

Zambia

Focus Group Discussions

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Introduction

According to the World Bank, access to clean cooking fuels and cooking technology (as a percentage of the population) in Zambia was 10.4% in 2020¹. Electric cooking (eCooking) was used by 34-40% of the population in urban and peri-urban regions, however, according to the Gender Strategy Plan, eCooking dropped from 34% to 18% in 2018². This is caused by the rising cost of electricity and the pervasive belief that eCooking is costly. Nonetheless, there is enormous untapped potential to improve clean cooking and alleviate pollutant fuel stacking. Charcoal use remains prevalent, and deforestation is a major issue in Zambia. The usage of LPG for cooking is currently less than 2%, and while the government has expressed a national aim of 40% cooking with LPG by 2030, the market is currently not conducive.

Through energy-efficient electric cooking devices, coupled with LPG to be used during load-shedding, eCooking can become an aspirational offer.

eCooking remains popular in Zambia, however, the usage of *inefficient* equipment may hinder users, especially given the load-shedding issue and rising tariffs. By encouraging *energy-efficient* devices and encouraging LPG to be used during load-shedding or black/brownouts, eCooking can become an aspirational offer. The concept of ease, modernity, and cost-effective solutions entices the populace, particularly in urban environments where cooking should be simple and economical.

This MECS focus group discussion report is a follow-up to the ‘eCook Zambia Focus Group Discussions Summary Report’ of 2019³. The FGDs undertaken in 2019 were to generate information to support the development of battery-supported electric cooking. The evidence from those FGDs indicated that electricity was the aspirational fuel for most households in Zambia and confirmed that access, affordability (or perception of affordability), and reliability were the main barriers holding back wider adoption of electric cooking.

¹<https://data.worldbank.org/indicator/EG.CFT.ACCS.ZS?locations=ZM>

²<https://www.moe.gov.zm/wp-content/uploads/2022/08/Gender-Equality-Strategy-and-Action-Plan-for-the-Energy-Sector.pdf>

³ <https://mecs.org.uk/wp-content/uploads/2020/12/eCook-Zambia-Cooking-Diaries-Report-JL-13-10-19-COMPRESSED.pdf>

Aim of Study

In fulfilment of MECS deliverables, *Centre for Energy, Environment and Engineering Zambia* (CEEEZ) undertook two respective focus group discussions to generate feedback post cooking diary activities. The two FGD took place in townships namely Kabangwe township along Great North Road and Ng'ombe township in Lusaka urban.

The report aims to discuss and showcase the results from focus group discussions that were held with high, medium, and low-income clusters in two communities in Lusaka to understand whether electricity and LPG are the aspirational fuels for most households and establish the main challenges preventing wider adoption of modern energy cooking.

Background

Kabangwe and Ng'ombe were selected as locations for the FGDs because of the field team's previous working ties to these communities.

Kabangwe township is located about 5km north off the Great North Road (T2) from the central business district (CBD). It can be classified as a planned developing/emerging residential area where people have been buying land and building houses to reside. The houses are modern and of varying sizes. The grid, which follows the main road (T2), passes through this location. Households that can afford to get grid connection have already been connected while others are yet to be connected. It should be noted that there is no public information available on the proportion of the population that is connected and not connected to the grid in Kabangwe. Access to water in this location is through individually sunk boreholes.

Ng'ombe township started as an unplanned settlement but was legalised by the then Ministry of Local Government and Housing under the Statutory and Improvements Act of 1999 on February 16, 1999. It is located about 10km northeast from the main post office in the CBD. The location can be described as densely populated. Since its legalisation, Ng'ombe has undergone a lot of improvements in terms of housing structures, roads, and social services, compared to Kabangwe. Even though water from the utility is piped in this location, it does not go into the households. It is accessed from taps in the yard of nearby households or at strategically located water points. Some households are connected to the grid since it runs through the area. There is no public information available on the proportion of the population that is connected and not connected in Ng'ombe.

"EPC is an energy efficient cooking appliance. Our households are already connected to National Electricity infrastructure and access to electricity to power our EPCs is within our reach". (Ng'ombe resident).



