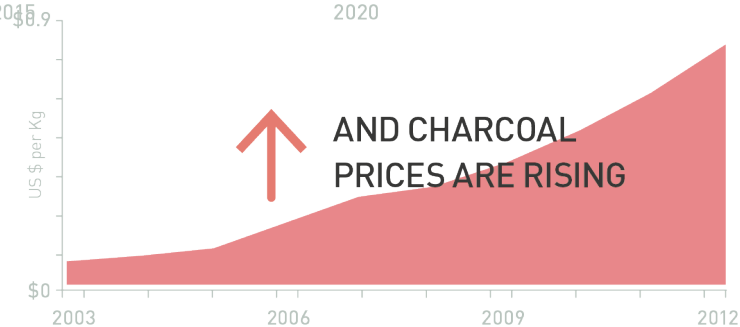
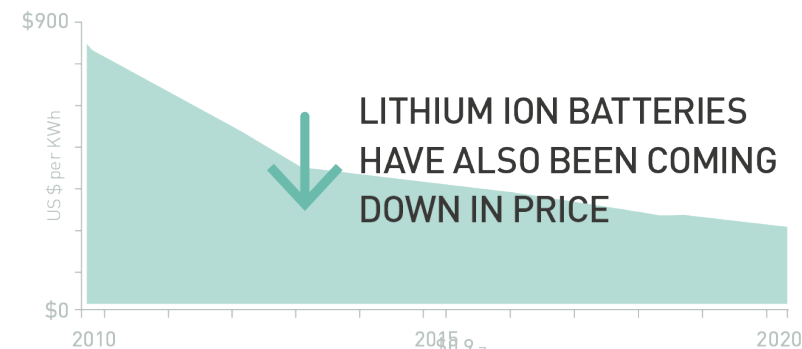
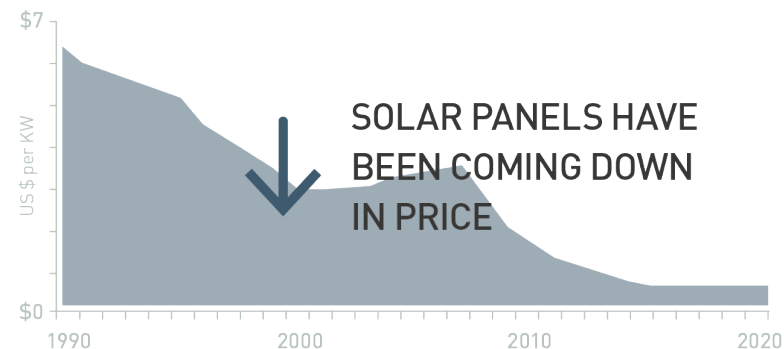
Affordable and clean energy access for all.



#GlobalGoals

- Overall SD7 Progress
- Progress with Clean Cooking
- Business as Usual will not be enough
- The Birth of MECS

## 2013 – we noticed something





# Modern energy cooking services (MECS)

The £40 million, 5-years MECS programme aims to **break out of the “business-as-usual”** cycle of developments on cooking by investigating how to rapidly accelerate a transition from biomass to genuinely ‘clean’ cooking (i.e. with electric or gas).



# MECS will deliver...

(Sep 2018 – Aug 2023)

1. **Transition pathways: Evidence, research and insights** into the drivers and pathways for economies to transition to modern energy cooking services.
2. **New technologies & innovations** that make using electricity and gas more efficient, more practical, more desirable and affordable for poor households. **Innovations** in business models, financing and private sector delivery of modern energy cooking services.
3. **SDG global tracking** that includes modern energy cooking services.
4. **Routes to Scale:** Inclusion of modern energy cooking services in WB, MDBs, RBF, accelerators, catalysing markets and finance.
5. A **changed narrative on cooking** for those involved in wider energy access policy and programming.



# MECS Challenge Fund Competition

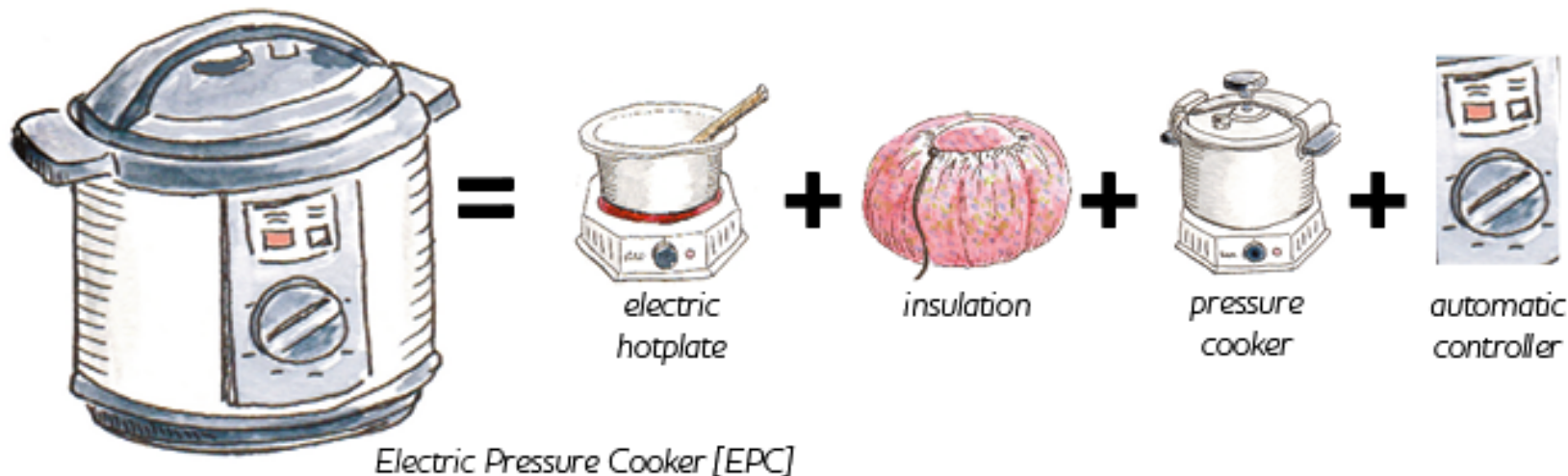
## Modern Energy Cooking Services (ECO)

Launch call : 11 December 2019

Pre-register for the Challenge Fund Competition

<https://www.meecs.org.uk/challenge/>

Focus on efficient electric cooking appliances (e.g. electric pressure cooker, rice cooker)





- Q&A -

# Thank you

- Feedback: [info@energypedia.info](mailto:info@energypedia.info)
- Webinar documentation/Additional Resources:  
[https://energypedia.info/wiki/Webinar\\_Series:\\_Sustainable\\_Energy\\_in\\_Humanitarian\\_Settings#4th\\_Webinar](https://energypedia.info/wiki/Webinar_Series:_Sustainable_Energy_in_Humanitarian_Settings#4th_Webinar)

