

Cooking Energy in Displacement Settings - All Relevant Cooking Systems in a Word - Breakout sessions content

Wood fuel

- Generally, several partners and CBOs are working on promoting firewood and improved firewood stoves and technologies
- It offers the most pragmatic solution to cooking and is the first steps in changing cooking in displacement settings
- The main advantage is availability of the fuel and knowledge of the product
- It offers options to use variety of biomass from crop residue, forest wood, cow dung and non woody plant type firewood's
- However not ideal for indoor cooking because of pollution and smoke-with increase health risk
- It is a time saving solution in displacement, affordable and readily available
- Generally, lights faster, in SSA and India most dry wood materials
- Firewood is adaptable to different multiple stove designs and technologies can used and also to changing situations. Especially disaster induced displacement setting can provide first line of cooking energy
- It has environmental impact as fuelwood/charcoal is one of the drivers of deforestation (far from land conversion for agriculture purpose)
- While living circumstances can change rapidly, cooking cannot delay-therefore firewood and firewood technologies offer prompt solution
- As most other fuels and technologies require orders to be made for a cooking system to be delivered from distant manufacturer in displacement, this is a critical solution
- Its portability, flexibility and not requiring user training skills makes it not specialised in useability
- The technologies for firewood can also be improved from tier 1-3 depending on advancement. However, this advancement is connected to higher fabrication costs.
- No payment usually required or very low payments for the fuel cost and technologies as compared to other forms of fuels
- Low cleaning required
- Private companies have not invested much in the firewood and fire technologies, mainly CBOs, because no clear investments plans are readily available for market-based approaches.
- It takes a while for firewood-based clean cooking companies to have a financially sustainable business model. For instance, after 3 years of investment in flood relief in India, Greenway starts to make the business profitable. Companies need to be patient and engage with renowned CBOs/NGOs.
- Some organizations like (Greenway) have started to offer microfinance schemes; Green way has its own MFI developing options for subsidies
- Alternative use of crop residue is being developed to replace dependency on forest wood products for firewood.

Processed Biomass

- What is the availability of pelletized fuels in Sub-Saharan Africa?
 - Great challenge but some small-scale manufactures are popping up in East Africa (previously the Swedish NGO Emerging Cooking Solutions had exported pallets from Zambia). For the future, stand-by stocks should be established

- How is the production of pellets in terms of environmental sustainability?
 - Pellets are produced from three types of wastes: field harvesting residues, which are largely not viable because they are not aggregated (e.g. stover, straws and other things left in the fields), agri-processing residues, which are much more viable (e.g. coffee husks, groundnut shells, macadamia shells) and forestry processing residues (e.g. wood chips, sawdust, off-cuts). As wastes or by-products, all of these are environmentally quite friendly. There can be cases of purpose-grown feedstock for pellet production if there is specific subsidy, but not likely in the humanitarian context
- Do the pellets and briquettes require special stoves?
 - Pellets and non-carbonised briquettes require special stoves to permit proper combustion. Char/charcoal briquettes generally work in existing charcoal stoves, though ash can eventually clog the grates.
- What are the limitations in pellet production (especially in anglophone Africa) and what are the limitations of gasifiers?
 - The production of pellets and gasifier stoves is not really a supply-side problem, but more of a market challenge. If buyers can be found, then they are unlikely to be major limitations on the supply side (e.g. linked to availability of material resources, technical knowledge, etc)
- We do briquette presses that make 40-50 mm diameter briquettes. These should work in most cooking stoves
 - Agree with this comment. In general, existing stoves will work best with smaller fuel sizes, and for larger briquettes (e.g. 70 mm), other stoves should be used/developed.
- Would pellets work for the urban poor in cities as well?
 - Urban situations are probably the best market, as in rural areas it's hard to compete with firewood (cheap), whereas in cities you are competing more with carbonised fuel (charcoal) and this is more expensive. For industrial uses, briquettes can compete with firewood for bulk supply, factory to business.
- What do you think are the investment returns in typical African cities? Or is it specific to displacements and refugee settings only?
 - The returns are likely to be best in cities, and much more challenging in rural areas and displacement settings, where purchasing power is much more limited.
- How practical is it to use gasifier stoves?
 - Wood must be cut very small for use in a gasifier. Users are rarely willing to do this. So, a ready-made fuel like a pellet is preferable for this type of stove.
- How could the humanitarian sector support clean cooking and clean cooking energy?
 - Humanitarian agencies tend to make top-down procurement decisions and roll these out to their own field operations, so they do have quite a lot of responsibility and opportunity to promote the supply of sustainable fuels in their own operations. This is one advantage of the humanitarian context over the totally free market.

