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MODERN COOKING FOR HEALTHY FORESTS IN MALAWI

URBAN COOKING ENERGY CONSUMER MARKET RESEARCH AND MIDLINE SURVEY

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Cover photo: UpEnergy sales agents interacting with a prospective client during a Cleaner Cooking Demonstration in Lilongwe.

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ACRONYMS AND ABBREVIATIONS

AE	Alternative Energy
BL	Baseline
BT	Blantyre
CMR	Consumer Market Research
EA	Enumeration Area
GoM	Government of Malawi
HH	Household
Kg(s)	Kilogram(s)
LL	Lilongwe
LPG	Liquefied Petroleum Gas
MCHF	Modern Cooking for Healthy Forests
MK	Malawian Kwacha
ML	Midline
MZ	Mzuzu
NGO	Nongovernmental Organization
SD	Standard Deviation
UNFCCC	United Nations Framework Convention on Climate Change
ZA	Zomba

EXECUTIVE SUMMARY

Modern Cooking for Healthy Forests (MCHF) is a five-year project co-funded by USAID and UKAID. MCHF is implemented by Tetra Tech in partnership with five subcontractors: Centre for Environmental Policy and Advocacy, Lilongwe Wildlife Trust, mHub, Winrock International, and World Resources Institute.

Kadale Consultants conducted the MCHF urban cooking energy consumer market research and midline survey from August 8 to September 24, 2022. This was a “follow-on” to the urban cooking energy consumer market research and baseline survey, which was conducted by Kadale Consultants between August and October 2020. The midline survey involved interviewing 1,611 households (HHs) across Malawi’s four cities of Lilongwe (LL), Blantyre (BT), Mzuzu (MZ), and Zomba (ZA). In addition, as part of the midline survey, Kadale completed a market-level survey that spanned 48 urban charcoal markets and engaged 348 individual sellers (“charcoal vendors”) in interviews.

For the purpose of this midline survey report, the original baseline results were recalculated to exclude Salima, so the results for the four cities, and in aggregate could be more easily compared. Key findings related to MCHF performance indicators include:

1. **Percent of urban households that have adopted alternative cooking energy sources (AE) and/or fuel-efficient cooking technologies (FE).¹** This was calculated as the proportion of HHs using one or more AE for cooking for 50% of the time or above. Overall, the findings showed that 28.6% at baseline and 32.1% at midline were using AE for at least 50% of their cooking needs. This represents a statistically significant increase of 3.5 percentage points. Of these, the most commonly used AE by households both at baseline (26.0%) and midline (26.7%) was electricity. This was followed by liquified petroleum gas (LPG), which was used by 2.1% of HHs at baseline and 6.1% at midline.
2. **Percent of urban households that have adopted fuel-efficient cooking technologies (FE).** This was calculated as the proportion of HHs using one or more FE for cooking for 50% of the time or above. Overall, the findings showed that 27.1% of the households were using improved cook stoves 50% of the time or more at midline compared to the 14.9% at baseline. This represents a statistically significant increase of 12.2 percentage points. Electric cookers were used by 17.9% of HHs at baseline and 18.2% at midline, chitetezo mbaula (firewood) by 7.4% of HHs at baseline and 10.3% at midline, and Envirofit (charcoal) by 0.6% of HHs at baseline and 0.9% at midline. UpEnergy SmartHome (Charcoal), Ngala ya moto (Charcoal) and Mbambande Quick fast (Charcoal) were used by 1.6%, 0.1% and 0.1% of the households at midline respectively (and were not available at the time of the baseline). Traditional jikos were used by 83.7% at baseline and 79.2% at midline.
3. **The percent of the sampled target audience reporting exposure to messages on alternative cooking energy sources and/or fuel-efficient technologies on radio, TV, electronic platforms, or in print.** This was calculated as a proportion of all HHs sampled, and was 93.7% at baseline and 96.2% at midline (unprompted). Of those that had heard of AEs, 90.8% at baseline and 92.8% at midline (unprompted) said they had heard of electricity, 34.3% at baseline and 77.3% at midline stated LPG, 10.3% at baseline and 31.2% at midline stated briquettes, 3.3% at baseline and 29.8% at midline stated sustainable charcoal, and 4.3% at baseline and 12.4% at midline stated pellets.
4. **Trends in household charcoal consumption.** There was a reduction in the percentage of HHs that used charcoal as their primary source of cooking energy between baseline (85.8%)

¹ While this indicator tracks adoption of both AE and FE, for ease in reporting these have been reported separately.

and midline (81.8%). In addition, the results of the midline indicate average daily household consumption of charcoal declined from 2.25 kilograms (kg) at baseline to 1.90 kg at midline.

5. **The mean price of illegal and unsustainably produced charcoal across the four cities.** Averaged across all four cities, between baseline (2020) and midline (2022), the price for illegal and unsustainably produced charcoal increased by 88%. Charcoal prices were calculated with dust (gross) and without dust (net, usable charcoal). At baseline, the mean (average) price per kilogram of charcoal was: Malawian Kwacha (MK) 176/kg, with dust; and, MK 185/kg, without dust. At midline, the average price per kilogram of charcoal was: MK 340/kg, with dust; and, MK 348, without dust. The per kg prices with dust, by city, at baseline and at midline (in brackets) were: LL - MK 207 (MK 439); BT- MK 173 (MK 324); MZ - MK 139 (MK 235); and ZA - MK 169 (MK 297). The per kg prices without dust, again by city, at baseline and at midline (brackets) were: LL - MK 218 (MK 445); BT - MK 178 (MK 335); MZ - MK 165 (MK 243); and ZA - MK 172 (MK 304).
6. **Charcoal sellers.** The highest level of education attained by most charcoal sellers both at baseline and midline was primary (Standard 1-8) at 54.9% and 50.9%, respectively. On average, the sellers had been selling at their particular market for five years both at baseline and midline. Most of them gave electricity (unprompted) as an AE to charcoal (87.3% at baseline and 89.2% at midline). Other fuel sources cited were LPG (13.2% at baseline and 50.9% at midline), briquettes (9.4% at baseline and 20.9% at midline), paraffin (8.7% at baseline and 17.0% at midline), sustainable charcoal (1.8% at baseline and 7.2% at midline), and pellets (0.7% at baseline and 1.8% at midline). Overall, there were substantial increases in charcoal sellers' knowledge regarding all the AEs.

In terms of HH demographics, the most common source of income for urban HHs both at baseline and midline was formal employment, at 48.7% and 46.5%, respectively.

In relation to cooking fuels and appliances, most HHs (85.8%) reported using illegal and unsustainable sources for cooking at baseline, compared to 81.8% at midline. Although 69.0% of HHs surveyed were connected to the grid, only 29.9% of HHs used electricity for cooking at baseline. Similarly, although 71.8% were connected to the grid at midline, only 30.2% of those HHs reported using electricity for cooking.

Unsustainable illegal charcoal and firewood were the most common fuels for heating water, used by 59.7% and 35.7% of HHs, respectively, at baseline. Charcoal usage decreased at midline where 57.8% reported using unsustainable illegal charcoal. Sustainable charcoal was used by 0.5% of HHs at baseline and 1.1% at midline for heating water.

The most commonly used cooking technology at baseline, with 83.7% of HHs, was the jiko stove (uses charcoal). Usage of the jiko reduced to 79.2% at midline. At baseline, 7.4% of HHs used chitetezo mbaula (firewood), which increased to 10.3% at midline. Less than 1% of HHs (0.6%) used the charcoal Envirofit stove at baseline; this increased to 0.9% at midline. No HHs used the firewood Envirofit stove at baseline, but usage increased to 0.1% at midline. At baseline, 17.9% of HHs were using an electric cooker, which increased to 18.2% at midline. For LPG, 1.6% of HHs used a cylinder burner at baseline, with an increase to 3.8% at midline. LPG cooker usage increased from 0.8% of HHs at baseline to 2.3% at midline.

On preferences, the jiko was the most preferred stove by 56.3% of HHs at midline, down from 60.8% at baseline. This was followed by the electric cooker preferred by 12.0% of HHs at baseline and 13.6% at midline. The top three reasons cited by respondents at baseline for these preferences were: cooks faster (52.4%), is affordable (46.8%), and is accessible (38.9%). A similar trend was

observed at midline with the top three reasons cited as cooks faster (60.5%), is affordable (59.7%), and is accessible (54.1%). Using three stones was the least preferred cooking method at baseline (62.5%) and midline (52.9%),² as it involved getting dirty (as expressed by 55.5% of HHs at baseline and 52.8% at midline). The pattern varies by location, with very high use of illegal and unsustainable charcoal and jikos in BT and high use of three stones and firewood in ZA, both at baseline and midline.

It was also found that 22.2% of all HHs had an improved stove/fuel-efficient cooking technology at baseline, which increased to 32.5% at midline. The percentage of HHs that did not have stoves but were willing to buy improved stoves if they were readily available was 87.7% at baseline and 91.2% at midline. Of those that were willing to buy stoves if readily available, the most common reason for buying was just to try them out, as reported by 66.5% at baseline and 84.0% at midline. 11.1% at baseline and 8.3% at midline were not willing to buy. 1.2% and 0.5% of the baseline and midline respectively did not respond to the question. 46.8% of those not willing to buy cited that they cannot afford it, while at midline, 44.0% cited that they cannot afford it. Another 44.0% at midline reported that they were satisfied with their current stove.

Overall, there was more awareness (both prompted and unprompted knowledge) of AE and FE at midline than at baseline. Despite the jiko and unsustainable charcoal being used by most HHs both at baseline and midline, there has been a reduction in both as HHs increased use of AE and FE.

Charcoal and firewood remain readily available in all urban markets, including wholesale and retail markets and smaller clusters of sellers outside these markets. This said, there has been an increase in the price of woodfuels, and most notably in the price of charcoal, across all four cities, between baseline and midline. At both baseline and midline the price of charcoal was most expensive in Lilongwe, followed by Blantyre; while the price of charcoal was least expensive in Mzuzu, both at baseline and at midline.

² Three stones are not cooking equipment or a stove, but it is a common alternative to these.

1.0 INTRODUCTION

The Malawi Modern Cooking for Healthy Forests Activity (MCHF) is a five-year activity funded by the United States Agency for International Development (USAID) and United Kingdom Foreign, Commonwealth, and Development Organization (UKaid), and implemented by Tetra Tech in association with five core subcontractors: the Centre for Environmental Policy and Advocacy (CEPA), the Lilongwe Wildlife Trust (LWT), mHub, Winrock International, and the World Resources Institute (WRI). The contractual period of performance for MCHF began on October 1, 2019 and will end on or around September 30, 2024.

This report presents the results from the Urban Cooking Energy Consumer Market Research (CMR) and Midline Survey conducted by Kadale Consultants Ltd, a Malawi-based research firm, ('Kadale'), between August and September 2022. The survey covered Malawi's four cities: Lilongwe (LL), Blantyre (BT), Mzuzu (MZ) and Zomba (ZA).

1.1 PURPOSE OF THE MIDLINE SURVEY

From the Terms of Reference, the specific objectives of the CMR and midline survey research are to:

1. Enable MCHF to understand the current context for urban household (HH) cooking (fuels and technologies); and
2. Establish whether, and if so, how this has changed compared to the baseline, conducted in 2020.

In particular, the survey provides information on two MCHF project performance indicators:

- **Project Indicator #5:** Percent of households in urban areas that have adopted alternative cooking energy sources and/or fuel-efficient cooking technologies.
- **Project Indicator #6:** Percent of sampled target audience reporting exposure to messages on alternative cooking energy sources and fuel-efficient technologies on radio, TV, electronic platforms, or in print.

1.2 THE MCHF PROJECT

MCHF supports the Government of Malawi to address the growing problem of charcoal-led deforestation. The main threat to Malawi's forests is unsustainable harvesting due to over-reliance on wood fuels to meet energy needs (charcoal and firewood for cooking, fish smoking, and brick and tobacco curing). More than 96 percent of households rely on wood fuels as their primary cooking energy, and between 2011 and 2018 the percent of urban households that relied on charcoal as their primary source of cooking and heating energy increased from below 45 percent to more than 75 percent (National Statistics Office—NSO, IHS3, 2012; and, NSO, Malawi Population and Housing Census, 2018).

The MCHF project works to strengthen regulation and enforcement, reduce unsustainable wood fuel demand, and increase sustainable wood fuel supply by:

1. Implementing a landscape approach that addresses wood fuel supply and demand, and reduces underlying drivers of forest cover loss;
2. Developing inclusive and sustainable market systems across alternative energy (AE) sustainable charcoal, and forestry value chains by engaging a wide range of actors within each value chain,

identifying leverage points that overcome market constraints, and facilitating market-based solutions that utilize local systems and resources;

3. Engaging the private sector and mobilizing financing, investment, and additional resources that mobilizes and increases investments for the alternative fuels, fuel-efficient technology, and improved forest governance and forest land restoration;
4. Building on and advancing key Government of Malawi (GoM) policies and strategies that directly support key GoM policies and strategies, particularly the Malawi Growth and Development Strategy III, Malawi 2020 Vision Document, National Charcoal Strategy, National Energy Policy, National Forestry Policy, Forestry Act, National Cook stoves Program Roadmap, National Forest Landscape Restoration Strategy, and Malawi Renewable Energy Strategy; and,
5. Strengthening local capacity for self-reliance and sustainability by prioritizing local partners, working with and through GoM institutions, implementing facilitative market system approaches, and supporting human and institutional capacity development.

2.0 METHODOLOGY AND IMPLEMENTATION

This section sets out the methodology for the two surveys: the CMR, which was a HH survey and the market price survey covering markets where charcoal was for sale and the vendors that were selling it.

2.1 HOUSEHOLD SURVEY

The key activities for the HH survey are set out in the sections below.

2.1.1 SAMPLE SIZE CALCULATION

MCHF proposed a HH sample that requires 403 HH interviews in each of the four locations, except Zomba (402) making 1,611 HHs in total. This was calculated at 95% confidence level and 5% margin of error using Cochran's formula and is very similar to the sample size used in the baseline. Kadale agrees with MCHF's proposed methodological approach, which evolved in the baseline study that was successfully implemented by Kadale. In the baseline, 62 wards/areas were intended to be sampled across the four cities and the research team ended up visiting the same number of wards/areas.

As with the baseline, the study had to be fully aligned with the United Nations Framework Convention on Climate Change (UNFCCC) standard for sampling and surveys for Clean Development Mechanism project participants.³ This is important to facilitate access to carbon finance. The UNFCCC standard⁴ provides clear information on how samples should be determined and conducted.

TABLE 1: OVERALL PLANNED SAMPLE PER CITY & AREA/WARD

CITY	NUMBER OF RESPONDENTS	AREAS/WARDS
Blantyre (BT)	403	13
Zomba (ZA)	402	10
Lilongwe (LL)	403	26
Mzuzu (MZ)	403	13
Total	1,611	62

TABLE 2: SPLIT OF PLANNED SAMPLE BY CITY AND AREAS/WARDS

CITY	NUMBER OF RESPONDENTS	AREAS/WARDS	RESPONDENTS PER AREA
BT	403	13	31 in 13 Wards
ZA	402	10	40 in 9 Wards & 42 in 1 Ward
LL	403	26	15 in 22 Areas & 18 in 4 Areas
MZ	403	13	31 in 13 Wards
Total	1,611	62	

³ https://cdm.unfccc.int/Reference/Standards/meth/meth_stan05.pdf

⁴ Ibid.

2.1.2 THE CREATION OF ZONES WITHIN WARDS/AREAS

At baseline, the research team created zones within each selected ward or area⁵ using ArcGIS and Google Earth; these zones were maintained for the midline survey. The zones were created to increase representativeness of the Wards/Areas by evenly allocating the surveys to the ward/area's sections. This increased the representativeness of the sample. The breakdown of the planned sample is displayed in the table below.

TABLE 3: PLANNED SAMPLE SIZE SPLIT BY CITY AND WARD/AREA

CITY	WARD/AREA WITH # OF PLANNED SURVEYS	# OF WARDS/AREAS	# OF EQUAL ZONES PER WARD/AREA	# OF STARTING POINTS PER ZONE	# OF HHS PER STARTING POINT	# OF INTERVIEWS PER WARD/AREA	TOTAL # OF HH INTERVIEWS
BT	Wards with 31 interviews	13	3	2	5/6	31	403
LL	Areas with 15 interviews	22	3	1	5	15	330
LL	Areas with 18 interviews	4	3	1	6	18	73
LL	Sub-total	26					403
MZ	Wards with 31 interviews	13	3	2	5/6	31	403
ZA	Wards with 40 interviews	9	4	2	5/4	40	360
ZA	Wards with 42 interviews	1	4	2	5/4	42	42
ZA	Sub-total	10					402
Total		62					1,611

At baseline, Kadale randomly selected the desired number of wards/areas and grouped these based on the city's categorization of high, medium, and low density.⁶ The number of wards/areas randomly selected in each of the three categories was established using probability proportional to size.

Each ward/area had a specific number of interviews to be conducted. The approach was that each ward would be divided into three equal zones and in some cases four using geographical features and the spread of HHs aided by map/Google Earth inspection.⁷ In each zone, four to six landmarks were identified, such as a school, a prominent shop, a church, a market, etc., and two randomly selected as

⁵ Different cities use different terms for parts of the city that form its administrative boundaries, e.g., BT, MZ and ZA use the term "ward," while LL uses the term "area."

⁶ Categorization enhances the representation of all sections of the city, based on that used by each city. As a result, the densities are not necessarily directly comparable.

⁷ Three equal zones based on the geographical features and map inspection/google earth map.

starting points with a specific number of interviews to be conducted from each starting point, using a right/left hand rule.

The same baseline study areas/wards were used as enumeration areas (EAs) for the midline survey. All the 26 areas in Lilongwe that were selected as EAs at baseline were revisited in the midline, as well as 13 wards in Blantyre, 13 in Mzuzu, and 10 wards in Zomba.

TABLE 4: WARDS/AREAS

	LL	BT	MZ	ZA	
Wards/Areas	6	26	Bangwe	Chibanja	Chambo
Wards/Areas	7	38	Bangwe Nthandizi	Chibavi East	Chilunga
Wards/Areas	9	39	Blantyre City South	Chibavi West	Chinamwali
Wards/Areas	11	43	Chilomoni	Chiputula	Likangala
Wards/Areas	12	47	Limbe Central	Jombo	Masongola
Wards/Areas	14	49	Makata	Katawa	Mbedza
Wards/Areas	15	50	Nkolokoti	Masasa East	Mpira
Wards/Areas	17	52	Mapanga	Masasa West	Mtiya
Wards/Areas	18	53	Mbayani	Mchengautuwa East	Sadzi
Wards/Areas	21	54	Michiru	Mchengautuwa West	Chambo
Wards/Areas	22	56	Mzedi	Nkholongo	Central
Wards/Areas	23	58	Namiyango	Zolozolo East	
Wards/Areas	24		Ndirande Gamulani	Luwinga	
Wards/Areas	25				
# of Wards/Area	26	13	13	13	
Sub-sample per city	403	403	403	402	
Avg. Interviews/Ward	16	31	31	31	

2.1.3 HOUSEHOLD TOOL DEVELOPMENT, TESTING AND FINALIZING

The HH instrument had to deal with difficulties in estimating usage for those using solid fuels (requiring weighing) or other fuels (electricity and liquid petroleum gas [LPG]) requiring calculations, based on the baseline approach. It included assessing multiple meal/drink occasions per day, and how these varied by day in the week. It also recognized that the amount of fuel varies according to the nature of the food that is being cooked, for example beans may need a long period of cooking and may require a specific cooking fuel or technology. There are also other uses of stoves, other than for meals/drinks, such as heating water and heating a dwelling/space.

The instrument had to find a good balance between reducing complexity and yet capturing the diversity of use. These issues were addressed in the design, testing, and proving of the baseline instrument, so the focus was on updating this, which was also essential for comparability.

Kadale and MCHF updated the baseline questionnaire with some options and questions added and one dropped. MCHF shared the baseline questionnaire with comments regarding questions to be modified, added, or dropped. Kadale reviewed and updated the instrument and was sharing it back with MCHF for review. Kadale tested the updated instruments in two locations (one high density and one medium density area in Lilongwe) to check that the revisions worked in terms of skips and responses and to re-confirm that the weighing methods that we planned to use were appropriate. This enabled Kadale to provide a draft final version to MCHF. The instrument had very minor changes made following a final pilot field test and finalized in collaboration with the MCHF team. The tool was comprehensive, as it included updated cook stoves and fuel options that have become available. Kadale submitted the final instruments in English and Chichewa.

2.1.4 WEIGHING OF ILLEGAL CHARCOAL IN THE HOUSEHOLD

A key part of the research was to weigh the charcoal used on each meal/drink preparation occasion. This involved the use of digital hanging and bench⁸ weighing scales. Each team was given a hanging scale that could measure up to 100 kgs and would be good for weighing large bags (at the market) and a bench digital scale that could measure 0-50 kgs to weigh small quantities with high accuracy in kgs and grams up to two decimal points.

The scales were tested for reliability and accuracy. The scales were calibrated by adjusting the dial to ensure that the reading was at zero before any weight was placed on it. Then a one kg packet of sugar was weighed to check that it weighed one kg. If not, the scales were adjusted to weigh the bag at one kg. The team was trained in calibrating and zeroing scales and took packets of sugar to the field for daily calibrating.

2.2 MARKET PRICE POINT IN TIME SURVEY

At baseline, a market price survey was planned at midline to determine the price of charcoal in different bags/containers at a range of places where it could be bought (markets and buying points). The experience gained from the baseline helped Kadale and MCHF to make some changes to the midline instruments. For instance, Kadale increased the number of unit sizes which better reflect those that vendors use to sell charcoal. A protocol for getting permission to interview in the markets was used at baseline and was reviewed. Considering the tension resulting from the recent introduction of heavier fines for illegal and unsustainably produced charcoal-related crimes, the team offered interviewees anonymity, as it was felt that asking for names might be misunderstood.

A key part of the market price point in time survey was weighing of charcoal, removal of charcoal dust and reweighing the charcoal to determine the net weight of usable charcoal. This is a challenging task, as emptying out the charcoal from its containers/bags might damage the charcoal and takes time to re-package it. The solution that Kadale came up with at baseline was to weigh a random sample of 10 bags of each type of packaging available in each market, then to buy three of these randomly selected, unpack them, separate the charcoal and dust, and weigh to establish the amount of dust and charcoal. The charcoal was then sold back to the vendor at a discount, effectively becoming a small payment for repacking it to be able to sell it. This method was acceptable to vendors and avoided Kadale having to buy and then subsequently dispose of illegal and unsustainably produced charcoal.

The research intended for the Field Supervisors to identify the main markets or ‘places’⁹ where charcoal was sold for each ward/area. In wards/areas where there was more than one market, the

⁸ Hanging means the bag/container is suspended. Bench means the bag/container sits on the scale.

⁹ It became clear that there are some larger wholesale focused markets, some consumer/retail markets where charcoal is sold alongside other produce (mainly foods), and locations where there are clusters of sellers outside formal/managed

Supervisor and research team determined the busiest market. In each market, Kadale followed a protocol that required the team to meet the Market Chairperson first, if there was one, to get consent and to introduce the activity to the market leadership. MCHF provided an appropriate letter for Kadale to us, giving information on who the Chairperson could call to check the research was genuine.

The team was required to assess the different units/bags of charcoal that were available in that market on the day of the survey – typically plastic carrier bags,¹⁰ pails/plastic containers and polypropylene bags which were classified according to size e.g., 25 kg and 50 kg bag were assumed to be common.¹¹ It was anticipated that some containers would be sold ‘flat’ or ‘extended’ (crude weaving), for which there could be different prices, meaning there are two variants being flat and extended for each unit.

Kadale selected up to 10 vendors per market at random for each type of unit/bag. In consumer focused, as opposed to wholesale markets, there could be less than 10 vendors in total. In such cases all the vendors were interviewed.

2.3 LIMITATIONS

For the household survey, there were few challenges in getting interviews. The only limitation was that the survey teams were instructed not to enter the house/dwelling, and not to touch appliances to avoid consumer concerns about theft and our concerns about safeguarding. This was overcome in many cases by asking the person to bring the appliance (often a portable stove) outside so the amount of charcoal used could be measured. With fixed cooking appliances, such as cookers, these were described, e.g., was it a full sized or mini-appliance, number of rings, whether an oven, etc.

For the market price survey, the limitations were:

It was not always possible to identify one market per area/ward, as two or more areas/wards would use one main market and there could also be smaller clusters of sellers. The team selected the most appropriate market for each area/ward, whether inside or outside the area/ward by asking the community members the commonly dependable market to buy charcoal. For instance, respondents from Area 11 and Area 12 in Lilongwe stated that they depended on Kauma market for charcoal and therefore the market survey was conducted in that location.

1. Related to the above, it was not possible to find the target minimum of 10 sellers of charcoal in many markets, as sellers appear scattered in multiple clusters than in more centralized locations within the zones.
2. There was resistance in some markets due to the sensitive nature of illegal charcoal trading despite engaging the market leaders on the purpose of the survey. This was anticipated as the survey was conducted when revised high fines for illegal charcoal sale had been brought in. Nevertheless, the teams managed to conduct some interviews with the individuals who were willing to grant an interview and managed to make them understand that this was purely for research purposes.

markets. The term ‘market’ was interpreted to cover formal designated markets and where there are clusters of sellers in ‘informal’ markets.

¹⁰ High- and low-density polyethylene ‘carrier’ bags.

¹¹ This refers to its size for maize/chimanga, as a commonly understood size, not charcoal weight.

3.0 RESULTS AND FINDINGS

The section below presents the midline findings. It is worth noting that the baseline which was conducted in 2020 comprised four cities (Lilongwe, Blantyre, Mzuzu and Zomba) and one town (Salima). In the midline, Salima was not part of the evaluation as MCHF concentrated its major activities in the four cities. Therefore, all the tables in the original baseline that included Salima have been recalculated to exclude Salima data and make them comparable with the midline data that covers the four cities.

3.1 HOUSEHOLD SURVEY

This section presents the findings from the household (HH) survey.

3.1.1 PROFILE OF RESPONDENTS

A total of 1,618 HHs were interviewed in the four cities at midline, as set out in the table below (baseline 1,572 HHs).

TABLE 5: CITY OF RESPONDENTS

CITY	COUNT	%
Lilongwe	405	25.03
Blantyre	404	24.97
Mzuzu	404	24.97
Zomba	405	25.03
Total	1,618	100.00

n= 1, 618, single response

Out of the 1, 618 respondents interviewed 1,285 were female, representing 79.4% (baseline 82.9%) of the sample. The enumerators specifically asked to interview the person most involved with food preparation. This suggests that females are more involved with cooking and so more knowledgeable about cooking fuels and stoves/appliances. Lilongwe had the highest representation of male respondents at 24.9% like the baseline at 23.7%, while Blantyre had the lowest at midline (17.1%) and Zomba had the lowest at baseline (11.0%).

TABLE 6: SEX OF RESPONDENTS

A.2 SEX OF RESPONDENT					
	LILONGWE	BLANTYRE	MZUZU	ZOMBA	TOTAL
SEX OF RESPONDENT	%	%	%	%	%
Female	75.1	82.9	77.0	82.7	79.4
Male	24.9	17.1	23.0	17.3	20.6
Total	405	404	404	405	1,618

n= 1,618 single response

The mean age of respondents was 35, like the baseline. There was little variation across the four cities.

TABLE 7: AGE OF RESPONDENTS

A.5 AGE OF RESPONDENT					
AGE	LILONGWE	BLANTYRE	MZUZU	ZOMBA	TOTAL
Mean	35	33	35	35	35
Median	32	32	32	33	32
Maximum	85	77	75	85	85
Minimum	16	16	17	13	13
Total respondents	405	404	403	405	1,617

n= 1,617 single response

In terms of responsibility for buying cooking fuel, at midline 41.7% (baseline 30.9%) of the respondents were solely responsible, and a further 24.7% were jointly responsible with their spouse or household head. 14.8% of respondents reported that another family member was responsible (baseline 19.1%).

TABLE 8: RESPONSIBLE PERSON FOR BUYING FUEL

A3 WHO IS RESPONSIBLE FOR BUYING FUEL FOR COOKING IN YOUR HH?					
	LILONGWE	BLANTYRE	MZUZU	ZOMBA	TOTAL
RESPONSIBLE	%	%	%	%	%
Respondent only	40	37.1	45.8	44	41.7
Respondent & HH head/Spouse of HH head	20	27.7	31.7	19.3	24.7
Another family member only	20	12.9	9.4	16.8	14.8
Spouse only	9.1	13.9	5.7	10.4	9.8
Another person	8.9	6.7	4	2.5	5.5
Respondent & another family member	2	1.7	3.5	7.2	3.6
Total	405	404	404	405	1,618

n= 1,618, single response

The most common source of income for the HHs at midline is formal work/employment which is represented by 46.5% of respondents (baseline highest was also formal work/employment at 48.7%), with Zomba having the highest proportion at 51.9% and Mzuzu with the lowest at 39.1%. This compares to Lilongwe with the highest proportion at 51.4% and Mzuzu with the lowest proportion at 42.7% at baseline. The lowest main source of household income both at midline and baseline was livestock farming at 0.4% and 0.3% respectively.

TABLE 9: HOUSEHOLD SOURCE OF INCOME

A12 WHAT IS THE MAIN SOURCE OF INCOME FOR THE HOUSEHOLD?					
	LILONGWE	BLANTYRE	MZUZU	ZOMBA	TOTAL
INCOME SOURCE	%	%	%	%	%
Formal work/ Employment	49.9	45.3	39.1	51.9	46.5
Business / self-employment	32.6	37.6	40.4	28.4	34.7
Wage labor (casual)	10.1	16.6	14.1	9.1	12.5
Other (specify)	3.0	0.5	2.5	5.7	2.9
Crop farming	3.7	-	3.7	4.2	2.9
Livestock farming	0.5	-	0.3	0.7	0.4
Do not know	0.3	-	-		0.1
Total respondents	405	404	404	405	1,618

n= 1,618, single response

In all the cities, above half the households were connected to the grid, and was represented by 71.8% of the sample households at midline and 69.0% at baseline. Mzuzu had the highest proportion both at midline (80.7%) and baseline (76.1%), followed by Blantyre both at midline (79.0%) and baseline (69.1%) while Zomba had the lowest at midline (59.5%) and Lilongwe had the lowest at baseline (63.6%).

TABLE 10: CONNECTION TO THE ELECTRICITY GRID

A18 IS YOUR HOME CONNECTED TO THE ELECTRICITY GRID?					
	LILONGWE	BLANTYRE	MZUZU	ZOMBA	TOTAL
RESPONSE	%	%	%	%	%
Yes	67.9	79.0	80.7	59.5	71.8
No	32.1	21.0	19.3	40.5	28.2
Total respondents	405	404	404	405	1,618

n= 1,618, single response

3.1.2 ENERGY SOURCES AND STOVES

This section summarizes the energy sources and stoves/appliances used by the sampled HHs. Respondents were asked to state the fuels/energy sources they use for cooking in their HHs.

ENERGY SOURCES: there was a significant decrease by 4.0% of household that reported using unsustainable illegal charcoal between baseline (85.8%) and midline (81.8%). like the baseline, the highest proportion of HHs using illegal charcoal was found in Blantyre at 94.7% at baseline and 91.3% at midline. there was also a decrease from 36.340.4% at baseline to 38.0% at midline reported by households that use firewood.

On the other hand, there were some increases reported in the usage of energy efficient fuels. for instance, 30.2% of HHs at midline compared to 29.9% at baseline reported using electricity; 6.7% at midline compared to 2.9% at baseline reported using LPG; 0.5% at midline compared to 0.4% at

baseline reported using sustainable charcoal; 0.5% at midline compared to 0.4% at baseline reported using briquettes. fuels such as pellets, dung and solar remained constant between baseline (BL) and midline (ML). The table below illustrates the findings.

TABLE 11: ENERGY SOURCES USED FOR COOKING

B.1A WHICH OF THE FOLLOWING ENERGY SOURCES DO YOU USE IN YOUR HOUSEHOLD FOR COOKING? (%)										
ENERGY SOURCE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Traditional charcoal	78.4	76.8	94.7	91.3	91.3	84.4	78.7	74.8	85.8	81.8
Firewood	33.1	32.8	18.0	20.8	35.0	43.6	58.9	54.8	36.3	38.0
Electricity	39.9	41.7	20.5	25.7	30.9	31.7	28.3	21.7	29.9	30.2
LPG	8.1	13.6	1.0	5.0	0.3	5.5	2.1	2.7	2.9	6.7
Other agricultural residues	4.8	3.5	1.3	1.0	0.5	1.2	0.3	0.7	1.7	1.6
Sustainable charcoal	0.5	0.7	-	-	0.8	1.2	0.8	-	0.5	0.5
Sawdust	1.8	2.0	-	-	-	-	0.3	0.5	0.5	0.6
Briquettes	-	0.3	1.3	1.5	0.3	0.3	-	-	0.4	0.5
Pellets	-	0.3	-	-	-	-	0.3	-	0.1	0.1
Dung	-	0.25	-	-	0.3	-	0.3	-	0.2	0.1
Rice/coffee husks	0.3	0	-	-	-	-	-	-	0.1	-
Paraffin	0.5	0.74	-	-	-	0.3	-	-	0.1	0.3
Solar	0.3	0.25	-	-	-	-	-	-	0.1	0.1
Other	0.3	0.25	-	-	-	-	-	0.3	0.1	0.1
Total respondents	393	405	395	404	391	404	389	405	1,568	1,618

n= 1,568 baseline, 1,618 midline, multiple response possible

ENERGY SOURCES FOR HEATING WATER: Apart from cooking, respondents were also asked about the energy sources they use for heating water. Similar to the results discussed above, there was a decrease in the number of HHs that reported using unsustainable charcoal between baseline and midline from 59.7% to 57.8%. On the other hand, there was an increase in usage of energy efficient fuels between baseline and midline such as electricity from 20.3% to 22.9%, briquettes from 0.2% to 0.6% and sustainable charcoal from 0.5% and 1.1%. LPG increased from 1.4% to 3.3% overall, with Mzuzu increasing from 0% to 3.5%. The table below illustrates the finding.