MAP OF LUSAKA DISTRICT

Methodology

The discussion within the focus group was recorded in the native language and then translated into English. The enumerators also made separate notes and compiled them to ensure they corresponded to their overall observations. The interview was semi-structured, with questions grouped into three themes (shown in table 1): adopting modern energy cooking, consumer awareness, and cooking habits. These topics help to assess whether electricity is the aspirational fuel for most Zambian homes and to identify the opportunities and challenges to further adoption of modern energy cooking.

The FGDs took place at centrally located homes in the two communities. A short agenda on how the discussions would flow was drawn up to create order. The FGDs began with welcoming remarks from the moderator and a prayer from one of the participants. The moderator introduced the MECS program, its aim, and the specific activity of that day. The moderator introduced the team which included an Assistant and an Enumerator. This was followed by obtaining consent to audio record and take photographs of the proceedings. The participants were then given a chance to introduce themselves⁴.

The materials used for this activity were:

- Questionnaire printouts
- smartphones- for audio recording and photographing
- Notebooks- for note taking

⁴ The consent given to the field team was to audio record for note-taking purposes only and to allow the use of the photographs taken. Participants real names will not be used.

The field team and their roles were as follows:

- Moderator- leading the team and facilitating the discussion
- Assistant- Assisting the Moderator and taking photographs
- Enumerator- note taking and managing the smartphone recording the discussion

The snowballing sampling method was used to select participants as the two communities were familiar locations to the researchers since some of the cooking diaries participants reside there. CEEEZ engaged with the household heads from the cooking diary activity first and then requested that they invite some friends or neighbours to participate in the FGD. The criteria relayed for the invitees were: they needed to use different fuels for cooking, they belonged to the three income groups, were of different age groups, and were from both genders.

	Question	Purpose	Theme
1	How did you first hear about the Electric pressure cooker (EPC)/ LPG stove?	Understand the opportunities and barriers of adopting MECS	Adopting Modern Energy Cooking
2	What do you like best about the EPC/LPG/charcoal stove?		
3	What are specific issues, concerns, or problems you've faced when using this appliance?		
4	What are specific issues, concerns, or problems you've faced when using this fuel (running out, load shedding, procurement etc.)?		
5	a) How significant is the problem or concern you have with this appliance/fuel? b) What is the cause of this problem?		
6	What is something that has deterred you or would deter you from using this appliance?		
7	What misconceptions do people have about this appliance/fuel? (Try to explore perceptions regarding safety, relative cost of cooking, quality etc.)	Gain insight on the attitudes and perceptions of MECS devices/fuels	Consumer Awareness & Marketing
8	What do other people think about you using this appliance / fuel? (Neighbors, friends, family, spouse – see who gets mentioned – these will be key social referents.).		
9	What is something that would make you more inclined to buy and use this product, even if you are already a user? (What are the best selling points for this product?)		
10	What changes would you recommend making to this appliance?		
11	What features or information do you feel should be contained in the marketing message that would make other people buy this appliance?		
12	How do you propose companies should market the appliance in order to reach and convince people?		

13	In terms of paying for cooking fuel, what difference have you observed between what you are paying now and what you paid before?	Understand how MECS can/should adapt to the current local cooking practices.	Cooking Practices
14	What were you using for cooking before?		
15	What has changed about the way you do your cooking now? Are you stacking? What fuels are you stacking?		
16	What fuel (or mix of fuels) would you ideally like to use at some point in the future?		

TABLE 1: QUESTIONS ASKED IN FOCUS GROUP DISCUSSION

Participants Profile

The first FGD was held in Kabangwe. In total, 13 participants attended the FGD in Kabangwe. Two were male participants while the rest were female participants. Six of the participants were users of MECS intervention stoves (three from LPG user households while the other three from EPC user households). The participants were friends and neighbours, and others were families related by marriage (each with their own house). Firewood and charcoal were fuels mostly used to cook the traditional maize meal drink (munkoyo) and beans, respectively. The group indicated that a 25kg bag of charcoal (which was bought from charcoal vendors) would last them one week. Those that used firewood mentioned that they collected it from a nearby mountainous area (but this was becoming more difficult because they have been beaten if found by the main occupants there). The participants who had taken part in the cooking diaries were using the appliances except when the fuel ran out or during loadshedding. It was mentioned that loadshedding was quite severe in this location.