LPG

- Where do you see the benefits of your business model in a displacement setting?
 - Using a smart meter generates comprehensive user data that can be monitored by organisations/ donors
 - In this model there is no upfront cost to accessing gas for households, only pay-as-you go (PAYG) costs for cooking; currently the main barriers are the initial costs to buy a cooker, the deposit associated with the first gas cylinder

- and the cost of a full cylinder of gas, which is not necessary under this pay-as-you-go business model
 - Significantly (at least 30%) cheaper than traditional fuels in the markets that Circle Gas operate e.g. charcoal and kerosene
- In your view, what are the most appropriate payment methods/schemes that could be tested for LPG cooking?
 - Wealthier households can make single payments for a stove, first cylinder and replacement gas cylinders, where the household can save and afford the next replacement cylinder
 - Middle income households – PAYG, where the cost of using the stove, first cylinder and replacement gas are wrapped up into the usage fee
 - Low to middle income households – blended solution when donors pay for initial stove and first cylinder, thereby removing the barrier to entry, with households either buying the replacement gas cylinders in a single payment or through a PAYG solution (noting that the PAYG solution would also be cheaper as the cost of the stove and initial cylinder would not have to be incorporated into the usage fee)
 - Poorer households – vouchers for fuel to subsidise cost (partially or fully)
- Are there beneficial conditions in displacement settings?
 - Concentration of end-users could reduce logistical cost
- Which kind of displacement settings do you think LPG is best suited for? What are the main factors to be considered for LPG commercial supply in displacement settings?
 - Availability – we need to have the fuel in the country – supply chains are relevant
 - Affordability – it is important to understand how the monthly costs of cooking with LPG is compare with existing cooking fuels
 - Enabling environment – Where the displaced community are expected to pay for energy solutions, a suitable enabling environment is required that allows the displaced community to work, use mobile phones, have access to microfinancing, etc
 - Existing LPG market in the host country, with sufficient competition among suppliers
 - Existence of a national LPG strategy or stated ambitions
 - Political support or buy-in from host governments, local host communities, UNHCR or major humanitarian NGOs
 - Existence of cooking fuel markets, where displaced communities are already paying for fuels
 - Ability and willingness to pay for LPG among enough households to justify commercial supply
- How long does training take for end-users? How does it look like?
 - Safety training is not outsourced to maintain quality control
 - Prior to covid some training was offered in groups, which has subsequently switched to 1-to-1 training in the homes of end users
 - Interaction is important to customize solution for end-users
 - Important safety aspect: location of the cooker and cylinder within the premise – trainer assesses premise and recommends best locations
- What are the main challenges of converting end-users who have traditionally used non-clean cooking methods into taking up LPG?
 - Barrier is getting them to use it as a primary cooking tool
 - PAYG product is a recent addition to the market
 - end-user still have other fuels on stock

- Upfront cost, lack of information, safety concerns
- Benefits of LPG: positive effect on children who don't have to collect firewood anymore and mothers are often interested because they are worried about smoke of other fuels
- Comments:
 - “At World Central Kitchen we always use LPG for food production during relief feeding. Mostly because it's the easiest to source. But this is mass feeding not traditionally in refugee camps. We have done LPG stove set ups in camps though which worked well paired with training.”
 - “Odd question: have you come across people being afraid of smart meters (for any reason)?!” – none that we are aware of