TABLE 12: ENERGY SOURCES USED FOR HEATING WATER

B.1B WHICH OF THE FOLLOWING ENERGY SOURCES DO YOU USE IN YOUR HOUSEHOLD FOR HEATING WATER?										
ENERGY SOURCE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Traditional Charcoal	50.1	50.1	71.1	72.8	61.1	68.1	56.3	40.3	59.7	57.8
Firewood	34.9	32.6	14.7	20.1	38.2	38.9	55.0	59	35.7	37.6
Electricity	30.8	33.8	15.7	19.6	18.1	27.5	16.4	10.9	20.3	22.9
Other agricultural residues	4.1	3.95	1.5	1.98	1.8	1.24	1.0	0.74	2.1	1.98
LPG	2.8	5.68	0.8	2.48	-	3.47	1.8	1.73	1.4	3.34
Sawdust	2.3	2.22	-	0.25	1.0	0	0.3	0.74	0.9	0.8
Solar	0.8	1.23	-	1.24	0.3	0	0.8	0.74	0.5	0.8
Sustainable charcoal	-	1.48	-	1.24	0.8	1.24	1.0	0.49	0.5	1.11
Other	0.8	0.25	-	0	0.5	0.5	-	0	0.3	0.19
Briquettes	0.3	0.49	1.0	1.49	0.3	0.5	-	0	0.2	0.62
Pellets	-	0.25	0.3	0	0.3	0.5	0.3	0.25	0.2	0.25
Dung	0.5	0.25	0.3	0.5	-	0.25	0.3	0.49	0.3	0.37
Paraffin	0.3	0.74	-	0.74	-	0.25	0.5	0	0.2	0.43
Rice/coffee husks	-	0.25	-	0.25	-	0	0.3	0.25	0.1	0.19
Total respondents	393	405	395	404	393	404	391	405	1,572	1,618

n= 1,572 baseline, 1,618 midline, multiple response possible

STOVES FOR COOKING OR PREPARING HOT DRINKS: When asked what stoves are used for cooking or preparing hot drinks, there was a 4.5 percentage significant decrease in the usage of Jiko between baseline (83.7%) and midline (79.2%). This was followed by Envirofit stove used by 0.9% of households at midline compared to 0.6% at baseline. There were other additional stoves that were being promoted by MCHF after the baseline. These included Up Energy SmartHome which was reported by 1.6% of the interviewed households, Ngala ya moto and Mbambande Quick fast which were both reported by 0.1% of the households. The table below illustrates the findings.

TABLE 13: TYPE OF CHARCOAL STOVE USED FOR COOKING/DRINKS

B2.1 CHARCOAL - WHAT STOVES DO YOU USE FOR COOKING OR FOR HOT DRINKS PREPARATION?										
STOVE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Jiko	77.6	75.6	94.4	90.6	89.8	78.2	73.1	72.3	83.7	79.2
Envirofit	0.8	-	0.3	0.7	1.0	1.7	0.3	1.0	0.6	0.9

B2.1 CHARCOAL - WHAT STOVES DO YOU USE FOR COOKING OR FOR HOT DRINKS PREPARATION?

Other	0.5	1.2	-	-	0.5	0.5	1.8	1.7	0.7	0.9
Metal Stove	0.3	0.2	-	-	0.3	1.2	1.3	-	0.5	0.4
Up Energy SmartHome	n/a	1.2	n/a	0.2	n/a	5.0	n/a	-	n/a	1.6
Ngala ya moto	n/a	-	n/a	-	n/a	0.5	n/a	-	n/a	0.1
Mbambande Quick Fast	n/a	-	n/a	-	n/a	-	n/a	0.2	n/a	0.1
Total respondents	393	405	395	404	393	404	391	405	1,572	1,618

n=1,572 baseline, 1,618 midline, multiple response possible

FIREWOOD: Three stones were the most popular technology reported by 27.8% of the total sample at baseline and 27.1% of the total sample at midline. This was followed by Chitetezo Mbaula reported by 7.4% at baseline and 10.3% at midline. The table below illustrates the findings.

TABLE 14: TYPE OF FIREWOOD STOVE USED FOR COOKING/DRINK PREPARATION

B2.2 FIREWOOD - WHAT STOVES DO YOU USE FOR COOKING OR FOR HOT DRINK PREPARATION? (%)

STOVE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Three stone	24.2	21.7	16.5	15.3	23.4	29.0	47.1	42.5	27.8	27.1
Chitetezo Mbaula	7.1	9.9	1.8	6.2	7.6	13.6	13.0	11.6	7.4	10.3
Mudstove	1.3	2.0	0.3	0.5	5.6	2.0	1.5	2.0	2.2	1.6
Other stoves	1.8	0.7	-	-	0.5	-	0.8	-	0.8	0.2
Rocket stove	0.3	-	-	0.2	-	-	0.3	-	0.2	0.1
Envirofit	-	-	-	-	-	0.2	-	-	-	0.1
Total respondents	393	405	395	404	393	404	391	405	1,572	1,618

n=1,572 baseline, 1,618 midline, multiple response possible

ELECTRICITY: Out of all the sample, 17.9% at baseline and 18.2% at midline reported using an electric cooker. This was followed by a kettle used by 17.4% at baseline and 15.1% at midline, and an electric hotplate used by 7.4% at baseline and 8.8% at midline. The rest of the appliances were used by less than 7% of the samples. The table below summarizes the findings.

TABLE 15: TYPE OF ELECTRIC STOVE/APPLIANCE USED FOR COOKING/DRINKS**B2.3 ELECTRICITY- WHAT STOVES OR COOKING APPLIANCES DO YOU USE FOR COOKING OR FOR HOT DRINK PREPARATION? (%)**

STOVE/ COOKING APPLIANCE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Electric cooker	29.3	30.4	10.9	13.6	15.5	14.1	15.9	14.8	17.9	18.2
Kettle	24.2	21.7	12.4	13.1	14.8	18.8	18.2	6.9	17.4	15.1
Electric hotplate	6.6	9.1	5.6	8.4	8.7	12.1	8.7	5.7	7.4	8.8
Microwave	15.3	14.6	2.3	5.2	1.5	4.5	3.1	-	5.6	6.1
Rice cooker	9.9	6.9	2.0	3.2	1.8	5.2	7.9	0.2	5.4	3.9
Electric mini cooker	1.8	2.0	2.0	3.0	3.1	3.5	2.0	0.7	2.2	2.3
Other	2.0	0.7	1.8	-	2.0	0.5	1.8	0.2	1.9	0.4
Fryer	2.0	1.5	0.8	1.7	0.8	0.7	0.8	-	1.1	1.0
Coffee maker	1.5	0.5	0.3	-	-	-	0.5	-	0.6	0.1
Pressure cooker	0.3	1.2	-	0.2	-	0.5	0.3	-	0.2	0.5
Induction plate	0.3	-	-	-	-	-	-	-	0.1	-
Total respondents	393	405	395	404	393	404	391	405	1,572	1,618

n=1,572 baseline, 1,618 midline, multiple response possible

LPG: There was an increase in the usage of all LPG stoves/appliances between baseline and midline. Usage of an LPG cylinder burner increased from 1.6% to 3.8%, LPG cooker usage increased from 0.8% to 2.3% and usage of LPG hotplate increased from 0.6% to 0.7%. The table below sets out the findings.

TABLE 16: TYPE OF LPG STOVES/APPLIANCES USED FOR COOKING/DRINKS**B2.4 LPG- WHAT STOVES OR COOKING APPLIANCES DO YOU USE FOR COOKING OR FOR HOT DRINKS PREPARATION?**

STOVE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
LPG cylinder burner	4.1	6.7	0.8	3.0	0.3	3.2	1.0	2.5	1.6	3.8
LPG cooker	2.0	5.9	0.3	1.2	-	1.7	1.0	0.2	0.8	2.3
LPG hotplate	2.3	1.5	-	1.0	-	0.5	-	0	0.6	0.7
Other	0.3	0	-	0	-	0	0.3	0	0.2	0
Total respondents	393	405	395	404	393	404	391	405	1,572	1,618

n=1572 baseline, 1,618 midline, multiple response possible

BIOMASS: The most used biomass stove both at baseline (1.9%) and midline (1.2%) was three stone. Mimi Moto, which is one of the stoves promoted by MCHF after the baseline, was reported by 0.1% of the total sample, which is 0.2% of the households in Lilongwe. The table below sets out the findings.

TABLE 17: TYPE OF BIOMASS STOVE USED FOR COOKING/DRINK PREPARATION

B2.5 BIOMASS - WHAT STOVES DO YOU USE FOR COOKING OR FOR HOT DRINKS PREPARATION?											
STOVE	LL		BT		MZ		ZA		Total		
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML	
Three stone	5.1	2.7	1.3	1.2	0.8	0.5	0.3	0.5	1.9	1.2	
Other	1.3	1.7	1.3	-	-	-	-	0.5	0.7	0.6	
Chitetezo Mbaula	-	0.5	-	0.2	-	0.7	0.3	0.5	0.1	0.5	
Mudstove	0.3	0.2	-	-	-	-	-	-	0.1	0.1	
Envirofit	n/a	0.2	n/a	-	n/a	-	n/a	-	n/a	0.1	
Jiko	n/a	0.2	n/a	1.0	n/a	0.2	n/a	-	n/a	0.4	
Mbambande Quick Fast	n/a	-	n/a	-	n/a	-	n/a	-	n/a	-	
Mimi Moto	n/a	0.2	n/a	-	n/a	-	n/a	-	n/a	0.1	
Total respondents	393	405	395	404	393	404	391	405	1,572	1,618	

n=1,572 baseline, 1,618 midline multiple response possible

FREQUENCY OF STOVE USAGE: When asked which stove they use the most often, the majority both at baseline (64.1%) and midline reported the Jiko (59.0%). This was followed by three stones reported by 13.7% at baseline and 11.4% at midline and electric cooker reported by 11.5% at baseline and 11.6% at midline. Up Energy SmartHome was reported by 0.9% of the total sample, with 0.3% based in Lilongwe and 3.2% in Mzuzu. Ngala ya moto, Mbambande Quick Fast and Mimi Moto were reported by 0.1% of the total sample. The table below sets out the findings.

TABLE 18: MOST USED STOVES/APPLIANCES

B4. OF ALL THE STOVES/APPLIANCES MENTIONED, WHICH ONE DO YOU USE MOST OFTEN?											
STOVE/APPLIANCE	LL		BT		MZ		ZA		Total		
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML	
Jiko	48.9	47.9	86.3	75.5	69.7	60.6	51.4	52.1	64.1	59.0	
Three stone	14.5	9.4	4.8	5.0	10.2	9.2	25.1	22.2	13.7	11.4	
Electric cooker	23.4	24.0	5.8	8.7	8.9	5.7	7.7	7.9	11.5	11.6	
Chitetezo Mbaula	2.5	3.5	0.8	1.2	2.0	4.7	9.2	8.6	3.6	4.5	
Electric hotplate	3.6	4.0	1.3	5.5	2.5	6.4	2.8	3.0	2.6	4.7	
Mudstove	0.5	0.7	-	-	3.6	1.5	0.8	2.2	1.2	1.1	
Other	1.5	-	-	-	2.3	-	0.3	-	1.0	-	
Electric mini cooker	0.8	0.3	0.8	-	0.5	-	-	-	0.5	0.1	
Metal stove	0.3	2.0	-	-	0.3	1.5	0.8	-	0.4	0.9	
LPG cooker	1.3	0.3	0.3	-	-	-	-	-	0.4	0.1	

B4. OF ALL THE STOVES/APPLIANCES MENTIONED, WHICH ONE DO YOU USE MOST OFTEN?

Kettle	0.5	0.3	-	-	-	0.3	0.8	0.3	0.3	0.2
Envirofit	-	0.3	-	0.7	-	1.5	0.3	0.7	0.1	0.8
Rice cooker	0.3	0.5	-	2.2	-	1.5	0.8	-	0.3	1.1
LPG cylinder burner	1.0	0.7	-	0.3	-	1.0	-	-	0.3	0.5
LPG hotplate (portable burner)	0.8	3.0	-	-	-	0.5	-	0.3	0.2	0.9
Induction plate	-	-	-	-	-	-	0.3	-	0.1	-
Paraffin stove	0.3	0.3	-	-	-	0.7	-	1.5	0.1	0.6
UpEnergy SmartHome	n/a	0.3	n/a	-	n/a	3.2	n/a	-	n/a	0.9
Ngala ya Moto	n/a	-	n/a	-	n/a	0.3	n/a	-	n/a	0.1
Mbambande Quick Fast	n/a	-	n/a	-	n/a	-	n/a	0.3	n/a	0.1
Mimi Moto	n/a	0.3	n/a	-	n/a	-	n/a	-	n/a	0.1
Total respondents	393	405	395	404	391	404	389	405	1,568	1,618

n=1,568 baseline, 1,618 midline, single response only

Respondents were asked to say why they use this stove/appliance most often. The most common reason given by respondents both at baseline (52.2%) and midline (64.2%) was that it was easier to use. This was followed by 49.3% at baseline and 59.6% at midline who stated that it was faster. The highest proportion who reported that it was faster both at baseline (70.4%) and midline (71.9%) were from Zomba. The table below illustrates the findings.

TABLE 19: REASONS FOR USING A STOVE MOST OFTEN

B5. WHY DO YOU USE THAT STOVE/APPLIANCE THE MOST?

RESPONSE	LL		BT		MZ		ZA		Total	
	%	%	%	%	%	%	%	%	%	%
Easier to use	53.7	64.4	47.6	47.0	40.8	65.8	66.8	79.5	52.2	64.2
Faster	50.4	67.7	40.9	49.8	35.6	49.0	70.4	71.9	49.3	59.6
It is cheap to buy	25.7	35.3	35.5	33.2	6.8	20.5	45.8	55.1	28.5	36.0
Easily accessible	35.2	37.3	36.6	25.7	27.4	26.2	53.2	53.1	38.1	35.6
More efficient/uses less fuel	24.4	29.9	9.7	25.5	22.0	26.0	56.3	50.9	28.1	33.1
Cleaner	22.4	37.0	9.0	30.2	9.8	15.6	50.1	41.0	22.8	31.0
It uses cheap fuel	33.2	36.8	38.9	37.9	28.3	15.6	56.3	32.6	39.2	30.7
Other	13.4	4.2	14.1	0.7	16.3	1.0	23.9	3.7	16.9	2.4
Do not know	1.3	1.2	0.3	1.2	1.1	-	0.8	1.2	0.9	0.9
Total respondents	389	405	391	404	368	404	389	405	1,537	1,618

n= 1,537 baseline, 1,618 midline, multiple response possible

3.1.3 PREFERENCES FOR STOVES

The Jiko is the most preferred stove with 60.8% of all respondents citing it at baseline and 56.3% citing it at midline. The second most preferred stove is the electric cooker mentioned by 14.1% at baseline and 13.6% at midline, with three stones third at 11.5% both at baseline and 11.2% at midline. For the MCHF promoted stoves, 0.7% stated that they preferred the UpEnergy SmartHome, and 0.1% stated Mbambande Quick fast and Mimi Moto.

TABLE 20: MOST PREFERRED COOKING STOVE/APPLIANCE

D.2A OF THE COOKING STOVE/APPLIANCES YOU HAVE, WHICH IS YOUR MOST PREFERRED? (%)										
STOVE	Lilongwe		Blantyre		Mzuzu		Zomba		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Jiko	48.6	45.7	82.5	75.3	62.3	55.2	49.9	49.1	60.8	56.3
Electric cooker (oven with plates)	24.9	25.4	8.6	10.2	12.7	8.7	10.2	10.1	14.1	13.6
Three stone	11.5	8.4	4.3	3.0	6.6	8.7	23.5	24.7	11.5	11.2
Chitetezo Mbaula	3.1	4.0	1.0	1.0	2.3	5.2	9.7	6.7	4.0	4.2
Electric hotplate	4.3	5.2	1.8	6.2	5.1	7.9	3.3	3.7	3.6	5.8
Other (Specify)	0.8	-	-	-	4.8	-	-	-	1.4	-
Mudstove	0.5	0.5	-	-	2.8	1.5	0.8	2.0	1.0	1.0
Electric mini cooker	1.0	-	1.0	-	2.3	-	-	-	1.1	-
LPG cooker	1.8	0.3	0.3	-	-	-	-	-	0.5	0.1
Metal stove	0.8	1.5	-	-	-	1.5	0.8	-	0.4	0.7
LPG cylinder burner	1.3	1.0	0.3	0.3	0.3	0.5	-	-	0.5	0.4
LPG hotplate (portable burner)	0.8	3.0	-	-	0.3	1.0	0.3	0.3	0.4	1.1
Kettle	-	0.3	-	0.3	0.3	0.3	0.8	-	0.3	0.2
Envirofit	-	0.3	-	0.5	-	2.0	0.3	0.5	0.1	0.8
Induction plate	0.3	-	-	-	-	-	-	-	0.1	-
Rice cooker	0.3	0.7	-	2.2	-	1.7	0.3	-	0.2	1.2
Paraffin stove	0.3	0.7	-	-	-	0.3	0.3	1.2	0.2	0.6
Pressure cooker	-	-	-	-	0.3	0.3	-	-	0.1	0.1
Electric fryer	-	-	0.3	-	-	-	-	-	0.1	-
Rocket stove	-	-	-	-	-	0.3	-	-	-	0.1
Microwave	-	-	-	-	-	-	-	-	-	-
UpEnergy SmartHome	n/a	-	n/a	-	n/a	2.5	n/a	0.3	n/a	0.7
Mbambande Quick Fast	n/a	-	n/a	-	n/a	0.3	n/a	0.3	n/a	0.1
Mimi Moto	n/a	0.5	n/a	-	n/a	-	n/a	-	n/a	0.1

D.2A OF THE COOKING STOVE/APPLIANCES YOU HAVE, WHICH IS YOUR MOST PREFERRED? (%)

Total respondents 393 405 395 404 393 404 391 405 1,572 1,618

n=1,572 baseline, 1,618 midline single response possible

Respondents were asked why they prefer the cooking technology/stove/appliance. The top five reasons cited by the respondents at baseline were: cooks faster (52.4%), affordable (46.8%), accessible (38.9%), efficient (33.2%) and cleaner (28.6%). A similar trend was observed at midline where the top five reasons were: cooks faster (60.5%), affordable (59.7%), accessible (54.1%), fuel efficient (39.4%) and cleaner to use (34.9%). The table below sets out the findings.

TABLE 21: REASONS FOR PREFERING THAT COOKING TECHNOLOGY

D2B. WHY DO YOU PREFER THIS COOKING TECHNOLOGY? (%)										
RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Cooks faster	56.4	66.7	40.6	43.6	42.1	59.4	70.4	72.4	52.4	60.5
Affordable	48.7	57.0	48.0	57.9	33.1	57.4	57.3	66.4	46.8	59.7
Accessible	36.9	52.1	43.4	48.5	30.9	41.8	44.5	74.1	38.9	54.1
Fuel efficient	32.7	36.3	14.5	39.1	24.2	37.6	61.4	44.4	33.2	39.4
Cleaner to use	28.9	42.0	13.7	23.8	16.8	21.0	54.8	52.6	28.6	34.9
No smoke	20.6	36.1	10.7	25.7	17.1	25.7	40.6	46.4	22.3	33.5
Cheap fuel	21.9	36.5	27.2	40.4	19.6	15.8	40.9	31.9	27.4	31.2
Modern	12.9	23.2	5.8	7.4	5.0	13.4	6.4	28.2	7.5	18.1
Safe to use	7.2	21.7	0.5	16.3	1.4	7.7	29.3	24.0	9.6	17.4
Durable	4.1	14.1	1.3	19.6	1.1	12.9	12.6	18.3	4.8	16.2
Portable	8.0	15.6	7.1	8.7	7.2	4.7	26.7	30.6	12.3	14.9
Other	6.2	4.7	15.2	11.9	9.6	4.5	3.1	3.7	8.5	6.2
Total respondents	388	405	394	404	363	404	389	405	1,534	1,618

n=1,534 baseline, 1,618 midline multiple response possible

Respondents were told to rank reasons why they prefer a cooking a technology in order of importance. The top five reasons at baseline were: affordable (34.5%), cooks faster (26.2%), efficient (15.7%), accessible (9.8%) and cleaner (5.7%). A similar trend was observed at midline where 33.7% cited affordable, 32.9% cited cooks faster, 11.8% cited fuel efficiency, 9.1% cited accessible and 5.9% cited cheap fuel. The least cited reason at baseline was that it was durable at 0.4% while the least cited reason at midline was that it was modern (0.6%). The table below illustrates the findings.

TABLE 22: REASONS FOR PREFERRING A TECHNOLOGY BY RANK

D.2C PLEASE RANK RESPONSES (UP TO THREE) MENTIONED ABOVE IN ORDER OF IMPORTANCE										
RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML

D.2C PLEASE RANK RESPONSES (UP TO THREE) MENTIONED ABOVE IN ORDER OF IMPORTANCE

Affordable	38.0	34.8	43.8	31.7	22.7	37.3	33.4	31.0	34.5	33.7
Cooks faster	28.8	39.8	23.5	22.0	26.9	25.4	25.7	44.5	26.2	32.9
Fuel efficient	14.9	8.2	8.0	12.6	15.0	13.7	24.7	12.8	15.7	11.8
Accessible	10.5	7.7	8.5	7.7	10.8	9.7	9.3	11.3	9.8	9.1
Cheap fuel	3.9	9.1	1.8	4.2	10.8	3.5	5.0	6.8	5.4	5.9
Cleaner to use	5.0	5.9	3.4	3.0	4.4	3.0	10.1	8.5	5.7	5.1
Other	2.6	3.7	9.8	5.9	6.1	2.5	2.1	2.8	5.2	3.7
No smoke	1.6	2.7	0.5	1.7	3.9	3.0	5.8	5.5	3.0	3.2
Safe to use	1.0	2.7	-	3.7	0.3	0.5	2.9	3.3	1.1	2.6
Durable	0.8	1.5	-	6.4	0.3	1.0	0.3	1.3	0.4	2.6
Portable	1.0	1.5	1.8	-	0.8	0.3	3.2	3.5	1.7	1.3
Modern	2.4	1.0	-	0.3	0.6	0.8	1.3	0.5	1.1	0.6
Total	382	405	388	404	361	402	377	400	1,508	1,611

n=1,508 baseline, 1,611 midline multiple response possible

When asked about the stove/appliances/technologies the respondents would most like to use, most of the respondents at baseline (41.8%) across all the cities stated that they would like to use an electric cooker and so did most of the respondents at midline (31.2%). 18.0% and 16.3% opted for the Jiko at baseline and midline respectively, followed by electric hotplate at 12.7% at baseline and 12.2% at midline. There was an increase in the number of respondents who wanted to use an LPG hotplate (portable burner) between baseline (0.7%) and midline (8.7%). The UpEnergy SmartHome, Mini Moto, and Mbambande Quick Fast were stated by 2.2%, 1.1% and 0.5% of the respondents respectively. The microwave was the least cited both at baseline and midline at 0.1%.

TABLE 23: MOST LIKED COOKING APPLIANCE/STOVE

D.2D OF THE COOKING STOVE/APPLIANCE YOU KNOW, WHICH ONE WOULD YOU MOST LIKE TO USE?

RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Electric cooker (oven with plates)	44	31.1	48	33.7	46	36.1	29	23.7	41.8	31.2
Jiko	18	18.8	20	19.3	16	3.7	18	23.2	18.0	16.3
Electric hotplate	5.9	9.4	16	16.3	13	15.6	16	7.4	12.7	12.2
LPG hotplate (portable burner)	0.8	8.9	-	8.9	1	13.1	0.8	3.7	0.7	8.7
Chitetezo Mbaula	10	5.4	4.6	5.0	7.3	1.2	15	6.7	9.2	4.6
LPG cylinder burner	3.3	3.7	2.5	1.7	1	3.0	1.3	4.9	2.0	3.3
Three stone	1.5	1.2	1.3	0.7	0.8	0.5	3.1	9.6	1.7	3.0

D.2D OF THE COOKING STOVE/APPLIANCE YOU KNOW, WHICH ONE WOULD YOU MOST LIKE TO USE?

UpEnergy SmartHome	n/a	1.7	n/a	0.3	n/a	4.7	n/a	2.0	n/a	2.2
Rice cooker	1.8	1.5	1	2.7	1	0.7	2	1.2	1.5	1.6
Envirofit	1.5	0.7	1	1.0	1.3	1.0	1.5	1.5	1.3	1.1
Mini Moto	n/a	2.5	n/a	1.0	n/a	0.3	n/a	0.5	n/a	1.1
Pressure cooker	0.5	1.2	0.3	1.0	-	0.5	0.5	-	0.3	0.7
LPG cooker	6.6	1.0	2.5	0.5	2.3	1.0	1.8	-	3.3	0.6
Paraffin stove	0.5	0.7	0.3	-	0.3	1.2	1.3	0.3	0.6	0.6
Mudstove	0.3	0.5	0.3	-	1.3	-	1.3	1.5	0.8	0.5
Mbambande Quick Fast	n/a	0.3	n/a	-	n/a	1.0	n/a	0.7	n/a	0.5
Electric fryer	0.5	1.0	0.5	-	-	0.3	1.5	0.3	0.6	0.4
Electric mini cooker	0.8	0.3	0.5	0.3	0.8	0.5	2.6	0.3	1.2	0.3
Metal stove	0.3	-	0.3	-	-	0.7	0.8	-	0.4	0.2
Rocket stove	0.3	-	0.3	-	-	0.3	0.5	0.3	0.3	0.1
Microwave	0.3	0.3	-	-	-	-	0.3	-	0.2	0.1
Kettle	0.5	-	0.5	0.3	1.6	-	1.5	-	1.0	0.1
Total respondents	393	405	394	404	383	404	391	405	1,561	1,618

n=1,568 baseline, 1,618 midline single response only

Respondents were asked the reasons behind wanting to use particular cooking stoves/appliances. At baseline most of the respondents (71.7%) gave the reason that it cooks faster. The same reason was given by the majority at midline (81.5%). The second reason cited by respondents at baseline was that it was fuel efficient (36.8%) while the second reason cited by respondents at midline was that it was cleaner to use (46.7%). The table below summarizes the findings.

TABLE 24: REASON FOR USE OF THE MOST USED COOKING STOVE

RESPONSE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Cooks faster	66.7	81.0	77.0	77.2	65.4	85.4	77.7	82.2	71.7	81.5
Cleaner to use	28.6	51.1	24.7	37.4	15.8	33.4	61.8	64.9	32.7	46.7
Fuel efficient	40.9	40.7	20.9	34.7	20.8	39.9	64.7	51.6	36.8	41.7
No smoke	18.2	39.5	10.7	25.0	8.7	45.5	47.0	56.5	21.2	41.7
Affordable	28.9	42.2	22.7	32.9	16.3	25.7	36.9	52.8	26.2	38.4
Modern	24.0	34.6	38.8	30.9	21.4	31.9	21.3	44.9	26.4	35.6
Accessible	19.8	38.8	14.0	28.2	11.8	12.9	35.3	55.6	20.2	33.9
Cheap fuel	17.2	27.4	21.4	20.1	13.2	13.9	34.8	32.4	21.7	23.4

D.2E WHY DO YOU MOST WANT TO USE THIS COOKING STOVE/APPLIANCE

Safe to use	10.7	23.0	2.8	9.2	2.0	7.4	30.1	30.4	11.4	17.5
Portable	10.9	18.3	5.6	9.2	4.2	5.9	31.4	32.6	13.0	16.5
Durable	8.1	15.1	5.9	15.4	2.5	10.9	22.3	24.4	9.7	16.4
Other	8.3	2.2	3.8	1.0	10.1	1.2	3.6	2.5	6.5	1.7
Total respondents	384	405	392	404	355	404	385	405	1,516	1,618

n=1,516 baseline, 1,618 midline, multiple response possible

Respondents were asked to rank their responses in order of importance. Cooks faster was the most important reason stated by 44.8% of HHs, followed by fuel efficient at 20.9% of HHs, and affordable at 18.0% of HHs at baseline. At midline, the most important reason stated by 51.7% of the respondents was that it cooks faster, followed by 22.2% who said it was affordable and that it was fuel efficient (14.2%). The table below summarizes the findings.

TABLE 25: REASONS FOR MOST USING THIS COOKING STOVE/APPLIANCE

D.2F PLEASE RANK RESPONSES (UP TO THREE) MENTIONED ABOVE IN ORDER OF IMPORTANCE

RESPONSE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Cooks faster	37.8	52.0	55.7	53.7	49.6	47.0	36.0	54.1	44.8	51.7
Affordable	20.1	27.1	19.8	16.1	11.6	19.6	20.6	25.9	18.0	22.2
Fuel efficient	22.2	12.9	15.2	12.4	14.5	18.3	31.7	13.3	20.9	14.2
Cleaner to use	5.6	6.0	2.6	2.0	1.4	1.2	11.1	7.2	5.2	4.1
Cheap fuel	3.2	4.2	1.5	3.5	7.0	1.7	5.3	5.9	4.3	3.8
No smoke	2.4	3.0	0.3	0.7	2.9	5.5	5.0	4.2	2.7	3.3
Accessible	5.0	3.2	1.8	3.2	2.0	1.5	5.8	4.2	3.7	3.0
Modern	5.0	2.7	2.8	1.2	8.4	4.2	3.4	1.7	4.9	2.5
Safe to use	1.9	1.2	-	2.2	0.3	0.3	3.7	3.2	1.5	1.7
Durable	1.1	0.5	-	2.7	0.6	0.5	2.1	2.5	1.0	1.6
Portable	1.1	1.2	1.3	0.5	-	0.5	5.3	3.2	1.9	1.4
Other	4.2	1.2	0.8	0.7	4.9	0.5	2.1	2.5	3.0	1.2
Total respondents	378	402	388	404	345	404	378	405	1,489	1,615

n=1,489 baseline, 1,615 midline multiple response possible

The least preferred stove at baseline (62.5%) and midline (52.9%) was three stones. At baseline the Jiko stove was the second least preferred with 9.4% of respondents, while the second least preferred at midline was the electric cooker (oven with plates) at 9.2%. The table below sets out the findings.

TABLE 26: LEAST PREFERRED STOVE/APPLIANCE/COOKING TECHNOLOGY

D.2G OF THE STOVES/APPLIANCES/COOKING TECHNOLOGIES, WHICH IS YOUR LEAST PREFERRED?										
RESPONSE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Three stone	59.1	49.6	67.8	61.4	74.4	50.0	48.7	50.6	62.5	52.9
Electric cooker (oven with plates)	4.9	8.2	2.8	5.2	5.2	6.2	10.0	17.0	5.7	9.2
LPG cooker (oven with plates)	3.1	6.9	1.0	3.7	-	12.6	3.8	8.9	2.0	8.0
Jiko	11.0	11.1	7.1	3.2	9.1	4.7	10.3	9.4	9.4	7.1
Mudstove	1.8	4.0	1.0	9.4	1.6	3.5	0.5	0.5	1.2	4.3
Electric hotplate	1.5	4.0	5.1	1.2	1.0	3.2	5.1	6.4	3.2	3.7
LPG hotplate (portable burner)	1.0	2.5	0.3	4.5	0.5	5.5	0.8	0.3	0.7	3.2
Chitetezo Mbaula	3.8	4.2	-	1.7	3.1	2.0	4.1	2.2	2.8	2.5
LPG cylinder burner	1.5	0.7	2.5	1.2	0.8	0.7	6.9	0.3	2.9	0.7
Paraffin stove	2.8	0.5	2.3	-	0.3	0.5	3.8	1.2	2.3	0.6
Metal stove	1.0	0.7	0.3	0.3	1.6	-	0.8	-	0.9	0.3
UpEnergy SmartHome	n/a	0.3	n/a	0.3	n/a	0.3	n/a	0.3	n/a	0.3
Envirofit	0.5	0.3	-	-	-	0.3	0.5	-	0.3	0.1
Rocket stove	0.8	0.5	-	-	-	-	1.0	-	0.5	0.1
Rice cooker	n/a	-	n/a	0.3	n/a	0.3	n/a	-	n/a	0.1
Mimi Moto	n/a	0.5	n/a	-	n/a	-	n/a	-	n/a	0.1
Induction plate	0.3	-	-	0.3	-	-	0.3	-	0.2	0.1
Mbambande Quick Fast	n/a	0.3	n/a	-	n/a	-	n/a	-	n/a	0.1
Respondents total	391	405	395	404	383	404	390	405	1,559	1,618

n=1,559 baseline, 1,618 midline single response only

When asked why they least prefer the cooking appliance/stove/technology, most respondents at baseline (55.5%) and midline (52.8%) said that it involves getting dirty. This was followed by 50.6% at baseline and 48.8% at midline who cited that it produces too much smoke. The third reason cited at baseline (33.8%) and 33.3% at midline was that it is difficult to use. The table below sets out the findings.

