USAID
FROM THE AMERICAN PEOPLE

UKaid
from the British people

MODERN COOKING FOR HEALTHY FORESTS IN MALAWI

Clean Cooking Market Information Package for Urban Malawi

OCTOBER 2020

This document was produced for review by the United States Agency for International Development and the United Kingdom Foreign, Commonwealth & Development Office. It was prepared by Tetra Tech for the Modern Cooking for Healthy Forests (MCHF) Activity.

This publication was produced for review by the United States Agency for International Development and the United Kingdom Foreign, Commonwealth & Development Office by Tetra Tech through USAID Contract No. 72061219C00005, the Modern Cooking for Healthy Forests (MCHF) Activity.

Cover Photo: Mfundo Mvundula, the CEO of 265 Energy
Photo Credit: John Fay

This report was prepared by:

Tetra Tech
159 Bank Street, Suite 300
Burlington, Vermont 05401 USA
Telephone: (802) 658-3890
Fax: (802) 485-0282
Email: international.development@tetratech.com

Contacts:
Ramzy Kanaan, Chief of Party
Email: Ramzy.Kanaan@tetratech.com
Anna Farmer, Project Manager
Email: Anna.Farmer@tetratech.com
Rod Snider, Deputy Project Manager
Email: Rod.Snider@tetratech.com

MODERN COOKING FOR HEALTHY FORESTS IN MALAWI

Clean Cooking Market Information Package for Urban Malawi

OCTOBER 2020

TABLE OF CONTENTS

ACRONYMS AND ABBREVIATIONS

CDM	Clean Development Mechanism
DM	Dry Matter
GDP	Gross Domestic Product
GoM	Government of Malawi
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
ICS	Improved Cookstove
LDC	Least-Developed Country
LPG	Liquified Petroleum Gas
MCHF	Modern Cooking for Healthy Forests in Malawi
MERA	Malawi Energy Regulation Authority
MITC	Malawi Investment and Trade Center
MRA	Malawi Revenue Authority
Mt	Megaton
MWK	Malawian Kwacha
NCSC	National Cookstove Steering Committee
SACCO	Saving and Credit Cooperative Society
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States Dollar
VAT	Value Added Tax

EXECUTIVE SUMMARY

The following market information package provides an overview of the urban clean cooking market in Malawi, with a focus on the urban areas of Blantyre, Lilongwe, Mzuzu and Zomba. Malawi's increasing urban population and urban demand for energy has increased pressure on the already depleted biomass stocks in the country. However, the high demand for cooking energy in Malawi's urban areas has resulted in an opportunity for the emergence of a dynamic urban cooking sector. There is an urgent need for alternatives to biomass-based cooking fuels, specifically unsustainably harvested firewood and charcoal, as, according to the 2018 Malawi Population and Housing Census, more than 88% of individuals living in the country's four cities use either charcoal or firewood as their primary cooking and heating fuel.

Fuel-efficient, improved cookstoves (ICS) and sustainably harvested biomass options can significantly contribute to a reduced rate of deforestation for Malawi in the medium term. Additionally, alternative cooking fuels such as liquified petroleum gas (LPG), electricity, and gasifiers can help to reduce pressure on Malawi's biomass stocks and propel Malawi toward a more sustainable, clean cooking trajectory for the future. However, effective incentives are required for widespread adoption of new technologies and alternative energy, especially to reach low-income households that are currently dependent on unsustainably harvested charcoal and firewood for their cooking needs. The following market information aims to provide a clear illustration of the status quo of cooking in urban Malawi. This information then can be used to inform potential entrepreneurs and enterprises in their designs of improved cooking technologies and the provision of alternative energy sources and services that can alleviate Malawi's high dependence on unsustainably harvested biomass and enable households in Malawian cities to meet their cooking needs in an acceptable and affordable fashion.

1.0 OVERVIEW OF MALAWI

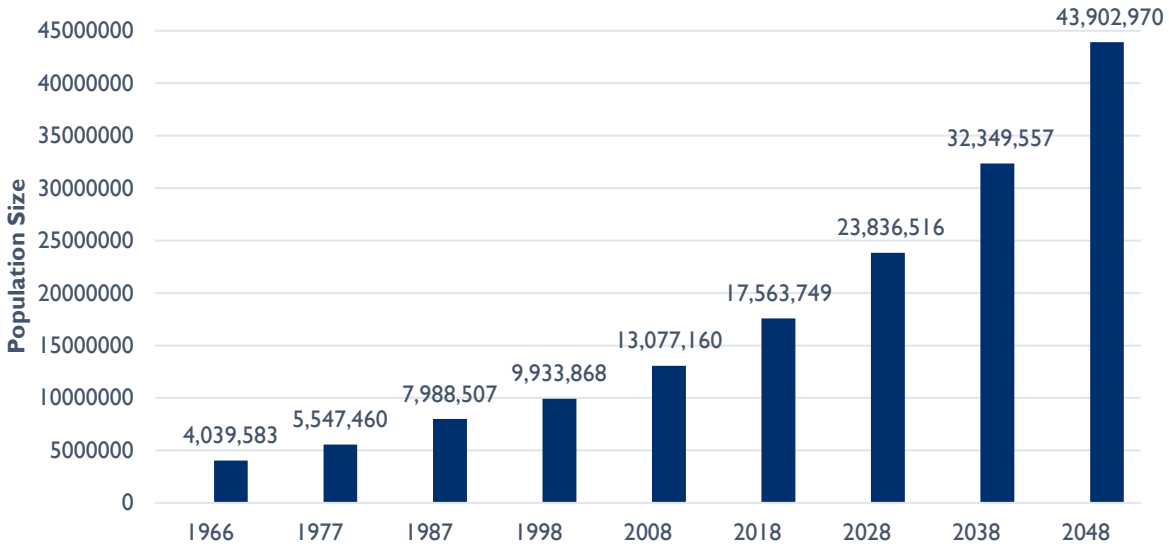
Malawi is a landlocked, least-developed country (LDC) situated in Southern Africa. Malawi is bordered by Mozambique to the southeast, Tanzania to the northeast, and Zambia to the west. The country's total land area is 118,484 km^2, 20% of which is covered by water, primarily Lake Malawi.

1.1 POPULATION DEMOGRAPHICS

According to the Malawi Population and Housing Census Main Report (2018), Malawi has a population of 17,563,749 people or 3,984,929 households. Of this population, 51% are women and 49% are male. Of this national population, 51% of people are under the age of 18. The census shares that 84% of the population or 14,747,257 people live in rural areas while 16% or 2,816,492 people live in urban areas. When looking strictly at the urban population of Malawi's four cities: Mzuzu, Lilongwe, Blantyre, and Zomba, the city population is 2,115,867 or 12% of the country's total population.

Between 2008 and 2018, the total population increased by 35%, representing an intercensal growth rate of 2.9% per annum. At this growth rate, the population of Malawi is projected to reach nearly 24 million in 2028 and nearly 44 million by 2048. Figure 1 below shows the projected population growth from 2018 to 2048 based on the above referenced 2.9% growth rate. Per the World Bank (2017), Malawi has the highest population density in Southern Africa with 198 people/km^2, while neighboring countries have significantly lower populations densities (e.g. Zambia: 23 people/km^2, Mozambique: 38 people/km^2, and Tanzania: 65 people/km^2).