The group in Ng’ombe consisted of thirteen participants, of which two were male. Of these, some had participated in the cooking diaries activity and were users of LPG and EPCs. The participants indicated that they were all charcoal users but those that had taken part in the cooking diaries had switched to using the clean cooking appliances they obtained during the study after experiencing the cost-saving benefits. They also added that when they ran out of fuel or there was a power outage, they would revert to charcoal or wait for power to come back (for EPC users).



IMAGE 1: FGD IN KABANGWE



IMAGE 2: FGD IN NG'OMBE

Observation

There was a good degree of participation from all participants, regardless of gender and type of fuel used. No behavioural or social observations were recorded in this study; however, one enumerator noted the EPC-users in Ng'ombe sounded more enthusiastic and had a more positive statements about eCooking, compared to Kabangwe. They noted, this could be because they have better electricity access, which is confirmed in the above background section.

Loadshedding, lack of spare parts, lack of local LPG refilling points, and increasing LPG prices all affect the uptake and use of clean cooking appliances and can cause households to revert to polluting fuels, despite increased biomass fuel prices.

Analysis and Discussion

Adopting Modern Energy Cooking

Inadequate access to modern energy for cooking can have a severe impact on households, causing them to revert to polluting fuels, despite increased fuel prices in some situations. For example, Kabangwe is prone to load shedding, as EPC participants reported experiencing it at least three times a week, and some resorted to using charcoal again. Similarly, the absence of local access to LPG refilling facilities deterred LPG participants from using the fuel frequently. Nonetheless, there are ways to work around the absence of infrastructure. A participant in Ngombe mentioned that LPG was important since it allowed them to continue cooking during load-shedding. Clean fuel-stacking is referenced in the Zambia eCookbook as a strategy for addressing electricity infrastructure concerns, as it strongly recommends

utilizing LPG in times of load-shedding and eCooking on energy-efficient devices to save money overall when conditions allow.

Convenience is a major factor. The main aspect is time savings- not only cooking time but also the time saved in cleaning the EPC. The EPC is able to keep food warm, allowing them to cook their meals earlier and eat later.

Convenience is a major factor for households contemplating to use modern energy cooking devices/fuels. Participants in both areas use comparative methods to determine the "worthiness" of fuel and associate "convenience" primarily with time-savings, which includes not only cooking time but also other permeating to lifestyle attributes such as the time it takes to clean the EPC device and the ability to keep food warm, allowing them to cook their meals earlier and eat later. Participants in Kabangwe also appreciated the ease of use and taste of foods prepared in the EPC, stating that these devices are easy to clean and produce tastier results.

Business models such as 'Pay as you go' and village banking groups are mechanisms which would enable community members to purchase Clean Cooking appliances through repayment plans.

Interestingly, affordability was the least influential aspect in the adoption of MECS. Although high capital costs were mentioned and payment plans were suggested as a solution, respondents hailed on the reductions in fuel costs since adopting MECS. Participants showed more willingness to embrace fuels if the preceding objectives were met (convenience and reliable fuels) rather than cost reductions alone. Participants, for example, would revert to charcoal/firewood if load-shedding (an inconvenient element) continued, as expressed by one participant. Furthermore, cost can include additional items beyond the cost of the fuel alone. For example, the lack of local access to LPG cylinders necessitates longer travel, which is both expensive and inconvenient, given that cylinders are bulky and heavy. Nonetheless, Ng'ombe participants report that LPG is still cheaper than charcoal, and there is evidence that both fuels will continue to rise in the near future⁵. Participants from both areas expressed a desire to be able to select how much to refill at a particular moment as they pointed out that the rising cost of LPG is a barrier to adoption. They believe that adoption can be increased if

⁵ Informal communications- forthcoming blog

initial costs can be met through PayGo technology, or through local savings groups, for example.