TABLE 27: REASONS FOR LEAST PREFERENCE FOR THIS COOKING TECHNOLOGY

D.2H WHY DO YOU LEAST PREFER THIS COOKING TECHNOLOGY										
RESPONSE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Involves getting dirty	55.5	54.8	68.5	63.9	47.3	43.8	50.5	48.6	55.5	52.8
Too much smoke	51.1	46.7	59.6	49.5	43.2	46.0	48.4	53.1	50.6	48.8
Difficult to use	33.6	29.9	29.5	40.1	28.4	36.9	43.5	26.4	33.8	33.3
Expensive to buy	16.7	20.3	12.4	19.3	7.7	28.2	42.4	31.6	19.8	24.9
Fuel is expensive	16.4	15.3	17.1	15.6	13.1	19.3	48.7	25.9	23.8	19.0
Takes longer	19.4	20.5	7.0	20.8	12.0	11.1	37.7	14.3	19.0	16.7
Not modern	16.1	17.3	7.0	11.4	6.8	20.1	15.7	13.3	11.4	15.5
Not accessible	12.3	12.6	8.1	10.2	2.7	20.5	32.7	17.0	14.0	15.1
Other	9.3	8.6	5.6	1.2	13.1	4.0	8.1	4.4	9.0	4.6
Total respondents	366	405	356	404	366	404	382	405	1,470	1,618

n=1,470 baseline, 1,618 midline multiple response possible

Respondents were asked to rank responses on why they least prefer a cooking technology. Over 20% of the respondents both at baseline (28.3%) and midline (25.4%) explained that they least prefer a cooking technology because it involves getting dirty. The second reason at baseline was that it is difficult to use (22.0%) while the second reason at midline was that it was expensive to buy (20.6%). The third reason cited both at baseline (15.2%) and midline (17.2%) was that it produces too much smoke. See table below for further details.

TABLE 28: REASONS FOR LEAST PREFERING THIS COOKING TECHNOLOGY

D.2I PLEASE RANK RESPONSES (UP TO THREE) MENTIONED ABOVE IN ORDER OF IMPORTANCE										
RESPONSE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Involves getting dirty	29.4	25.9	41.0	29.0	25.1	19.6	17.7	26.9	28.3	25.4
Expensive to buy	11.9	17.5	12.1	16.4	7.0	19.8	26.5	28.9	14.4	20.6
Too much smoke	16.1	16.5	10.5	8.2	21.8	15.1	12.3	29.2	15.2	17.2
Difficult to use	21.9	15.7	24.0	24.8	23.2	21.5	18.8	5.0	22.0	16.8
Takes longer	7.5	12.7	3.7	11.9	7.3	3.2	18.8	7.0	9.3	8.7
Fuel is expensive	6.1	5.0	4.5	3.7	7.5	5.7	12.9	11.5	7.8	6.5
Not accessible	4.7	3.7	1.1	1.2	1.4	8.7	7.2	3.2	3.6	4.2
Other	6.6	6.7	2.8	0.7	5.9	2.5	5.9	3.7	5.3	3.4
Not modern	3.3	3.2	0.8	2.2	3.4	4.0	1.6	1.3	2.3	2.7

D.2I PLEASE RANK RESPONSES (UP TO THREE) MENTIONED ABOVE IN ORDER OF IMPORTANCE

Total respondents	361	401	354	403	358	404	373	401	1,446	1,609
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n=1,446 baseline, 1,609 midline multiple response possible

3.1.4 IMPROVED STOVES

Out of all respondents, there was an increase between baseline (22.2%) and midline (32.5%) in the number of HHs that own an improved cooking stove. Specifically, for Zomba, 22.8% of the HHs reported having an improved stove at baseline and 41.2% reported at midline.

The table below sets out the findings.

TABLE 29: PERCENTAGE OF THOSE THAT HAVE AN IMPROVED STOVE

D.2J DO YOU HAVE AN IMPROVED COOKING STOVE?

RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Yes	32.1	34.6	7.1	14.9	26.7	39.4	22.8	41.2	22.2	32.5
No	67.9	65.4	92.9	85.2	72.8	60.6	77.2	58.8	77.7	67.5
NR/DNK	-	-	-	-	0.5	-	-	-	0.1	-
Total respondents	393	405	395	404	393	404	391	405	1,572	1,618

n=1,572 baseline, 1,618 midline multiple response possible

In terms of how frequently the improved stove is used, 47.8% of those who own an improved cooking stove said every day at baseline and 59.7% said the same at midline. 14.8% at baseline said they never used the stove and 8.4% at midline said the same. The table below summarizes the findings.

TABLE 30: FREQUENCY OF USING AN IMPROVED STOVE

D.2JI HOW OFTEN DO YOU USE AN IMPROVED STOVE?

RESPONSE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Every day (100%)	65.1	60.7	46.4	50.0	37.1	67.9	42.7	54.5	47.8	59.7
Most days a week (75%)	7.1	14.3	7.1	15.0	6.7	9.4	10.1	26.4	7.8	16.7
About half the time (50%)	7.1	7.1	7.1	8.3	8.6	6.9	16.9	6.0	9.9	6.8
One or two days per week (25%)	9.5	10.7	21.4	5.0	21.0	6.3	27.0	9.6	19.7	8
Never (0%)	11.1	7.1	17.9	21.7	26.7	9.4	3.4	3.6	14.8	8.4
Total respondents	126	140	28	60	105	159	89	167	348	526

n=348 baseline, 526 midline multiple response possible

At both baseline and midline, respondents that do not have an improved stove were asked if they would buy one if the improved cooking stove was readily available and affordable to them. At baseline, 87.7% of the respondents said that they would buy and 11.1% said they would not. Compared to the baseline, there was a 3.5% increase at midline in those who said would buy and a decrease of 2.8% in

those who said would not buy. At midline, those in Zomba and Blantyre were more willing to buy one, as was the case at baseline. The table below summarizes the findings.

TABLE 31: WILLINGNESS TO BUY AN IMPROVED STOVE

D.2K IF IMPROVED COOKING STOVES WERE READILY AVAILABLE AND AFFORDABLE TO YOU, WOULD YOU BUY ONE?										
RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Yes	83.5	88.3	91.8	94.2	79.7	87.4	95.7	94.1	87.7	91.2
No	16.1	10.9	8.2	5.8	15.7	11.4	4.3	5.9	11.1	8.3
NR/DNK	0.4	0.8	-	-	4.5	1.2	-	-	1.2	0.5
Total respondents	267	265	367	344	286	245	301	238	1,221	1,092

n=1,221 baseline, 1,092 midline single response only

In terms of reasons to buy one, 65.5% at baseline and 84.0% at midline said that they would buy a stove just to try it out. While 54.2% at baseline said would buy it because it is fuel efficient, 23.2% said so at midline. 32.9% at baseline said that they would buy it because they can afford to buy it. Some at baseline said they would buy it because the current stove is not fuel efficient (19.2%), can afford to buy it (19.0%) and because the improved stove is affordable (19.2%). At midline, some said they would buy because it is affordable (24.7%); current stove not fuel-efficient (23.4%); and that the new improved stoves are fuel efficient (23.2%).

TABLE 32: REASONS FOR WILLINGNESS TO BUY AN IMPROVED STOVE

D.2L IF YES, WHY?										
RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Just to try them out	59.5	79.9	66.8	91.4	64.8	91.6	74.7	70.5	66.5	84.0
Can afford to buy	22.0	37.2	9.4	34.0	6.2	15.0	38.2	44.2	19.0	32.9
Affordable	20.3	33.3	6.8	17.9	7.9	16.8	41.9	33.0	19.2	24.7
Current stove not fuel-efficient	19.8	27.8	13.8	34.6	3.1	9.8	39.9	15.6	19.2	23.4
Fuel efficient	50.7	26.5	66.8	20.4	32.2	24.3	67.2	22.8	54.2	23.2
Safe to use	13.2	21.8	2.4	14.5	2.6	8.4	34.1	13.8	13.1	14.8
Portable	12.8	13.7	6.5	8.3	4.8	12.2	37.2	13.4	15.3	11.6
Other	6.6	-	6.5	0.3	12.8	0.5	1.7	1.8	6.9	0.6
Total respondents	227	234	340	324	227	214	296	224	1,090	996

n=1,090 baseline, 996 midline multiple response possible

Out of those that said they would not by improved stoves, 49.4% at baseline and 44.0% at midline said they are satisfied with their current stove, 46.8% at baseline and 44% at midline said they cannot afford.

37.5% at baseline and 41.8 at midline said they were just not interested in buying an improved stove. The table below summarizes the findings.

TABLE 33: REASON FOR NOT BUYING AN IMPROVED STOVE

D.2M IF NO, WHY?										
RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Satisfied	42.6	41.4	32.3	55.0	56.5	39.3	66.1	42.9	49.4	44.0
Cannot afford	47.1	24.1	67.7	20.0	32.6	67.9	39.8	71.4	46.8	44.0
Not interested	30.9	55.2	24.2	60.0	30.4	25.0	64.4	21.4	37.5	41.8
Total respondents	68	29	62	20	46	28	118	14	294	91

n=294 baseline, 91 midline multiple response possible

In terms of the attributes that would influence purchase, 75.7% at baseline and 84% at midline said it had to be affordable., 63.5% at baseline said it had to be fuel-efficient while 75.2% at midline said it had to cook faster. The table below summarizes the findings.

TABLE 34: ATTRIBUTES OF AN IMPROVED COOKING STOVE

D.2N ATTRIBUTES THAT WOULD INFLUENCE YOU TO BUY AN IMPROVED COOKING STOVE										
RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Affordable	70.6	81.5	91.5	88.4	67.7	71.8	73.0	92.9	75.7	84.0
Cooks faster	49.2	76.2	62.7	69.5	35.9	77.1	68.2	80.3	54.0	75.2
Fuel efficient	62.1	58.1	72.0	56.4	32.7	54.3	87.2	67.7	63.5	58.8
Easily accessible	31.0	51.3	28.0	52.6	13.1	38.8	51.0	59.7	30.8	50.7
Cheap fuel	26.6	57.4	41.0	57.9	19.1	28.6	56.1	55.0	35.7	50.6
Cleaner to use	24.6	44.5	17.5	24.1	4.0	32.7	61.1	56.7	26.8	38.1
Less or no smoke	20.2	41.5	16.9	21.2	10.4	30.2	57.4	58.0	26.2	36.2
Durable	14.5	32.8	19.5	32.6	12.0	22.9	36.8	47.1	20.7	33.6
Safe to use	13.3	37.4	6.5	18.3	1.6	15.5	49.7	51.7	17.8	29.6
Modern	20.6	36.2	20.6	12.2	4.8	23.7	39.5	50.4	21.4	28.9
Portable	11.3	27.2	9.9	10.8	5.6	12.2	43.2	49.6	17.5	23.5
Other	1.2	2.3	0.3	1.7	4.4	-	2.4	1.3	2.1	1.4
Total respondents	248	265	354	344	251	245	296	238	1,149	1,092

n=1,149 baseline, 1,092 midline multiple response possible

At baseline, of those who said they can buy an improved stove, the mean amount they would be willing to pay for the stove across all the locations was MK 9,062. The amount rose at midline to MK 14,391, and the mean varied from the highest at MK 19,302 in Lilongwe to the lowest at MK 11,294 in Mzuzu.

TABLE 35: AMOUNT RESPONDENTS WILLING PAY FOR AN IMPROVED STOVE

D.2O HOW MUCH WOULD YOU BE WILLING TO PAY FOR AN IMPROVED STOVE										
MK	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Mean	10,108	19,303	4,749	13,082	12,082	11,294	9,308	14,070	9,062	14,391
Median	3,000	6,000	2,000	5,000	5,000	5,000	3,000	5,000	2,500	5,000
Minimum	500	500	200	500	500	1,000	300	1,000	200	500
Maximum	150,000	500,000	90,000	150,000	180,000	350,000	250,000	250,000	500,000	500,000
Total	215	243	344	288	195	239	225	236	1,204	1,006

n=1,204 baseline, 1,092 midline single response only

The preferred mode of payment to loan at both baseline and midline was by cash according to 63.9% and 69.2% of respondents respectively. The table below sets out the findings.

TABLE 36: PREFERRED MODE OF PAYMENT FOR AN IMPROVED STOVE

D.2P WHAT WOULD BE YOUR PREFERRED MODE OF PAYMENT FOR THE IMPROVED COOKING STOVE?										
RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Cash	66.8	69.8	65.7	50.6	64.4	83.3	58.6	81.1	63.9	69.2
Loan	33.2	30.2	34.3	49.4	35.6	16.7	41.4	18.9	36.1	30.8
Total respondents	250	265	362	344	236	245	295	238	1,143	1,092

n=1,143 baseline, 1,092 midline single response only

A high proportion of respondents at baseline (73.8%) and midline (79.9%) do not know where they can find an improved cooking stove in their area. Blantyre had the highest proportion who did not know both at baseline (86.6%) and at midline (84.9%). The table below summarizes the findings.

TABLE 37: KNOWLEDGE OF WHERE TO FIND AN IMPROVED COOKING STOVE

D.2Q IN YOUR AREA, DO YOU KNOW WHERE CAN YOU MOST LIKELY FIND AN IMPROVED COOKING STOVE? (%)										
RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Yes	24.6	14.3	13.1	15.1	33.9	22.9	32.6	29.0	26.1	19.7
No	75.0	84.5	86.6	84.9	66.1	76.3	67.4	71.0	73.8	79.9
NR/DNK	0.4	1.1	0.3	-	-	0.8	-	-	0.2	0.5
Total respondents	264	265	367	344	274	245	301	238	1,206	1,092

n=1,206 baseline, 1,092 midline, single response only

3.1.5 KNOWLEDGE OF ALTERNATIVE FUELS/ENERGIES

Of the 1,572 respondents at baseline, 93.7% reported to have heard of AEs for cooking apart from unsustainable illegal charcoal and firewood. During midline, there was an increase in the number of respondents that reported to have heard of AEs for cooking apart from unsustainable illegal charcoal and firewood, at 96.2% of the total sample of 1,618. Both at baseline (97.2%) and midline (99.5%), the highest proportion was from Blantyre.

As electricity is classed as an AE, this result may be misleading as it would be surprising if almost all people had not heard of electricity and so should have said they did know AEs. For those that said they did not know any AE, they may not have understood that AE included electricity. As the question was unprompted, then it was not possible to explain what AEs were covered. The table below sets out the findings.

TABLE 38: KNOWLEDGE OF ANY ALTERNATIVE FUELS

E.1A HAVE YOU HEARD OF ANY ALTERNATIVE FUELS? (%)										
RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Yes	89.8	93.3	97.2	99.5	94.4	97.0	93.4	94.8	93.7	96.2
No	9.9	6.7	2.8	0.5	5.6	3.0	6.6	5.2	6.2	3.8
Total respondents	393	405	395	404	393	404	391	405	1,572	1,618

n=1,572, baseline, 1,618 midline, single response only

Unprompted knowledge of AE both at baseline and midline was scored in two ways, first as a percentage of those that know AE and secondly out of the whole sample, since a higher score in later surveys on those saying they don't know any AEs, could distort the scores within the sub-group of those that say they know AEs. Therefore, both calculations have been considered.

There was an increase in knowledge levels of all the AEs between baseline and midline. Notably, most of the respondents at baseline (89% of the whole sample and 96.8% of those that said they knew AEs) reported knowing electricity as an AE that they have heard. At midline, 92.8% of the whole sample and 96.5% of those that said they knew AEs also reported knowing electricity as an AE. LPG as an AE at baseline was reported by 34.3% of the whole sample and 36.8% of the sub-sample) and at midline by 77.3% of the whole sample and 80.3% of the sub sample. The findings are set out in the two tables below, the first being as a proportion of those that know AE and the second being as a proportion of the whole sample. The table below sets out the findings.

TABLE 39: UNPROMPTED KNOWLEDGE OF AE (OF THOSE THAT KNOW)

E.1B WHICH ALTERNATIVE FUELS TO TRADITIONAL CHARCOAL AND FIREWOOD HAVE YOU HEARD OF? (Unprompted)										
RESPONSE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Electricity	92.9	94.2	98.7	99.3	97.6	99.0	97.8	93.2	96.8	96.5
LPG	47.0	77.3	28.4	75.9	27.5	92.4	44.4	75.8	36.8	80.3
Paraffin/kerosene	10.8	28.8	12.0	23.9	5.7	50.8	6.8	26.8	8.8	32.6

E.IB WHICH ALTERNATIVE FUELS TO TRADITIONAL CHARCOAL AND FIREWOOD HAVE YOU HEARD OF? (Unprompted)

RESPONSE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Briquettes	10.8	26.5	18.5	31.1	4.6	27.8	9.9	44.5	11.0	32.5
Sustainable charcoal	7.6	28.8	1.6	19.7	1.1	46.2	4.1	29.4	3.6	31.0
Pellets	6.5	15.6	6.8	8.7	1.6	16.3	3.3	10.9	4.6	12.9
Gasifiers	4.8	9.8	-	3.7	3.0	9.2	7.9	4.2	3.9	6.7
Other	-	4.5	-	4.5	-	0.5	-	2.3	-	3.0
Total respondents	353	378	384	402	371	392	365	384	1,473	1,556

n= 1,473 baseline, 1,556 midline, multiple response possible

TABLE 40: UNPROMPTED KNOWLEDGE OF AE (WHOLE SAMPLE)

E.IB WHICH ALTERNATIVE FUELS TO TRADITIONAL CHARCOAL AND FIREWOOD HAVE YOU HEARD OF? (Unprompted)

ALTERNATIVE FUEL	Lilongwe		Blantyre		Mzuzu		Zomba		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Electricity	83.7	87.9	95.9	98.8	92.1	96.0	91.3	88.4	90.8	92.8
LPG	42.3	72.1	27.6	75.5	26.0	89.6	41.4	71.9	34.3	77.3
Sustainable charcoal	6.9	26.9	1.5	19.6	1.0	44.8	3.8	27.9	3.3	29.8
Paraffin	9.7	26.9	11.6	23.8	5.3	49.3	6.4	25.4	8.3	31.3
Pellets	5.9	14.6	6.6	8.7	1.5	15.8	3.1	10.4	4.3	12.4
Briquettes	9.7	24.7	18.0	30.9	4.3	27.0	9.2	42.2	10.3	31.2
Gasifiers	4.3	9.1	-	3.7	2.8	8.9	7.4	4.0	3.6	6.4
Never heard of AE	9.9	n/a	2.8	n/a	5.6	n/a	6.6	n/a	6.2	n/a
Total Respondents	392	405	395	404	393	404	391	405	1,571	1,618

n= 1,571 baseline, 1,618 midline, multiple response possible

Respondents were also prompted on some of the AEs they had knowledge on. The trend was similar to the unprompted question as there was an increase in knowledge across all the AEs between the baseline and midline. The majority at midline (99.1%) and baseline (97.5%) were aware of electricity, followed by 90.6% at midline and 64.8% at baseline who knew LPG as an AE. Sustainable charcoal was known by 50.4% at midline and 15.0% at baseline. Notably, for Mzuzu, 95.5% and 69.3% were aware of LPG and sustainable charcoal respectively. The table below summarizes the findings.

TABLE 41: KNOWLEDGE OF AE (prompted)

E.1C WHICH ALTERNATIVE FUELS TO TRADITIONAL CHARCOAL AND FIREWOOD HAVE YOU HEARD OF? (PROMPTED) %										
ALTERNATIVE FUEL	Lilongwe		Blantyre		Mzuzu		Zomba		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Electricity	96.0	98.5	99.5	99.3	96.0	99.0	98.4	99.5	97.5	99.1
LPG	67.7	88.4	66.1	92.1	61.7	95.5	63.8	86.4	64.8	90.6
Sustainable charcoal	22.4	48.9	12.8	35.9	8.9	69.3	15.9	47.4	15.0	50.4
Paraffin	39.4	54.3	51.8	66.8	41.8	66.6	17.0	36.1	37.5	55.9
Pellets	11.9	27.4	18.2	15.4	8.4	32.7	6.8	20.7	11.3	24.0
Briquettes	23.2	45.2	47.1	62.9	22.6	45.3	18.1	59.5	27.8	53.2
Gasifiers	7.9	13.8	1.6	3.7	1.9	12.4	8.5	6.4	5.0	9.1
Other	9.1	0.7	3.1	-	4.6	0.7	4.1	-	5.2	0.4
Total Respondents	353	405	384	404	371	404	365	405	1,473	1,618

n=1,473 baseline, 1,618 midline, multiple response possible

Respondents were asked for their sources of information on the AE for cooking that they know. The majority both at baseline (66.4%) and midline (66.3%) reported that they heard from a neighbor or friend or a relative. This was followed by 40.4% at midline who reported knowing through TV and 44.1% at baseline who reported knowing through the radio. The third source at midline was radio (23.6%) while the third source at baseline was TV (27.3%). The table below shows the finding.

TABLE 42: SOURCES OF INFORMATION OF AEs

E.1D WHAT WAS THE SOURCE OF THIS INFORMATION ON THE ONES YOU KNOW?										
RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Neighbor/friend/relative	56.4	63.7	74.6	80.7	76.2	57.9	58.2	62.7	66.4	66.3
TV	37.6	36.1	28.5	47.0	16.6	51.5	26.4	27.2	27.3	40.4
Radio	50.4	23.7	52.1	16.3	18.0	27.0	55.8	27.2	44.1	23.6
Other family member	11.4	15.1	9.2	12.6	14.6	10.9	24.5	11.4	14.9	12.5
Newspapers	11.4	10.4	4.7	9.9	0.6	2.5	14.8	7.9	7.9	7.7
Promotional events	10.8	4.4	13.6	7.2	8.3	6.2	12.1	2.7	11.2	5.1
Social media	-	4.0	-	5.0	-	4.5	-	2.7	-	4.0
Other	15.1	2.7	5.2	2.0	13.0	3.5	2.7	7.7	9.0	4.0
Posters	6.6	4.4	2.6	2.2	0.8	3.0	16.8	5.4	6.7	3.8
SMS	2.8	2.5	3.7	3.5	0.6	1.7	12.1	3.0	4.8	2.7

E.1D WHAT WAS THE SOURCE OF THIS INFORMATION ON THE ONES YOU KNOW?

Nongovernmental organization (NGO) extension worker	1.4	2.5	0.5	0.5	0.6	1.0	9.3	5.4	3.0	2.4
Traditional leaders	2.6	1.5	3.1	0.3	2.2	0.7	4.4	3.0	3.1	1.4
Govt. extension worker	0.9	1.2	-	1.0	0.8	0.7	6.9	2.0	2.2	1.2
Meetings	-	1.2	-	0.5	-	0.3	-	1.7	-	0.9
Public demos	-	0.5	-	0.7	-	-	-	0.3	-	0.4
Business promos	-	0.5	-	0.3	-	-	-	0.3	-	0.3
Billboards	-	-	-	0.3	-	-	-	0.5	-	0.2
Total respondents	351	405	382	404	362	404	364	405	1,459	1,618

n=1,459 baseline, 1,618 midline, multiple response possible

When asked what their most preferred/trusted source on information on AE for cooking, most respondents at baseline (72.9%) and midline (72.5%) cited the radio, followed by the TV (44.1% at baseline and 60.8% at midline). Neighbors, friends, and relatives were the third trusted source both at baseline (27.2%) and midline (40.1%).

TABLE 43: PREFERRED/TRUSTED SOURCE OF INFORMATION ON AEs

E.1E WHAT WOULD BE YOUR PREFERRED/TRUSTED SOURCE ON INFORMATION LIKE THIS?

RESPONSE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Radio	70.3	75.1	75.9	65.4	58.7	59.4	86.8	90.1	72.9	72.5
TV	49.5	60.0	43.8	59.4	42.1	68.8	40.9	54.8	44.1	60.8
Neighbor/friend/relative	24.2	35.8	18.2	43.1	26.0	38.4	40.4	43.0	27.2	40.1
SMS	13.0	27.2	23.8	42.1	12.6	29.5	41.7	24.2	22.8	30.7
Posters	14.3	21.7	9.6	16.1	6.7	20.1	28.2	32.4	14.7	22.6
Social media	-	17.3	-	19.8	-	22.3	-	21.2	-	20.2
Promotional events	24.5	19.5	50.1	31.4	24.1	8.2	24.6	13.6	30.8	18.2
Newspapers	19.3	25.2	15.7	17.3	3.2	5.5	25.1	23.0	15.8	17.7
Traditional leaders	10.9	13.8	21.3	4.0	4.3	5.5	16.8	31.4	13.3	13.7
Other family member	9.4	13.3	2.3	8.7	3.8	12.1	24.9	17.0	10.1	12.8
Govt extension worker	9.4	11.4	8.1	6.9	8.0	1.2	22.5	18.8	12.0	9.6
NGO extension worker	8.9	11.1	11.6	4.2	13.4	2.2	24.6	19.8	14.6	9.3
Public demos	-	11.1	-	14.4	-	1.5	-	6.9	-	8.5
Business promos	-	9.9	-	8.7	-	1.5	-	7.2	-	6.8

E.I.E WHAT WOULD BE YOUR PREFERRED/TRUSTED SOURCE ON INFORMATION LIKE THIS?

Billboards	-	7.2	-	5.5	-	2.0	-	6.9	-	5.4
Meetings	-	4.9	-	6.4	-	0.3	-	4.7	-	4.1
Other	4.2	-	0.3	-	12.6	0.7	2.6	0.7	4.9	0.4
Total respondents	384	405	395	404	373	404	386	405	1,538	1,618

n=1,538 baseline, 1,618 midline, multiple response possible

Respondents were also asked the level of access they have to their trusted information source. 40.3% at baseline and 38.01% at midline reported that they had regular access while 9.6% at baseline and 22.9% at midline reported to have had constant access to the trusted source(s) of information. Only 0.8% at midline reported to have had no access compared to 1.9% at baseline.

TABLE 44: ACCESS TO TRUSTED SOURCE(S) OF INFORMATION ON AEs

E.I.F HOW MUCH ACCESS TO TRUSTED SOURCE(S) OF INFORMATION DO YOU HAVE?

RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
No access	4.1	1.2	-	-	2.6	0.3	0.8	1.7	1.9	0.8
Very limited access	13.4	13.3	6.6	2.5	7.8	13.9	19.2	21.2	11.8	12.7
Some access	24.8	27.7	29.9	34.7	50.5	10.9	40.7	28.9	36.5	25.5
Regular access	40.3	35.6	56.3	36.6	35.5	61.6	28.9	18.3	40.3	38.0
Constant access	17.3	22.2	7.1	26.2	3.6	13.4	10.5	29.9	9.6	22.9
Total respondents	387	405	394	404	386	404	391	405	1,558	1,618

n=1,558 baseline, 1,618 midline, single response only

When asked unprompted regarding the information that would help them to decide the usage of alternative cooking fuels, most of the respondents both at baseline (67.1%) and midline (82.9) cited price. The second piece of information reported at baseline was efficiency (47.9%) while the second piece at midline was advantages and disadvantages of the AEs at 54.3%. The third piece of information at baseline was the AEs advantages and disadvantages (47.3%) while the third at midline was where to purchase the AEs (51%).

TABLE 45: INFORMATION HELPFUL TO DECIDE TO USE AES (Unprompted)

E.I.G WHAT INFORMATION ON ALTERNATIVE COOKING FUELS WOULD HELP YOU TO DECIDE TO USE IT? (Unprompted)

RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Price	70.8	82.2	77.4	72.8	52.9	91.1	67.4	85.4	67.1	82.9
Advantages & disadvantages	40.1	55.1	45.8	57.9	34.6	43.6	68.5	60.7	47.3	54.3
Where to purchase	36.6	54.8	14.0	42.6	16.0	44.6	53.1	62.0	29.9	51.0

E.I.G WHAT INFORMATION ON ALTERNATIVE COOKING FUELS WOULD HELP YOU TO DECIDE TO USE IT? (Unprompted)

Efficiency	50.7	48.2	43.8	38.9	20.6	50.3	76.3	58.0	47.9	48.8
How to use	29.7	49.1	18.6	39.6	22.0	36.6	55.5	53.1	31.5	44.6
If it is clean	14.9	34.1	4.3	20.1	4.6	23.3	47.1	46.9	17.7	31.1
Other	4.0	1.5	0.5	-	5.1	1.0	1.8	0.5	2.9	0.7
Total respondents	377	405	393	404	350	404	384	405	1,504	1,618

n=1,504 baseline; 1,618 midline, single response only

When prompted on the information that would help them to decide to use alternative cooking fuels, most respondents at baseline (93.2%) and midline (97.3%) still cited price. The second piece of information cited at baseline (82.5%) and midline (92.8%) was efficiency of the AEs. This was followed by 77.8% at baseline who cited where to purchase the AEs and 92.6% at midline who cited its advantages and disadvantages. The table below sets out the findings.

TABLE 46: INFORMATION HELPFUL TO DECIDE TO USE AES (Prompted)

E.I.H WHICH OF THE FOLLOWING INFORMATION ON ALTERNATIVE COOKING FUELS WOULD HELP YOU TO DECIDE TO USE IT? (Prompted)

RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Price	88.2	95.1	95.9	97.8	94.1	97.8	94.6	98.8	93.2	97.3
Efficiency	74.5	90.1	85.8	90.6	76.7	92.1	93.1	98.5	82.5	92.8
Advantages & disadvantages	67.5	90.4	78.9	95.8	75.4	86.6	91.3	97.5	78.3	92.6
Where to purchase	64.5	89.9	76.6	92.8	80.2	88.1	89.7	98.3	77.8	92.3
How to use	52.7	85.9	60.4	90.6	66.8	78.5	88.9	98.0	67.2	88.3
If it is clean	41.1	81.2	47.7	87.1	53.7	64.9	85.3	96.5	57.0	82.5
Other	4.3	1.0	2.8	-	8.3	0.7	3.9	0.3	4.8	0.5
Total respondents	372	405	394	404	374	404	389	405	1,529	1,618

n=1,529 baseline, 1,618 midline, single response only

When asked unprompted about the information that would help them to decide to use a fuel-efficient cooking stove, most respondents both at baseline (68.3%) and midline (88.3) cited price, similar to the response on alternative fuels. The second piece of information reported both at baseline (50.5%) and midline (62.4%) was efficiency of the stove. This was followed by the advantages and disadvantages of the stoves, by 44.8% at baseline and 59.3% at midline. The findings are set out in the table below.

TABLE 47: INFORMATION ON FUEL EFFICIENT COOKING STOVES (Unprompted)**E.2B WHAT INFORMATION ON FUEL-EFFICIENT COOKING STOVES WOULD HELP DECIDE ON THE USAGE OF A STOVE? (Unprompted)**

RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Price	74.3	87.9	72.8	83.9	58.1	91.8	67.8	89.4	68.3	88.3
Efficiency	50.7	64.9	46.7	67.6	27.4	46.0	77.1	70.9	50.5	62.4
Advantages & disadvantages	39.4	62.5	51.3	57.2	26.8	48.8	61.6	68.9	44.8	59.3
Where to purchase	42.6	56.3	19.8	40.8	28.8	49.5	54.4	75.6	36.4	55.6
How to use	31.6	59.8	17.5	51.7	19	38.6	55.9	71.1	31.0	55.3
If it is clean	16.9	42.5	8.1	35.6	4.2	27.5	45.9	62.7	18.8	42.1
Other	2.4	0.7	1.3	0	7.3	1	0.8	2	3.0	0.9
Total respondents	373	405	394	404	358	404	388	405	1,513	1,618

n= 1,513 baseline, 1,618 midline, multiple response possible

The same question regarding the information that would help the respondents to decide the usage of fuel-efficient cooking stove was also asked in a prompted manner. Similarly, the majority both at baseline (91.9%) and midline (97.8%) cited the price of the stove, followed by 81.6% at baseline who cited the efficiency of the stove and 94.1% at midline who cited its advantages and disadvantages. The table below summarizes the findings.