Figure 1. Projected Malawi Population Growth from 2018-2048

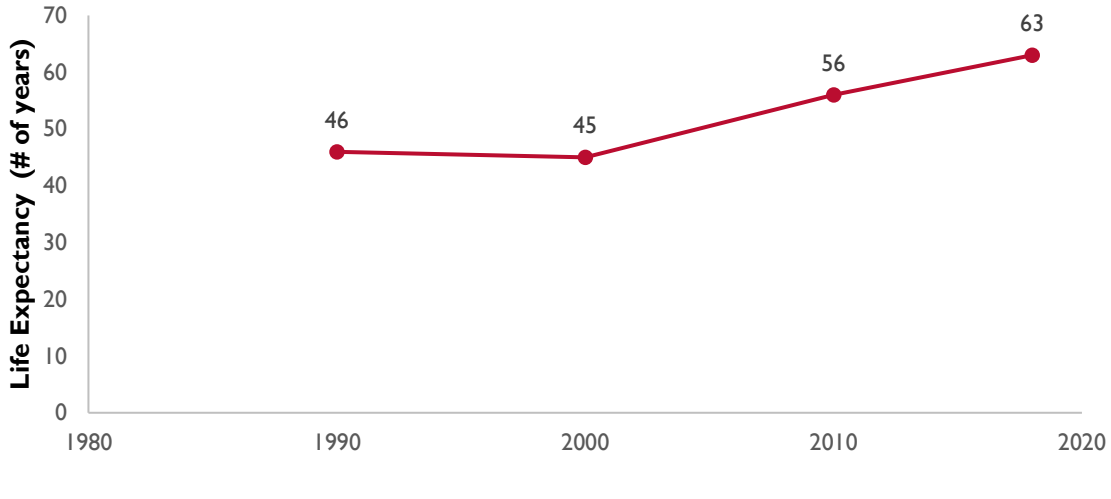


Source: Malawi Population and Housing Census Main Report (2018)

1.1.1 LIFE EXPECTANCY

Malawi's life expectancy has improved over the years, from 46 years in the 1990s to 63 years in 2018 (UNWPP, 2019). Figure 2 illustrates Malawi's positive life expectancy trend below.

Figure 2. Malawi Life Expectancy from 1990-2018



Source: World Bank Country Report (2020)

1.1.2 POPULATION DISTRIBUTION

Malawi is divided into three (3) regions: Northern Region, Central Region, and the Southern Region. Further, the country is organized into twenty-eight (28) districts. Population distribution among the regions is as follows: Southern Region (44%), Central Region (43%), and Northern Region (13%). According to the 2018 Malawi Population and Housing Census Main Report, the Southern Region has 244 persons per square km; the Central Region has 211 persons per square km; and the Northern Region has 84 person per square km. Meanwhile, cities were recorded to have the following population densities and growth rates:

Table 1. Population Density and Growth Rates of Malawian Cities

CITY	POPULATION DENSITY (persons per mile^2)	GROWTH RATE (%)
Blantyre	3,334	2.0%
Zomba	2,500	2.5%
Lilongwe	2,455	3.8%
Mzuzu	1,516	5.4%

1.1.3 POVERTY PREVALENCE

More than fifty-one percent (51.5%) of Malawi's population is considered poor or have an income below the poverty line of $1.25 per day. In rural areas, the poverty level is higher at 59.5% than in urban areas (17.7%). This means that approximately three out of every five people in rural areas as compared to one out of every five people in urban areas live in poverty (IHS4, 2018). Table 2 below presents the Poverty Headcount Ratio from the year 2000.

Table 2. Poverty Prevalence 2000-2018

DESCRIPTION	2000	2010	2018
Poverty Prevalence	65.3%	50.7%	51.5%

Source: World Bank Malawi Country Report (2020)

Despite robust economic growth rates since the mid-2000s, the country's poverty levels have remained persistently high. This is one of the country's development challenges. The United Nations Development Programme's (UNDP) Human Development Report (HDR) of 2019 indicates that Malawi remains below average on human development in the sub-Saharan countries. According to the report, Malawi is categorized in the low human development category, ranking 172 out of 189 countries and territories. Malawi is categorized in the low human development category, with a 2019 Human Development Index (HDI) value of 0.485 (below the average of 0.493 and the low human development group threshold of 0.502). Malawi has shown a slight improvement from an HDI value of 0.477 in 2017.

1.1.4 LITERACY LEVELS

Of Malawi's population over the age of five (5), 68.6% is considered literate. The 2018 Population and Housing Census Main Report estimates higher literacy for men than women – 71.6% and 65.9%, respectively. The Northern Region had the highest literacy rate at 79.0% than the Central and Southern Regions both at 67%.

1.1.5 HUMAN IMMUNODEFICIENCY VIRUS (HIV) PREVALENCE

Malawi's Human Immunodeficiency Virus (HIV) infection rate reached its peak in the 2000s (14.4%) before a steady decline in 2010 and 2018. The table below shows Malawi's HIV infection rate of people aged 15-49 from 1990 to 2018.

Table 3. Prevalence of HIV, Total (% of Population Ages 15-49)

YEAR	INFECTION RATE (%)
1990	8.1%
2000	14.4%
2010	10.6%
2019	8.9%

Source: United Nations Program on HIV/AIDS (UNAIDS) Malawi (2019)

1.2 ECONOMY

1.2.1 GROSS DOMESTIC PRODUCT (GDP)

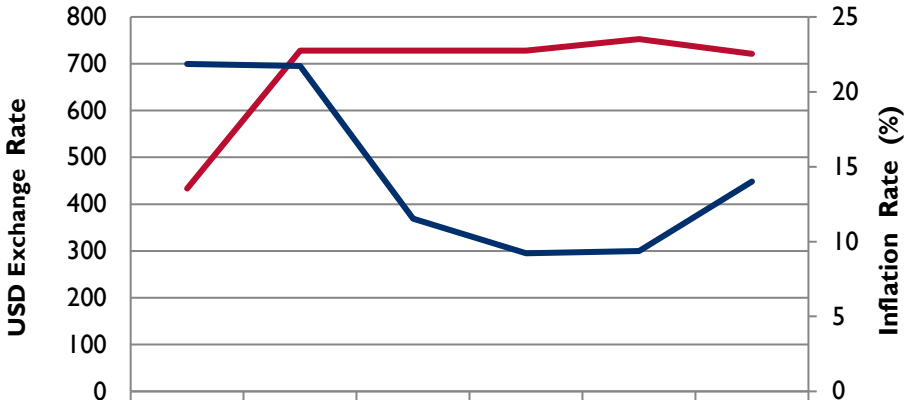
Malawi's Real Gross Domestic Product (GDP) grew an estimated 5.0% in 2019, up from 4.0% in 2018, despite the effects of Cyclone Idai (AfDB, 2020). Growth was supported by continued macroeconomic stability and improved agricultural performance as evidenced by an increase in maize output of 25.7% in the 2018/2019 agricultural season.