Consumer Awareness and Marketing

In Kabangwe and Ng'ombe communities, neighbours are the primary social connection when it comes to cooking, and peer-to-peer sales are likely to prosper by word of mouth.

Participants referred to their neighbours as their primary social connections when it comes to cooking, so they used them as examples to answer questions 7 and 8. Neighbourhood kinship is extremely important for knowledge collection and perception formation. One participant cited their neighbour as proof that the EPC can be a harmful item because they had pressure cooker-related issues. The issue of safety concerns relating to both LPG and EPCs is common among the participants' referees. When describing the dangers, participants relayed talks of "bursting," a word used multiple times to describe LPG cylinders and EPC lids. Bursting events are instantaneous and unpredictable, which makes them more difficult to cope with compared to traditional fuels where the dangers tend to develop more gradually. Two points should be addressed here. First, consumers are likely to associate the stove-top

Safety concerns relating to pressure cookers is common among participants. Marketing needs to emphasize the range of safety features incorporated in EPC designs to distinguish them from stove top pressure cookers.

pressure cooker with its more advanced version of the EPC; this suggests that a clear contrast needs to be made when marketing EPCs, emphasizing the range of safety features incorporated in EPC designs. Stovetop pressure cookers have a long history, and there have been mishaps involving their use. However, EPCs in SSA are still relatively new and are not sufficiently widely used to change consumer perceptions. Second, the proximity of neighborhood linkages means that promoting new cooking fuels will be best done through local relationships. The notion of community has a long history of trust among neighbouring communities in Zambia, and programmes like peer-to-peer sales are likely to prosper under these conditions. As a result, consumer awareness should be concentrated in communities, and the likelihood of purchasing new cooking devices is based on word of mouth. This is supported by Kabangwe participants' suggestions for community-based activities such as culinary demonstrations and gatherings.

There is an opportunity to make EPC design more user friendly and better adapted to normal cooking practices. For example, Nshima, vegetables and meat could not all be prepared concurrently in the EPC.

Cooking Practices

It is more necessary for a device to adapt to the user's cooking practice than for the user to adapt to the device. Many participants asked for additional pots to allow cooking multiple dishes in an EPC. This is a normal practice in households, which is usually achieved by other appliances such as 2-4 stove hotplates and twin burner LPG stoves. Furthermore, as shown in the Zambia Modern Energy cookbook⁶, at least 67% of meals require stirring and Nshima, for example, requires vigorous stirring, hence why a participant suggested EPC pots should have a handle. Participants in Ngombe stated that their EPCs did not respond to their commands. While this could indicate a malfunction, it could also indicate a deeper need to understand the EPC functions needed to achieve the desired outcome. There is also scope for adapting eCooking devices to the needs of consumers, for example, an East African EPC features popular dishes such as nyama choma, are featured as buttons⁷.

Further Research

The Focus Group Discussions have identified key issues that need to be researched further in the realm of modern-energy cooking in Zambia, such as