TABLE 48: INFORMATION ON FUEL EFFICIENT COOKING STOVES (Prompted)**E.2C WHICH OF THE FOLLOWING INFORMATION ON FUEL-EFFICIENT COOKING STOVES WOULD HELP YOU TO DECIDE TO USE IT? (Prompted) (%)**

RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Price	87.2	95.56	95.2	98.02	90.9	98.27	94.3	99.51	91.9	97.84
Advantages & disadvantages	61.2	91.6	73.4	98.02	75.3	87.38	86.1	99.26	74.0	94.07
Where to purchase	61.2	90.62	67.5	93.81	77.7	91.83	80.5	98.52	71.7	93.7
Efficiency	72.7	89.63	86	94.06	74.5	92.33	93.1	98.27	81.6	93.57
How to use	54.8	86.91	50.3	93.32	65.1	83.66	81.5	97.04	62.9	90.23
If it is clean	36.6	83.7	40.4	87.87	53.8	71.04	74.8	97.04	51.4	84.92
Other	4.8	0.49	1.8	0	11.3	1.24	4.4	0.49	5.6	0.56
Total respondents	374	405	394	404	364	404	389	405	1,521	1,618

n= 1,521 BL, 1,618 ML multiple response possible

3.2 MARKET PRICE SURVEY

This section presents the findings of the market price survey.

3.2.1 SAMPLE DETAIL

A total of 48 markets were visited both at baseline and midline across the four cities.

TABLE 49: LIST OF MARKETS SURVEYED

	LL	BT	MZ	ZA	TOTAL
Market	3 ways	Bangwe	Chibanja big 5	Mtiya	
	Area 21	Gamulani	Chibavi east	Chinamwali	
	Area 18	Kachere	Chibavi west Market	Hygiene	
	Area 22	Kayange	Chiputula	Mitekete	
	Area 23	Limbe central	Luwinga main market	Mpondabwino	
	Area 24	Makata	Masasa East	Mpunga	
	50/ Mgona market	Manja	Masasa west Market	Sadzi 3-Miles	
	Bwandro	Mdala	Mchengautuwa East	Central market	
	Chatata	Namiyango	Mchengautuwa market		
	Chigwirizano	Nkolokoti	Nkholongo Market		
	Kauma	Nthandidzi	Zolozozo East		
	Kawale	Nthukwa			
	Lumbadzi	Bangwe			
	Mtandire	Gamulani			
	Nchepa	Kachere			
	Shire				
Count	17	12	11	8	48
Row %	35.4%	25.0%	22.9%	16.7%	100.0%

n=48

3.2.2 UNIT PACKS BEING SOLD

The most common size of units of charcoal on sale across the cities were both small jumbo/heaps and medium jumbo at baseline (68.7% and 81.3%, respectively) and midline (72.9% and 83.3%, respectively).

TABLE 50: CHARCOAL UNIT SIZES, BY CITY, BASELINE AND MIDLINE

UNIT SIZES OF CHARCOAL ON SALE PER CITY											
RESPONSE	LL		BT		MZ		ZA		Total		
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML	

UNIT SIZES OF CHARCOAL ON SALE PER CITY

Medium jumbo	66.7	76.5	83.3	83.3	80.0	90.9	90.9	87.5	68.7	83.3
Small jumbo heaps	53.3	52.9	58.3	83.3	90.0	90.9	90.9	75.0	81.3	72.9
Large jumbo	40.0	29.4	25.0	83.3	40.0	81.8	45.5	25.0	37.5	54.2
50 kg bag flat	40.0	17.7	58.3	41.7	80.0	18.2	9.1	12.5	45.8	22.9
50 kg raised 2	-	11.8	-	33.3	-	45.5	-	-	-	22.9
50 kg raised 1	73.3	23.5	75.0	16.7	30.0	27.3	45.5	12.5	58.3	20.8
5 liter bucket raised	33.3	17.7	8.3	-	-	18.2	9.1	25.0	14.6	14.6
50 kg raised 1.5	-	11.8	-	33.3	-	9.1	-	-	-	14.6
25 kg bag	6.7	-	25.0	-	-	-	27.3	-	14.6	-
5 liter bucket flat	13.3	23.5	-	-	-	-	9.1	25.0	6.2	12.5
10 liter bucket raised	-	5.9	-	-	-	27.3	-	-	-	8.3
25 kg bag raised top	-	5.9	-	-	-	-	-	25.0	-	6.3
10 liter bucket flat	-	-	-	8.3	-	-	-	-	-	2.1
50 kg raised 3	-	-	-	-	-	-	-	12.5	-	2.1
90 kg bag	6.7	-	-	-	-	-	-	-	-	2.1
Number of markets	15	17	12	12	10	11	11	8	48	48

3.2.3 PRICE OF CHARCOAL

In the tables that follow, the prices per pack size are compared across the different locations. The unit prices were higher in Lilongwe compared to the other locations. The prices are presented in the series of tables below.

TABLE 51: PRICES BY PACK SIZE AND CITY

A.13 WHAT IS THE PRICE TODAY? (Mean)

UNIT SIZE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
50 kg bag raised 2	n/a	13,083	n/a	10,125	n/a	9,750	n/a	-	n/a	10,492
50 kg bag raised 1.5	n/a	6,750	n/a	9,917	n/a	10,500	n/a	-	n/a	9,095
50 kg bag raised 1	5,667	10,125	6,192	7,375	4,500	7,667	5,353	8,000	5,428	8,625
50 kg bag flat	4,559	6,817	4,375	6,510	4,075	7,750	4,667	4,000	4,419	6,591
25 kg bag flat	3,700	8,000	3,417	5,700	-	5,000	2,500	2,500	2,404	5,100
25 kg bag raised top	n/a	5,000	n/a	-	n/a	-	n/a	2,750	n/a	3,500
10 liter raised	n/a	1,100	n/a	.	n/a	1,078	n/a	-	n/a	1,083
5 liter raised	494	1,017	500	-	-	667	533	1,350	382	1,013

A.13 WHAT IS THE PRICE TODAY? (Mean)

10 liter flat	n/a	-	n/a	1,000	n/a	-	n/a	-	n/a	1,000
Large jumbo	671	667	482	1,119	277	313	484	650	479	701
5 liter flat	411	617	-	-	-	-	250	750	165	670
Medium jumbo	268	538	271	406	313	227	222	336	269	392
Small jumbo	150	317	117	211	212	150	183	225	166	224
90 kg bag	8,500	-	n/a	-	n/a	-	n/a	-	8,500	-
Number of markets	15	17	12	12	10	11	11	8	48	48

n=48 Baseline, 48 Midline, multiple count possible

3.3 INDIVIDUAL CHARCOAL SELLER INTERVIEWS**3.3.1 SAMPLE PROFILE**

The sample for the charcoal seller survey at midline ranged between 46 to 93 sellers across the four locations, with Blantyre having the highest proportion of the overall sample (31.7%) and Zomba having the lowest (15.7%). The details are set out in the table below.

TABLE 52: LOCATION OF THE CHARCOAL SELLERS SAMPLED

RESPONDENTS PER CITY		
CITY	BL	ML
Lilongwe	21.8	30.4
Blantyre	26.7	31.7
Mzuzu	23.6	22.2
Zomba	27.9	15.7
Total Respondents	348	293

n=, 348 baseline, 293 midline, single response only

The mean age of the sellers at midline across all cities was 34 (baseline 33), with the oldest seller being 72 and youngest aged 14. The findings are set out in the table below.

TABLE 53: AGE OF CHARCOAL SELLERS

Q.2 AGE OF RESPONDENT										
AGE	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Mean	35	35	32	33	34	35	33	33	33	34
Median	33	35	32	33	31	33	33	31	32	33
Maximum	54	72	67	72	69	69	72	60	72	72

Q.2 AGE OF RESPONDENT

AGE	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Minimum	15	17	10	14	18	19	14	14	10	14
Total respondents	76	89	93	93	81	65	96	46	346	293

n= 346 baseline, 293 midline single response only

Overall, there were more female charcoal sellers (midline 65.5%, baseline 59.8%) than male (midline 34.5% baseline 40.2%). The findings are set out in the table below.

TABLE 54: SEX OF CHARCOAL SELLER RESPONDENTS

Q.3 SEX OF RESPONDENT

SEX	Lilongwe		Blantyre		Mzuzu		Zomba		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Male	63	44	38	41	22	17	38	28	40	34
Female	37	56	62	59	78	83	62	72	60	66
Total respondents	76	89	93	93	82	65	97	46	348	293

n= 348 baseline, 293 midline, single response only

The highest level of education attained by charcoal sellers at midline was primary school (Standard 1-8) at 50.9% with 40.6% having reached secondary school (Form 1-4). At baseline 54.9% had primary school education (Standards 1–8). The findings are set out in the table below.

TABLE 55: HIGHEST LEVEL OF EDUCATION FOR CHARCOAL SELLERS

Q.7 WHAT IS THE HIGHEST LEVEL OF EDUCATION YOU COMPLETED? (Percentage)

EDUCATIONAL LEVEL	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Standard 1-8	69.7	58.4	41.9	50.5	56.1	44.6	54.6	45.7	54.9	50.9
Form 1-4	25.0	33.7	49.5	39.8	37.8	47.7	28.9	45.7	35.7	40.6
None	1.3	4.5	1.1	6.5	1.2	1.5	12.4	8.7	4.3	5.1
Further education	3.9	2.2	5.4	3.2	2.4	4.6	3.1	-	3.7	2.7
Adult literacy	-	1.1	2.2	-	2.4	1.5	-	-	1.2	0.7
No response	-	-	-	-	-	-	1.0	-	0.3	-
Total respondents	76	89	93	93	82	65	97	46	348	293

n = 348 baseline, 293 midline, single response only

3.3.2 CHARCOAL SELLING EXPERIENCE

On average, respondents had been selling at a particular market for five years at midline and four years at baseline. The shortest period for selling was one year and the longest period was 33 years.

TABLE 56: NO. OF YEARS SELLER HAS BEEN SELLING AT THE MARKET

A.1 HOW LONG HAVE YOU BEEN SELLING AT THIS MARKET? (Years)										
YEARS	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Mean	5	6	5	5	4	5	5	6	5	5
Median	3	3	3	3	2	2	4	2	3	3
Maximum	30	20	20	25	42	33	20	30	42	33
Minimum	1	1	1	1	1	1	1	1	1	1
Total respondents	71	89	93	93	80	62	84	46	328	290

n= 328 baseline, 290 midline, single response only

Of the possible unit sizes, the medium jumbo (57.3%) was the most common at midline just like the baseline (56.2%). The small jumbo was the second most common (45.4%) at midline and baseline (47.8%). The table below summarizes the findings.

TABLE 57: UNIT SIZES OF CHARCOAL SOLD BY CHARCOAL SELLERS

A.5 WHAT UNIT SIZES OF CHARCOAL AND/OR FIREWOOD DO YOU SELL? (%)										
UNIT	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Medium jumbo	40.8	50.6	69.9	53.8	48.1	73.8	61.9	54.3	56.2	57.3
Small jumbo heap	21.1	37.1	51.6	61.3	61.7	41.5	53.6	34.8	47.8	45.4
Large jumbo	9.2	15.7	18.3	33.3	13.6	33.8	15.5	28.3	14.4	27.3
5litre bucket raised top	22.4	20.2	5.4	-	-	3.1	3.1	15.2	7.2	9.9
Small firewood bundle	2.6	18	-	1.1	9.9	1.5	3.1	13	3.7	8.2
5litre bucket flat	11.8	18	-	-	-	-	2.1	15.2	3.2	7.8
50 kg bag flat	224.4	4.5	12.9	11.8	24.7	3.1	4.1	6.5	59.5	6.8
50 kg bag raised top 2	n/a	3.4	n/a	8.6	n/a	10.8	n/a	-	n/a	6.1
Other unit 1	n/a	4.5	n/a	3.2	n/a	12.3	n/a	4.3	n/a	5.8
50 kg bag raised top 1	23.7	5.6	14	5.4	7.4	7.7	16.5	2.2	15.3	5.5
50 kg bag raised top 1.5	n/a	5.6	n/a	8.6	n/a	4.6	n/a	-	n/a	5.5
25 kg bag flat	5.3	6.7	6.5	6.5	-	1.5	5.2	4.3	4.4	5.1
Large firewood bundle	-	4.5	-	-	1.2	1.5	-	10.9	0.3	3.4
Medium firewood bundle	6.6	4.5	-	1.1	4.9	3.1	7.2	2.2	4.6	2.7
25 kg bag raised top	n/a	3.4	n/a	-	n/a	-	n/a	6.5	n/a	2
Very large firewood bundle	1.3	3.4	-	1.1	1.2	1.5	-	-	0.6	1.7
50 kg bag raised top 2.5	n/a	1.1	n/a	-	n/a	3.1	n/a	-	n/a	1

A.5 WHAT UNIT SIZES OF CHARCOAL AND/OR FIREWOOD DO YOU SELL? (%)

UNIT	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Other unit 2	n/a	-	n/a	-	n/a	1.5	n/a	-	n/a	0.3
50 kg bag raised top 3	n/a	-	n/a	-	n/a	-	n/a	-	n/a	-
90 kg bag	1.3	-	-	-	-	-	-	-	0.3	-
Total respondents	76	89	93	93	81	65	97	46	348	293

n= 348 baseline, 293 midline, multiple response possible

There was a similar trend between baseline and midline in terms of the sources of charcoal/firewood. Most of the respondents at baseline (58.2%) and endline (48.1%) reported that they bought from another person, followed by “buying from someone at the same market” at 19.5% and 37.9% at baseline and midline respectively. Only 4.4% at baseline and 3.8% at midline said that they made it themselves.

TABLE 58: SOURCE OF CHARCOAL/FIREWOOD

A.6 WHERE DO YOU GET YOUR CHARCOAL/FIREWOOD? (%)

RESPONSE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Buy from another person	51.3	51.7	73.6	57.0	31.3	40.0	76.6	34.8	58.2	48.1
Buy from someone at this market	15.8	38.2	16.5	20.4	35.0	43.1	10.6	65.2	19.5	37.9
Directly from charcoal burners	18.4	7.9	8.8	16.1	25.0	4.6	2.1	-	13.6	8.5
Buy from someone near market	14.5	4.5	4.4	9.7	27.5	9.2	8.5	6.5	13.7	7.5
Other	7.9	11.2	2.2	2.2	11.3	6.2	3.2	2.2	6.2	5.8
Make it myself	5.3	4.5	-	1.1	1.3	3.1	10.6	8.7	4.3	3.8
No response	2.6	-	1.1	-	1.3	-	-	-	1.3	-
Total respondents	76	89	91	93	80	65	94	46	341	293

n= 341 baseline, 293 midline, multiple response possible

All the sellers that said they did not make charcoal themselves were asked to state if they knew where the charcoal came from. Most of them, both at baseline (77.0%) and midline (70.1%), said they knew.

TABLE 59: KNOWLEDGE OF WHERE CHARCOAL/FIREWOOD COMES FROM

A.7 DO YOU KNOW WHERE THE CHARCOAL/FIREWOOD COMES FROM? (%)										
RESPONSE	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Yes	71.1	79.3	91.2	75.3	55.0	32.8	90.7	95.5	77.0	70.1
No	27.6	18.4	6.6	24.7	40.0	65.6	8.1	4.5	20.6	28.8
Do not know	1.3	1.1	2.2	-	5.0	1.6	1.2	-	2.4	0.7
No response	1.0	1.1	-	-	-	-	-	-	0.3	0.3
Total respondents	76	87	91	93	80	64	86	44	333	288

n= 333 baseline, 288 midline, single response only

Sellers were asked if they had knowledge of AEs to unsustainable charcoal (unprompted). As with HHs, most of the respondents at baseline (87.3%) and endline (89.2%) knew that electricity is an AE to charcoal. Compared to baseline (13.2%), 50.9% at midline knew that LPG is also an AE to charcoal. Overall, there was more awareness of the AEs at midline such as briquettes (20.9%), kerosene (17.0%), sustainable charcoal (7.2%) and gasifiers (6.1%) compared to lower levels reported at baseline at 9.4%, 8.7%, 1.8% and 0% respectively. When prompted during midline, most respondents reported knowledge in most of the AEs, with 99.7% reporting knowledge in electricity, 84.3% in LPG, 56.3% in kerosene, 50.2% in briquettes and 29.4% in sustainable charcoal. The least known were pellets at 8.5%. From the prompted AE which they knew, respondents were further asked which ones they could also sell. Most of the respondents reported that they could also sell electricity (62.5%), followed by LPG (53.6%) and briquettes (45.2%). The least reported AE were pellets at 7.7%.

TABLE 60: KNOWLEDGE OF AEs TO UNSUSTAINABLE CHARCOAL (Unprompted)

A.11 WHAT ALTERNATIVE ENERGIES TO TRADITIONAL CHARCOAL DO YOU KNOW? (%)										
ENERGY	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Electricity	88.2	83.1	88.2	97.8	82.9	90.0	89.7	81.0	87.3	89.2
LPG	6.6	57.8	29.0	63.0	9.8	36.7	7.2	31.0	13.2	50.9
Briquettes	6.6	15.7	25.8	30.4	1.2	10.0	4.1	26.2	9.4	20.9
Kerosene	7.9	19.3	7.5	20.7	4.9	18.3	14.4	2.4	8.7	17.0
Other	38.2	30.1	6.5	6.5	8.5	3.3	23.7	21.4	19.2	15.2
Sustainable charcoal	3.9	4.8	2.2	4.3	1.2	20.0	-	-	1.8	7.2
Gasifiers	-	2.4	-	1.1	-	23.3	-	-	-	6.1
Do not know	5.3	2.4	5.4	1.1	14.6	1.7	5.2	4.8	7.6	2.2
Pellets	2.6	1.2	-	2.2	-	3.3	-	-	0.7	1.8
No response	-	-	-	-	-	1.7	-	-	-	0.4
Total respondents	76	83	93	92	82	60	97	42	348	277

n= 348 baseline, 277 midline multiple response possible

Of the sellers that were knowledgeable of AE, 82.7% cited neighbors or friends as the source of information at baseline and 85.5% cited the same at midline. Generally, there seems to be an increase in information sources between baseline and midline. For instance, 28.6% cited ‘other sellers’ compared to 8.2% at baseline; 22.4% cited ‘customers’ compared to 3.9% at baseline and 13.1% cited ‘TV’ compared to 7.1% at baseline. Posters as an information source declined from 0.9% to 0.7% while newspapers declined from 0.6% at baseline to 0.3% at midline. only 2.1% cited ‘social media’ and 1.4% ‘AE distributor’ at midline. Details are set out in the table below.

TABLE 61: SOURCE OF INFORMATION

A.12 HOW DID YOU LEARN ABOUT THESE ALTERNATIVE ENERGIES? (%)										
RESPONSE	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Neighbor friend	94.5	78.7	86.0	89.0	72.5	90.6	77.7	84.8	82.7	85.5
Other sellers	12.3	22.5	16.1	41.8	-	25.0	4.3	19.6	8.2	28.6
Customers	2.7	21.3	2.2	34.1	-	15.6	10.6	10.9	3.9	22.4
Other info source	9.6	28.1	3.2	13.2	13.8	1.6	28.7	32.6	13.8	18.3
Radio	5.5	14.6	41.9	17.6	2.5	7.8	7.4	13.0	14.3	13.8
TV	2.7	6.7	19.4	20.9	5.0	18.8	1.1	2.2	7.1	13.1
Social media	n/a	-	n/a	6.6	n/a	-	n/a	-	n/a	2.1
Alt energy distributor	n/a	2.2	n/a	-	n/a	1.6	n/a	2.2	n/a	1.4
Promotional event at market	-	.2	-	-	-	1.6	-	-	-	1.0
Do not know	4.1	1.1	-	2.2	13.8	-	6.4	-	6.1	1.0
Posters	1.4	-	1.1	2.2	-	-	1.1	-	0.9	0.7
Local smith	n/a	-	n/a	2.2	n/a	-	n/a	-	n/a	0.7
SMS	-	-	-	-	-	1.6	-	-	-	0.3
Newspapers	1.4	-	1.1	-	-	1.6	-	-	0.6	0.3
No response	-	1.1	5.4	-	-	-	-	-	1.4	0.3
Total respondents	73	89	93	91	80	64	94	46	340	290

n= 340 baseline, 290 midline multiple response possible

The mean selling price for charcoal by unit volume was MK 251 at midline and MK 166 for a small jumbo at baseline, MK 6,220 for a 25 kg flat bag at midline compared to MK 3,206 for a 25 kg bag at baseline, and MK 6,465 for a 50 kg bag with a flat top at midline compared to MK 4,419 at baseline. As could be expected, the smaller the unit volume, the smaller the price and vice versa. Just like the baseline, prices in Lilongwe were generally the highest, compared to the other cities. Overall, there was an increase in price of charcoal across all the unit sizes between baseline and midline. This could be a result of the persistent blackouts in Malawi which has increased the demand of alternative cooking fuels to electricity. Note that pack sizes are not directly comparable. The findings are set out in the table below.

TABLE 62: MEAN PRICE OF CHARCOAL SOLD BY UNIT SIZE

A.13 WHAT IS THE PRICE TODAY? (Mean)										
UNIT PRICE	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
90 kg bag	8,500									8,500
50 kg bag raised 2.5		13,000				9,000				10,333
50 kg bag raised 1.5		11,100		9,438		8,500				9,781
50 kg bag raised 2		9,533		9,813		9,357				9,589
50 kg bag raised 1	5,667	11,800	6,192	7,800	4,500	5,800	5,353	10,000	5,428	8,563
50 kg bag flat	4,559	7,625	4,375	6,118	4,075	6,000	4,667	6,500	4,419	6,465
25 kg bag flat	3,700	8,333	3,417	5,383	-	3,000	2,500	4,000	3,206	6,220
25 kg bag raised top		5,000						5,167		5,125
5 liter bucket raised	494	1,050	500			725	533	1,543	509	1,124
5 liter bucket flat	411	856		250				1,071	331	922
Large jumbo	671	771	482	1,113	277	595	484	585	479	825
Medium jumbo	268	527	271	375	313	341	222	314	269	397
Small jumbo	150	344	117	212	212	237	183	219	166	251

N= 251, midline multiple responses possible

3.4 RESULTS ON THE INDICATORS

The following are the findings on the indicators from the survey:

INDICATOR 1: PERCENTAGE OF HOUSEHOLDS CURRENTLY ADOPTING AE FUEL AND TECHNOLOGIES¹²

This indicator is measured by calculating the percentage or proportion of the HHs using alternative fuels out of the total sample. For the purpose of this study, a HH would be counted as adopting the AE fuel, if it is used 50 percent or more of the time. The research question for estimating this metric was repeated for each AE used such that a HH was asked the frequency of use for every AE used.

¹² The indicator numbering has been created by Kadale for ease of reference.

The following categorization was used in the survey: everyday (100%), most days a week (75%), about half the time (50%), one or two days per week (25%), and never (0%). MCHF also requested that if a HH used more than one AE, then all the AEs should be added up to count towards the indicator. This meant that the threshold of 50% or above could be attained from any combined frequency of the individual AEs.

TABLE 63: HHs WITH 50% AND ABOVE USE OF SINGLE AE FUEL

	BLANTYRE	MZUZU	ZOMBA	TOTAL
RESPONSE	COUNT	COUNT	COUNT	COUNT
>=50 Baseline	174	82	95	450
>=50 Midline	196	108	127	508

In mathematical terms, $\hat{p} = \frac{x}{n}$, the sample proportion is \hat{p} (called “p-hat”), and it is computed by taking the ratio of the number of HHs using AEs 50% or above in the sample to the HH using AEs or total sample size.

If the proportion (p2) of HHs using AEs is calculated out of total sample, 32.1%¹³ [point estimate] of the HH surveys were using AEs 50% of the time or more at midline compared to the 28.6% that were using AEs at baseline. This represents a significant 3.5 percentage point increase overall, however, Zomba registered a decrease of 6.3 percentage point. The findings are set out in the tables below.

TABLE 64: USAGE OF AE FUELS, INDICATOR I

INDICATOR I BASED ON TOTAL HH USING THE AEs & TOTAL SAMPLE – Baseline (%)										
	LL		BT		MZ		ZA		TOTAL	
ENERGY SOURCES	%(p1)	%(p2)	%(p1)	%(p2)	%(p1)	%(p2)	%(p1)	%(p2)	%(p1)	%(p2)
HHs with >=50% usage of AE	90.2	44.3	88.2	20.8	76.0	24.2	86.8	25.3	99.0	28.6
Base										
Base for P1: Total HH that at least use any AE fuels	193		93		125		114		525	
Base for P2: Total HH sampled	393		395		393		391		1,572	
INDICATOR I BASED ON TOTAL HH USING THE AEs & TOTAL SAMPLE -Midline (%)										
	LL		BT		MZ		ZA		Total	
ENERGY SOURCES	%(p1)	%(p2)	%(p1)	%(p2)	%(p1)	%(p2)	%(p1)	%(p2)	%(p1)	%(p2)
HHs with >=50% usage of AE	76.6	48.4	80.6	26.7	78.4	31.4	74.0	19.0	79.3	32.1

Standard error of the mean = SEM = $\sqrt{x(N-x)/N^3}$ = 0.0099
 $\alpha = (1-CL)/2 = 0.0250$
 Standard normal deviate for $\alpha = Z_\alpha = 1.9600$

Proportion of positive results = $P = x/N = 0.2568$
 Lower bound = $P - (Z_\alpha * SEM) = 0.2374$
 Upper bound = $P + (Z_\alpha * SEM) = 0.2763$

¹³

<https://sample-size.net/confidence-interval-proportion/>

INDICATOR I BASED ON TOTAL HH USING THE AEs & TOTAL SAMPLE -Midline (%)

	LL	BT	MZ	ZA	Total
Base					
Base for P1: Total HH that at least use any AE fuels	256	134	162	104	656
Base for P2: Total HH sampled	405	404	404	405	1,618

HHs WITH 50% AND ABOVE USE OF SINGLE AE FUEL

ENERGY SOURCE	LL		BT		MZ		ZA		Total	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Electricity	36.9	38.5	19.0	23.5	23.3	27.7	24.9	17.0	26.0	26.7
LPG	5.9	12.8	1.0	4.7	-	4.7	1.5	2.2	2.1	6.1
Other agricultural residues	3.1	3.5	1.3	1.0	0.5	1.2	-	0.5	1.2	1.6
Sawdust	1.8	2.0	-	-	-	-	0.3	0.5	0.5	0.6
Briquettes		0.3	-	1.2	-	0.3	-	-	-	0.4
Sustainable charcoal	6.4	0.3	-	-	5.7	1.2	-	-	0.4	0.4
Paraffin	0.3	0.5	-	-	-	0.3	-	-	0.1	0.2
Pellets	-	0.3	-	-	-	-	-	-	-	0.1
Solar	-	0.3	-	-	-	-	-	-	-	0.1
Total respondents	393	405	395	404	393	404	391	405	1,572	1,618

The percentage using improved stoves was calculated as a ratio of HH using improved stoves to the total HHs sample. Overall, it was also found that 27.1% of the people were using improved stoves at midline compared to the 14.9% at baseline. This represents a 12.2 percentage point increase which was statistically significant. The percentage point increases by city were Lilongwe 6.6, Blantyre 19.2, Mzuzu 19.9 and Zomba 19.9.

TABLE 65: USAGE OF IMPROVED STOVES
D.2JI HOW OFTEN DO YOU USE AN IMPROVED STOVE - Baseline

NUMBER OF TIMES	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	Count	% (p2)	Count	% (p2)	Count	% (p2)	Count	% (p2)	Count	% (p2)
50% & above	100	25.4	17	4.3	55	14.0	62	15.9	234	14.9
Total HH sampled	393		395		393		391		1,572	

D.2JI HOW OFTEN DO YOU USE AN IMPROVED STOVE - Midline

NUMBER OF TIMES	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	Count	% (p2)	Count	% (p2)	Count	% (p2)	Count	% (p2)	Count	% (p2)
50% & above	115	28.4	44	10.9	134	33.2	145	35.8	438	27.1
Total HH sampled	405		404		404		405		1,618	

INDICATOR 2: PERCENT OF HHS REPORTING EXPOSURE TO MESSAGES ON AE FUEL AND TECHNOLOGIES.

The indicator is calculated by using the percentage of HHs that reported having heard of AEs out of the total sample in the midline HH survey.

The question in the survey was in two parts. First, respondents were asked without prompting whether they knew any AEs, to which they gave a yes/no response. For those that said yes, they were asked to state (unprompted) which AEs they knew.

The findings from the HH survey have shown that there was a significant increase in the proportion of the respondents from 93.7% at baseline to 96.2% at midline that had heard of AE fuels across all the locations. This represents a 2.5 percentage point increase, which is statistically significant.

TABLE 66: PERCENTAGE OF HHs WITH KNOWLEDGE OF AE

E. IA HAVE YOU HEARD OF ANY ALTERNATIVE FUELS (%)										
RESPONSE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Yes	89.8	93.3	97.2	99.5	94.4	97.0	93.4	94.9	93.7	96.2
No	9.9	6.7	2.8	0.5	5.6	3.0	6.6	5.2	6.2	3.8
NR/DNK	-	-	-	-	-	-	-	-	0.1	-
Total Respondents	393	405	395	405	393	404	391	405	1,572	1,618

In terms of the specific alternative fuels known, the proportion of respondents that know LPG has shifted from 34.3% at baseline to 77.3% at midline, 3.3% to 29.8% for sustainable charcoal, and 10.3% to 31.2% for Briquettes. The findings are set out in the table below.

TABLE 67: ALTERNATIVE FUELS TO UNSUSTAINABLE CHARCOAL AND FIREWOOD

E. IB WHICH ALTERNATIVE FUELS TO TRADITIONAL CHARCOAL AND FIREWOOD HAVE YOU HEARD OF? (Unprompted) (%)										
ALTERNATIVE FUEL	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Electricity	83.7	87.9	95.9	98.8	92.1	96.0	91.3	88.4	90.8	92.8
LPG	42.3	72.1	27.6	75.5	26.0	89.6	41.4	71.9	34.3	77.3

E.1B WHICH ALTERNATIVE FUELS TO TRADITIONAL CHARCOAL AND FIREWOOD HAVE YOU HEARD OF? (Unprompted) (%)

	LL		BT		MZ		ZA		TOTAL	
Sustainable charcoal	6.9	26.9	1.5	19.6	1.0	44.8	3.8	27.9	3.3	29.8
Paraffin	9.7	26.9	11.6	23.8	5.3	49.3	6.4	25.4	8.3	31.3
Pellets	5.9	14.6	6.6	8.7	1.5	15.8	3.1	10.4	4.3	12.4
Briquettes	9.7	24.7	18.0	30.9	4.3	27.0	9.2	42.2	10.3	31.2
Gasifiers	4.3	9.1	-	3.7	2.8	8.9	7.4	4.0	3.6	6.4
Never heard of AE	9.9	-	2.8	-	5.6	-	6.6	-	6.2	-
Total Respondents	392	405	395	404	393	404	391	405	1,571	1,618

Multiple response possible

On information sources, the majority heard from neighbors both at midline (66.3%) and baseline (61.8%).

TABLE 68: SOURCE OF INFORMATION ON ALTERNATIVE FUELS

E.1D WHAT WAS THE SOURCE OF THIS INFORMATION ON THE ONES YOU KNOW? (%)

SOURCE	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Neighbor/friend/relative	50.5	63.7	72.2	80.7	70.2	57.9	54.2	62.7	61.8	66.3
Radio	45.2	23.7	50.4	16.3	16.5	27.0	51.9	27.2	41.0	23.6
TV	33.7	36.1	27.6	47.0	15.3	51.5	24.6	27.2	25.3	40.4
Other family member	10.2	15.1	8.9	12.6	13.5	10.9	22.8	11.4	13.8	12.5
Promotional events	9.7	4.4	13.2	7.2	7.6	6.2	11.3	2.7	10.4	5.1
Other	13.5	2.7	5.1	2.0	12.0	3.5	2.6	7.7	8.3	4.0
Newspapers	10.2	10.4	4.6	9.9	0.5	2.5	13.8	7.9	7.3	7.7
Posters	5.9	4.4	2.5	2.2	0.8	3.0	15.6	5.4	6.2	3.8
SMS	2.6	2.5	3.5	3.5	0.5	1.7	11.3	3.0	4.5	2.7
Traditional leaders	2.3	1.5	3.0	0.3	2.0	0.7	4.1	3.0	2.9	1.4
NGO extension worker	1.3	2.5	0.5	0.5	0.5	1.0	8.7	5.4	2.7	2.4
Govt. extension worker	0.8	1.2	-	1.0	0.8	0.7	6.4	2.0	2.0	1.2
Social media	-	4.0	-	5.0	-	4.5	-	2.7	-	4.0
Public demos	-	0.5	-	0.7	-	-	-	0.3	-	0.4
Business promos	-	0.5	-	0.3	-	-	-	0.3	-	0.3
Billboards	-	-	-	0.3	-	-	-	0.5	-	0.2

E.ID WHAT WAS THE SOURCE OF THIS INFORMATION ON THE ONES YOU KNOW? (%)

	LL		BT		MZ		ZA		TOTAL	
Meetings	-	1.2	-	0.5	-	0.3	-	1.7	-	0.9
Total Respondents	392	405	395	404	393	404	391	405	1,571	1618

Multiple responses possible

INDICATOR 3: AVERAGE FUEL USE, DISAGGREGATED BY TYPE

The average fuel use by type was calculated by using a two-step method in the household survey. Firstly, the average amount of fuel used for cooking each meal/drink was estimated for each HH that reported using the fuel for the meal. Secondly, the researcher measured the quantity of the estimated fuel. The indicator metric is the sum of the average fuel used for each meal across all the HHs that used the fuel. This is calculated for each type of fuel.