In 2019, the Government of Malawi's (GoM) tax revenue declined, and public debt increased. The government also attempted to reduce domestic debt from 30% of GDP in 2018 to 20% of GDP in 2019 by reducing 2019 fiscal spending from 29.5% of GDP to 25.6%. The 2019 deficit was an estimated 5.9% of GDP, and the 2020 deficit is projected at 4.3%, which will be financed from external and domestic resources. The current account deficit was estimated in 2019 at 16.9% of GDP, up from 16.2% of GDP in 2018. This increase can be explained by a decline in tobacco prices. A current account deterioration is projected at 17.4% of GDP in 2020 and 17.8% of GDP in 2021.

1.2.2 EXCHANGE RATE AND INFLATION

The exchange rate of the Malawian Kwacha (MWK) per United States Dollar (USD) has been relatively stable the past few years. However, this has not always been the trend; previously the Malawian Kwacha depreciated from an average of MWK 156.5 to one USD in 2011, to an average of about MWK 706.8 to one USD in 2015 (UNECA Country Profile, 2016). Since then the Malawian Kwacha has remained stable for the past five years averaging around MWK 750 to one USD. However, inflation has been volatile with an inflation rate of 8.78% in 2019, but as high as 21.73% as recent as 2016 (Statista, 2020). The figure below shows Malawi's inflation and exchange rate to the United States Dollar from 2015 to 2020.

Figure 3. Malawian Kwacha to the US Dollar Exchange Rate and Inflation Rate (%) from 2015-2020



	2015	2016	2017	2018	2019	2020
US$ Exchange Rate	433.33	728.28	728.28	728.28	752.63	721.05
Inflation Rate	21.86	21.73	11.54	9.22	9.38	14.01

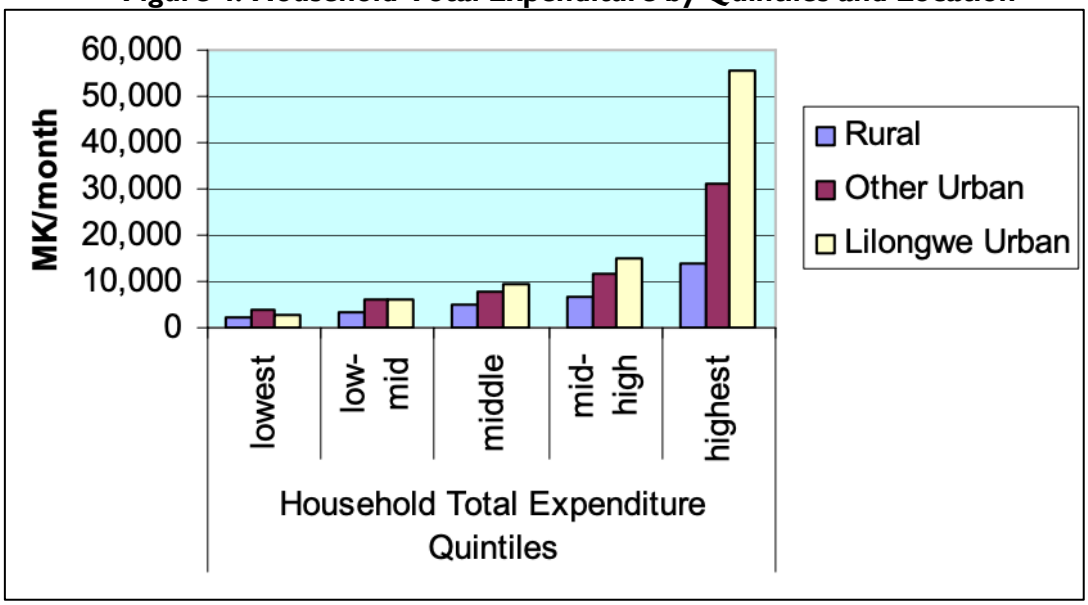
Source: Statistica (2020; Inflation) & Trading Economics (2020, Exchange Rate)

1.2.3 URBAN INCOME SEGMENTATION

Malawi GDP per capita is estimated to be $389 (World Bank, 2018). This is considered comparably low to neighboring countries (e.g. Zambia $1,540, Tanzania $1,031, Mozambique $499) but also fraught with significant inequality, evidenced by the median income per month being estimated at MWK 13,400 and the mean income being estimated at MWK 41,643 (ibid). The non-income dimensions of poverty are significant but improving recently. For example, the share of the population that faced deprivation in the areas of education, health, and holding of assets fell from 71% in 2004 to 61% in 2010 (ibid).

Rural and urban households' expenditure on education and alcohol were found to be equal, yet overall rural household expenditure was lower than urban. Perhaps because many rural dwellers own their own homes unlike urban dwellers (ibid), urban households have less income flexibility. Despite typically having higher cash incomes, urban households spend a larger share of their budgets on fuels because of the much higher use and costs of charcoal and electricity in urban areas (O'Sullivan, 2006). However, the situation is complex and fraught with inequity. For example, in Lilongwe, the 20% poorest households are on average spending less than the 20% poorest rural households on their energy needs. In other words, the poorest in Lilongwe are poorer than their rural counterparts.

Figure 4. Household Total Expenditure by Quintiles and Location



Source: National Statistical Office Malawi (2005)

1.3 ENERGY

Malawi is one of the least electrified countries globally currently at 11% overall, with 42% of the urban and only 4% of the rural population connected to electricity (SE4All, 2020). The country generates 439 megawatts of installed electricity capacity which is not enough to meet the country's demand for electricity (USAID, 2020). The 2018 Malawi Population and Housing Census shows that batteries were the main source of energy used for lighting in most households in Malawi (52.9%) followed by electricity (11.4%), solar (6.6%), candles (6.2%) and 4.4% of households used firewood as main source of lighting.

According to the same census, nearly 96% of households in Malawi rely on illegally and unsustainably sourced biomass (charcoal and firewood) for domestic cooking and heating energy. The report further shows that countrywide most households (77.4%) in Malawi use firewood for cooking, followed by charcoal (18%), and electricity (2%). In Malawi's rapidly growing cities, biomass energy remains the primary cooking and heating fuel for more than 88% of the population, and charcoal is now the primary source of fuel for the majority (75.9%) of the city-dwelling population. Meanwhile, 10.6% and 0.2% of the city population use electricity and LPG, respectively, as the primary fuel for household cooking and heating.

Unlike in many neighboring countries, firewood is still available in all four major cities of Malawi (Lilongwe, Blantyre, Zomba and Mzuzu) as well as in the district capitals (National Charcoal Strategy, 2017). This, in combination with high charcoal use, has resulted in high levels of deforestation and forest degradation throughout the country. Within the urban context, a readily available market for charcoal is a key driver of deforestation and is reinforced by a lack of reliable, affordable alternatives, and weak law enforcement.