E-Cooking

- Cultural appropriateness of e-cooking:
 - Look at cooking processes and what access they have
 - Work out the easy wins, energy efficient appliances for on-grid
 - In some contexts, e-cooking already makes sense (grid, reliable electricity access; high expenditure on current cooking fuels, e.g. charcoal; suitability of traditional meals cooked on a daily basis (e.g. rice, beans, stews, ugali, etc.))
 - Cost is a consideration for off-grid, but it is still possible to cook with electricity; tariff breaks might have to be consideration if future uptake of e-cooking appliances on mini-grids is to go up
- Classification of off-grid:
 - Mini-grid
 - Generator
 - Household system
 - Solar is most common especially at household level
 - Electricity can come from anywhere, even biomass
- Examples of e-cooking:
 - PESITHO in BidiBidi- closely mimics how people cook with biomass
- Institutional cooking:
 - EPCs up to 60L, large enough for many schools and medium scale institutions, 20-100 people per day; little operational difference
 - Meals are typically prepared for lunch (where in the case of SHS or solar-powered mini-grid, the energy production is at its highest), though some institutions (like boarding schools) will also cook in the morning and evening in addition
 - Other appliances that we're looking at, matching which appliances fit the local cooking culture, especially heavy foods
- Battery storage around 300-400 USD per households, has to be a service-based delivery model
- Batteries will likely be among the biggest challenges
 - collecting and recycling
 - for appliances- we can leverage existing supply chains
- Political dimensions and the willingness of the govts to support medium- and long-term solutions is needed (and paired with the rural electrification strategy so that e-cooking is considered from the very beginning on)
- Concerns about efficiency of solar and the lower power output on rainy days
 - Increase the number of panels
 - Fuel stacking (e.g. electricity and LPG)

Biogas

- How successful is biogas as a clean cooking solution?
 - Not widespread yet as cooking solution due to misconceptions: people think it smells due to animal/human waste which is used but this is actually not the case. Also, the time for instalment is rather short but many think it takes long and is a complicated process.
 - Some types of biodigesters more successful than others (in terms of sales figures)
- How is the policy and regulatory environment for biogas in Kenya?
 - Very little regulation so far
 - Easy certification process for biodigesters
 - Internationally, there is a norm for prefabricated biodigesters
- What do you need to do to keep the biodigester running?
 - Feeding frequency: digester needs to be fed daily with waste in order to work properly
 - Ratio between water and waste can be adjusted --> then also possible to feed only every second day
- Will Sistema.Bio expand to Ethiopia?
 - Sistema.Bio is interested to expand in ET
 - Sistema.Bio can ship digesters anywhere (also remote areas) - supply chain is reliable and run by Sistema.Bio
 - Sistema-Bio is looking for solid distribution partners working in the clean energy sector
 - Sistema.Bio offers training for potential distributors
 - Instalment of digesters can be done also virtually
- Does Sistema.Bio sell biodigester for different settings?
 - Yes, different sizes of digesters are available – for different settings, e.g. for a single household, for many households in a refugee camp, for schools, for companies etc.
- Comments - Pros of biogas:
 - Clean cooking solution
 - Organic fertilizer is used
 - no smell
 - (human/animal) waste can be used to generate energy (for cooking and lighting)
 - Biodigester produces biogas but also biofertilizer (which supports food security)

Ethanol

- Ethanol distribution chain, is it difficult to make fuel accessible/available?
 - Very easy to use kerosene infrastructure, which is in place, no separate infrastructure needed
 - Project Gaia used to focus on refugee camps to replace kerosene, now they look also at commercialization, distribution is easy in urban areas.
- Ethanol promotion used to be a big issue some time ago, now it gets less attention, little projects: why?
 - Production is the bottleneck, at least in Ethiopia, governmental sugar factories are not producing enough, sugar production remained low, has not grown as planned.
 - Thus: limited supply, only 2 distilleries are producing ethanol
 - Any expansion of stove technology needs to go in hand with fuel supply

- Cost of fuel? Competitive?
 - Market price 10.78 birr per liter of Ethanol, cheaper than LPG and kerosene at the moment.
 - But price will go up most likely, as all ethanol goes into the production of sanitizers, due to COVID. Access to ethanol as a cooking fuel for HH is thus very limited at the moment
 - Stove technology is not everything, fuel supply is highly relevant!