The midline survey established that the mean daily average use per HH across all cities for charcoal has reduced from 2.25 kgs at baseline to 1.9 at midline, from 3.91 kgs to 3.83 kgs for firewood. The use of biomass had reduced from 2.73 kgs to 2.45 kgs.

TABLE 69: AMOUNT OF CHARCOAL/FIREWOOD/BIOMASS USED FOR COOKING

B.10-14 HOW MUCH CHARCOAL/FIREWOOD/BIOMASS USED FOR COOKING PER DAY (Kgs)?							
FUEL TYPE	BASELINE			MIDLINE			
	Mean	Min	Max	Mean	Min	Max	
Traditional charcoal	2.25	0.05	7.84	1.90	0.10	3.64	
Firewood	3.91	0.08	13.00	3.83	0.07	8.7	
Biomass	2.73	0.03	7.58	2.45	0.35	6.74	

In the case of HHs that use electricity, LPG and paraffin as cooking energy, the mean average running time per day for electrical cooking appliances has increased from 85 minutes at baseline to 92 at midline, 74 minutes to 78 for LPG appliances.

TABLE 70: AVERAGE TIME USE OF ELECTRICITY/LPG/PARAFFIN FOR COOKING

B.10-14 FOR HOW LONG ON AVERAGE DO YOU USE ELECTRICITY/LPG/PARAFFIN PLATES (mins)						
TOTAL (EXCLUDING BUSINESS)	BL			ML		
FUEL TYPE	Mean	Min	Max	Mean	Min	Max
Electricity	85	5	300	92	5	360
LPG	74	5	225	78	2	240
Paraffin (kerosene)	15	10	20	-	-	-

INDICATOR 4: PRICE OF UNSUSTAINABLE /ILLEGAL CHARCOAL ACROSS THE ALL THE LOCATIONS

The study used data from the market price survey to calculate the real price of unsustainable charcoal. The vendors at the market were asked to state the prices for each charcoal pack size on the day of the

interview. The researchers sought two metrics for this indicator: 1) the price per pack sizes available, and 2) the weight of the unit with and without dust. The real price of charcoal per kg was determined by dividing the price with the weight of the unit. The latter is further split into price per kg for charcoal with dust and charcoal without dust.

On average, charcoal with dust costs MK 340/kg, while the price of charcoal net without dust is MK 348/kg at midline. The ‘real’ net price of usable charcoal is higher than the price paid for charcoal with dust. This was also the case at baseline.

TABLE 71: MEAN PRICE OF CHARCOAL IN MK/KG WITH OR WITHOUT DUST

MEAN PRICE IN MK	LL		BT		MZ		ZA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Charcoal as bought (with dust) per kg	207	439	173	324	139	235	169	297	176	340
Charcoal net price (with dust removed) per kg	218	445	178	335	165	243	172	304	185	348

At midline, the price of charcoal with dust is most expensive in LL (MK 439/kg), followed by BT and ZA and is lowest in MZ (MK 235/kg). For the price without dust, the highest price is in LL (MK 445/kg) followed by BT and ZA. It is much lower in MZ at MK 243/kg. This trend or variations are similar to what was found at baseline. The findings further show that the price of charcoal has increased.

TABLE 72: PRICE OF CHARCOAL BY CITY, BASELINE

MEAN PRICE OF CHARCOAL-WITH AND WITHOUT DUST PER KG						
LILONGWE	# OF MARKETS	MEAN	MEDIAN	STD. DEV.	MIN	MAX
Average price of charcoal with dust/kg	15	207	180	93	107	450
Average price of charcoal without dust/kg	15	218	188	90	105	450
BLANTYRE	# OF MARKETS	MEAN	MEDIAN	STD. DEV.	MIN	MAX
Average price of charcoal with dust/kg	12	173	169	34	106	217
Average price of charcoal without dust/kg	12	178	174	35	106	225
MZUZU	# OF MARKETS	MEAN	MEDIAN	STD. DEV.	MIN	MAX
Average price of charcoal with dust/kg	10	139	134	22	108	176
Average price of charcoal without dust/kg	8	155	151	23	122	189
ZOMBA	# OF MARKETS	MEAN	MEDIAN	STD. DEV.	MIN	MAX
Average price of charcoal with dust/kg	8	169	159	39	131	240
Average price of charcoal without dust/kg	8	172	163	37	138	240
TOTAL	# OF MARKETS	MEAN	MEDIAN	STD. DEV.	MIN	MAX
Average price of charcoal with dust/kg	45	176	156	63	96	450
Average price of charcoal without dust/kg	43	185	168	62	96	450

TABLE 73: PRICE OF CHARCOAL BY CITY, MIDLINE

MEAN PRICE OF CHARCOAL-WITH AND WITHOUT DUST						
LILONGWE	# OF MARKETS	MEAN	MEDIAN	STD. DEV.	MIN	MAX
Average price of charcoal with dust/kg	17	439	448	81	261	577
Average price of charcoal without dust/kg	17	445	454	75	287	577
BLANTYRE	# OF MARKETS	MEAN	MEDIAN	STD. DEV.	MIN	MAX
Average price of charcoal with dust/kg	12	324	327	64	225	424
Average price of charcoal without dust/kg	12	335	332	57	246	424
MZUZU	# OF MARKETS	MEAN	MEDIAN	STD. DEV.	MIN	MAX
Average price of charcoal with dust/kg	11	235	217	80	124	344
Average price of charcoal without dust/kg	11	243	224	81	140	361
ZOMBA	# OF MARKETS	MEAN	MEDIAN	STD. DEV.	MIN	MAX
Average price of charcoal with dust/kg	8	297	289	45	219	354
Average price of charcoal without dust/kg	8	304	306	46	221	357
TOTAL	# OF MARKETS	MEAN	MEDIAN	STD. DEV.	MIN	MAX
Average price of charcoal with dust/kg	48	340	339	106	124	577
Average price of charcoal without dust/kg	48	348	340	104	140	577

As was the case at baseline, midline results have shown that there are a range of units from smallest to largest with prices that increase as size increases. At baseline, the minimum and maximum money required to at least purchase charcoal was 137 (small jumbo) to 9,000 for a 50kg bag raised. At midline, the minimum is 224 (small jumbo) to 10,492 (50kg bag raised).

TABLE 74: PRICE OF CHARCOAL BY CITY AND UNIT SIZE

UNIT PRICES – BASELINE					
UNIT	MEAN	LL	BT	MZ	ZA
Small jumbo	137	138	114	148	144
Medium jumbo	260	320	242	244	225
Large jumbo	553	767	539	283	501
5 liter raised	548	607	500	-	300
5 liter flat	356	400	-	-	267
25 kg bag	3,250	4,500	3,500	-	2,250
50 kg bag flat	4,227	4,417	4,429	4,063	3,000
50 kg bag raised	5,712	5,765	5,354	4,667	5,325
90 kg bag	9,000	9,000	-	-	-

UNIT PRICES – MIDLINE

UNIT	Total	LL	BT	MZ	ZA
Small jumbo	224	317	211	150	225
Medium jumbo	392	538	406	227	336
Large jumbo price	701	667	1,119	313	650
5 liter raised price	1,013	1,017	-	667	1,350
5 liter flat	670	617	-	-	750
10 liter flat price	1,000	-	1,000	-	-
10 liter Raised	1,083	1,100	-	1,078	-
25 kg bag flat	5,100	8,000	5,700	5,000	2,500
25 kg bag raised top	3,500	5,000	-	-	2,750
50 kg bag flat price	6,591	6,817	6,510	7,750	4,000
50 kg bag raised 1	8,625	10,125	7,375	7,667	8,000
50 kg bag raised 1.5	9,095	6,750	9,917	10,500	-
50 kg bag raised 2	10,492	13,083	10,125	9,750	-

4.0 CONCLUSION AND RECOMMENDATIONS

This section draws conclusions specifically on the indicators.

The midline provides updated data for MCHF Project Indicators 5 and 6 as follows:

For **indicator one** (project indicator 5), which is “percent of households in urban areas that have adopted alternative cooking energy sources and/or fuel-efficient cooking technologies,” 32.1%¹⁴ [point estimate] of the HH surveys were using AEs 50% of the time or more at midline compared to the 28.6% that were using AEs at baseline. This represents a significant 3.5 percentage point increase. However, Zomba registered a decrease of 6.3 percentage points.

For **indicator two**, which is “the % of households reporting exposure to messages on AE fuel and technologies on radio, TV, electronic platforms, or in print”, the findings from the HH survey have shown that there was a significant increase in the proportion of the respondents from 93.7% at baseline to 96.2% at midline that had heard of AE fuels across all the locations. In terms of the specific alternative fuels known, the proportion of respondents that know LPG has shifted from 34.3% at baseline to 77.3% at midline, 3.3% to 29.8% for sustainable charcoal, and 10.3% to 31.2% for Briquettes.

For **indicator three**, which is the average fuel use disaggregated by type; The midline survey established that the mean daily average use per HH across all cities for charcoal has reduced from 2.25 kgs at baseline to 1.9 at midline, from 3.91 kgs to 3.83 kgs for firewood. The use of biomass had reduced from 2.73 kgs to 2.45 kgs. The average running time per day for electrical cooking appliances has increased from 85 minutes at baseline to 92 at midline, 74 minutes to 78 for LPG appliances.

For **indicator four**, which is the price of unsustainable/illegal charcoal across the five locations, at baseline the per kg prices of charcoal with dust (and without dust) were found to be Lilongwe - MK 207 (MK 218), Blantyre - MK 173 (MK 178), Mzuzu - MK 139 (MK 165), and Zomba - MK 169 (MK 172). During the midline, the price per kg of charcoal with dust (and without dust) had increased to Lilongwe - MK 439 (MK 445), Blantyre - MK 324 (MK 335), Mzuzu - MK 235 (MK 243), and Zomba - MK 297 (MK 304).

Standard error of the mean = SEM = $\sqrt{x(N-x)/N^3}$ = 0.0099
 $\alpha = (1-CL)/2 = 0.0250$
Standard normal deviate for $\alpha = Z_\alpha = 1.9600$

Proportion of positive results = $P = x/N = 0.2568$
Lower bound = $P - (Z_\alpha * SEM) = 0.2374$
Upper bound = $P + (Z_\alpha * SEM) = 0.2763$

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<https://sample-size.net/confidence-interval-proportion/>

5.0 ANNEXES

ANNEX I: HOUSEHOLD SURVEY INSTRUMENT

Question	Response	
Supervisor Name		
Enumerator Name		
Date of Interview	Time:	
City	Lilongwe	01
	Blantyre	02
	Mzuzu	03
	Zomba	04
Ward/Area		
Zone #	#	Name:
Household GPS		

“Hello, my name is [NAME] and I work for Kadale Consultants. Kadale is conducting an Urban Cooking Energy Consumer Survey, which includes interviewing households in your community. Your household has been randomly selected to participate in this survey, which will ask questions concerning the fuel and technologies you use when cooking. The aim is to gather useful information that will be used to assess the cooking energy sources and technologies being used in Malawi. These questions will take approximately 45 minutes to complete and your participation is entirely voluntary. If you agree to participate, you can choose to stop at any time or to skip any questions you do not want to answer. The personal identifiable information is strictly confidential and will be removed but your general responses might be shared with the public. If you have any questions regarding the survey and the interview or concerns and complaints we welcome you to contact Kadale Consultants, by calling the Research Manager on 0992 594 170. Taking part in this research is voluntary.”

Do you have any questions?

Are you willing to participate in this survey? Yes No

If yes Thank you for accepting to take part in this interview

Does not consent (Terminate interview and record the name and why they did not consent)

“Zikomo, dzina langa ndi [NAME] ndipo ndimagwira ntchito ku bungwe lotchedwa Kadale Consultants. Kadale ikuchita kafukufuku wowona za njira zamakono zosaononga chilengedwe m’matauni ndi m’mizinda kapena kuti **Urban Cooking Energy Consumer Survey** mchingerezi. Mwa zina, mukafukufukuyu tikucheza ndi anthu m’makomo osiyanasiyana mudela lino. Khoma lanu lasankhidwa mwamayere kuti litenge nawo mbali pakafukufukuyu kotero tikufunsani mafunso okhudza mitundu ya mphanvu za moto komanso zipangizo zomwe mumaphikira. Cholinga cha kafukufukuyu ndi chakuti zotsatira zake zidzagwiritsidwa ntchito kuunika njira ndizipangizo zophikira zomwe anthu mdziko muno akugwiritsa ntchito. Kucheza kwathu kutenga pafupifupi mphindi 45 minutes ndipo kutenga kwanu mbali sikokakamiza. Ngati muvomere kutenga nao mbali, ndinu oloedwa kusankha kusayankha mafunso ena

omwe simukufuna kuyankha kapenanso kuthetsa macheza athu nthawi yiliyonse. Zomwe tikambirane pano ndizachinsinsi ndipo zidasungidwa mwachoncho kotero kuti chilichonse chokulumikizani kumachezawa zoti munthu wina atha kukudziwani zikasiyantsidwa ndi mayankho anu komanso kusungidwa mwachinsinsi. Ngati muli ndi funso lililonse kapena mukufuna kudziwa zambiri zakafukufukuyu kapenaso ngati muli ndi chidandalulo, ndinu olandiridwa kuyimba phone ku office yathu ya Kadale Consultants pa nambala iyi 0992 594 170 ndipo mudzalankhula ndi mkulu wakafukufukuyu,. Kutenga kwanu mbali ndikongodzipereka.”

Muli ndifunso lililonse?

Muli okondwera kutenga mbali? Yes No (*Terminate interview, record the name and why*)

A. GENERAL INFORMATION

Q#	Question	Response	Logic
A.1	What is your name? <i>(First & family name)</i> Dzina lanu ndi dzina la banja lanu		
A.2	<i>(Note the respondent's sex)</i>	1=Male 2=Female	
A.3	Who is responsible for buying fuel for cooking in your HH? Amene amagula mphamvu zophikira pakhomo panu pano ndi ndani? <i>(Unprompted)</i> <i>(If 1,2 or 3 continue, if 4,5 or 6, ask to speak to them. If that person is not available, then book a call back later that day if available)</i>	1=Respondent only 2= Respondent & HH head/Spouse of HH head 3= Respondent & another family member 4= Spouse only 5= Another family member only 6= Another person 99= NR/DNK (terminate interview)	
A.4	What is your relationship to household head (HHH)? Ubale wanu ndi mkulu wa pakhomo panu ndiotani? <i>(Unprompted)</i> <i>If respondent is a maid, ask consent from the HH Head. If the maid is unable to answer some questions, they could be asked to the HH head possibly by phone if the HH head is not home)</i>	1= Self 2= Spouse 3= Daughter/son 4= Brother/sister 5= Mother/ father 6= Other relation 7= House help/Maid 8= Other (specify)	
A.5	How old are you? Muli ndi zaka zingati?	_____ Years	
A.6	What is your marital status? <i>(read out options if they need a prompt)</i> Muli pabanja?	1=Married 2=Widowed 3=Divorced 4=Separated 5=Never Married 99=NR/DNK	

Q#	Question	Response	Logic
A.7	<p>What is the highest level of education attained by you? (Read out if they need a prompt)</p> <p>Sukulu munapita nayo patali bwanji?</p>	<p>1=Adult literacy</p> <p>2=Standard 1-8</p> <p>3=Form 1-4</p> <p>4=Further Education</p> <p>5=None</p> <p>99=NR/DNK</p>	
A.8	<p>If respondent is not HH head, what is the age of the HH head?</p> <p>Wankulu wabanja lino ali ndi zaka zingati?</p>	<p>_____ Years</p>	<p>Only ask A.8 to A.11 if respondent is not HH head</p>
A.9	<p>If respondent is not HH head, what sex is the HH head?</p> <p>Wankulu wabanja lino ndi abambo kapena amayi?</p>	<p>1=Male</p> <p>2=Female</p>	
A.10	<p>What is the marital status of the HH Head?</p> <p>Mkulu wakhomo lino ali pabanja? (read out options if they need a prompt)</p>	<p>1=Married</p> <p>2=Widowed</p> <p>3=Divorced</p> <p>4=Separated</p> <p>5=Never Married</p>	
A.11	<p>What is the highest level of education attained by the HH head? (read out if they need a prompt)</p> <p>Wankulu wapakhomo lino anafika patali bwanji ndimaphunziro?</p>	<p>1=Adult literacy</p> <p>2=Standard 1-8</p> <p>3=Form 1-4</p> <p>4=Further Education</p> <p>5=None</p> <p>99=NR/DNK</p>	
A.12	<p>What is the main source of income for the household? (read out if they need a prompt)</p> <p>Kodi pakhomo pano mumadalira kwambiri chiyani pachuma?</p>	<p>1=Formal work / employment</p> <p>2=Wage labor (casual)</p> <p>3=Business / self-employment</p> <p>4=Crop farming</p> <p>5=Livestock farming</p> <p>6=Other (specify)</p> <p>99=NR/DNK</p>	
A.13	<p>How many people live in the household i.e. eat from the same pot and sleep under the same roof</p> <p>Mumakhala anthu angati pakhomo pano?</p>		
A.14	<p>How many are adult males in the HH (18 years and above)</p> <p>Ndi anthu angati aamuna azaka zosachepera zaka khumi, zisanu ndi zitatu (18)?</p>		

Q#	Question	Response	Logic
A.15	How many are adult females in the HH (18 years & above) Ndi anthu angati aakazi a zaka zosachepera khumi, zisanu ndizitatu (18)?		
A.16	How many are male children in the HH (0 – 17years) Ndi ana angati aamuna ochepera zaka khumi, zisanu ndiziwiri?		
A.17	How many are female children in the HH (0 -17years) Ndi ana angati aakazi ochepera zaka khumi, zisanu ndiziwiri?)		Cross check Qs. A.14- A17 = A.13
A.18	Is your home connected to the electricity grid? Nyumba yanu yinalumikizidwa kumpamvu yamagetsi?	1= Yes 2= No	
A.19	Does your home have a generator? Muli ndi geneleta pakhomo pano?	1= Yes 2= No	
A.20	Does your home have solar panels? Muli ndima solar panel pakhomo pano?	1= Yes 2= No	
A.21	Does your home have an inverter system? Muli ndima Inverter pakhomo pano?	1= Yes 2= No	

B. ENERGY SOURCES AND STOVES

B.1 Which of the following energy sources do you use in your household.....?

Mwa mphamvu izi, ndiziti zomwe inu mumaphikira pakhomo panu?

<u>Energy/fuel source:</u>	<p>a. for cooking (Pophikira zakudya)?</p> <p>unprompted, multiple responses</p> <p>1=Yes, 2=No</p>	<p>b. for heating water (Potenthesa madzi)?</p> <p>unprompted, multiple responses</p> <p>1=Yes, 2=No</p>	<p>c. for how long have you been using this energy source?</p> <p>Mwakhala mukugwiritsa ntchito mphamvu imeneyi kwanthawi yaitali bwanji?</p> <p>1=0 to 6months 2=6 months up to 1year 3=1 up to 2 years 4=2 up to 3 years 5=More than 3years 99=NR/DNK</p>	<p>d. How often do you use this energy source?</p> <p>Mphamvu iyi mumayigwilitsa mowilikiza bwanji?</p> <p>1= Everyday (100%) 2=Most days a week (75%) 3=About half the time (50%) 4=One or two days per week (25%) 5= Never (0%)</p>
Electricity/Magetsi				

B.1 Which of the following energy sources do you use in your household.....?

Mwa mphamvu izi, ndiziti zomwe inu mumaphikira pakhomo panu?

Liquefied Petroleum gas (LPG)/Gas				
Traditional charcoal/ Makala				
Sustainable charcoal/ Makala amakono <i>(probe to see if they know if it is specifically sustainable from Kwandama Hills, JICA or AFRIBAM)</i>				
Firewood/ Nkhuni				
Pellets				
Briquettes				
Dung/ Ndowe				
Sawdust/ Utuchi				
Rice/coffee/other husks/ Deya				
Other agricultural residues/ Zotsalira kumbewu zakumunda				
Paraffin				
Solar/ Mphamvu za dzuwa				
Other (specify)/ Zina (Tchulani)				
Other (specify)				
Other (specify)				

B.2 “What stoves or cooking appliances do you use for cooking or for hot drinks preparation?”

Kodi pakhomo panu pano mumagwiritsa ntchito chopikira chanji pophika chakudya kapena kuwilitsila madzi?

(sub-questions selected based on answers on types of fuel in Q.1. – may be multiple options under some category – e.g. two-ring electric and microwave)

Fuel	a. Cooking Appliance <i>Multiple response, prompt if necessary</i>
Charcoal/ Makala	1=Jiko
	2=Envirofit stove
	3=Metal stove
	4=Other (specify)
	201=UpEnergy SmartHome

B.2 “What stoves or cooking appliances do you use for cooking or for hot drinks preparation?”

Kodi pakhomo panu pano mumagwiritsa ntchito chopikira chanji pophika chakudya kapena kuwilitsila madzi?

(sub-questions selected based on answers on types of fuel in Q.1. – may be multiple options under some category – e.g. two-ring electric and microwave)

	202=Dziwani Investments Ngala ya Moto
	203=Mbambande Quick Fast (MQF)
Firewood/ Nkhuni	1=3 stone
	2=Chitetezo mbaula
	3=Mudstove
	4=Envirofit stove
	5=Rocket stove
	6=Other (specify)
Electricity/ Magetsi	1=Electric hotplate
	2=Induction Plate
	3=Electric Cooker (Oven with Plates)
	4=Electric Mini Cooker (Oven with Plates)
	5=Microwave
	6=Rice Cooker
	7=Kettle
	8=Pressure cooker
	9=Fryer
	10=Coffee maker
	11=Other (Specify)
Liquefied Petroleum gas (LPG)/ Gas	1=LPG Cylinder burner
	2=LPG hotplate (portable burner)
	3=LPG Cooker (Oven with plates)
	4=Other (specify)
Paraffin	1= Paraffin stove
	2= Other (specify)
Biomass	1=3 Stone
	2= Mudstove
	3=Jiko
	4=Envirofit stove
	5=Chitetezo mbaula

B.2 “What stoves or cooking appliances do you use for cooking or for hot drinks preparation?”

Kodi pakhomo panu pano mumagwiritsa ntchito chophikira chanji pophika chakudya kapena kuwilitsila madzi?

(sub-questions selected based on answers on types of fuel in Q.1. – may be multiple options under some category – e.g. two-ring electric and microwave)

6=Other (specify)

203= Mbambande Quick Fast (MQF)

204=Mimi Moto

B.3 For each stove/cooking appliance you have.....		a. Who made the decision to buy the stove/cooking appliance?	b. How much did you pay for this stove/appliance? (MK)	c. For how long have you been using this stove/appliance?	d.	e. Where was this stove/appliance purchased? <Appliance> imeneyi munaigula kuti?	If electric stove / oven Check the kWh for the appliance or take a picture
Stove/Cooking appliance		Anapanga chiganizo chogula <appliance> ndindani? 1= Me only 2= Me and my spouse 3= Me & another family member 4= My spouse only 5= Another family member only 6= It was a gift 7= Another person (specify) 99= Don't Know	Munalipira ndalama zingati pogula <appliance>? <i>Enumerator: record - 99 if they Don't know</i>	Mwakhala mukugwiritsa ntchito <appliance> imeneyi kwanthawi yaitali bwanji? <i>Enumerator: record in months, so if 1 year 3 months then record 15 months and -99 if they Don't Know</i>		1= Supermarket 2= Formal shop 3= Local shop 4= Market 5= Local smith 6= Other (Specify) 201= UpEnergy 202= Dziwani Investments 203= Mbambande quick Fast (MQF) 204= LPG distributor 205= SupaMoto/ECS 99= Don't Know	
1	Jiko						
2	Envirofit stove						
3	Metal stove						
4	3 stone						
5	Chitetezo mbaula						
6	Mudstove						
7	Rocket stove						
8	Electric hotplate						kWh rating_____
9	Induction Plate						kWh rating_____

10	Electric cooker (oven with hotplates)					kWh rating_____
11	Electric mini cooker (oven with hotplates)					kWh rating_____
12	Microwave					kWh rating_____
13	Rice cooker					kWh rating_____
14	Kettle					kWh rating_____
15	Pressure cooker					kWh rating_____
16	Fryer					kWh rating_____
17	Coffee maker					kWh rating
18	LPG cylinder burner					
19	LPG hotplate (portable burner)					
20	LPG Cooker (oven with plates)					
201	UpEnergy SmartHome					
202	Dziwani Investments Ngala ya Moto					
203	Mbambande Quick Fast (MQF)					
204	Mimimoto					
21	Paraffin stove					
22	Other (Specify)					
23	Other (Specify)					
24	Other (Specify)					

Q#	Question	Response	Logic
B.4	Of all the stoves/appliances mentioned, which one do you use most often? Pa zophikira zimene mwatchulazi, ndi iti imene mumagwiritsa ntchito pafupi pafupi kwambiri?	Stove/appliance list (from those selected in B.2.)	Only ask B.4 – B.8 if HH has more than one stove/ appliance
B.5	Why do you use that stove/appliance the most? Kodi mumagwiritsa ntchito <appliance> imeneyi pafupi pafupi kwambiri chifukwa chiyani? <i>(Unprompted)</i>	1= Easier to use 2= Faster 3= More efficient/uses less fuel 4= Cleaner 5= It uses cheap fuel 6= It is cheap to purchase 7= Easily accessible 8= Other (specify) 99=NR/DNK	
B.6	Of all the stoves/appliances mentioned, which one do you use least often? Pa zophikira zimene mwatchulazi, ndi iti imene mumagwiritsa ntchito mochepetsa kwambiri?	Stove/appliance list (from those selected in B.2.)	
B.7	Why do you use that stove/appliance the least? Kodi mumagwiritsa ntchito <appliance> imeneyi mochepetsa kwambiri chifukwa chiyani? <i>(Unprompted)</i>	1= Hard to use/complicated 2=Takes longer to prepare meals 3= Uses too much fuel 4=The fuel it uses is expensive 5=The stove/ appliance is expensive to purchase 6= Not easily accessible 7=Other (specify) 99=NR/DNK	

Q#	Question	Response	Logic
B.8	<p>For the one you use least often, what do you use it for?</p> <p>Kodi <appliance> imene mumagwiritsa ntchito mochepetsetsa kwambiriyi, mumaphikirapo chiyani?</p> <p>(Unprompted)</p>	<p>1=Cooking foods that take longer</p> <p>2=Cooking foods that take less time</p> <p>3= Heating water</p> <p>4= Heating the home</p> <p>5= Making beverages</p> <p>6= Other Specify</p> <p>99=NR/DNK</p>	
B.9	<p>Who does most of the cooking in your HH?</p> <p>Ndindani pakhomo pano amene amaphika nthawi zambiri?</p> <p>(Unprompted)</p>	<p>1=Self</p> <p>2=Spouse</p> <p>3=Own child</p> <p>4=Another adult</p> <p>5=Another child</p> <p>6=House help/maid</p> <p>7= Other (specify)</p> <p>99=NR/DNK</p>	

Stove / cooking appliance list: 1=Jiko 2= Envirofit 3=Metal stove 4=3stone 5= Chitetezo mbaula 6= Mudstove 7= Rocket stove 8=Electric hotplate 9= Induction plate 10= Electric Cooker(oven with plates) 11=Electric Mini cooker (Oven with plates) 12= Microwave 13= Rice Cooker 14=Kettle 15=Pressure cooker 16= Fryer 17= Coffee Maker 18= LPG Cylinder burner 19=LPG hotplate (Portable burner) 20= LPG Cooker (Oven with plates) 21=paraffin stove 22= Other (Specify) 201= UpEnergy SmartHome 202=Dziwani Investments Ngala ya Moto 203=Mbambande Quick Fast (MQF) 204=Mimimoto

B.10 Breakfast

Q#	Question	Response	Logic
a	<p>Do you do any cooking or hot drink preparation using energy/fuel for breakfast on any days of a usual week?</p> <p>Kodi mumaphika chakudya cham'mawa kapena kuwilitsa zokumwa zilizonse pogwilitsa ntchito mphemvu zosiyanasiyana patsiku lililonse musabata</p>	<p>1=Yes</p> <p>2=No</p>	<p>If no, go to B.11</p>
b	<p>For how many days in a usual week do you prepare breakfast involving cooking or making a hot drink?</p> <p>Ndimasiku angati pasabata womwe mumapika chakudya cham'mawa kapena kuwilitsa zokumwa zilizonse</p>	<p>_____ days</p>	

Q#	Question	Response	Logic
d	<p>Which of the cooking stoves or appliances you mentioned earlier do you use when preparing breakfast?</p> <p>Ndi chipangizo chiti pazomwe mwatchula zija chomwe mumagwilitsa ntchito pokonza chakudya cham'mawa?</p> <p><i>Multiple responses possible</i></p>	<p>Stove/Appliance list in source list</p> <p><i>(Choice takes enumerator to correct sections below)</i></p>	<p>Cross check that on list B.2</p>

If Charcoal, Firewood or Biomass: Please show me how much charcoal/firewood you use for that meal

Kodi mungandionetseko kuchuluka kwa makala ndi nkuni zomwe mumaphikira chakudya chimenechi?

(Record weight or if firewood, in part bundle – enumerator specifies as a fraction 0.25, 0.5, etc).

Enumerator: For charcoal, kindly ask if they can show you their stove and try filling it with charcoal and how many times, they fill it for this meal, then weigh the charcoal. If they will not or cannot allow it, ask them to select the amount of charcoal from your supply.

Traditional Charcoal (Weight in Kgs/grams) _____

Sustainable Charcoal (Weight in Kgs/grams) _____

Firewood (Weight in Kgs/grams) _____

Biomass (Weight in Kgs/grams) _____

If Electricity/LPG/Paraffin

Electric hotplates <i>(including as part of a cooker)</i>	<p>How many plates do you use for this meal?</p> <p>Mumaphikira pangati mukamaphika chakudya cham'mawa/kadzutsa?</p>	<p>1=One</p> <p>2=Two</p> <p>3=Three</p> <p>4=Four</p>
	<p>For how long on average do you use the plates?</p> <p><i>(enumerator – if they have a cooker that has hotplate and oven, treat it as if two separate devices – ask here as if just a separate hotplate)</i></p> <p>Mumaphikila kwa nthawi yayitali bwanji?</p>	<p>Plate 1 = _____mins</p> <p>Plate 2 = _____mins</p> <p>Plate 3 = _____mins</p> <p>Plate 4 = _____mins</p>
Oven	<p>What energy source does the oven use?</p> <p>Oven yanu imagwiritsa ntchito moto wanjji?</p> <p><i>(Enumerator – this is for the oven part not for the hotplates)</i></p>	<p>1=Electricity</p> <p>2=LPG</p> <p>3=Solar</p> <p>4=Other (Specify)</p>
	<p>For how long do you use it?</p> <p>Mumaphikamo kwanthawi yayitali bwanji?</p>	<p>_____minutes</p>
Microwave	<p>For how long do you use it?</p> <p>Mumaphikamo kwanthawi yayitali bwanji?</p>	<p>_____minutes</p>

If Electricity/LPG/Paraffin		
LPG	<p>How many plates/rings do you use for this meal?</p> <p>Mumaphikira pangati mukamaphika chakudya cham'mawa/kadzutsa?</p>	<p>1=One</p> <p>2=Two</p> <p>3=Three</p> <p>4=Four</p>
	<p>For how long on average do you use the plates?</p> <p>Mumaphikamo kwanthawi yaitali bwanji?</p> <p><i>(enumerator – if they have a cooker that has hotplate and oven, treat it as if two separate devices – ask here as if just a separate hotplate)</i></p>	<p>Plate 1 = ____ mins</p> <p>Plate 2 = ____ mins</p> <p>Plate 3 = ____ mins</p> <p>Plate 4 = ____ mins</p>
Paraffin	<p>How many plates/rings do you use for this meal?</p> <p>Mumaphikira pangati mukamaphika chakudya cham'mawa/kadzutsa?</p>	<p>1=One</p> <p>2=Two</p> <p>3=Three</p> <p>4=Four</p>
	<p>For how long on average do you use the plates/rings?</p> <p>Mumaphikapo kwanthawi yaitali bwanji?</p>	<p>Plate 1 = ____ mins</p> <p>Plate 2 = ____ mins</p> <p>Plate 3 = ____ mins</p> <p>Plate 4 = ____ mins</p>
If any other	<p>For how long do you use this other stove/appliance?</p> <p>Mumaphikamo kwanthawi yaitali bwanji?</p> <p><i>Multiple devices possible</i></p>	<p>____ Mins</p>

B.11 Meal for Lunch

Q#	Question	Response	Logic
a	<p>Do you do any cooking or hot drink preparation using energy/fuel for lunch on any days of a usual week?</p> <p>Kodi mumaphika chakudya chamasana kapena kuwilitsa zokumwa zilizonse pogwilitsa ntchito mphamvu zosiyanasiyana patsiku lililonse musabata</p>	<p>1=Yes</p> <p>2=No</p>	<p>If no, go to B.12</p>
b	<p>For how many days in a usual week do you prepare lunch involving cooking or making a hot drink?</p> <p>Ndimasiku angati pasabata womwe mumapika chakudya chamasana kapena kuwilitsa zokumwa zilizonse</p>	<p>_____ days</p>	
c	<p>On the days you prepare foods and drinks using energy/fuel, which foods or hot drinks do you typically prepare for lunch?</p> <p>Pamasiku womwe mumaphika zokudya kapena zokumwa kugwilitsa ntchito mphamvu zosiyanasiyana, ndizokudya kapena zokumwa ziti zomwe zimakhala zamasana/nkhomalilo?</p> <p><i>Enumerator to classify. Multiple responses possible</i></p>	<p>1=Nsima</p> <p>2=Rice/Pasta (other starch foods)</p> <p>3=Potatoes/cassava</p> <p>4=Beans</p> <p>5=Meat/fish/eggs</p> <p>6=Vegetable</p> <p>7=Chips/fried food</p> <p>8=Hot Drink</p> <p>9= Other (Specify)</p> <p>10=Other (specify)</p> <p>99=NR/DNK</p>	
d	<p>Which of the cooking stoves or appliances you mentioned earlier do you use when preparing lunch?</p> <p>Ndi chipangizo chiti pazomwe mwatchula zija chomwe umagwilitsa ntchito pokonza chakudya chamasana/nkhomalilo?</p> <p><i>Multiple responses possible</i></p>	<p>Stove/Appliance list in source list</p> <p><i>(Choice takes enumerator to correct sections below)</i></p>	<p>Cross check that on list B.2</p>

If Charcoal, Firewood or Biomass –

Please show me how much charcoal/firewood you use for that meal

Kodi mungandionetseko kuchuluka kwa makala ndi nkhuni zomwe mumaphikira chakudya chamasana/nkhomaliro?