1.4 CITY COMPARISON

As previously mentioned, Malawi has four official cities: Lilongwe, Mzuzu, Zomba and Blantyre cities. The capital of Malawi is Lilongwe, while the commercial capital is Blantyre. Table 4 below organizes key metric comparisons across the four major cities in Malawi. Using select data from the below table, it is estimated that 64,514 city households have the potential to switch to LPG and 195,498 city households have the ability to purchase an ultra-efficient charcoal stove. Clean cooking, LPG, and ultra-efficient charcoal stoves will be discussed in detail in Sections 2, 4, and 5 of this report.

Table 4. Malawi City Comparison

	METRIC	BLANTYRE	LILONGWE	MZUZU	ZOMBA
Size	Population	800,264	989,318	221,272	105,013
	Average Household Size	4.2	4.3	4.5	4.2
	Number of Households	191,681	230,266	49,565	24,993
	Density (people/km2)	3,334	2,455	1,516	2,500
	Growth Rate (%)	2.0%	3.8%	5.4%	2.5%
Income Allows to	Build Savings (%)	15.0	12.7	24.7	12.1
	Save Just A Little (%)	20.5	18.1	25.5	18.6
	Only Just Meets Expenses (%)	35.9	51.6	21.5	45.7
	Not Sufficient so Use Savings (%)	12.5	8.8	12.8	8.3
	Not Sufficient so Need to Borrow (%)	16.1	8.8	15.5	15.3
Economic Well-Being (1)	Very Poor (%)	13.4	13.7	16.1	20.7
	Poor (%)	31.4	40.4	29.9	31.1
	Average (%)	34.9	32.9	33.2	30.3
	Rich (%)	20.2	13.0	20.8	17.9
Livelihoods	Wage or Salary Worker (%)	32.3	25.3	25.2	29.2
	Households Operating Non-Agricultural Enterprise (%)	38.0	49.8	58.6	52.1
	Enterprises Registered (%)	24.9	12.4	20.7	14.9
	Enterprises Wholesale or Retail Trade (%)	66.9	80.2	82.2	72.7
Loans	Never Applied for a Loan (%)	82.4	78.0	82.2	66.3
	That Has Taken a Loan (%)	13.3	18.8	19.8	20.0
Household	Own Home (%)	30.5	36.2	35.7	41.0
	Rent Home (%)	53.1	52.9	52.8	43.7
	Mobile Phone (%)	84.5	82.4	93.8	83.2
	TV (%)	52.2	37.1	51.8	43.7
	Computer (%)	13.9	11.0	8.5	15.9

	METRIC	BLANTYRE	LILONGWE	MZUZU	ZOMBA
	Use Rubbish Bin Collection (%)	23.0	14.1	17.0	9.6
	Flush Toilet (%)	20.8	12.0	11.6	25.3
Power	Electricity in Home (%)	62.9	30.9	53.5	44.0
Primary Cooking Fuel	Firewood (%)	7.2	13.2	22.3	18.9
	Charcoal (%)	81.2	74.1	69.1	66.8
	Electricity (%)	10.8	10.7	7.8	13.4
	Other (%)	0.8	2.0	0.8	0.9
Lighting	Dry Cell Battery (%)	10.2	43.7	28.6	34.8
	Electricity (%)	63.2	30.5	53.3	43.8
	Candles (%)	21.3	22.6	17.2	18.9
	Paraffin (%)	4.3	1.4	0	1.4
Food Security	High (%)	57.9	36.7	31.8	29.5
	Marginal (%)	3.4	5.5	8.8	2.3
	Low (%)	5.9	14.2	16	9.3
	Very Low (%)	32.8	43.6	43.4	58.9
	Have 3 Meals a Day (%)	78.5	75.3	79.2	67.5
	Without Enough Food (%)	29.2	53.8	45.2	54.1
	Average Number of Months without Enough Food	4	3	3	4
Improved Cooking Addressable Market Estimates	Potential Ultra Efficient Charcoal Stove Market (HHs)	92,236	70,716	21,655	10,891
	Potential Ultra Efficient Charcoal Stove Market (%)	40.1%	29.6%	40.8%	31.8%
	Potential LPG Market (HHs)	30,962	22,859	6,462	4,231
	Potential LPG Market (%)	13.5%	9.6%	12.2%	12.4%

Sources: Fourth Integrated Household Survey (2017) & Malawi Population and Housing Census (2018)

2.0 CLEAN COOKING FOR URBAN MALAWI

The urban clean cooking sector in Malawi is at a nascent stage and trendlines point to an improved willingness to adopt new technologies to meet cooking demand in the future. This is likely due to the increasing cost of status quo cooking approaches (e.g. using illegal, unsustainably produced charcoal on an inefficient stove). However, the main question is: *When will Malawi reach the tipping point that results in widespread adoption of improved cooking technologies?* At the moment, there is an unprecedented opportunity in Malawi to scale up cleaner cooking. According to the Government of Malawi, the most relevant challenges to the Malawian energy sector are "…dependency on biomass from unsustainable sources; … reliance on end-use devices with low energy efficiency; … adverse impacts of the urban household energy mix on the environment and on health and safety" (Malawi Energy Policy, 2003).

Globally, three billion people depend on polluting, open fires or inefficient stoves to cook their food, harming health, the climate, and the environment. Inefficient combustion of solid fuels like wood, charcoal, animal dung, crop residue, and coal produce a range of climate-damaging emissions (Clean Cooking Alliance Fact Sheet, 2015). Clean cooking, defined as meeting the most recent World Health Organization guidelines for indoor air quality, is a proven solution to this climate problem with energy efficient improved cookstoves estimated to reduce wood fuel by 30-60% and reduce greenhouse gases (GHG) and carbon emissions. Other benefits of clean cooking can be seen in health, women's empowerment and improved local economies. However, despite numerous interventions, the desired large-scale uptake and sustained use of clean cooking fuels and technologies required to address health and environmental problems effectively have not been achieved (Stockholm Environment Institute, 2015).

Malawi's cooking landscape is complex and requires increased efforts to better energy supply and needs (Simon, 2010). The landscape is further complicated by the variation between urban and rural cooking as well as the rapid changes in the urban cooking landscape and continued urban migration. To date, development focus has been on understanding the rural cooking and energy use landscape, but now there is increasing effort being made to understand urban cooking needs by government and development partners. Key aspects of urban cooking in Malawi include:

- Use of charcoal as the primary cooking fuel in urban households increased from 44.6% in 2011 to 76% in 2018 (Malawi Population and Housing Census, 2018).
- Charcoal use estimated to be increasing 10% per year in Malawi (ibid).
- The number of Malawians using firewood is estimated to have increased from 11,571,500 in 2005 to 14,877,442 in 2017, representing a percentage increase of 28%. For the same period, the number of Malawians using charcoal is estimated to have increased from 1,072,500 to 2,643,505 representing a percentage increase of 146%. In absolute terms, 4,876,947 more Malawians are estimated to have used charcoal and firewood in 2017 than in 2005 (USAID, 2018).
- The Jiko (charcoal stove) and Chitetezo Mbaula (firewood stove) are widely used for cooking (across urban and rural Malawi).
- 'Stove stacking' and 'fuel stacking[1]' is common in Malawi.