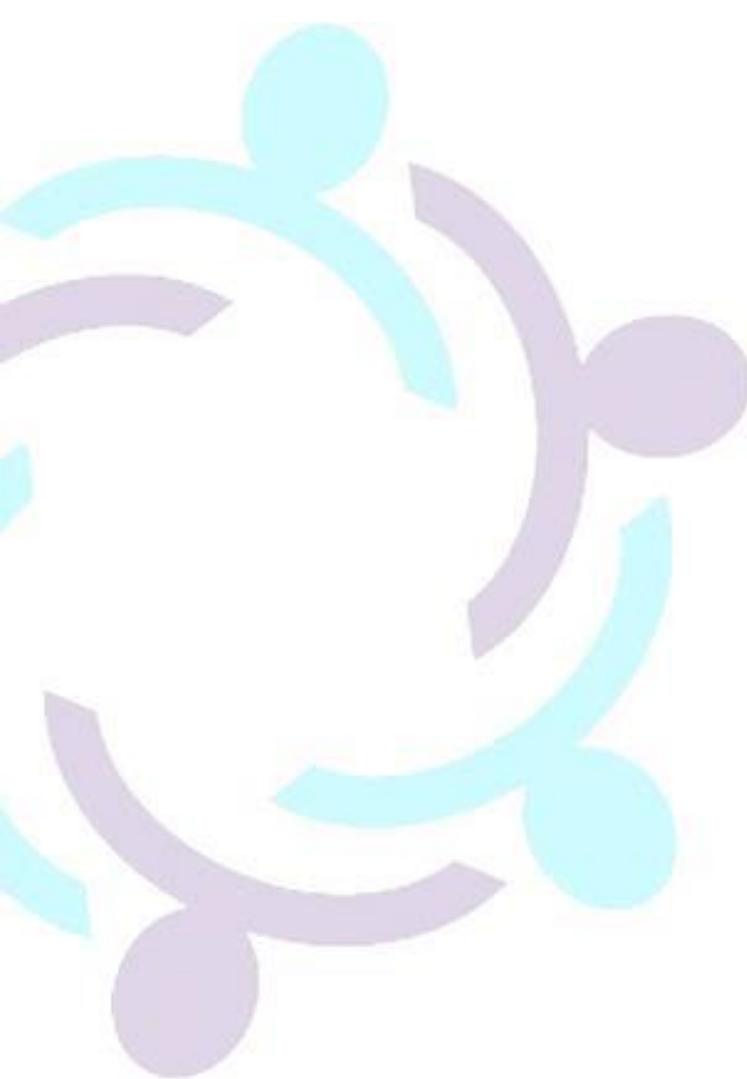
- Infrastructure needs to be strengthened to improve the quality of the supply of electricity and to improve the availability of LPG.
- Business models should include affordable delivery of LPG and flexible refill amounts.
- Marketing and awareness-raising campaigns should emphasize the convenience of modern fuels, such as time savings and cleanliness, and ongoing fuel cost savings.
- Marketing and awareness-raising campaigns should include community-level activities to take advantage of neighbourhood linkages.
- Marketing and awareness-raising campaigns need to address consumer concerns, including safety, and impaired taste (EPCs).

⁶ <https://mecs.org.uk/wp-content/uploads/2022/03/Zambias-modern-energy-cookbook-the-future-of-Zambian-cooking.pdf>

⁷ <https://mecs.org.uk/blog/pioneering-advances-in-the-affordability-and-usability-of-electric-pressure-cookers-for-underserved-markets-burn-manufacturing-kenya/>

Findings highlight several issues that merit further research:

- The role of local, informal savings groups in helping consumers pay the high up-front costs of modern, efficient cooking devices.
- EPC designs should be modified to accommodate the needs of cooks, including solutions to facilitate stirring, appropriate cooking functions and buttons, and designs that will enable people to cook multiple dishes at the same time.



Appendix

Appendix 1

MECS FOCUS GROUP DISCUSSION

Kabangwe Township FGD

The Kabangwe FGD meeting took place on the 29TH of April 2022 at 09:30HRS. In total, 13 participants attended the FGD in Kabangwe. Two were male participants while the rest were female participants. Six of the participants were users of MECS intervention appliances (three from LPG user households while the other three from EPC user households).

All the users of MECS intervention clean cooking appliances revealed that they first heard about MECS program and its Cooking Diary activities from a person working for Centre for Energy, Environment and Engineering Zambia. This was during his round of household visitation to recruit participants for the cooking diary study. Non-users heard about the appliances through the users who happened to be their neighbours.

Having used MECS intervention appliances for over five months, the user participants agreed that they were better placed to share their respective experiences. According to feedback across the users, the most common best attributes associated with both using LPG or EPC were the appliance ability to cook dishes faster than charcoal, mbaula and hotplates combined, low energy consumption, convenience/ user friendliness and basically clean cooking experience. However, one participant liked the EPC for its 'keep warm' feature, easy to clean pot and its ability to remain the natural aroma of dishes especially for beans and Nshima. She said that, **provided that electricity was available**, she was able to cook in advance, slightly earlier than meal time and her household could still enjoy Nshima because the EPC kept it warm and tasty even for the household members who opted eat after an hour. She also added that the pot was so easy to clean, it requires few minutes to clean post cooking without soaking it in water, comparing with the practice when Nshima is cooked in ordinary pots on either mbaula, LPG or hotplates stoves. As a result, she has packed most of her pots and she no longer faced the challenge of cleaning pots with scouring powder.