(record weight or if firewood, in part bundle – enumerator specifies as a fraction 0.25, 0.5, etc).

Enumerator: For charcoal, kindly ask if they can show you their stove and try filling it with charcoal and how many times, they fill it for this meal, then weigh the charcoal. If they will not or cannot allow it, ask them to select the amount of charcoal from your supply.

Traditional Charcoal (Weight in Kgs/grams) _____

Sustainable Charcoal (Weight in Kgs/grams) _____

Firewood (Weight in Kgs/grams) _____

Biomass (Weight in Kgs/grams) _____

If Electricity/LPG/Paraffin

Electric hotplates <i>(including as part of a cooker)</i>	How many plates do you use for this meal? Mumaphikira pangati mukamaphika chakudya chamasana/nkhomaliro?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates? Mumaphikapo kwanthawi yaitali bwani? <i>(enumerator – if they have a cooker that has hotplate and oven, treat it as if two separate devices – ask here as if just a separate hotplate)</i>	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins
Oven	What energy source does the oven use? Oven yanu imagwiritsa ntchito moto wani? <i>(Enumerator – this is for the oven part not for the hotplates)</i>	1=Electricity 2=Gas 3=Solar 4=Other (Specify)
	For how long do you use it? Mumaphikamo kwanthawi yaitali bwani?	_____minutes
Microwave	For how long do you use it? Mumaphikiramo kwanthawi yaitali bwani?	_____minutes

If Electricity/LPG/Paraffin		
LPG	How many rings/plates do you use for this meal? Mumaphikira pangati mukamaphika chakudya chamasana/nkhumaliro?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates/rings? Mumaphikapo kwanthawi yaitali bwanji? <i>(enumerator – if they have a cooker that has hotplate and oven, treat it as if two separate devices – ask here as if just a separate hotplate)</i>	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins
Paraffin	How many rings do you use for this meal? Mumaphikira pangati mukamaphika chakudya chamasana/nkhumaliro?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates/rings? Mumaphikapo kwanthawi yaitali bwanji?	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins
If any Other	For how long do you use this other stove/appliance? Mumaphikamo kwanthawi yaitali bwanji? <i>Multiple appliances possible</i>	_____ mins

B.12 Meal in the evening/Dinner

Q#	Question	Response	Logic
a	Do you do any cooking or hot drink preparation using energy/fuel for evening meal on any days of a usual week? Kodi mumaphika chakudya chamadzulo/mgonero kapena kuwilitsa zokumwa zilizonse pogwilitsa ntchito mphamvu zosiyanasiyana patsiku lililonse musabata	1=Yes 2=No	If no, go to B.13

Q#	Question	Response	Logic
b	<p>For how many days in a usual week do you prepare evening meal involving cooking or making a hot drink?</p> <p>Ndimasiku angati pasabata womwe mumapika chakudya chamadzulo/mgonero kapena kuwilitsa zokumwa zilizonse</p>	_____ days	
c	<p>Which foods do you typically prepare for evening meal/dinner?</p> <p>Ndizokudya kapena zokumwa ziti zomwe zimakhala zamadzulo/ngonero?</p> <p><i>Enumerator to classify. Multiple responses possible</i></p>	<p>1=Nsima</p> <p>2=Rice/Pasta (other starch foods)</p> <p>3=Potatoes/cassava</p> <p>4=Beans</p> <p>5=Meat/fish/eggs</p> <p>6=Vegetables</p> <p>7=Chips/fried foods</p> <p>8=Hot drink</p> <p>9= Other (Specify)</p> <p>99=NR/DNK</p>	
d	<p>Which of the cooking stoves or appliances you mentioned earlier do you use when preparing evening meal/dinner?</p> <p>Ndi chipangizo chiti pazomwe mwatchula zija chomwe umagwilitsa ntchito pokonza chakudya chamadzulo/mgonero?</p> <p><i>Multiple responses possible</i></p>	<p>Stove/Appliance list in source list</p> <p><i>(Choice takes enumerator to correct sections below)</i></p>	Cross check that on list B.2

If Charcoal, Firewood or Biomass

Please show me how much charcoal/firewood you use for that meal (record weight or if firewood, in part bundle – enumerator specifies as a fraction 0.25, 0.5, etc).

Enumerator: For charcoal, kindly ask if they can show you their stove and try filling it with charcoal and how many times, they fill it for this meal, then weigh the charcoal. If they will not or cannot allow it, ask them to select the amount of charcoal from your supply.

Traditional Charcoal (Weight in Kgs/grams) _____

Sustainable Charcoal (Weight in Kgs/grams) _____

Firewood (Weight in Kgs/grams) _____

Biomass (Weight in Kgs/grams) _____

If Electricity/LPG/Paraffin		
Electric hotplates <i>(including as part of a cooker)</i>	How many plates do you use for this meal? Mumaphikira pangati mukamaphika chakudya chamadzulo/mgonero?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates? Mumaphikapo kwanthawi yaitali bwanji? <i>(enumerator – if they have a cooker that has hotplate and oven, treat it as if two separate devices – ask here as if just a separate hotplate)</i>	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins
Oven	What energy source does the oven use? Oven yanu imagwiritsa ntchito moto wANJI? <i>(Enumerator – this is for the oven part not for the hotplates)</i>	1=Electricity 2=Gas 3=Solar 4=Other (Specify)
	For how long do you use it? Mumaphikiramo kwanthawi yaitali bwanji?	_____minutes
Microwave	For how long do you use it? Mumaphikirapo kwanthawi yaitali bwanji?	_____minutes
LPG	How many plates/rings do you use for this meal? Mumaphikira pangati mukamaphika chakudya chamadzulo/mgonero?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates/rings? Mumaphikapo kwanthawi yaitali bwanji?	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins

If Electricity/LPG/Paraffin		
Paraffin	How many plates/rings do you use for this meal Mumaphikira pangati mukamaphika chakudya chamadzulo/mgonero?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates/rings? Mumaphikapo kwanthawi yaitali bwanji?	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins
If any other	For how long do you use this other stove/appliance? Mumaphikamo kwanthawi yaitali bwanji? <i>Multiple stoves/appliances possible</i>	____ Mins

B.13 Other meals

Q#	Question	Response	Logic
a	Do you do any cooking using energy/fuel for any other meal on any days of a usual week? Kodi mumaphika zakudya zinazi pogwilitsa ntchito mphamvu zosiyanasiyana patsiku lililonse musabata	1=Yes 2=No	If no, go to B.14
b	For how many days in a usual week do you prepare any other meal involving cooking or making a hot drink? Ndimasiku angati pasabata womwe mumapika chakudyachilichonse kapena kuwilitsa zokumwa zilizonse?	____ days	
c	What time of the day do you eat this meal? Chokudyachi mumadya nthawi yanji? <i>Multiple response possible</i>	1=Between breakfast and lunch 2=Between lunch and dinner 3=After dinner 4=Other (specify) 99=NR/DNK	

Q#	Question	Response	Logic
d	<p>Which other foods do you typically prepare?</p> <p>Ndizokudya zina ziti zomwe mumaphika?</p> <p><i>Enumerator to classify.</i></p> <p><i>Multiple responses possible</i></p>	<p>1=Pumpkins</p> <p>2=Fresh groundnuts</p> <p>3=Green maize</p> <p>4=Snacks</p> <p>5=Thobwa (for home consumption)</p> <p>6= Other hot drinks</p> <p>7=Other Specify</p> <p>99=NR/DNK</p>	
e	<p>Which of the cooking stoves or appliances you mentioned earlier do you use when preparing this meal?</p> <p>Ndi chipangizo chiti pazomwe mwatchula zija chomwe umagwilitsa ntchito pokonza chakudya?</p> <p><i>Multiple responses possible</i></p>	<p>Stove/Appliance list in source list</p> <p><i>(Choice takes enumerator to correct sections below)</i></p>	<p>Cross check that on list B.2</p>

If Charcoal, Firewood or Biomass

Please show me how much charcoal/firewood you use for that meal (*record weight or if firewood, in part bundle – enumerator specifies as a fraction 0.25, 0.5, etc*).

Enumerator: For charcoal, kindly ask if they can show you their stove and try filling it with charcoal and how many times, they fill it for this meal, then weigh the charcoal. If they will not or cannot allow it, ask them to select the amount of charcoal from your supply.

Traditional Charcoal (*Weight in Kgs/grams*) _____

Sustainable Charcoal (*Weight in Kgs/grams*) _____

Firewood (*Weight in Kgs/grams*) _____

Biomass (*Weight in Kgs/grams*) _____

If Electricity/LPG/Paraffin		
Electric hotplates <i>(including as part of a cooker)</i>	How many plates do you use for this meal? Mumaphikira pangati mukamaphika chakudya chinachi?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates? Mumaphikapo kwanthawi yaitali bwanji? <i>(enumerator – if they have a cooker that has hotplate and oven, treat it as if two separate devices – ask here as if just a separate hotplate)</i>	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins
Oven	What energy source does the oven use? Oven yanu imagwiritsa ntchito moto wanji? <i>(Enumerator – this is for the oven part not for the hotplates)</i>	1=Electricity 2=Gas 3=Solar 4=Other (Specify)
	For how long do you use it? Mumaphikiramo kwanthawi yaitali bwanji?	_____minutes
Microwave	For how long do you use it? Mumaphikiramo kwanthawi yaitali bwanji?	_____minutes
LPG	How many plates/rings do you use for this meal? Mumaphikira pangati mukamaphika chakudya chimenechi?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates/rings? Mumaphikapo kwanthawi yaitali bwanji?	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins

If Electricity/LPG/Paraffin		
Paraffin	How many plates/rings do you use for this meal? Mumaphikira pangati mukamaphika chakudya chimenechi?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates/rings? Mumaphikapo kwanthawi yaitali bwanji?	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins
If any other	For how long do you use this other stove/appliance? Mumaphikamo kwanthawi yaitali bwanji? <i>Multiple appliances possible</i>	_____ mins

B.14 Hot drinks preparation other than with a meal

Q#	Question	Response	Logic
a	Do you prepare any hot drinks using energy/fuel outside of the meals you have already mentioned on any days of a usual week? Mumakhonza zokumwa zotentha zina kupatula zomwe mwatchulazi kugwilitsa ntchito mphamvu zosiyana patsiku lililonse musabata?	1=Yes 2=No	If no, go to B.15
b	For how many days in a usual week do you prepare any hot drinks outside of your meals? Ndimasiku angati pasabata womwe kutenthetsa zokumwa zilizonse kupatula zomwe mwatchula kale?	_____ days	
c	How many times in a normal day do you prepare hot drinks outside of your meals? Patsiku lililonse mumawilitsa zokumwa zilizonse kupatula chokudya chanu chatsiku ndi tsiku?		
d	Which hot drinks do you typically prepare? Ndizokumwa zake ziti zomwe mumawilitsa? <i>Enumerator to classify. Multiple responses possible</i>	1=Tea 2=Coffee 3=Other (Specify) 99=NR/DNK	

Q#	Question	Response	Logic
e	Which stove/cooking appliance do you use when preparing hot drinks? Mumaphikira pamoto wanji pokonza zakumwazi? <i>Multiple responses possible</i>	Stove/Appliance list in source list <i>(Choice takes enumerator to correct sections below)</i>	Cross check that on list B.2

If Charcoal, Firewood or Biomass

Please show me how much charcoal/firewood you use for making drinks (*record weight or if firewood, in part bundle – enumerator specifies as a fraction 0.25, 0.5, etc.*)

For charcoal, kindly ask if they can show you their stove and try filling it with charcoal and how many times, they fill it for this purpose, then weigh the charcoal. If they will not or cannot allow it, ask them to select the amount of charcoal from your supply.

Traditional Charcoal (*Weight in Kgs/grams*) _____

Sustainable Charcoal (*Weight in Kgs/grams*) _____

Firewood (*Weight in Kgs/grams*) _____

Biomass (*Weight in Kgs/grams*) _____

If Electricity/LPG/Paraffin

Electric hotplates <i>(including as part of a cooker)</i>	How many plates do you use for making drinks? Mumaphikira pangati mukamaphika chakumwachi?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates? Mumaphikapo kwanthawi yaitali bwanji? <i>(enumerator – if they have a cooker that has hotplate and oven, treat it as if two separate devices – ask here as if just a separate hotplate)</i>	Plate 1 = ___ mins Plate 2 = ___ mins Plate 3 = ___ mins Plate 4 = ___ mins
Electric Kettle	For how long do you use it? Mumaphikiramo kwanthawi yaitali bwanji?	_____ minutes
Coffee Maker	For how long do you use it? Mumaphikiramo kwanthawi yaitali bwanji?	_____ minutes
Microwave	For how long do you use it? Mumaphikiramo kwanthawi yaitali bwanji?	_____ mins

If Electricity/LPG/Paraffin		
LPG	How many plates/rings do you use for making hot drinks? Mumaphikira pangati mukamaphika chakumwachi?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates? Mumaphikapo kwanthawi yaitali bwanji? <i>(enumerator – if they have a cooker that has hotplate and oven, treat it as if two separate devices – ask here as if just a separate hotplate)</i>	Plate 1 = ___mins Plate 2 = ___mins Plate 3 = ___mins Plate 4 = ___mins
Paraffin	How many plates/rings do you use for this meal Mumaphikira pangati mukamaphika chakumwachi?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates/rings? Mumaphikapo kwanthawi yaitali bwanji?	Plate 1 = ___mins Plate 2 = ___mins Plate 3 = ___mins Plate 4 = ___mins
If any other	For how long do you use this other stove/appliance mentioned? Mumaphikamo kwanthawi yaitali bwanji? <i>Multiple appliances possible</i>	_____ mins

B.15 Cooking from home for a business

Q#	Question	Response	Logic
a	Do you have a business that requires cooking or heating using any of the mentioned fuels? Muli ndi bizinesi yophika kapena imene mmafunika kutenthesa malonda anu ndi moto wochokera kumphamvu zimene mwatchulapozi?	1=Yes 2=No	If “NO” Skip to B16.

Q#	Question	Response	Logic
b	<p>If yes, what is the business?</p> <p>Ndi bizinesi yanji?</p>	<p>1=Cooking food for sale later (e.g. mandazi, roasted groundnuts, boiled eggs, etc.)</p> <p>2=Cooking for immediate sale (chips etc)</p> <p>3=Hot drinks (Thobwa etc)</p> <p>4=Small eating place</p> <p>5=Other (specify)</p> <p>99=NR/DNK</p>	
c	<p>Which stove/cooking appliance do you use when preparing food/hot drinks for this business?</p> <p>Mumagwilitsa moto wanji pophika ndi kwilitsa zokumwa za bizinesi yanu?</p> <p><i>Multiple responses possible</i></p>	<p>Stove/Appliance list in source list</p> <p><i>(Choice takes enumerator to correct sections below)</i></p>	<p>Cross check that on list B.2</p>

If Charcoal, Firewood or Biomass

Please show me how much charcoal/firewood you use for that business in a day (*record weight or if firewood, in part bundle – enumerator specifies as a fraction 0.25, 0.5, etc.*)

Enumerator: For charcoal, kindly ask if they can show you their stove and try filling it with charcoal and how many times, they fill it for this purpose, then weigh the charcoal. If they will not or cannot allow it, ask them to select the amount of charcoal from your supply.

Traditional Charcoal (*Weight in Kgs/grams*) _____

Sustainable Charcoal (*Weight in Kgs/grams*) _____

Firewood (*Weight in Kgs/grams*) _____

Biomass (*Weight in Kgs/grams*) _____

If Electricity/LPG/Paraffin		
Electric hotplates <i>(including as part of a cooker)</i>	How many plates do you use for this purpose? Mumaphikira pangati mukamaphika kapena kutenthetsa zakudya zabinesizi?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates? Mumaphikapo kwanthawi yaitali bwanji? <i>(enumerator – if they have a cooker that has hotplate and oven, treat it as if two separate devices – ask here as if just a separate hotplate)</i>	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins
Oven	What energy source does the oven use? Oven yanu imagwiritsa ntchito moto wANJI? <i>(Enumerator – this is for the oven part not for the hotplates)</i>	1=Electricity 2=Gas 3=Solar 4=Other (Specify)
	For how long do you use it? Mumaphikiramo kwanthawi yaitali bwanji?	_____minutes
Microwave	For how long do you use it? Mumaphikiramo kwanthawi yaitali bwanji?	_____minutes
LPG	How many rings do you use for this meal? Mumaphikira pangati mukamaphika zakudya za binesizi?	1=One 2=Two 3=Three 4=Four
	For how long on average do you use the plates? Mumaphikapo kwanthawi yaitali bwanji? <i>(enumerator – if they have a cooker that has hotplate and oven, treat it as if two separate devices – ask here as if just a separate hotplate)</i>	Plate 1 = ____ mins Plate 2 = ____ mins Plate 3 = ____ mins Plate 4 = ____ mins

If Electricity/LPG/Paraffin		
Paraffin	<p>How many plates/rings do you use for this?</p> <p>Mumaphikira pangati mukamaphika kapena kutenthetsa zakudya zabizinesizi?</p>	<p>1=One</p> <p>2=Two</p> <p>3=Three</p> <p>4=Four</p>
	<p>For how long on average do you use the plates/rings?</p> <p>Mumaphikapo kwanthawi yaitali bwanji?</p>	<p>Plate 1 = ____ mins</p> <p>Plate 2 = ____ mins</p> <p>Plate 3 = ____ mins</p> <p>Plate 4 = ____ mins</p>
If any other	<p>For how long do you use this other stove/appliance?</p> <p>Mumaphikiramo kwanthawi yaitali bwanji?</p> <p><i>Multiple appliances possible</i></p>	<p>_____ mins</p>

B.16 Heating

Q#	Question	Response	Logic
a	<p>Do you heat water in the home for laundry or for bathing etc?</p> <p>Mumatenthetsa madzi wochapila kapena kusamba nyumba mwanu?</p>	<p>1=Yes</p> <p>2=No</p>	
b	<p>If yes, for how many months in the year do you heat water?</p> <p>Ngati zilichoncho, mumatenthetsa mumiyezi yake yiti pachaka?</p> <p><i>(Record how many months on average)</i></p>	<p>_____ months</p> <p>99 = No Response or Don't know</p>	<p>If "NO"</p> <p>Skip to B.17</p>
c	<p>How many days of the week do you heat water?</p> <p>Pasabata, ndi masiku angati womwe mumatenthetsa madzi?</p>	<p>_____ days</p>	
d	<p>If yes, what fuel do you use to heat water?</p> <p>Mumagwiritsa ntchito moto wanjikotenthetsa madziwa?</p>	<p>Fuel list</p>	

Q#	Question	Response	Logic
e	<p>Why do you use this/these fuels to heat water?</p> <p>Ndichifukwa chiyani mumagwiritsa ntchito moto umenewu potenthetsa madziwa</p>	<p>1=Affordable</p> <p>2=Faster</p> <p>3=Only source available</p> <p>4=Other (Specify)</p> <p>99=NR/DNK</p>	<p>If using charcoal, firewood or biomass go to weight section, if not go to f. below</p>

Please show me how much charcoal/firewood you use for heating water

Kodi mungandionetseko kuchuluka kwa makala ndi nkuni zomwe mumatenthetsera madzi?

(record weight or if firewood, in part bundle – enumerator specifies as a fraction 0.25, 0.5, etc).

Enumerator: For charcoal, kindly ask if they can show you their stove and try filling it with charcoal and how many times, they fill it for heating, then weigh the charcoal. If they will not or cannot allow it, ask them to select the amount of charcoal from your supply.

Traditional Charcoal (Weight in Kgs/grams) _____

Sustainable Charcoal (Weight in Kgs/grams) _____

Firewood (Weight in Kgs/grams) _____

Biomass (Weight in Kgs/grams) _____

f	<p>Do you heat your home?</p> <p>Mumatenthetsa m’nyumba mwanu?</p>	<p>1=Yes</p> <p>2=No</p>	<p>If “No” skip to section C</p>
g	<p>If yes, for how many months in the year do you heat the home?</p> <p>Ndimiyazi ingati pachaka yomwe mumatenthetsa m’nyumba mwanu?</p> <p>(Record how many months on average)</p>	<p>_____months</p> <p>Record -99 if No Response or Don’t know</p>	
h	<p>If yes, what fuel do you use to heat the home?</p> <p>Mumagwilitsa mphavu yanji potenthetsa mnyumba mwanu?</p>	<p>Fuel list</p>	
i	<p>Why do you use this fuel to heat the home?</p> <p>Mumagwiritsa ntchito mphamvu zimenezi chifukwa chiyani?</p>	<p>1=Affordable</p> <p>2=Faster</p> <p>3=Only source available</p> <p>4=less smoke emission</p> <p>4=Other (Specify)</p> <p>99=NR/DNK</p>	<p>If using charcoal, firewood or biomass go to weight section, if not go to f. below</p>

Please show me how much charcoal/firewood you use for heating the home

Kodi mungandionetseko kuchuluka kwa makala ndi nkhu ni zomwe mumatenthetsera mnyumba?

(record weight or if firewood, in part bundle – enumerator specifies as a fraction 0.25, 0.5, etc).

Enumerator: For charcoal, kindly ask if they can show you their stove and try filling it with charcoal and how many times they fill it for heating then weigh the charcoal

Traditional Charcoal (Weight in Kgs/grams) _____

Sustainable Charcoal (Weight in Kgs/grams) _____

Firewood (Weight in Kgs/grams) _____

Biomass (Weight in Kgs/grams) _____

C. FUEL PURCHASING

(ODK routes them to the first question on each source of energies/fuels used)

C.1 Electricity

Q#	Question	Response	Logic
C.1a	Who in the HH purchases electricity units? Pakhomo pano, ndindani amagula magetsi?	1=Male household member 2=Female household member 3= Both	
C.1b	How much do you spend on electricity in a month? Pamwezi mumagwiritsa ntchito ndalama zingati kugula magetsi?	MK _____	
C.1c	What is the distance to where electricity units are purchased? (estimated kms) Pali mtunda wotalika bwanji kukafika pomwe mumagula ma units a magetsi?	_____Kms	

Q#	Question	Response	Logic
C.1d	<p>What do you like about this fuel?</p> <p>Ndichani chomwe mmakonda pogwilitsa ntchito magetsi?</p> <p><i>Multiple response</i></p>	<p>1= Affordable/ costs less</p> <p>2=Easier to use</p> <p>3=Cooks faster</p> <p>4=Cleaner to use</p> <p>5= Modern</p> <p>6= Easily accessible</p> <p>7=Not smoky</p> <p>8=Cooks better</p> <p>9=Can leave to cook without having to watch over</p> <p>10=This is the only fuel I can get</p> <p>11=Other (specify)</p> <p>99=NR/DNK</p>	
C.1e	<p>Do you have any problems using electricity</p> <p>Muli ndivuto lililonse kumbali ya kugwiritsa ntchito magetsi?</p>	<p>1=Yes</p> <p>2=No</p> <p>99=NR/DNK</p>	
C.1f	<p>What problems do you have in using this fuel?</p> <p>Mumakomana ndivuto lanji?</p>	<p>1=Power cuts</p> <p>2=Variable power</p> <p>3= Expensive</p> <p>4= Takes longer to prepare a meal</p> <p>5=Other</p> <p>99=NR/DNK</p>	If yes to C.1.j

C.2 LPG

Q#	Question	Response	Logic
C.2a	<p>What size of bottle do you buy?</p> <p>Mumagula botolo la gas lalikulu bwanji?</p>	<p>1= 4.5 kgs</p> <p>2= 5 kgs</p> <p>3= 6 kgs</p> <p>4= 9 kgs</p> <p>5= 14 kgs</p> <p>6= 19 kgs</p> <p>7= 45 kgs</p> <p>8= Other specify (_____kgs)</p>	
C.2b	<p>How long does one bottle last in weeks</p> <p>Botololimodzi limatha nthawi yayitali bwanji?</p>	<p>_____Weeks</p>	
C.2c	<p>What is the distance to where LPG is purchased?</p> <p>Pali mtunda wotalika bwanji kukafika pomwe mumagula gas?</p> <p><i>(estimated kms – if delivered record as 0)</i></p>	<p>_____Kms</p>	
C.2d	<p>Who in HH purchases or sources LPG?</p> <p>Pakhomo pano, ndindani amagula gas?</p>	<p>1= Male household member</p> <p>2= Female household member</p> <p>3= Both</p>	
C.2e	<p>What do you like about this fuel?</p> <p>Ndichani chomwe mmakonda pogwilitsa ntchito gas?</p>	<p>1= Affordable/ costs less</p> <p>2=Easier to use</p> <p>3=Cooks faster</p> <p>4=Cleaner to use</p> <p>5= Modern</p> <p>6= Easily accessible</p> <p>7=Not smoky</p> <p>8=Cooks better</p> <p>9=Can leave to cook without having to watch over</p> <p>10=This is the only fuel I can access</p> <p>11=Other (specify)</p> <p>99=NR/DNK</p>	

Q#	Question	Response	Logic
C.2f	Do you have any problems using LPG Muli ndivuto lililonse kumbali ya kugwiritsa ntchito gas?	1=Yes 2=No 99=NR/DNK	
C.2g	What problems do you have in using this fuel? Mumakomana ndivuto lanji pogwilitsa ntchito gas?	1=Availability is erratic 2=Transporting bottles is difficult 3= Worried about safety of gas 4=Other 99=NR/DNK	If yes to C.2.j

C.3 Firewood

Q#	Question	Response	Logic
C.3a	How often do you buy? Mumagula nkhuni pafupi pafupi bwanji?	1=Daily 2=Every two days 3=Once a week 4=Once a month 5=Twice a month 6=Other (specify)	
C.3b	Where do you buy firewood? Nkhunizi mumagula kuti?	1=Local market 2=Central market 3=Mobile sellers (on a bicycle) 4=Buy when travelling 5= Other 99=NR/DNK	
C.3c	What is the distance to where it is bought? Pali mtunda wotalika bwanji kukafika pomwe mumagula nkhuni? <i>(estimated kms)</i>	_____Kms	
C.3d	Who in the HH purchases or sources? Pakhomo pano, ndindani amagula kapena kubweretsa makala?	1= Male household member 2= Female household member 3= Both	

Q#	Question	Response	Logic
C.3e	What is the unit that you most commonly buy? Kawirikawiri, mumagula pamlingo wanji?	1=Small bundle 2=Medium bundle 3= Large bundle 4= Other (specify) 99=NR/DNK	
C.3f	What is the unit Price? Mumagula pamtengo wanji?	MK_____	
C.3g	How many units do you buy in a week? Pa week, mumagula mulingowokwana bwanji?	_____	
C.3h	What is the total spending in a week? Pa week, mumagwiritsa ntchito ndalama zingati?	MK_____	
C.3i	What do you like about this fuel? Ndichani chomwe mmakonda pogwilitsa ntchito nkhuni?	1= Affordable/ costs less 2=Easier to use 3=Cooks faster 4=Cleaner to use 5= Modern 6= Easily accessible 7=Not smoky 8=Cooks better 9=Can leave to cook without having to watch over 10=Other (specify) 99=NR/DNK	
C.3j	Do you have any problems using this fuel? Muli ndivuto lililonse kumbali ya kugwiritsa ntchito nkhuni?	1=Yes 2=No 99=NR/DNK	

Q#	Question	Response	Logic
C.3k	What problems in using this fuel? Mumakomana ndivuto lanji?	1=Not safe 2= Expensive 3= Takes longer to prepare a meal 4=Availability is erratic 5=Transporting the fuel is difficult 6=Its too involving/complicated 7=Makes cooking utensils dirty 8=Worried about smoke 9=Other (specify) 99=NR/DNK	If yes to C.3.j

C.4 Charcoal/Sustainable Charcoal

Q#	Question	Response	Logic
C.4a	How often do you buy? Mumagula makala pafupi pafupi bwanji?	1=Daily 2=Every two days 3=Once a week 4=Once a month 5=Twice a month 6=Other (specify)	
C.4b	Where do you buy charcoal? Mumagula kuti makala?	1=Local market 2=Central market 3=Mobile sellers (on a bicycle) 4=Buy when travelling 5= Other 99=NR/DNK	
C.4c	What is the distance to where it is bought? (estimated kms) Pali mtunda wotalika bwanji kukafika pomwe mumagula makala?	_____Kms	
C.4d	Who in the HH purchases or sources it? Pakhomo pano, ndindani amagula kapena kubweretsa makala?	1= Male household member 2= Female household member 3= Both	

Q#	Question	Response	Logic
C.4e	<p>What is the unit that you most commonly buy?</p> <p>Kawirikawiri, mumagula pamlingo wanji?</p>	<p>1=Small jumbo/heap</p> <p>2=Medium jumbo</p> <p>3= Large jumbo</p> <p>4= 5litre bucket with raised top</p> <p>5= 5litre bucket flat</p> <p>6=25kg bag flat</p> <p>7= 25 kg bag raised</p> <p>8=50kg bag flat</p> <p>9=50kg bag with raised top – One</p> <p>201= 50kg bag with raised top – One and a half</p> <p>202= 50kg bag with raised top – Two</p> <p>203= 50kg bag with raised top – Two and a half</p> <p>204= 50kg bag with raised top - Three</p> <p>10=90kg bag</p> <p>11=Other specify</p> <p>99=NR/DNK</p>	
C.4f	<p>What is the unit price?</p> <p>Mumagula pamtengo wanji?</p>	MK_____	
C.4g	<p>How many units do you buy in a week?</p> <p>Pa week, mumagula mulingowokwana bwani?</p>	_____	
C.4h	<p>What is the total spending in a week?</p> <p>Pa week, mumagwiritsa ntchito ndalama zingati?</p>	MK_____	

Q#	Question	Response	Logic
C.4i	<p>What do you like about this fuel?</p> <p>Ndichani chomwe mmakonda pogwilitsa ntchito makala?</p>	<p>1= Affordable/ costs less</p> <p>2=Easier to use</p> <p>3=Cooks faster</p> <p>4=Cleaner to use</p> <p>5= Modern</p> <p>6= Easily accessible</p> <p>7=Not smoky</p> <p>8=Cooks better</p> <p>9=Can leave to cook without having to watch over</p> <p>10=Other (specify)</p> <p>99=NR/DNK</p>	
C.4j	<p>Do you have any problems using this fuel?</p> <p>Muli ndivuto lililonse kumbali ya kugwiritsa ntchito makala?</p>	<p>1=Yes</p> <p>2=No</p> <p>99=NR/DNK</p>	
C.4k	<p>What problems in using this fuel?</p> <p>Mumakomana ndivuto lanji?</p>	<p>1=Not safe</p> <p>2= Expensive</p> <p>3= Takes longer to prepare a meal</p> <p>4=Availability is erratic</p> <p>5=Transporting the fuel is difficult</p> <p>6=Its too involving/complicated</p> <p>7=Makes cooking utensils dirty</p> <p>8=Worried about smoke</p> <p>9=Other (specify)</p> <p>99=NR/DNK</p>	<p>If yes to C.4.j</p>