[1] Fuel or stove stacking refers to the continued use of traditional fuel and technologies after adopting more modern fuels and technologies. Households stack fuel and stoves as a way to improve their energy security. Fuel stacking allows greater flexibility around fuel choices, enabling households to be more resilient, and less vulnerable to variables such as fluctuating fuel prices, changes in the availability of fuel and unreliable energy services.

- The use of biomass (charcoal and firewood) for cooking is largely driven by its wide availability and relative affordability.
- Promotional strategies aim to expand the use of improved ceramic firewood stoves in poor, peri-urban households and to "reduce the proportion of households using three stone cookstoves to 50% by 2020" (Malawi Energy Policy, 2003).
- Despite higher electrification rates in urban Malawi compared to rural areas, 73% of urban households use unimproved cookstoves (Practical Action Consulting, 2018).
- Fuel saving is a significant driver of preferred use of improved biomass cookstove. Improved cookstoves are estimated to save between 23-50% fuel wood (Pailman et al., 2018).

The increase in demand for cooking fuel is due primarily to the population growth and continued dependency on wood fuels as the primary energy source for cooking. National demand for fuelwood, charcoal, and small construction material is projected to increase from 11.2 megatons of dry matter (Mt DM) in 2016 to 13.3 Mt DM in 2021 (Drigo, 2019). Most relevant are the changes taking place in urban areas. The rapid increase of charcoal demand (+10% annually) is only partially compensated by the reduction of fuelwood demand (-5% annually) (ibid). Furthermore, alternative fuel sources are perceived by most to be expensive. The following table presents the actual costs of alternative fuels in Malawi.

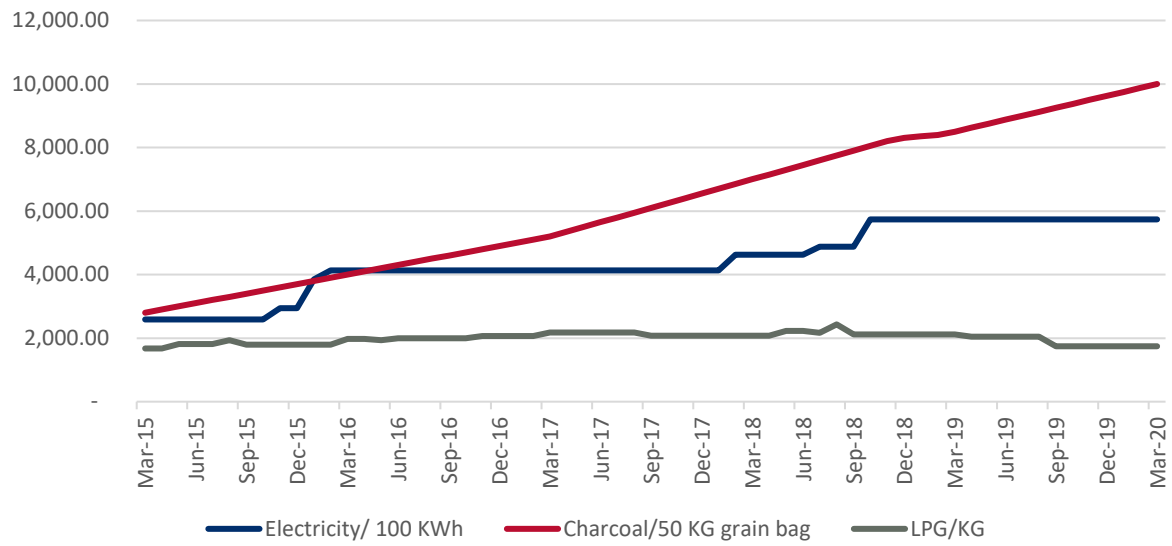
Table 5. Energy Prices in Malawian Kwacha (MWK) as of 08 March 2020

FUEL	PRICE (MWK)	UNIT
Petrol	930.00	Liter (L)
Diesel	887.00	Liter (L)
Paraffin	693.60	Liter (L)
Liquid Petroleum Gas (LPG)	1,744.75	Kilogram (kg)
Electricity	88.02	Kilowatt Hour (KWh)

Source: Malawi Energy Regulatory Authority (2020)

Furthermore, the pricing trends of electricity, charcoal, and LPG since 2015 are shown in Figure 5 below. The trends show that the price LPG has been relatively consistent on a per kilogram cost since 2015; residential electricity costs have been steadily increasing with step-up pricing as determined by Malawi Energy Regulatory Authority (MERA); and charcoal pricing has shown a continual increase in cost per a 50 kilogram grain bag, which is estimated to weigh approximately 13 kgs when filled with charcoal. These trends, if they continue, demonstrate the dynamic nature of cooking fuel costs, and show the informal charcoal pricing continually increasing. This constant increase in charcoal pricing is likely to be the result of increasing demand for charcoal as urban populations grow and decreasing charcoal supply due to continued deforestation in Malawi.

Figure 5. Electricity, Charcoal, and LPG Pricing Trends for Lilongwe 2015-2020



Source: Electricity Supply Corporation of Malawi Limited & Malawi Energy Regulatory Authority (2020)

3.0 MALAWI'S CARBON POTENTIAL

Since 2007, efficient cookstoves (firewood and charcoal) and fuel switching stoves (gasifier stoves using sustainably harvested biomass such as woodchips or ethanol) qualify for the United Nations Framework Convention on Climate Change (UNFCCC) Clean Development Mechanism (CDM) of under:

- "Switch from Non-Renewable Biomass for Thermal Applications by the User" (I.E).
- "Energy Efficiency for Thermal Appliances by the User" (II.G).

AMS I.E only applies to projects introducing 100% renewable energy and zero emission technologies such as solar or biogas cookers. They, therefore, cannot be used by stove projects disseminating efficient firewood or charcoal cookstoves. However, AMS-II.G or "Energy Efficiency for Thermal Appliances by the User" provides an opportunity for qualifying efficient biomass stove projects under the CDM. However, under CDM, the projects receive credits for reducing only carbon dioxide (CO_2) emissions and do not account for reduction of other greenhouse gases (Energypedia, 2017).

Assuming a wood savings of 23% for fuel-efficient fuelwood stoves and of 30% for improved charcoal stoves, Drigo concludes that the target of 2.7 Mt DM of reduction in deforestation cannot be met solely by replacing inefficient stoves, but it will go a long way toward reaching this goal (2019). Further, the opportunity to generate carbon credits under the CDM further incentivizes enterprises to undertake business ventures in the clean cooking sector.

For LPG, currently the only opportunity to generate carbon credits is on the voluntary carbon market for fuel switching to LPG from biomass fuels. However, the UNFCCC is currently exploring LPG for addition to the CDM compliance market.