The other EPC user added that she enjoyed boiling rice, the crust formed when Nshima was cooked and easiness in boiling water for tea in the EPC.

For the LPG user, his specific preference was the LPG ability to cook any type of dishes without producing smoke and that unlike charcoal mbaula stove, LPG had the provision to control heat emission flow and it kept the kitchen warm. The other two users revealed that they cooked Nshima faster with LPG stove than charcoal or hotplate. In an event that unexpected visitors came; they were not bothered as it was easy to switch on the stove and cook a meal so fast to save the visitors.

Although challenges linked to these intervention appliances appeared to be few, participants indicated that they were profound as they affected their daily cooking experiences. Common to EPC was the appliance inability to accommodate more than one dish at a time due to use of only one pot. EPC users felt that it was inconveniencing to wait until one dish finished cooking before they could start another one. This was against their typical historic household practice where Nshima, vegetables and meat dishes could all be prepared concurrently. The specific issue was associated with EPC's sudden switching off and at some instances failure in responding to assigned command to cook dishes even when the Menu display showed power was available to the EPC. Unavailability of spare parts on the local market to replace malfunctional parts and absence of EPC repairers outside the retail shops was also a big problem as identified by the users.

EPC users identified loadshedding as the biggest problem they faced in Kabangwe. They complained that load shedding was commonplace in the area, and often occurred at least 3 times/week and could last for 2 hours. Participants confirmed that loadshedding drove and forced them to switch back to charcoal fuel for the EPC users while the non-users continued to heavily rely on charcoal.

Synonymous with LPG were the difficulties to know gas consumption pattern due to absence of flow rate meter on the gas cylinder. They revealed that this issue made planning and budgeting for the next refill difficult as gas could finish when it was least expected and at times LPG abruptly finished when the household had no money.

The other problems which caused inconsistent use of LPG stoves, included the absence of refilling points within the area. LPG users lamented that they travel long distance to refill the LPG cylinders and these travels came with transportation cost. In addition, participants complained that the distributors of LPG were not flexible to allow refilling their cylinder based on the available money but that customers needed to refill maximum gas as prescribed by cylinder respective sizes. One of the users pointed out brand specificity as one issue affecting uptake and frequency use of LPG stoves. He noticed that despite his area having nearby filling stations which stocked LPG, he could not refill from them because they were a different brand from the cylinder he possessed. Lastly, the unstable price of LPG made cooking with gas difficult and unpredictable undertaking going forward as gas was becoming more expensive.

Both the users and non-users of MECS intervention cooking appliances recognized loadshedding and lack of spare parts for the EPC, lack of refilling points within the neighborhoods and high cost of LPG as barriers to domesticating these clean and energy efficient appliances.

People's Misconceptions about MECS intervention appliances

People's Misconceptions about EPC

The participants were asked to highlight people's misconceptions about EPC. The following were the feedback.

- i. The EPC is not 100% safe in the household. There is high likelihood that due to high pressure inside the enclosed pot, it can accidentally burst and cause severe burns. One non-user narrated that her neighbor and one of her relatives got burnt with the steam from the ordinary pressure cooker.
- ii. The EPC is very expensive for a low and medium income to purchase.
- iii. Food cooked in an EPC loses its natural taste.

People's Misconceptions about LPG

- i. It is very dangerous to place the LPG cylinder in the house while cooking. One non-user claimed that she had heard of an accident associated with a cylinder bursting causing burns.

Users of the EPC cited the 'Keep warm' feature and fry option, the ability to cook Nshima, rice and beans faster with less energy and non-stick pot feature, would make them buy another EPC. Adding an extra pot was the most common suggestion across users including non-users who had seen the EPC and saw how it worked. In the case of LPG, participants cited the easiness to switch on and off, faster in cooking foods, less fuel use, and no smoke during cooking as the attributes which would trigger them to buy another LPG stove and cylinder.