C.5 Biomass

Q#	Question	Response	Logic
C.5a	How often do you buy? Mumagula makala pafupi pafupi bwanji?	1=Daily 2=Every two days 3=Once a week 4=Once a month 5=Twice a month 6=Other (specify	
C.5b	Where do you buy Mumagula kuti? <charcoal, alternative charcoal, biomass, alternative biomass>? (options: local market, central market, buy when travelling, other____)	1=Local market 2=Central market 3=Mobile sellers (on a bicycle) 4=Buy when travelling 5= Other 99=NR/DNK	
C.5c	What is the distance to where it is bought (estimated kms) Pali mtunda wotalika bwanji kukafika pomwe mumagula?	_____Kms	
C.5d	Who in the HH purchases or sources? Mumagula makala pafupi pafupi bwanji?	1= Male household member 2= Female household member 3= Both	
C.5e	What is the weight of the unit that you most commonly buy? Kawirikawiri, mumagula pamlingo wanji?	_____kgs	
C.5f	What is the unit Price? Mumagula pamtengo wanji?	MK_____	
C.5g	How many units do you buy in a week? Pa week, mumagula mulingowokwana bwanji?	_____	
C.5h	What is the total spending in a week? Pa week, mumagwiritsa ntchito ndalama zingati?	MK_____	

Q#	Question	Response	Logic
C.5i	What do you like about this fuel? Ndichani chomwe mmakonda pogwilitsa ntchitomphamvu yimeneyi?	1= Affordable/ costs less 2=Easier to use 3=Cooks faster 4=Cleaner to use 5= Modern 6= Easily accessible 7=Not smoky 8=Cooks better 9=Can leave to cook without having to watch over 10=This is the only fuel I have access to 11=Other (specify) 99=NR/DNK	
C.5j	Do you have any problems using this fuel? Muli ndivuto lililonse kumbali ya kugwiritsa ntchito mphamvu yimeneyi?	1=Yes 2=No 99=NR/DNK	
C.5k	What problems in using this fuel? Mumakomana ndivuto lanji?	1=Its too involving/complicated 2=Involves getting dirty 3=Worried about smoke emission 4=It causes me to cough 5=Other 99=NR/DNK	If yes to C.5.j

C.6 Paraffin

Q#	Question	Response	Logic
C.6a	How often do you buy? Mumagula makala pafupi pafupi bwanji?	1=Daily 2=Every two days 3=Once a week 4=Once a month 5=Twice a month 6=Other (specify)	

Q#	Question	Response	Logic
C.6b	Where do you buy Paraffin? Mumagula kuti paraffin?	1=Local market 2=Central mark 3= Local shop 4= Other 99=NR/DNK	
C.6c	What is the distance to where it is bought? (estimated kms) Pali mtunda wotalika bwanji kukafika pomwe mumagula paraffin?	_____Kms	
C.6d	Who in the HH purchases or sources? Pakhomo pano, ndindani amagula kapena kubweretsa paraffin?	1= Male household member 2= Female household member 3= Both	
C.6e	What is the unit that you most commonly buy? Kawirikawiri, mumagula pamlingo wanji?		
C.6f	What is the unit Price? Mumagula pamtengo wanji?	MK_____	
C.6g	How many units do you buy in a week? Pa week, mumagula mulingo wokwana bwanji?	_____	
C.6h	What is the total spending in a week? Pa week, mumagwiritsa ntchito ndalama zingati?	MK_____	
C.6i	What do you like about this fuel? Ndichani chomwe mmakonda pogwilitsa ntchitomphamvu yimeneyi?	1= Affordable/ costs less 2=Easier to use 3=Cooks faster 4=Cleaner to use 5= Modern 6= Easily accessible 7=Not smoky 8=Cooks better 9=Can leave to cook without having to watch over 10=Other (specify) 99=NR/DNK	

Q#	Question	Response	Logic
C.6j	Do you have any problems using this fuel? Muli ndivuto lililonse kumbali ya kugwiritsa ntchito paraffin?	1=Yes 2=No 99=NR/DNK	
C.6k	What problems in using this fuel? Mumakomana ndivuto lanji?	1=Not safe 2= Expensive 3=Takes longer to prepare a meal 4=Availability is erratic 5=Transporting the fuel is difficult 6=Its too involving/complicated 7=Makes cooking utensils dirty 8=Worried about smoke 9=Other (specify) 99=NR/DNK	If yes to C.6.j

D. PERCEPTIONS AND MOTIVATION

D.1 Cooking Fuels

Q#	Question	Response	Logic
D.1a	Of the fuels you use, which is your most preferred cooking fuel? Pa mitundu ya mphamvu zimene mumagwiritsa ntchito, ndi iti imene mumakonda?	<i>Energy source list</i>	

Q#	Question	Response	Logic
D.1b	<p>Why do you prefer this cooking fuel?</p> <p>Ndichifukwa chiyani mumakonda mtundu umenewu wa mphamvu?</p> <p><i>Enumerator to classify. Multiple responses</i></p>	<p>1= Affordable/ costs less</p> <p>2=Easier to use</p> <p>3=Cooks faster</p> <p>4=Cleaner to use</p> <p>5= Modern</p> <p>6= Easily accessible</p> <p>7=Not smoky</p> <p>8=Cooks better</p> <p>9=Can leave to cook without having to watch over</p> <p>10=Other (Specify)</p> <p>99=NR/DNK</p>	
D.1c	<p>Please rank (up to three) responses mentioned above in order of importance</p> <p>Ikani mphamvu zimenezi mundandanda malingana ndi kufunika wake</p>	<p>Ranking</p>	
D.1d	<p>Of all the fuels you know which cooking fuel would you most like to use if you could?</p> <p>Pa mitundu yonse ya mphamvuyi, ndi iti imene mungakonde kugwiritsa ntchito</p>	<p>Energy source list</p>	
D.1e	<p>Why do you most want to use this cooking fuel?</p> <p>Ndichifukwa chiyani mukufuna kugwiritsa ntchito mtundu umenewu wamphamvu?</p> <p><i>Enumerator to classify. Multiple response</i></p>	<p>1= Affordable/ costs less</p> <p>2=Easier to use</p> <p>3=Cooks faster</p> <p>4=Cleaner to use</p> <p>5= Modern</p> <p>6= Easily accessible</p> <p>7=Not smoky</p> <p>8=Cooks better</p> <p>9=Can leave to cook without having to watch over</p> <p>10=Other (Specify)</p> <p>99=NR/DNK</p>	

Q#	Question	Response	Logic
D.If	Please rank responses (up to three) mentioned above in order of importance Ikani mphamvu zimenezi mundandanda malingana ndi kufunika wake	1 st # _____ 2 nd # _____ 3 rd # _____	
D.Ig	Which is your least preferred cooking fuel? Pa mitundu yonse ya mphamvuyi, ndi iti imene simungakonde kugwiritsa ntchito	Energy source list	
D.Ih	Why do you least prefer this cooking fuel? Ndichifukwa chiyani simukufuna kugwiritsa ntchito mtundu umenewu wamphamvu? <i>Enumerator to classify. Multiple response</i>	1=Not safe 2= Expensive 3= Takes longer to prepare a meal 4=Availability is erratic 5=Transporting the fuel is difficult 6=Its too involving/complicated 7=Makes cooking utensils dirty 8=Worried about smoke 9=Other (specify) 99=NR/DNK	
D.Ii	Please rank responses (up to three) mentioned above in order of importance Ikani mphamvu zimenezi mundandanda malingana ndi kufunika wake	1 st # _____ 2 nd # _____ 3 rd # _____	
D.Ij	Which foods do you prefer cooking using charcoal? Ndizakudya ziti zimene mumakonda kuphikira pamakala?	Food list	<i>Only if they cook with charcoal</i>

Q#	Question	Response	Logic
D.Ik	<p>Why do you prefer cooking these foods using charcoal?</p> <p>Ndichifukwa chiyani mumakonda kuphikira zakudya zimenezi pamakala</p> <p><i>Enumerator to classify. Multiple response</i></p>	<p>1= Affordable/ costs less</p> <p>2=Easier to use</p> <p>3=Cooks faster</p> <p>4=Cleaner to use</p> <p>5= Modern</p> <p>6= Easily accessible</p> <p>7=Not smoky</p> <p>8=Cooks better</p> <p>9=Can leave to cook without having to watch over</p> <p>10=This is the only fuel I have access to</p> <p>11=Other (specify)</p> <p>99=NR/DNK</p>	
D.II	<p>Which foods do you prefer cooking using firewood?</p> <p>Ndizakudya ziti zimene mumakonda kuphikira pankhuni?</p>	<p>Food list</p>	<p><i>Only if they cook with firewood</i></p>
D.Im	<p>Why do you prefer cooking these foods using firewood?</p> <p>Ndichifukwa chiyani mumakonda kuphikira zakudya zimenezi pankhuni?</p> <p><i>Enumerator to classify. Multiple response</i></p>	<p>1= Affordable/ costs less</p> <p>2=Easier to use</p> <p>3=Cooks faster</p> <p>4=Cleaner to use</p> <p>5= Modern</p> <p>6= Easily accessible</p> <p>7=Not smoky</p> <p>8=Cooks better</p> <p>9=Can leave to cook without having to watch over</p> <p>10=This is the only fuel I have access to</p> <p>11=Other (specify)</p> <p>99=NR/DNK</p>	

Food list: 1=Nsima 2= Rice 3=Beans 4= Meat/fish 5= Vegetables 6= Pumpkins 7=Green maize 8= Cassava/potatoes 9=Fresh groundnuts 10= Others (specify) 98= Does not use this fuel 99= DNK/NR

Energy source list: 1=Electricity 2=LPG 3= Traditional charcoal 4= Sustainable charcoal 5= Firewood 6= Pellets, 7=Briquettes 8= Dung 9= Sawdust 10= Rice/coffee/other husks 11=other agric residues 12= Paraffin 13= Solar 14= Other

D.2 Cooking stoves/appliances

Q#	Question	Response	Logic
D.2a	Of the cooking stove/appliances/ technologies you have, which one is your most preferred? Pazipangizo zophikira zonse mulinazoji, ndichiti chimene mumakonda kuphikira?	Stove/appliance list	
D.2b	Why do you prefer this cooking technology? Ndichifukwa chiyani mumakonda kuphikira chipangizo chimenechi? <i>Enumerator to classify. Multiple response</i>	1= Affordable 2=Fuel Efficient 3=Cooks faster 4=Cleaner to use 5= Modern 6= Easily accessible 7=Less or no smoke 8= The fuel used is cheap 9= Portable 10= Safe to use 11=Cannot easily break/ durable 12= Other (Specify) 99=NR/DNK	
D.2c	Please rank responses (up to three) mentioned above in order of importance Ikani zifukwa zimenezi mundandanda (up to three) malingana ndi kufunika kwake	Ranking	
D.2d	Of the cooking stove/appliance/technologies you know, which one would you most like to use? Pazipangizo zophikira zonse mumadziwazi, ndichiti chimene mungakonde kwambiri kuphikira?	Stove/appliance list	

Q#	Question	Response	Logic
D.2e	<p>Why do you most want to use this cooking stove/appliance?</p> <p>Ndichifukwa chiyani mungakonde kwambiri kuphikira chipangizo chimenechi?</p> <p><i>Unprompted, Enumerator Classified.</i></p> <p><i>Multiple response possible</i></p>	<p>1= Affordable</p> <p>2=Fuel Efficient</p> <p>3=Cooks faster</p> <p>4=Cleaner to use</p> <p>5= Modern</p> <p>6= Easily accessible</p> <p>7=Less or no smoke</p> <p>8= The fuel used is cheap</p> <p>9= Portable</p> <p>10= Safe to use</p> <p>11=Cannot easily break/ durable</p> <p>12= Other (Specify)</p> <p>99=NR/DNK</p>	
D.2f	<p>Please rank responses (up to three) mentioned above in order of importance</p> <p>Ikani mayankho mwandipatsawa mundandanda malingana ndi kufunika kwake</p>	<p>1st # _____</p> <p>2nd # _____</p> <p>3rd # _____</p>	
D.2g	<p>Of all the stoves/appliances/cooking technologies you know, which one is your least preferred?</p> <p>Pazipangizo zophikira zonse mumadziwazi, ndichiti chimene simungakonde kuphikira?</p>	<p>Stove/appliance list</p>	
D.2h	<p>Why do you least prefer this cooking technology?</p> <p>Ndichifukwa chiyani simungakonde kuphikira chipangizo chimenechi?</p> <p><i>Unprompted, Enumerator to classify.</i></p> <p><i>Multiple response possible</i></p>	<p>1=Expensive to buy</p> <p>2=Difficult to use</p> <p>3= Takes longer</p> <p>4= Involves getting dirty</p> <p>5=Not easily accessible</p> <p>6=Not modern</p> <p>7= Too much smoke</p> <p>8= its fuel is expensive</p> <p>9=Other (specify)</p> <p>99=NR/DNK</p>	

Q#	Question	Response	Logic
D.2i	Please rank responses (up to three) mentioned above in order of importance Ikani mayankho mwandipatsawa mundandanda malingana ndi kufunika kwake	1 st # _____ 2 nd # _____ 3 rd # _____	
D.2j	Do you have an improved cooking stove? Muli ndi chipangizo chilichose chopikira cha makono? <i>(Enumerator explains to them the difference between traditional and improved cooking stove using script and pictures)</i>	1= Yes 2=No	If yes, ask D.2ji
D.2ji	How often do you use an improved stove? Mbaula ya makono mumachigwiritsa pamulingo wotani?	1= Everyday (100%) 2=Most days a week (75%) 3=About half the time (50%) 4=One or two days per week (25%) 5= Never (0%) 99=NR/DNK	then skip to section E
D.2k	If improved cooking stoves were readily available and affordable to you, would you buy one? Panakhala kuti zipangizo zamakono zikupezeka zogulika, mungagule?	1=Yes 2=No	If "No" Skip to D.2.m
D.2l	If Yes, why? Chifukwa chiyani?	1=Just to try them out 2=Current stove not fuel efficient 3=Can afford to buy 4=Fuel efficient 5=Portable 6=Affordable 7=Safe to use 8=Likes to be first or get things before other people 9=Other (specify) 99=NR/DNK	Go to D.2n

Q#	Question	Response	Logic
D.2m	If No. Why? Chifukwa chiyani?	1=Not interested 2=Satisfied with current cook stove 3=Cannot afford 4=Other (specify) 99=NR/DNK	
D.2n	What attributes would influence you to buy an improved cooking stove? Kodi chipangizo chamakono chophikira chikhale chotani kuti muchikonde ndikugula?	1= Affordable 2=Fuel Efficient 3=Cooks faster 4=Cleaner to use 5= Modern 6= Easily accessible 7=Less or no smoke 8= The fuel used is cheap 9= Portable 10= Safe to use 11=Cannot easily break/ durable 12= Other (Specify) 99=NR/DNK	
D.2o	How much would you be willing to pay for an improved cooking stove? Mungakwanitse kugula chipangizo chamakono chophikira pa mtengo wanji?	MK_____	
D.2p	What would be your preferred mode of payment for the improved cooking stove? Ndi ndondomeko yotani yakalipilidwe yomwe yingakhale yabwino kwa inu pogula chophikila chamakono?	1= Cash 2= Loan 3= Other (specify) 99=NR/DNK	
D.2q	In your area, do you know where can you most likely find an improved cooking stove? Kodi mukudziwa komwe mdera lanu mungapezeco chipangizo chamakono chophikira?	1=Yes 2=No	

Q#	Question	Response	Logic
<p>Stove / cooking appliance list: 1=Jiko 2= Envirofit 3=Metal stove 4=3stone 5= Chitetezo mbaula 6= Mudstove 7= Rocket stove 8=Electric hotplate 9= Induction plate 10= Electric Cooker(oven with plates) 11=Electric Mini cooker (Oven with plates) 12= Microwave 13= Rice Cooker 14=Kettle 15=Pressure cooker 16= Fryer 17= Coffee Maker 18= LPG Cylinder burner 19=LPG hotplate (Portable burner) 20= LPG Cooker (Oven with plates) 21=paraffin stove 22= Other (Specify) 201= UpEnergy SmartHome 202=Dziwani Investments Ngala ya Moto 203=Mbambande Quick Fast (MQF) 204= Mimi Moto</p>			

E. ACCESS TO INFORMATION/EXPOSURE TO ALTERNATIVE ENERGIES/FUELS

E.1 Alternative energies/fuels

Q#	Question	Response	Logic
E.1a	<p>Have you heard of any alternative fuels for cooking apart from traditional charcoal and firewood?</p> <p>Kupatula makala ndi nkhuhi, munamvapo za mitundu ina ya mphamvu zophikira?</p>	<p>1= Yes</p> <p>2= No</p>	<p>If "No"</p> <p>Skip to E.1e</p>
E.1b	<p>If yes, which alternative fuels to traditional charcoal and firewood have you heard of?</p> <p>Munamvapo za mitundu iti? (Unprompted)</p>	<p>1=Electricity</p> <p>2=LPG</p> <p>3=Sustainable charcoal</p> <p>4=Paraffin</p> <p>5=Pellets</p> <p>7=Briquettes</p> <p>8=Gasifiers</p> <p>9=Other (specify)</p> <p>99=NR/DNK</p>	
E.1c	<p>Which of the following alternative fuels have you heard of?</p> <p>Munamvapo za mitundu iti? (Prompted)</p>	<p>1=Yes, No=2</p> <p>Electricity</p> <p>LPG</p> <p>Sustainable charcoal</p> <p>Paraffin</p> <p>Pellets</p> <p>Briquettes</p> <p>Gasifiers</p> <p>Other (specify)</p>	

Q#	Question	Response	Logic
E.1d	<p>What was the source of this information on the ones you know?</p> <p>Munamvera kuti zimenezi? (Unprompted)</p>	<p>1=Posters</p> <p>2=Radio</p> <p>3=TV</p> <p>4=Promotional events</p> <p>5=SMS</p> <p>6= Newspapers</p> <p>7= Neighbor/friend/relatives</p> <p>8= NGO extension worker</p> <p>9= Govt extension worker</p> <p>10=Other family member</p> <p>11=Traditional leaders</p> <p>12=Other</p> <p>13=Social media (Facebook/WhatsApp)</p> <p>14=Public demonstrations/events</p> <p>15=Business promotions</p> <p>16= Billboards</p> <p>17= Meetings/Workshops/Seminars</p> <p>99=NR/DNK</p>	
E.1d_a	Please specify the radio station and advert/content		
E.1d_b	Please specify the social media page (ie, MCHF page or another)		
E.1d_c	Please specify the public event organizer, location and year		
E.1d_d	Please specify the business promotion event organizer, location and year		
E.1d_e	Please specify the billboard or poster content and business name		

Q#	Question	Response	Logic
E.1e	<p>What would be your preferred/trusted source on information like this?</p> <p>Ndikuti komwe mungakonde kuti mudzimva za izi?</p> <p><i>Unprompted, enumerator to classify</i></p> <p><i>Multiple response possible</i></p>	<p>1=Posters</p> <p>2=Radio</p> <p>3=TV</p> <p>4=Promotional events</p> <p>5=SMS</p> <p>6= Newspapers</p> <p>7= Neighbor/friend/relatives</p> <p>8=NGO extension worker</p> <p>9= Govt extension worker</p> <p>10=Other family member</p> <p>11=Traditional leaders</p> <p>12=Other</p> <p>13=Social media (Facebook/WhatsApp)</p> <p>14=Public demonstrations/events</p> <p>15=Business promotions</p> <p>16= Billboards</p> <p>17= Meetings/Workshops/Seminars</p> <p>99=NR/DNK</p>	
E.1f	<p>How much access to trusted source(s) of information do you have?</p> <p>Muli ndi mwai waukulu bwanji wokumva kuchokera kumeneko?</p> <p><i>(Read out)</i></p>	<p>1=No access</p> <p>2=Very limited access</p> <p>3=Some access</p> <p>4=Regular access</p> <p>5=Constant access</p> <p>99=NR/DNK</p>	

Q#	Question	Response	Logic
E.1g	<p>What information on alternative cooking fuels would help you to decide to use it?</p> <p>Ndi mauthenga ati ndi ati amene angakuthandizeni kupanga maganizo ophikira mitunduyi?</p> <p><i>Unprompted, enumerator to classify</i></p> <p><i>Multiple response possible</i></p>	<p>1=Price of the fuel</p> <p>2=Efficiency of the fuel</p> <p>3=Where to purchase the fuel</p> <p>4=How to use the fuel</p> <p>5=Its advantages and disadvantages</p> <p>6=If it is clean</p> <p>7=Other</p> <p>99=NR/DNK</p>	
E.1h	<p>Which of the following information on alternative cooking fuels would help you to decide to use it?</p> <p>Mwa mauthenga awawa, ndiati amene angakuchititseni kuti muphikire mitundu ya mphamvu imeneyi?</p> <p><i>Read out</i></p>	<p>1=Yes 2=No</p> <p>Price of the fuel</p> <p>Efficiency of the fuel</p> <p>Where to purchase the fuel</p> <p>How to use the fuel</p> <p>Its advantages and disadvantages</p> <p>If it is clean</p> <p>Other</p>	

E.2 Fuel efficient cooking stoves

Q#	Question	Response	Logic
E.2a	<p>Have you heard of any of the following fuel-efficient cooking stoves?</p> <p>Munamvapo za zophikira izi zosunga moto?</p> <p><i>(Read out list)</i></p>	<p>Efficient stove list – Yes, no, not sure</p>	
E.2b	<p>What information on fuel-efficient cooking stoves would help you to decide to use it?</p> <p>Ndi mauthenga ati amene angakuthandizeni kupanga maganizo ophikira zipangizozi?</p> <p><i>(Unprompted, enumerator to classify)</i></p>	<p>1=Price of the stove</p> <p>2=Efficiency of the stove</p> <p>3=Where to purchase the stove</p> <p>4=How to use the stove</p> <p>5=Its advantages and disadvantages</p> <p>6=if it is clean</p> <p>7=Other</p> <p>99=NR/DNK</p>	

Q#	Question	Response	Logic
E.2c	<p>Which of the following information on fuel-efficient cooking stoves would help you to decide to use it?</p> <p>Mwa mauthenga awawa, ndiati amene angakuchititseni kuti muphikire zipangizozi?</p> <p><i>(Read out)</i></p>	<p>1=Yes 2=No</p> <p>Price of the stove</p> <p>Efficiency of the stove</p> <p>Where to purchase the stove</p> <p>How to use the stove</p> <p>Its advantages and disadvantages</p> <p>If it is clean</p> <p>Other</p>	

Please provide us with your phone number, as someone may call to confirm the interview took place _____. Thank you for taking part.

ANNEX 2. MARKET PRICE SURVEY INSTRUMENT

All questions will be unprompted options for that question, unless it says read out options.

Supervisor to complete prior to the starting interviews:		
Supervisor Name		
Date of Interview	2022 Time:	
District	Lilongwe	01
	Blantyre	02
	Mzuzu	03
	Zomba	04
Ward/Area name:		
Zone located within	01	02 03
Name of Market		
GPS co-ordinates		
Description of market (eg close to XX church or school, etc)		
Fuel Sold	Charcoal	01
	Firewood	02

Supervisors to meet Chairperson for the market to explain who we are, what we are researching, and how we will do the interviews/weighing. We will present a letter from MHCF to seek permission to interview.

Does the Chairperson give their consent? Yes / No.

Name of Chairperson: _____

Cell # of Chairperson: _____

Enumerator checks what unit sizes are on sale at this market on this day:

Unit sizes	Present 1=Yes 2=No	Number of sellers selling this unit size
Small jumbo/heaps		
Medium jumbo		
Large jumbo		
5litre bucket with raised top		
5litre bucket flat		
25 Kg bag flat		
25 Kg bag raised		
50 kg bag flat		
50 Kg bag with raised top- One		
50 Kg bag with raised top- One and a half		
50 Kg bag with raised top- Two		

Unit sizes	Present 1=Yes 2=No	Number of sellers selling this unit size
50 Kg bag with raised top- Two and a half		
50 Kg bag with raised top- Three		
90 Kg bag (4judu)		
Other unit (specify _____)		
Other unit (specify _____)		
Other unit (specify _____)		

Enumerator randomly selects 10 sellers of each unit size of charcoal (or all those if 10 or less) using the randomized method prescribed by Kadale. Proceed to interviews for the sellers. Select according to the methodology.

Introduction and Consent from Individual Vendors

“Hello, my name is [NAME] and I work for Kadale Consultants. As we have explained to the chairperson of this market, Kadale is conducting an Urban Cooking Energy Market Survey, which includes interviewing charcoal/firewood sellers. You have been randomly selected to participate in this survey, which will ask questions concerning the charcoal/firewood that you are selling. We are not from the government or any regulatory body. The aim of this research is to gather useful information that will be used to calculate the price of charcoal/firewood in Malawi among other things. The information we will collect is confidential and will not affect you or your business in anyway. These questions will take approximately 20 minutes to complete and your participation is entirely voluntary. If you agree to participate, you can choose to stop at any time or to skip any questions you do not want to answer. If you have any questions regarding the survey and the interview, or concerns and complaints we welcome you to contact Kadale Consultants, by calling the Research Manager on 0992 594 170. Taking part in this research is voluntary.

Do you have any questions?

Are you willing to participate in this survey? Yes No

“Zikomo, dzina langa ndi [NAME] ndipo ndimagwira ntchito ku bungwe lotchedwa Kadale Consultants. Monga tafotokoza kale kwa apampando amumsika muno, Kadale ikuchita kafukufuku wowona za njira zophikira zamakono m’matauni ndi m’mizinda zomwe zingathandizire kusamala zachilengedwe kapena kuti **Urban Cooking Energy Consumer Survey** mchingerezi. Mwa zina, mukafukufukuyu tikucheza ndi anthu m’makomo ndi m’madera osiyanasiyana. Inuyo mwasankhidwa mwamayere kuti mutenge nawo mbali pakafukufukuyu kotero tikufunsani mafunso okhudza Makala komanso nkhuni zomwe mukugulitsa. Ife sitinachokere ku kuboma kapena nthambi ina iliyonse yoyang’anira zankhalango. Cholinga cha kafukufukuyu mwazina ndi kuwerengetsa mitengo yogulira makala ndi nkhuni m’Malawi muno. Kucheza kwathu kutenga pafupifupi mphindi 20 minutes ndipo kutenga kwanu mbali ndikongodzipereka komanso sikudzakhudza business yanu munjira ina iliyonse. Ngati muvomere kutenga nao mbali, ndinu oloedwa kusankha kusayankha mafunso ena omwe simukufuna kuyankha kapenanso kulekeratu mafunso onse. Zomwe tikambirane pano ndizachinsinsi ndipo zidzasungidwa mwachoncho kotero kuti chilichonse

chokulumikizani kumachezawa zoti munthu wina atha kukudziwani zikasiyantsidwa ndi mayankho anu komanso kusungidwa mwachinsinsi. Ngati muli ndi funso lililonse kapena mukufuna kudziwa zambiri zakafukufukuyu kapenaso ngati muli ndi chidandalulo, ndinu olandiridwa kuyimba phone ku office yathu ya Kadale pa nambala iyi 0992 594 170 ndipo mudzalankhula ndi mkulu wakafukufukuyu, Kutenga kwanu mbali ndikongodzipereka.”

Muli ndifunso lililonse??

Muli okondwera kutenga mbali? Yes

No (Terminate interview, record the name and why)

If does not consent (Terminate interview and record the name and why they did not consent)

Sellers' General Information

Q#	Question	Response	Logic
1	What is your name? (obtain first name and last name) Dzina lanu ndindani? – if they wish to be anonymous, get first name only		
2	How old are you? Muli ndi zaka zingati	_____Years	
3	(Note the sex of the respondent)	1= Male 2= Female	
4	Where do you live? Mumakhala kuti?	Area/Ward/Village: TA if out of city:	
5	Approximately how far is that in distance? (assist them to estimate in kms), Kuchoka pano, kumatalikana bwanji ndikomwe inu mumakhala?	_____Kms	
6	What is your marital status? Muli pabanja? (read out options if they need a prompt)	1=Married 2=Widowed 3=Divorced 4=Separated 5=Never Married 99=Does not want to disclose	
7	What is the highest level of education you completed? (read out if they need a prompt) Munafika patali bwanji pamaphunziro anu?	1=Adult literacy 2=Standard 1-8 3=Form 1-4 4=Further Education 5=None 99=No response	

A. Market Information

Q#	Question	Response	Logic
1	How long have you been selling at this market? Mwakhala mukugulitsa pamsika uno kwanthawi yaitali bwanji?	_____ Years	
2	Prior to selling at this market, were you selling at another market? Kodi munkagulitsa kumsika wina musanayambe kugulitsira uno?	1=Yes 2=No	
3	What made you change to this market? Chinakuchititsani kuti musinthe msika wogulisirako ndichiyani?	1=More customers here 2=Easier to get to 3=Prices are better 4=No space at other market 5=Other (Specify _____) 99=No response	
4	Blank		
4b	Blank		
5	What unit sizes of charcoal and/or firewood do you sell? <i>(Enumerator should check if the sizes are available on the day of interview)</i> Kodi mumagulitsa makala anu kapena nkhu ni zanu mu milingo yotani?	1=Small Jumbo/heap 2=Medium Jumbo 3=Large Jumbo 4=5 litre bucket with raised top 5=5 litre bucket flat 6=25kg bag flat 7= 25 kg bag raised 8=50Kg bag flat 9=50Kg bag with raised top – One 10 = 50Kg bag with raised top – One and a half 11 = 50Kg bag with raised top – Two 12 = 50Kg bag with raised top – Two and a half 13 = 50Kg bag with raised top – Three 14=90Kg Bag (4judu) 15=Other unit (Specify) 16=Other unit (Specify) 17= Other unit (Specify) 18=Small bundle firewood	

Q#	Question	Response	Logic
		19=Medium bundle firewood 20=Large bundle firewood	
6	Where do you get your <charcoal/firewood>? Kodi nkhuṇi zomwe mumagulitsa/Makala omwe mumagulitsa mumapeza kuti?	1=I make it myself and bring to the market 2=Buy from another person (like a wholesaler) and bring to the market 3=Buy from someone near this market 4=Buy from someone at the market 5=Buy it directly from charcoal burners at the forest 6=Other (specify ____) 99=No response	
7	If you buy it, do you know where it comes from (where it is made)? Ngati mumachita kuwoda, mumadziwa kumene nkhuṇizi zimachokera kapena makalawa amachokera?	1=Yes 2=No 98=Do not know 99=No response If Yes, where from? _____	
8	<i>If buy from another outside the market</i>) How far is it from the place you buy the <charcoal/ firewood> to this market? <i>(estimated kms)</i> Ngati mumawoda kunjā kwamsika uno ndimtunda wotalika bwanji kuchokera kumsika uno?	_____Kms	
	<i>(but record as unsure if not clear)</i>	Unsure – yes/no	
9	How many days per week do you come to this market in the dry season? Munthawi ya chilimwe, mumabwera kangati kumsika pa sabata?	_____ days	
10	How many business days per week do you come to this market in the rainy season? Munthawi ya dzinja, mumabwera kangati kumsika pa sabata?	_____ days	
11a	What <alternative energies/ types of fuel> to traditional charcoal for cooking do you know,? Kupatula makala ndinkhuṇi, ndinjira zina ziti zophikira zomwe inu mumadziwa? <i>(Unprompted)</i>	1=Electricity 2=LPG 3=Sustainable charcoal 4=Kerosene 5=Pellets 7=Briquettes 8= Gasifiers	

Q#	Question	Response	Logic
		6=Other(specify_____) 98=Do not know 99=No response	
I 1b	Which of the following <alternative energies/other types of fuel> to traditional charcoal for cooking do you know? Mwazotsatirazi, kupatula makala ndinkhuni, ndinjira zina ziti zophikira zomwe inu mumadziwa? <i>(Prompt with the list)</i>	1=Electricity 2=LPG 3=Sustainable charcoal 4=Kerosene 5=Pellets 7=Briquettes 8= Gasifiers 6=Other(specify_____) 98=Do not know 99=No response	
I 1c	Of the ones you know, which ones can you also sell? Pazomwe mukudziwa, ndi ziti zomwe mungathenso kugulitsa? <i>(Prompt with the list)</i>	1=Electricity 2=LPG 3=Sustainable charcoal 4=Kerosene 5=Pellets 7=Briquettes 8= Gasifiers 6=Other(specify_____) 98=Do not know 99=No response	Only the ones they mention in I 1b
I 2a	How did you learn about these? Njira zimenezi munazidziwa bwanji? <i>(Enumerator classifies according to response given options: posters, radio, promotional events at the market, other sellers, customers, etc.)</i>	1=Posters 2=Radio 3=TV 4=Promotional events at the market 5=SMS 6= Newspapers/Flyers/billboards 7= Neighbor/friend 8=Other sellers 9=Customers 10=Social media (Facebook, WhatsApp, etc) 11=Local smith	

Q#	Question	Response	Logic
		12=Alternative Energy distributor 13= Other(specify _____) 98=Do not know 99=No response	
12b	When did you learn about these alternative energies?	1=I have always known 2= More than 10 years ago 3=More than 5 years ago 4=More than two years ago 5=Two years ago 6=A year ago 7= 0-6 months ago 8= Other (Specify)	
12c	Please specify the radio station and advert/content		
12d	Please specify the promotional activity		
12e	Please specify the flyer or billboard or poster content and company		
12f	Please specify social media platform, ie MCHF page or another		
12g	Please specify alternative energy distributor	[Name:] _____	

13. Selling price per unit (ask only for those unit sizes they are selling today - add more types if not listed)

(Ask for all unit sizes they are selling)	What is the price (today)? Mtengo ndibwanji (Iero)?	What was the highest price in last 3 months? Pamiyezi itatu yapitayi mtengo wokweretsetsa unali bwanji?	What was the lowest price in last 3 months? Pamiyezi itatu yapitayi mtengo wotsikitsitsa unali bwanji?	(select 7 th bag starting on left & weigh)* kgs & grams
Small jumbo/heaps				
Medium jumbo				
Large jumbo				
5 litre bucket with raised top				
5 litre bucket flat				
25 Kg bag flat				
25 Kg bag raised				
50 kg bag flat				
50 Kg bag with raised top- One				
50 Kg bag with raised top- One and a half				

(Ask for all unit sizes they are selling)	What is the price (today)? Mtengo ndibwanji (Iero)?	What was the highest price in last 3 months? Pamiyezi itatu yapitayi mtengo wokweretsetsa unali bwanji?	What was the lowest price in last 3 months? Pamiyezi itatu yapitayi mtengo wotsikitsitsa unali bwanji?	(select 7 th bag starting on left & weigh)* kgs & grams
50 Kg bag with raised top- Two				
50 Kg bag with raised top- Two and a half				
50 Kg bag with raised top- Three				
90 Kg bag (4judu)				
Other unit (specify _____)				
Other unit (specify _____)				
Other unit (specify _____)				

* If less than seven bags being sold by that vendor, count up to the number of bags, then go back to the first bag, but counting from where you left off until you get to seven

Phone number (if willing to disclose):
Are you willing for someone to call you later on to cross check about this interview? They will pick some people at random so they may not call.
Mungalole kuti enanso akuyimbireni phone kanthawi kena kutsimikizira kucheza kwathuku? Koma akusankha ena mwa anthu mwa mayere choncho mwina akhonza osayimba nkomwe.
1=Yes 2=No

-Ends-

Weighing

Charcoal

After completing all the interviews, the enumerator buys three randomly selected bags from those interviewed for each unit size available at the market. Enumerator asks the seller to remove the dust then weighs bag with charcoal only (kgs & grams)

Name of the unit:	(insert all options identified in the market, one table for each)		
Weight in kgs & grams	Sample #	weight (kgs & grams)	Price from this seller
Total weight for unit - kgs/gms	1		
Charcoal without dust & original bag - kgs/gms			
Total weight for unit - kgs/gms	2		
Charcoal without dust& original bag - kgs/gms			
Total weight for unit - kgs/gms	3		
Charcoal without dust & original bag - kgs/gms			
Average calculated in the analysis			

If **firewood** is being sold:

Enumerator randomly selects 10 firewood bundles of each size. Ask only for those units/bundle sizes they are selling today.