While the carbon market is an opportunity to financially incentivize cleaner cooking, it is extremely uncertain. There is currently a limited demand for both voluntary and compliance credits, and there is additional further uncertainty of the role of carbon markets as part of the international response to climate change after 2020. Volatile pricing for carbon and a lack of carbon credit buyers mean business models cannot rely on these payments (SE4All, 2019). For example, it has been estimated that an annual investment of USD 4.4 billion is required to close the carbon finance access gap, yet only USD 32 million (1%) in finance commitments for clean cooking solutions have been tracked (Drigo, 2019).

Furthermore, while carbon financing can advance clean cooking investment and ultimately adoption, countries' ability to attract CDM investment is highly reliant on good governance and an enabling environment (Fay, 2013). Unfortunately, some decisions in the CDM have also had a disproportionate negative impact on LDCs, including:

- Suppressed demand in the low emission baseline calculations of LDCs as they often rely on historical experience and do not consider the latent demand for energy that exists. Instead, calculations assume a continued supply of low/poor quality energy services as these countries develop. In addition to not being compatible with sustainable development, this assumption leads to such low baseline levels that projects, such as those dealing with energy efficiency, do not generate sufficient emission reductions for carbon finance to have an impact.
- Projects that replace non-renewable biomass treat the replacement of firewood in a conservative manner, which can lead to a lower emission factor for these types of projects and result in fewer carbon credits. This has disproportionately affected Sub-Saharan Africa and projects in poor communities where firewood, most often from non-renewable sources, is used more often for cooking and heating than other fuels.

- Treatment of forestry projects and exclusion of agriculture under the CDM as this situation affects LDCs particularly negatively as these sectors are, relatively speaking, more important than in middle income developing countries. Forestry projects are penalized with "temporary" credits that are not recognized in some markets (e.g., the European Union Emissions Trading Scheme), depressing demand and price for these credits. Agriculture and avoided deforestation, both extremely relevant for poor communities, are currently not eligible project types under the CDM.
- Transaction costs and onerous the CDM process, including methodologies and documentation requirements, are often geared toward the most advanced developing countries and do not work well for smaller projects and less sophisticated project entities such as those more frequently found in LDCs.
- Streamlined methodologies and registration procedures that are expedited, reflect circumstances on the ground, and do not create a barrier for participation are crucial for LDCs since the projects tend to be smaller.
- The result of the absence of an entity to link small companies to the carbon market and help deal with the required documentation is that stove projects are not engaging with or benefiting from the carbon markets, especially in LDCs.

4.0 LPG OVERVIEW

The largest African consumer markets for LPG are in North Africa. While the annual LPG consumption rate per capita in Sub-Saharan Africa is 2.3 kilograms (kg) compared to 55 kg per capita annual consumption in North Africa (Rockall, 2016). The largest LPG markets in Sub-Saharan Africa per capita annual utilization in kilograms is Senegal (10.1 kg), Ivory Coast (8.6 kg), Angola (7.8 kg), South Africa (5.7 kg), Ghana (5.4 kg) and Sudan (5.3 kg) (Holmes, 2011). The higher utilization of LPG in these countries is due to long-term government support and subsidies. Meanwhile, some of the biggest constraints to the growth of LPG markets are supply deficits due to low and erratic production capacity of refineries and increased cost for LPG resulting from inadequate transport, distribution, and storage infrastructure (LPG Business Review, 2016).

In Malawi, there has been significant year-on-year growth of LPG importation from 200,000 in 2013 to 900,000 kgs in 2019 The main suppliers of LPG in Malawi are currently Afrox and Delta Gas. Based on best available and most recent information, this study estimates total household utilization of LPG to be 0.2% in Malawi (Malawi Housing and Population Census, 2018)). Much like the case in the rest of Sub-Saharan Africa, LPG consumption in Malawi is largely amongst middle to high-income urban households (PAC, 2018). Typically, LPG users in Malawi previously used electricity as their primary means for cooking supported by charcoal, and often switch to LPG due to the erratic supply and/or increasing cost of electricity.

Table 6. Comparable Country LPG Utilization

COUNTRY	SENEGAL	TANZANIA	ZIMBABWE	ZAMBIA	BOTSWANA	GHANA	MALAWI
% of Population Using LPG*	27%	4.1%	3.3%	0.6%	6.1%	24.5%	0.2%**
Tons Volume of LPG***	147	144	25	5	11	202	2.5

Sources:
*World Bank Database (2019): Main Cooking fuel: LPG/natural gas/biogas, % of households + key stakeholder estimates
**Malawi Population and Housing Census Main Report (2018)
***UN Data, LPG Imports, Metric Tons, Thousands (2017) + key stakeholder estimates

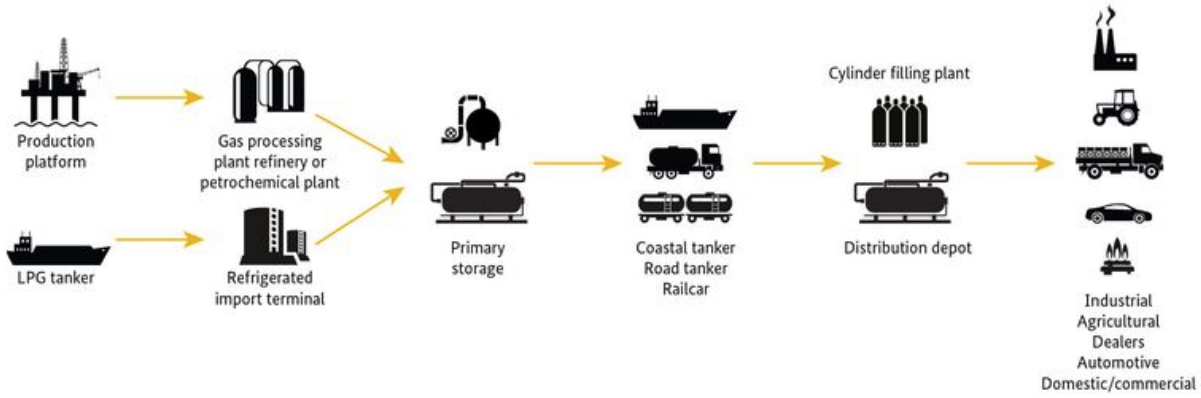
4.1 CHALLENGES

According to the Government of Malawi's National Charcoal Strategy (2017), LPG is one of the most promising alternatives to urban charcoal use in the medium and long term. However, affordability, accessibility and acceptability of LPG are key variables that determine adoption. All three of these variables must be clear to the potential customer otherwise adoption will remain limited. Explanations of each are as follows:

Affordability: MERA recommends the retail price of LPG per kilogram. As of March 2020, the cost was MWK 1,744.74 or $2.32 USD, significantly higher than the global average price of $0.63 USD per kg (Global Petrol Prices, 2019), and significantly higher than the South African Freight on Board price of 10.69 Rand (MERA, 2020). Affordability itself has numerous drivers including LPG regulation; proximity of Malawi from the LPG source; and resulting transport costs, storage, last mile distribution; market acceptability; and understanding of use. When considering (both accurately and inaccurately) perceived cost of viable alternatives, it is important to note alternative energy costs are often compared to charcoal prices. The cost of charcoal has an upward trajectory, a trend that is anticipated to continue due to large and increasing demand for charcoal and limited supply of biomass to produce charcoal. Furthermore, LPG in Malawi is extremely expensive relative to the global average and has potential to decrease with greater volume of LPG sales.