Recommendations

The participants recommended that manufacturing should consider adding a detachable handle on the EPC to prevent the pot from rotating during cooking of Nshima. They also propose the addition of an extra pot as this will allow swift switch from one dish to another. Lastly, they also recommended that EPC spare part should be readily available on the market. On the LPG stove, one participant recommended that the holes of burners to be made smaller to restrict high flow of gas and flame.

On marketing messages, the participants advised that the information should be made simpler for all to understand and should be able to demonstrate energy and time efficiency as well as speak to typical households needs. Participants also expressed that organising open meetings, FGD coupled with cooking demonstrations on clean cooking appliances, would generate so much interest from the communities especially members of village banking groups.

In term of how prospective companies dealing with clean cooking technology such as EPC and LPG could reach out to typical mass markets, participants recommended Pay as you go business model and approaching women's groups such as village banks to negotiate a

mechanism which would allow group members to own clean cooking appliances by remitting their part of the savings via PayGo repayment plan towards the appliances of their choice.

In conclusion, it was heard that the users of both EPC and LPG were now spending less time on cooking as well as fuel than before they switched. One EPC user narrated how she occasionally used electricity prior to MECS program to prepare her food and how she used less charcoal after transition. Although she could not quantify her savings as a result of transition, she said she saw a significant reduction in her monthly fuels costs.

EPC and LPG with their fuels were the ideal appliance they would want to use in future.

Appendix 2

MECS FOCUS GROUP MEETING

DATE: 4th May 2022.

TIME: 10: 00 hrs. - about 1:30m

VENUE: Ng’ombe Compound

The Chairperson welcomed all to the meeting and thanked the host for allowing us to hold the meeting at her home. He asked them to be comfortable, freely express themselves and give suggestions that will be beneficial.

MEETING PURPOSE:

To undertake focus group discussions with high, medium and low-income clusters in the community to understand whether electricity is the aspirational fuel for most households in Zambia and to establish the main barriers in adoption of modern energy cooking.

13 participants were present at Ng’ombe Focus group discussion. Below is a breakdown by gender and user appliance.

Type of intervention appliance	Number of users	Number of Non-Users	Gender of participant		Total participants
			M	F	
EPC	7		1	6	7
LPG	3			3	3
Unknown		3	1	3	3

All EPC users confirmed to have heard about the MECS intervention stoves through enumerators who were tasked by CEEZ to recruit participants for the cooking diary in the community.

In the case of LPG users, two users heard about MECS intervention stoves just the way all EPC users did, except one user who had heard through a friend whose household took part in the 2019-2020 PEER/EPPSA charcoal alternatives project and later introduced her to CEEZ-MECS enumerator.

The non-users were basically informed by their neighbours who owned the intervention stoves. However, one non-user had found her sister using the EPC the previous day. She got intrigued when she noticed that her sister was able to cook Nshima in the EPC which made her conclude that the appliance was good for the environment. One non-user had to account how she found her sister using an LPG stove and that after a series of questions about the appliances, she came to know about the MECS intervention cookstoves.

Both the EPC and LPG users agreed to the fact that their respective intervention stoves were fast (time smart) in meals preparation, clean for both the cook and the surrounding environment as no smoke, or powdered char and ashes were generated in the process, were easy to use, and energy efficient compared to charcoal and hotplate cookers. Two impact stories associated with EPC user experience came from two female participants. The first woman revealed that the EPC became so handy during the period she was nursing her now deceased husband. Because of EPC's ability to cook diverse dishes and boil water, she found it easy to prepare porridge for her sick husband in the morning, boil water to bath him and make tea for the family and the visitors. In addition, her workload drastically reduced as she spent less time cooking and washing pots after meals due to the non-sticker property of the EPC. Her shift to EPC made her save time which she utilized well to care for her late husband.

An elderly woman who has difficulties moving about due to swelling legs, narrated how the acquisition of the MECS-EPC brought relief in her household and basically made her cooking experience so exciting. She said she had been able to cook household meals with less stress. Apart from cooking many dishes such as Nshima faster and cheaper due to low energy consumption, she loved the fact that the EPC was a portable cooking appliance as this meant that she could cook right from where she sat without stressing herself by moving about.