Sample number	Small bundle		Medium bundle		Large bundle	
	Weight in kgs & grams	Price	Weight in kgs & grams	Price	Weight in kgs & grams	Price
1 st sample						
2 nd sample						
3 rd sample						
4 th sample						
5 th sample						
6 th sample						
7 th sample						
8 th sample						
9 th sample						
10 th sample						

Ends

ANNEX 3: CHARCOAL CDM COMPLIANT REPORT

This annex presents the analysis on traditional charcoal. The analysis is compliant with requirements outlined in the CDM guidelines. The sample and subsample have achieved the minimum requirements, and the measures of central tendency are in line with what is recommended in the guidelines.

A-3.1 SAMPLE SIZE CALCULATION

MCHF requested a HH sample that required 403 HH interviews in three cities, with Zomba at 402 making 1,611 HHs in total. This was calculated at 95% confidence level and 5% margin of error using Cochran's formula and is very similar to the sample size used in the baseline. Kadale agreed with MHCF's proposed methodological approach, which evolved in the baseline study and was successfully implemented. In the baseline, 62 Wards/Areas were sampled across the four cities and the research team ended up visiting the same Wards/Areas.

As with the baseline, the study had to be fully aligned with the UNFCCC standard for sampling and surveys for CDM project participants.¹⁵ This is important to facilitate access to carbon finance. The UNFCCC standard¹⁶ provides clear information on how samples should be determined and conducted.

TABLE 3-1: OVERALL SAMPLE PER CITY & AREA/WARD

CITY	NUMBER OF RESPONDENTS	AREAS/WARDS
BT City	403	13
ZA City	402	10
LL City	403	26
MZ City	403	13
Total	1,611	62

TABLE 3-2: SPLIT OF SAMPLE BY CITY AND AREAS/WARDS

CITY	NUMBER OF RESPONDENTS	AREAS/WARDS	RESPONDENTS PER AREA
BT City	403	13	31 in 13 Wards
ZA City	402	10	40 in 9 Wards & 42 in 1 Ward
LL City	403	26	15 in 22 Areas & 18 in 1 Area
MZ City	403	13	31 in 13 Wards
Total	1,611	62	

¹⁵ https://cdm.unfccc.int/Reference/Standards/meth/meth_stan05.pdf

¹⁶ Ibid.

A-3.2 THE CREATION OF ZONES WITHIN WARDS/AREAS

At baseline, the research team created zones within each selected Ward or Area¹⁷ using ArcGIS and google earth map; these zones were maintained for the midline survey. The zones were created to increase the representativeness of the Areas/Wards by evenly allocating the surveys to the Area/Ward's sections. This increased the representativeness of the sample.

The breakdown of the sample is set out in the table below.

TABLE 3-3: SAMPLE SIZE SPLIT BY CITY AND WARD/AREA

CITY	WARD/AREA WITH # OF PLANNED SURVEYS	# OF WARDS/AREAS	# OF EQUAL ZONES PER WARD/AREA	# OF STARTING POINTS PER ZONE	# OF HHS PER STARTING POINT	# OF INTERVIEWS PER WARD/AREA	TOTAL # OF HH INTERVIEWS
BT	Wards with 31 interviews	13	3	2	5/6	31	403
LL	Areas with 15 interviews	22	3	1	5	15	330
	Areas with 18 interviews	4	3	1	6	18	73
	sub-total	26					403
MZ	Wards with 31 interviews	13	3	2	5/6	31	403
ZA	Wards with 40 interviews	9	4	2	5/4	40	360
	Wards with 42 interviews	1	4	2	5/4	42	42
	Sub-total	10					402
Total		62					1,611

At baseline, Kadale randomly selected the desired number of Wards/Areas and grouped these based on the city's categorization of high, medium, and low density.¹⁸ The number of Wards/Areas randomly selected in each of the three categories was established using Probability Proportional to Size (PPS). The same baseline study Areas/Wards were to be used as enumeration areas (EAs) for the midline survey.

¹⁷ Cities use different terms for their boundaries, e.g., BT uses the term Ward, while LL uses Areas.

¹⁸ Categorization enhances the representation of all sections of the city and is based on that used by each city, so the densities are not necessarily directly comparable.

All the 26 Areas in Lilongwe that were selected as EAs at baseline were revisited in the midline, as were 13 Wards in Blantyre, 13 in Mzuzu, and 10 Wards in Zomba.

Each Ward/Area had a specific number of interviews to be conducted. The approach was that each Ward would be divided into three equal zones and in some cases four using geographical features and the spread of HHs aided by map/google earth inspection.¹⁹ In each zone, four to six landmarks were identified, such as a school, a prominent shop, a church, a market, etc., and two randomly selected as starting points and using a right/left hand rule.

A-3.3 FINDINGS

The household (HH) survey found that most HHs had been using traditional charcoal for more than three years (90.6 and 89.6% at midline and baseline respectively). The proportion that had been using traditional charcoal for more than three years at midline was 91.0 in Lilongwe (87.0% at baseline), 94.3% in BT (88.5% at baseline), 86.8 in MZ (95.5% at baseline), 89.8% in ZA (87.3% at baseline). Details are set out in the table below.

TABLE 3-4: TIME USING THAT ENERGY SOURCE

B.1C HOW LONG HAVE YOU BEEN USING THIS ENERGY SOURCE? (%)											
ENERGY/FUEL SOURCE		LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	DURATION	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Traditional charcoal	0 to 6 months	1.9	0.3	1.9	1.4	0.3	0.6	1.3	-	1.4	0.6
	6 months to 1 year	1.6	2.9	2.1	0.3	1.1	3.2	0.3	1.0	1.3	1.8
	1 up to 2 years	2.9	2.9	1.6	0.3	1.1	2.1	3.9	2.0	2.4	1.7
	2 up to 3 years	2.9	1.6	5.9	3.8	1.4	3.2	7.2	5.9	4.4	3.6
	More than 3 years	87.0	91.0	88.5	94.3	95.5	86.8	87.3	89.8	89.6	90.6
	NR/DNK	3.6	1.3	-	-	0.6	4.1	-	1.3	1.1	1.7
Total		308	311	374	369	357	341	306	303	1,345	1,324

The frequency of using charcoal at midline was 68.7% of the HHs reported using charcoal every day (75.9% at baseline). 60.5% (66.2% at baseline) reported using traditional charcoal every day in LL, 87.8% (90.9% at baseline) in BT, 70.1% (76.8% at baseline) in MZ, and 52.1% (69.6% at baseline) in ZA. Details are set out in the table below.

¹⁹ Three equal zones based on the geographical features and map inspection/google earth map.

TABLE 3-5: FREQUENCY OF USING THAT ENERGY SOURCE

B.1D HOW OFTEN DO YOU USE THIS ENERGY SOURCE											
ENERGY/FUEL SOURCE		LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	DURATION	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Traditional charcoal	Every day (100%)	66.2	60.5	90.9	87.8	76.8	70.1	69.6	52.1	75.9	68.7
	Most days a week (75%)	9.1	15.1	3.5	4.1	11.8	17.3	11.8	25.4	9.1	15.0
	About half the time (50%)	9.4	10.9	2.1	3.3	5.6	8.5	9.5	11.6	6.7	8.3
	One or two days per week (25%)	13.0	12.9	3.5	4.9	5.6	4.1	6.5	10.9	7.2	7.9
	Never (0%)	2.3	0.6	-	-	0.3	-	2.6	-	1.3	0.2
	Total		308	311	374	369	357	341	306	303	1,345

Across all the cities, 48.2 % (43.1% at baseline) of the respondents reported making the decision to buy the Jiko themselves (Me only). Details are set out in the table below.

TABLE 3-6: DECISION-MAKING ON BUYING JIKO STOVES

B.3A WHO MADE THE DECISION TO BUY THE JIKO? (Percentage)											
RESPONSE	LL		BT		MZ		ZA		Total		
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML	
Me only	38.4	37.58	39.9	51.64	48.4	60.76	45.8	41.3	43.1	48.17	
Another family member only	19.3	23.53	24.4	15.3	15	12.03	17.8	29.69	19.1	19.75	
Me and my spouse	19	15.69	12.3	13.11	14.2	11.39	26.2	22.53	14.6	15.46	
My spouse only	16.4	12.09	22.3	14.21	13.3	5.38	6.3	4.44	2.1	9.29	
Another person (specify)	3.9	3.92	0.3	4.1	2.8	2.22	1.4	0	1.7	2.65	
It was a gift	1.6	1.31	0.8	1.09	2.8	0.63	1.7	0	1.2	0.78	
Do not know	1.3	4.58	-	0.27	2.8	5.38	0.7	1.02	0.2	2.73	
Me and another family member	-	1.31	-	0.27	0.6	2.22	-	1.02	14.6	1.17	
Total Respondents	305	306	373	366	353	316	286	293	1,317	1,281	

On average, the HHs had been using the current Jiko for one year and ten months in LL, one year and a month in BT, one year and two months in MZ, and one year and 11 months in ZA. Details are set out in the table below.

TABLE 3-7: USE OF CURRENT JIKO STOVE

B.3C USAGE OF CURRENT JIKO (Number of months)											
RESPONSE	LL		BT		MZ		ZA		Total		
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML	
Mean	22	26	13	17	14	15	23	22	19	20	
Median	18	24	12	12	12	12	17	15	12	13	
Minimum	1	1	1	1	1	1	1	1	1	1	
Maximum	144	84	60	84	84	72	96	60	144	84	
Total Respondents	283	263	364	356	308	307	284	277	1,239	1,203	

The HHs report to have had the previous Jiko for two years and two months in LL, one year and six months in BT, one year and four months in MZ and ZA.

The highest proportion of the HHs at 46.0% at midline (42.6% at baseline) reported buying charcoal once a month with 27.0% (25.0% baseline) purchasing each day. Details are set out in the table below.

TABLE 3-8: FREQUENCY OF BUYING CHARCOAL

C4A HOW OFTEN DO YOU BUY CHARCOAL? (Number of years)											
RESPONSE	LL		BT		MZ		ZA		Total		
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML	
Once a month	41.4	44.9	40.4	43.1	45.5	47.1	43.1	49.5	42.6	46.0	
Daily	23.9	29.0	36.6	39.3	13.4	16.8	26.1	21.5	25.0	27.0	
Twice a month	14.9	7.3	14.4	7.1	24.3	28.9	15.0	9.6	17.2	13.4	
Once a week	6.5	7.6	5.1	4.9	4.2	2.0	8.5	12.2	6.1	6.5	
Other	6.5	5.7	1.3	3.3	10.6	2.9	3.3	1.3	5.4	3.3	
Every two days	6.8	5.4	2.1	2.4	2.0	2.3	3.9	5.9	3.7	3.9	
Total Respondents	309	314	374	369	358	346	306	303	1,347	1,332	

Across all locations, 43.2% of HHs (44.6% at baseline) reported buying charcoal from a local market. In LL and BT, the highest proportion bought charcoal at the market at 44.9% (50.5% at baseline) and 57.7% (63.1% at baseline) respectively. In MZ, the highest proportion said they bought charcoal from mobile sellers at 58.1 % (58.5 at baseline). Details are set out in the table below.

TABLE 3-9: SOURCE OF BUYING CHARCOAL

C4B WHERE DO YOU BUY CHARCOAL? (Percentage)										
RESPONSE	LILONGWE %		BLANTYRE %		MZUZU %		ZOMBA %		TOTAL %	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Local market	50.5	44.9	63.1	57.7	22.6	30.1	42.3	38.9	44.6	43.2
Mobile sellers (on a bicycle)	27.8	30.3	11.2	8.9	58.5	58.1	43.3	38.9	35.2	33.6
Buy when travelling	12.6	8.6	6.7	8.9	12.1	5.2	10.2	4.6	10.4	6.9
Other	4.5	14.0	4.8	17.6	5.6	6.1	3.3	15.8	4.6	13.4
Central market	4.5	2.2	14.2	6.8	1.1	0.6	1.0	1.7	5.2	2.9
Total respondents	309	314	374	369	354	346	305	303	1,342	1,332

On average, buyers travelled 0.9 km (1.0 km at baseline) to buy charcoal. Buyers in ZA cover the longest distance of 1.3 km (1.6 km at baseline) to buy charcoal, with shortest distance covered by the buyers in MZ who covered only 0.5 km. Details are set out in the table below.

TABLE 3-10: DISTANCE TO SOURCE OF BUYING CHARCOAL

C4C WHAT IS THE DISTANCE TO WHERE CHARCOAL IS PURCHASED?										
Kms	LILONGWE		BLANTYRE		MZUZU		ZOMBA		TOTAL	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Mean	1.3	1.0	0.9	0.7	1.0	0.5	1.6	1.3	1.1	0.9
Maximum	35.0	12.0	30.0	10.0	50.0	20.0	45.0	25.0	50.0	25.0
Minimum	0.0	-	0.0	-	0.0	-	0.0	-	0.0	-
Median	0.4	0.2	0.5	0.4	0.3	-	0.3	0.1	0.4	0.2
Total respondents	200	278	274	354	90	328	173	270	923	1,230

Across all the cities, it was reported that charcoal was bought by a female member (27.1 at midline, 45.8% at baseline), male member (52.3% at midline, 31.2% at baseline), and both (20.6% at midline, 23.0% at baseline). In three out of the cities, most charcoal purchasers at baseline were female HH members, and these were LL (38.5%), MZ (50.1%), and ZA (62.1%). In BT, charcoal was most sourced by a male member at baseline (47.9%) and 65.7% in Zomba at midline. Details are set out in the table below.

TABLE 3-11: PERSON WHO BUYS CHARCOAL

C4D WHO IN YOUR HH PURCHASES OR SOURCES CHARCOAL?										
RESPONSE	LILONGWE %		BLANTYRE %		MZUZU %		ZOMBA %		TOTAL %	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Female HH member	38.5	31.5	32.4	41.5	50.1	20.2	62.1	12.9	45.8	27.1
Male HH member	37.2	45.5	47.9	42.6	24.4	57.2	15.4	65.7	31.2	52.3
Both	24.3	22.9	19.8	16.0	25.5	22.5	22.5	21.5	23.0	20.6
Total respondents	309	314	374	369	353	346	306	303	1,342	1,332

In relation to the attraction of buying charcoal, the highest proportion of the HHs found charcoal to be easier to use at 61.0% (44.7% at baseline), easily accessible at 52.3% (43.0% at baseline) and affordable at 50.8% (53.3% at baseline).

TABLE 3-12: ATTRACTION OF BUYING CHARCOAL

C4I WHAT DO YOU LIKE ABOUT CHARCOAL?										
RESPONSE	LILONGWE %		BLANTYRE %		MZUZU %		ZOMBA %		TOTAL %	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Affordable	54.9	54.1	57.6	65.9	50.7	40.2	50.0	41.3	53.3	50.8
Easier to use	42.2	58.3	37.5	47.7	36.3	64.5	62.7	76.2	44.7	61.0
Easily accessible	41.8	45.2	45.3	53.4	37.8	50.3	47.1	60.4	43.0	52.3
Cooks faster	31.7	41.7	44.0	31.2	18.6	36.4	47.7	44.2	35.5	38.0
Cleaner	27.1	29.3	12.3	18.4	16.2	14.5	64.4	52.5	30.0	27.7
Not smoky	21.6	24.2	15.8	15.7	24.2	7.8	47.1	41.9	27.2	21.6
Can leave to cook without watching	21.2	23.6	31.1	25.2	13.6	8.1	36.6	31.4	25.6	21.8
Cooks better	14.7	27.4	4.3	4.9	7.1	22.8	39.2	50.5	16.3	25.2
Only fuel	6.5	13.4	16.6	40.1	4.1	9.8	14.4	13.9	10.4	20.0
Other	4.6	3.8	2.1	0.8	7.1	0.9	7.2	6.6	5.3	2.9
Modern	3.6	11.8	0.3	3.5	2.1	2.0	3.9	31.4	2.5	11.4
Total respondents	306	314	373	369	339	346	306	303	1,324	1,332

Majority of the HHs at 67.3% (70.6% at baseline) reported that they did not have any problems using charcoal. Details are set out in the table below.

TABLE 3-13: PROBLEMS USING CHARCOAL

C4J DO YOU HAVE ANY PROBLEMS USING CHARCOAL?										
RESPONSE	LILONGWE %		BLANTYRE %		MZUZU %		ZOMBA %		TOTAL %	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
No	70.1	62.1	78.6	83.7	70.6	60.4	72.5	60.7	70.6	67.3
Yes	29.5	37.6	21.4	16.3	29.3	39.6	27.5	39.3	29.3	32.6
Do not know	0.3	0.3	-	-	0.1	-	-	-	0.1	0.1
Total respondents	308	314	374	369	349	346	305	303	1,338	1,332

Of those that had problems, 63.6% said it was expensive compared to 28.2% at baseline. Details are set out in the table below.

TABLE 3-14: TYPES OF PROBLEMS USING CHARCOAL

C4K WHAT PROBLEMS DO YOU HAVE USING CHARCOAL?										
RESPONSE	LILONGWE %		BLANTYRE %		MZUZU %		ZOMBA %		TOTAL %	
	BL	ML	BL	ML	BL	ML	BL	ML	BL	ML
Expensive	27.5	62.7	11.3	15.0	32.6	78.8	40.5	71.4	28.2	63.6
Takes longer to prepare meal	29.7	25.4	17.5	26.7	24.2	15.3	33.3	17.7	25.7	20.3
Worried about smoke	28.6	27.1	56.3	48.3	12.9	13.1	25.0	14.3	24.9	22.1
Other	22.0	7.6	6.3	8.3	28.0	13.1	22.6	9.2	24.5	9.9
Not safe	17.6	23.7	33.8	25.0	7.6	1.5	22.6	12.6	17.0	13.8
Availability erratic	8.8	6.8	11.3	3.3	16.7	7.3	20.2	5.0	11.8	6.0
Too involving	12.1	10.2	12.5	25.0	11.4	1.5	14.3	5.0	10.8	8.1
Makes utensils dirty	15.4	29.7	15.0	11.7	2.3	11.0	20.2	5.9	10.4	14.8
Transporting it is difficult	-	10.2	1.3	3.3	0.8	2.9	17.9	5.0	3.5	5.5
Total respondents	91	118	80	60	132	137	84	119	482	434

The overall mean for HHs that use charcoal to prepare breakfast is 0.55 kgs (0.5 kgs at baseline). Across the whole sample, the mean is 0.43 Kgs/HH (0.39 kgs at baseline).

TABLE 3-15: AMOUNT OF CHARCOAL USED FOR PREPARING BREAKFAST

B.10-14 HOW MUCH CHARCOAL USED FOR THAT MEAL (Kgs)? Breakfast									
CITY		BASE	MEAN	SD ²⁰	SUM	MIN	MAX	TOTAL SAMPLE	MEAN BASED ON TOTAL SAMPLE
LL	ML	211	0.52	0.31	109.15	0.02	2.02	405	0.27
	BL	191	0.60	0.35	114.18	0.02	2.11	393	0.29
BT	ML	315	0.53	0.25	165.54	0.05	2.24	404	0.41
	BL	322	0.51	0.19	163.95	0.14	1.22	395	0.42
MZ	ML	272	0.66	0.39	178.72	0.10	2.60	404	0.44
	BL	266	0.70	0.33	185.92	0.03	2.47	393	0.47
ZA	ML	209	0.49	0.50	103.31	0.01	3.26	405	0.26
	BL	197	0.73	0.44	143.12	0.10	2.40	391	0.37
Total respondents	ML	1,007	0.55	0.37	556.72	0.01	3.26	1,618	0.34
	BL	976	0.5	0.33	607.2	0.02	3.25	1,572	0.39

In LL, a HH uses 0.92 kgs (0.87 kgs at baseline) of traditional charcoal to prepare lunch, 0.86 kgs (0.93 kgs at baseline) in BT, 0.93 kgs (1.08 kgs at baseline) in MZ, and 0.91 kgs (1.08 kgs baseline). The overall mean for those HHs that use charcoal to prepare lunch is 0.90 kgs (1.0 kgs at baseline). Across the whole sample the mean is 0.61 kgs/HH (0.67 kgs/HH at baseline).

TABLE 3-16: AMOUNT OF CHARCOAL USED FOR PREPARING LUNCH

B.10-14 HOW MUCH CHARCOAL USED FOR THAT MEAL (KGS)? LUNCH									
CITY		BASE	MEAN	SD	SUM	MIN	MAX	TOTAL SAMPLE	MEAN BASED ON TOTAL SAMPLE
Lilongwe	ML	249	0.92	0.61	228.63	0.03	5.42	405	0.56
	BL	215	0.87	0.45	186.95	0.02	2.46	393	0.48
Blantyre	ML	332	0.86	0.41	285.01	0.10	3.45	404	0.71
	BL	352	0.93	0.34	327.13	0.14	2.82	395	0.83
Mzuzu	ML	290	0.93	0.49	268.63	0.21	3.40	404	0.66
	BL	285	1.08	0.51	307.62	0.03	2.93	393	0.78
Zomba	ML	229	0.91	0.93	208.42	0.02	5.89	405	0.51
	BL	213	1.08	0.53	229.17	0.12	2.84	391	0.59

²⁰ SD = Standard Deviation

B.10-14 HOW MUCH CHARCOAL USED FOR THAT MEAL (KGS)? LUNCH

CITY		BASE	MEAN	SD	SUM	MIN	MAX	TOTAL SAMPLE	MEAN BASED ON TOTAL SAMPLE
Total respondents	ML	1,100	0.90	0.61	990.70	0.02	5.89	1,618	0.61
	BL	1,065	1.0	0.45	1,050.9	0.02	2.93	1,572	0.67

In LL, a HH uses 0.74 kgs (0.78 kgs at baseline) of traditional charcoal to prepare dinner/evening meal, 0.66 kgs (0.70 kgs at baseline) in BT, 0.79 kgs (0.96 kgs at baseline) in MZ, and 0.65 kgs in ZA (0.83 kgs at baseline). The overall mean for those HHs that use charcoal to prepare an evening meal/dinner is 0.71 kgs (0.80 kgs at baseline). Across the whole sample the mean is 0.49 kgs/HH (0.54 kgs/HH at baseline). Details are set out in the table below.

TABLE 3-17: AMOUNT OF CHARCOAL USED FOR PREPARING DINNER

B.10-14 HOW MUCH CHARCOAL USED FOR THAT MEAL (Kgs)? – Dinner/Evening Meal

CITY		BASE	MEAN	SD	SUM	MIN	MAX	TOTAL SAMPLE	MEAN BASED ON TOTAL SAMPLE
Lilongwe	ML	245	0.74	0.58	182.42	0.03	5.42	405	0.45
	BL	207	0.78	0.46	161.74	0.02	2.60	393	0.41
Blantyre	ML	342	0.66	0.27	225.34	0.02	2.41	404	0.56
	BL	341	0.70	0.30	240.23	0.14	1.97	395	0.61
Mzuzu	ML	307	0.79	0.38	241.71	0.04	2.70	404	0.60
	BL	289	0.96	0.44	278.75	0.03	2.61	393	0.71
Zomba	ML	228	0.65	0.81	149.30	0.01	5.81	405	0.37
	BL	204	0.83	0.51	168.31	0.10	2.41	391	0.43
Total respondents	ML	1,122	0.71	0.52	798.77	0.01	5.81	1,618	0.49
	BL	1,041	0.8	0.41	849.0	0.02	2.61	1,572	0.54

The overall mean for those HHs that use charcoal to prepare other meals is 0.59 kgs (0.56 kgs at baseline). Across the whole sample the mean is 0.06 kgs/HH (0.08 kgs/HH at baseline). Details are set out in the table below.

TABLE 3-18: AMOUNT OF CHARCOAL USED FOR PREPARING OTHER MEALS

B.10-14 HOW MUCH CHARCOAL USED FOR THAT MEAL (Kgs)? Other meals									
CITY		BASE	MEAN	SD	SUM	MIN	MAX	TOTAL SAMPLE	MEAN BASED ON TOTAL SAMPLE
Lilongwe	ML	38	0.57	0.51	21.54	0.02	2.25	405	0.05
	BL	61	0.46	0.25	28.13	0.02	1.02	393	0.07
Blantyre	ML	45	0.49	0.24	22.18	0.13	1.50	404	0.05
	BL	63	0.53	0.19	33.18	0.24	1.02	395	0.08
Mzuzu	ML	43	0.81	0.38	35.04	0.30	1.90	404	0.09
	BL	50	0.60	0.23	29.92	0.22	1.10	393	0.08
Zomba	ML	43	0.50	0.61	21.46	0.02	3.74	405	0.05
	BL	40	0.65	0.36	26.09	0.02	1.21	391	0.07
Total respondents	ML	169	0.59	0.47	100.22	0.02	3.74	1,618	0.06
	BL	214	0.56	0.25	117.3	0.02	1.21	1,572	0.08

The overall mean for those HHs that use charcoal to prepare hot drinks is 0.44 (0.40 kgs at baseline). Across the whole sample the mean is 0.01 kgs/HH (0.02kgs/HH at baseline. Details are set out in the table below.

TABLE 3-19: AMOUNT OF CHARCOAL USED FOR PREPARING HOT DRINKS

B.10-14 HOW MUCH CHARCOAL IS USED TO PREPARE HOT DRINKS (Kgs)?									
CITY		BASE	MEAN	SD	SUM	MIN	MAX	TOTAL SAMPLE	MEAN BASED ON TOTAL SAMPLE
Lilongwe	ML	15	0.61	0.75	9.10	0.02	2.75	405	0.02
	BL	11	0.33	0.14	3.61	0.10	0.56	393	0.01
Blantyre	ML	1	0.42	.	0.42	0.42	0.42	404	0.00
	BL	28	0.33	0.09	9.38	0.13	0.52	395	0.02
Mzuzu	ML	15	0.46	0.08	6.91	0.30	0.60	404	0.02
	BL	13	0.53	0.15	6.87	0.23	0.75	393	0.02
Zomba	ML	16	0.26	0.14	4.16	0.02	0.45	405	0.01
	BL	7	0.39	0.27	2.76	0.03	0.85	391	0.01
Total	ML	47	0.44	0.45	20.59	0.02	2.75	1,618	0.01
	BL	59	0.40	0.15	22.62	0.03	0.85	1,572	0.02

The overall mean for those HHs that use charcoal to run a business from home is 1.36 kgs (1.31 kgs at baseline). Across the whole sample the mean is 0.08 kgs/HH at midline and 0.90 at baseline. Details are set out in the table below.

TABLE 3-20: AMOUNT OF CHARCOAL USED TO RUN A BUSINESS FROM HOME

B.10-14 HOW MUCH CHARCOAL USED FOR THAT MEAL (Kgs)? – Midline									
Business (run from home)									
CITY		BASE	MEAN	SD	SUM	MIN	MAX	TOTAL SAMPLE	MEAN BASED ON TOTAL SAMPLE
Lilongwe	ML	19	1.49	1.13	28.33	0.04	4.58	405	0.07
	BL	14	0.92	0.59	12.88	0.21	2.20	393	0.03
Blantyre	ML	42	1.50	0.78	62.82	0.35	3.75	404	0.16
	BL	53	1.44	0.73	76.55	0.39	3.12	395	0.19
Mzuzu	ML	20	1.21	0.80	24.20	0.35	3.65	404	0.06
	BL	19	1.33	0.54	25.31	0.30	2.67	393	0.06
Zomba	ML	17	1.08	1.26	18.32	0.04	4.85	405	0.05
	BL	17	1.56	0.76	26.50	0.24	2.78	391	0.07
Total	ML	98	1.36	0.95	133.67	0.04	4.85	1,618	0.08
	BL	103	1.31	0.73	141.24	0.21	3.12	1,572	0.09

The overall mean for those HHs that use charcoal to heat their home is 0.49 (0.18 kgs at baseline). Across the whole sample the mean is 0.01 kgs/HH. Details are set out in the table below.

TABLE 3-21: AMOUNT OF CHARCOAL USED FOR HEATING THE HOME

B.10-14 HOW MUCH CHARCOAL USED FOR HEATING THE HOME (Kgs)?									
CITY		BASE	MEAN	SD	SUM	MIN	MAX	TOTAL SAMPLE	MEAN BASED ON TOTAL SAMPLE
Lilongwe	ML	7	0.67	0.6	4.72	0.09	1.71	405	0.01
	BL	-	-	-	-	-	-	393	-
Blantyre	ML	10	0.36	0.2	3.59	0.12	0.83	404	0.01
	BL	-	-	-	-	-	-	395	-
Mzuzu	ML	1	0.4	-	0.4	0.4	0.4	404	-
	BL	1	0.73	-	0.73	0.73	0.73	393	0.002
Zomba	ML	4	0.52	0.4	2.09	0.25	1.03	405	0.01

B.10-14 HOW MUCH CHARCOAL USED FOR HEATING THE HOME (Kgs)?

CITY		BASE	MEAN	SD	SUM	MIN	MAX	TOTAL SAMPLE	MEAN BASED ON TOTAL SAMPLE
	BL	-	-	-	-	-	-	391	-
Total	ML	22	0.49	0.4	10.8	0.09	1.71	1,618	0.01
	BL	1	0.18		0.73	0.73	0.73	1,572	0.0005

The overall mean for those HHs that use charcoal to heat water is 0.60 (0.80 kgs at baseline). Across the whole sample the mean is 0.23 kgs/HH. Details are set out in the table below.

TABLE 3-22: AMOUNT OF CHARCOAL USED FOR HEATING WATER

B.10-14 HOW MUCH CHARCOAL USED FOR HEATING WATER (Kgs)?

CITY		MEAN	SD	SUM	MIN	MAX	TOTAL SAMPLE	MEAN BASED ON TOTAL SAMPLE
Lilongwe	ML	0.70	0.76	87.0	0.0	8.0	405	0.21
	BL	0.72	0.50	80.9	-	2.7	393	0.21
Blantyre	ML	0.50	0.32	136.0	0.0	2.2	404	0.34
	BL	0.54	0.30	120.0	0.1	1.9	395	0.30
Mzuzu	ML	0.70	0.36	95.0	0.1	2.2	404	0.24
	BL	0.90	0.50	127.0	0.0	2.9	393	0.32
Zomba	ML	0.50	0.44	51.0	0.0	2.5	405	0.13
	BL	1.01	0.60	123.0	0.0	2.7	391	0.31
Total	ML	0.60	0.48	369.0	0.0	8.0	1,618	0.23
	BL	0.8	0.49	451	0.0	2.9	1,572	0.29

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