Accessibility: LPG safety regulation in Africa follows a European standard which is generally higher than that of South America and Asia. While this is good for maintaining safe distribution and use of LPG, it makes LPG even more expensive and limits its accessibility. Regional gas storage facilities are important for ensuring safe storage of large amounts of LPG for easy onward transmission to the consumer. Shorter distances from the storage facility to consumer's home is needed to create a denser network of distributors and consequently, users. The LPG value chain is complicated in any market, but in an underdeveloped market such as in Malawi, there are limitations on accessibility that are a function of storage and distribution, both of which limit supply because of the high storage costs and limited LPG supply from gas producers. Suppliers need to supply LPG at significant volumes in order to reduce cost.

Figure 6. LPG Value Chain from Source to Consumer



Source: Energypedia (2020)

Acceptability: The knowledge and understanding of LPG in Malawi remains low. A study by Practical Action Consulting highlighted limited knowledge of LPG efficiency and safety among potential users (PAC, 2018). Perceptions that LPG is unsafe and more expensive than other cooking fuels further hamper uptake.

4.1.1 LPG IMPORTATION ROUTES

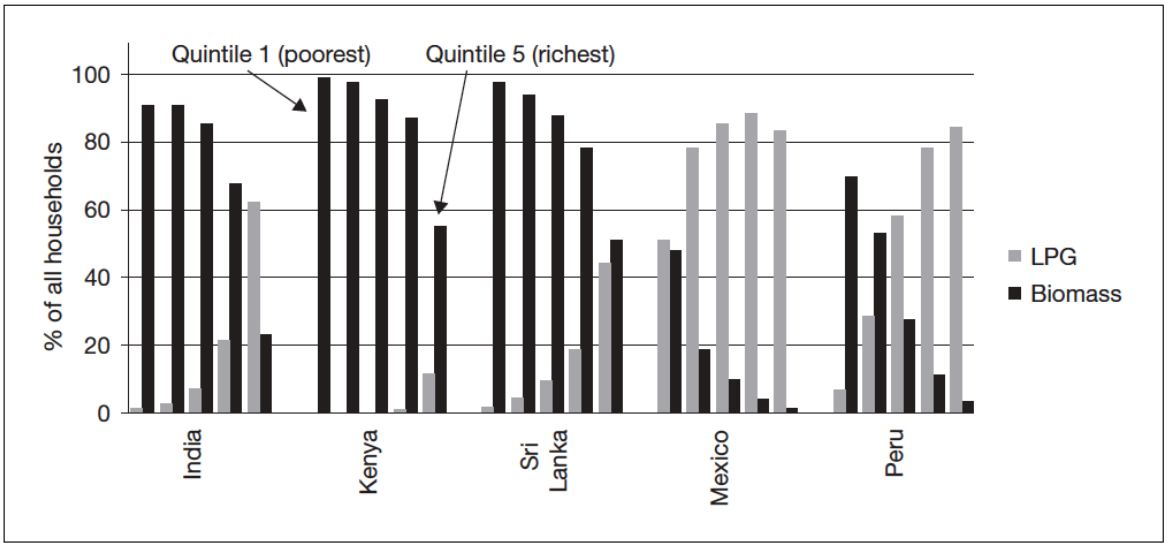
There are standard importation routes Malawi which are applicable to importation of LPG. Figure 7 below shows the importation routes being currently used by LPG suppliers in Malawi. These include ports of Dar es Salaam, Tanzania; Nacala, Mozambique; Beira, Mozambique; and Durban, South Africa as well as Lusaka, Zambia.

Figure 7. Malawi LPG Importation Routes

4.2 OPPORTUNITIES

Despite the challenges to LPG businesses, the opportunities remain vast. There are opportunities to incentivize LPG adoption, increase awareness of LPG's benefits, and introduce new and varying distribution approaches for LPG stoves, accessories, cylinders, and the on-going supply and sale of the LPG. However, it is important to note that LPG adoption is most likely to start with higher income households. This suggestion is in line with growth of LPG in other countries as demonstrated by the following figure.

Figure 8. LPG Global Usage Customer Segmentation



Source: World Bank (2011)

Laboratory tests and data analysis found LPG to be the most efficient cooking fuel in comparison to electricity, sustainably produced charcoal, local charcoal, and firewood options in Malawi (PAC, 2018). This evidence presents an opportunity to encourage high-income, urban households to switch to LPG on the basis of it being an effective and reliable alternative to charcoal and cooking with electricity with is negatively impacted by power outages.

Table 7. Fuel Comparisons of Typical Efficiencies

FUEL SOURCE	ENERGY CONTENT (Megajoules per kilogram, MJ per kg)	CONVERSION EFFICIENCY (%)	USEFUL ENERGY AT FINAL CONSUMPTION STAGE OF COOKING (MJ per kg)	APPROXIMATE QUANTITY OF FUEL NECESSARY TO PROVIDE 5 GIGAJOULES OF USEFUL ENERGY FOR COOKING (kg)
LPG	45.5	60	27.3	180
Natural Gas	38 MJ/M^3	60		219 M^3
Kerosene (Pressure)	43.0	55	23.6	210
Kerosene (Wick)	43.0	35	15.1	330
Biogas (60% Methane)	22.8 MJ/M^3	60		365 M^3
Charcoal (Efficient)	30.0	30	9.0	550
Charcoal (Traditional)	30.0	20	6.0	830

FUEL SOURCE	ENERGY CONTENT (Megajoules per kilogram, MJ per kg)	CONVERSION EFFICIENCY (%)	USEFUL ENERGY AT FINAL CONSUMPTION STAGE OF COOKING (MJ per kg)	APPROXIMATE QUANTITY OF FUEL NECESSARY TO PROVIDE 5 GIGAJOULES OF USEFUL ENERGY FOR COOKING (kg)
Bituminous Coal	22.5	25	5.6	880
Fuelwood (Efficient), 15% Moisture	16.0	25	4.0	1250
Fuelwood (Traditional), 15% moisture	16.0	15	2.4	2000
Crop Residue (Straw, Leaves, and Grass), 5% moisture	13.5	12	1.6	3000
Dung, 15% moisture	14.5	12	1.7	2900

Source: Bruce et al. (2017)

Further, LPG distribution approaches that consider consumer preferences and behaviors can open up the LPG business sector to approaches such as Pay-As-You-Go (PAYGO) which may make the upfront costs of cylinders and stoves more manageable by spreading this cost over time, which can increase utilization and adoption.