For the LPG users, significant saving on money and time was equally reported. One LPG user revealed that before transitioning to LPG, her household used to spend about K300 on charcoal per month and switching to LPG stove, gas for K180 was enough to last for a month. She further added LPG performed faster than charcoal and hotplate combined in preparing her dishes.

In a similar trend, the other LPG user was happy because the stove "beautified" her house and helped her save money. Prior to transition her household use to spend K400 on charcoal but the switch meant that the household needed a K180 worth of gas monthly.

One interesting feedback from the LPG users hinged on an uninterrupted cooking experience during load-shedding moments. The users of LPG agreed that it was an all-time clean fuel and unlike electricity.

Challenges associated with use of EPC

The EPC

The pronounced problems associated with EPC performance was the failure to respond to cooking command. 2 EPC recipients reported that their EPCs could not accept commands that trigger the plate to heat up and cook respective dishes despite power being available. One participant informed FGD that her EPC stopped receiving power despite the appliance being correctly connected.

One participant lost the pressure valve when cleaning the appliance and therefore could not cook anything that needed pressure such as beans. They claimed the appliance became slow when in use.

LPG

Although no technical challenges were observed on LPG, access to refueling points and the fluctuating price of LPG posed a serious concern for the users. LPG users lamented that refueling points were designated in places far away from their households. This situation was a cost on their time and additional cost to their household expenses because travelling to refueling points meant that they spent extra money on transport. On the part of fluctuating LPG prices, it made budgeting for LPG difficult.

LPG users would be deterred if price of Gas keeps going up. There are also misconceptions that gas is very dangerous.

The participants highlighted the following misconceptions about the intervention appliances:

- The Neighbors and extended family think EPC can suddenly burst and cause serious injuries during cooking.
- The Neighbours and extended family believed that the EPC seemed difficult to operate and that it cannot cook Nshima.
- The Neighbors and extended family think the EPC is as bad as the hotplate when it comes to electricity consumption hence an expensive appliance to cook food with.
- LPG is a dangerous type of fuel in the household and a safety hazard.
- Gas is very flammable hence it is dangerous to place an LPG cylinder in the kitchen while cooking.
- Gas is very expensive for a typical Zambia household.

The most appealing feature about EPC and LPG, respectively are:

- The keep warm option- participants valued it so much because they were able to cook in advance and eat warm foods later.

- The non-sticker feature- Participants were happy because it was very easy to clean the pot after cooking.
- EPC is an energy efficient cooking appliance. Our households are already connected to National Electricity infrastructure making it cheaper and easy to adopt and adapt to the appliances. Access to electricity connectivity to power our EPCs is within our reach.
- LPG gas cooks faster and is usable in the face of loadshedding which is not the case with EPC.
- EPC users interested in LPG as it works well even when load shedding happens.

Recommendations on appliances features:

- Let the EPCs come with spare parts. Currently, it is very difficult to purchase spare parts on the markets.
- Make the EPC compatible with our local dishes by adding a removable handle to hold it tight during steering of Nshima.
- Let the Menu options inscription be written in local language for easy grasping of cooking instructions.
- Introduce an additional pot.
- Add a flowrate gauge so that we would be able to monitor our consumption rate.
- Let the customer determine the quantities of gas to be refilled. Oftentimes customers fail to refill to the cylinder's threshold quantities when the available money does not match the assigned price of respective cylinder size.

Information about time and energy saving, climate and safety should be at the center of marketing message. This message would be more impactful if packaged in demonstrations via road shows, media, and documentaries that talk about time and energy saving, climate and safety.

Pay as you go is recommendable because many households would be able to manage payments in instalments. The stove companies must also consider working with Village banks groups to reach out since many would be willing to pay back through their savings.

It was also noted that both LPG and EPC users are paying less for Fuel now than before. Electricity users paid less whilst most users have reduced dependency on charcoal.

Finally, the participants for both the EPC and LPG admitted that they still stack fuel although the fuel quantities used on mbaula and hotplates had significantly reduced due to the adoption of intervention stoves. They also confirmed that their cooking had become easier, cleaner, and faster.