5.0 EFFICENT CHARCOAL STOVE & FUEL OVERVIEW

The National Charcoal Strategy estimates that nearly every Malawian household (97%) relies on firewood or charcoal as their primary source of cooking and heating fuel (2017). With alternative fuel sources underdeveloped, firewood and charcoal continue to form a significant part of Malawi's energy mix. World Bank data estimates that firewood remains the most used cooking fuel at 79.5% of households, but charcoal use has been increasing steadily to 18.3% (World Bank Data, 2017), and is now the most used in urban areas at 76% (Malawi Population and Housing Census, 2018). The demand for charcoal and firewood, of which most is unsustainably harvested and produced, is driving deforestation and forest degradation in Malawi. This is undermining agricultural productivity and food security, water security, and hydroelectric generating capacity all of which are increasing Malawi's vulnerability to climate shocks.

Acknowledging the potential of improved cookstoves (ICS) to reduce the adverse health and environmental impacts related to current cooking practices, the Government of Malawi developed a Cookstoves Roadmap, which targets the increase in clean and energy efficient stoves from 500,000 in 2016 to 2,000,000 households by 2020. Following the launch of this initiative, the National Cookstove Steering Committee (NCSC), chaired by the Department of Energy Affairs and supported by various development partners, was formed to coordinate the efforts toward achieving the government's commitment of increasing the adoption of improved cookstoves. Efforts thus far have primarily focused on the 'Chitetezo Mbaula', a clay firewood ICS.

Other improved stoves have been introduced historically on the Malawi market primarily via individual initiatives or by private sector players. There are currently an estimated 225 local groups in Malawi engaging approximately 4,000 people in the production of local ICS. Most of these groups produce firewood improved cookstoves; however, there are at least five (5) semi-industrialized stove models also being produced in the country. While there are various firewood ICS available in Malawi, there are only three types of charcoal improved cookstoves available in Malawi. These are:

1. ***Basic Malawian Jiko Charcoal Stove***: This stove features small functional improvements in fuel-efficiency over the traditional, inefficient 'mbaula' charcoal cookstove that is typically made from scrap metal. The Jiko stove is locally made and has a clay lining and a metal casing. This stove was introduced in Malawi during the 1980s from Kenya. The price range for the Jiko is between $3 USD and $5 USD.
2. ***Intermediate Charcoal ICS:*** This stove is primarily designed as a rocket style stove with a portable design focused on an improved fuel-efficiency estimated at 30%-40% when compared to the Jiko. Intermediate Charcoal ICS are just starting to be developed locally in Malawi. There have been significant advances in East Africa with locally made intermediate ICS stoves, and with a stronger focus on charcoal ICS, continual improvements in the intermediate ICS are possible in Malawi. The intermediate ICS retail price is estimated between $8 USD and $10 USD.
3. ***Ultra-Efficient Charcoal ICS:*** This stove is a rocket style ICS with portable designs that are either round or square. Ultra-efficient charcoal ICS have fuel savings up to an estimated 60% when compared to the Jiko. These stoves are currently available through importation to Malawi. Since September 2019, these imported stoves are exempt from customs duty and value added tax (VAT) The most well-established brands for ultra-efficient ICS are EnviroFit, Burn Jikokoa, and the EcoZoom Jet. The cost for the ultra-efficient ICS is estimated between $25 - $60 USD.

The sustainable charcoal production sector is at an early stage of development. There are numerous activities underway to explore new approaches to charcoal production (e.g. softwoods, bamboo, agricultural, and forestry waste) that have the potential to serve as an alternative to illegal, unsustainably harvested charcoal.

5.1 CHALLENGES

Identified challenges that affect adoption of a charcoal ICS in Malawi are tied to the affordability (e.g. upfront and on-going versus the status quo), accessibility (e.g. distribution and service reach), and acceptability (e.g. cultural and social norms) (Kapfudzaruwa, 2017). These factors are explored further below.

- A limited ability to pay for a higher cost, more efficient ICS and sustainably harvested fuels is a significant obstacle to broader adoption of ICSs and sustainable biomass fuels in Malawi. Even where households are willing to adopt ICSs and fuels, they often lack the ability to pay for the ICS due to insufficient disposable incomes and a lack of savings. The upfront costs of intermediate and ultra-efficient ICSs are estimated to be three (3) to 20 times more expensive relative to the traditional Jiko. These higher upfront costs serve as major deterrents to adoption.
- Accessibility to ICS and sustainably harvested fuels vis-à-vis the status quo is limited. Improving ICS and sustainable fuel accessibility requires significant investment in improving last-mile distribution and service channels to replicate the ubiquitous availability of low-cost, inefficient stoves (e.g. Jikos) and illegally harvested and unsustainably produced fuels.
- Sustained adoption and use of an improved ICS or fuel is often impacted by "stove and fuel stacking," where end users retain traditional cooking solutions for use alongside clean or improved solutions to accommodate both diverse household cooking needs and tradition or culture involved in cooking (Kammila et al, 2014). In Malawi, the hierarchy of stacking is as follows: firewood, charcoal, electricity, and finally, LPG.
- Consumers' willingness to adopt (either initial or sustained adoption) new cooking solutions is often influenced by limited consumer exposure to new technologies and low awareness of their benefits. These combined limit demand for these cooking solutions. Additionally, cooking is a deeply tied to culture and changing culture is a long-term process whereby incremental change is important to retain cooking practices and norms.
- New technologies' inability to fit with consumers' cooking preferences (due to reality, perceptions, or inappropriate designs); build consumer trust in stove performance and durability; address consumers' concerns about the accessibility of fuel supply or provide after-sales support; and technologies' inability to overcome behavioral (e.g., risk aversion, present bias) and cultural obstacles reduce the likelihood of sustained adoption of new ICS technologies.
- Customer perception of performance of alternative charcoal options (e.g. softwood & bamboo) versus hardwood charcoal can be negative.
- Illegal charcoal dominates the biomass fuel market, with little effective regulation.
- The wide availability and low cost of illegal charcoal drives is a barrier to sustainable charcoal market entry. Sustainably harvested fuels are produced by formal companies, which incur production costs and taxes on the sale of their fuels unlike informal, illegal charcoal entities which do not pay taxes. This difference results in a lower cost of illegal charcoal to the end customer.

In general, acceptability, accessibility and affordability of any new ICS or sustainable biomass fuel must be carefully considered to reach sustained adoption at scale.

5.2 OPPORTUNITIES

Most charcoal-using households use the Jiko as their primary stove; Therefore, a significant opportunity exists to increase the utilization of the intermediate and ultra-efficient charcoal stoves in urban Malawi, especially for those that are already comfortable cooking on charcoal. The key drivers of the market opportunity for advancing and increasing the uptake of ICS in Malawi relate to cost drivers of cooking, improving stoves, local production capabilities and smart subsidies and incentives

for adoption of an ICS. While for the end-consumer, reduction of fuel expenditure has been identified as the most motivating factor for adoption of an ICS, time savings, convenience, smoke reduction, durability, and safety are other key characteristics that have been identified and could be marketed to motivate adoption.

There is an extremely high return on investment via fuel cost savings for adopters of efficient charcoal stoves. It has been observed that charcoal prices in urban areas of Malawi have doubled in the past four (4) years and prices are expected to continually increase at 10% a year as supply continues to decrease (Drigo, 2019). As a result, increasing charcoal prices will create a significant financial incentive for charcoal reliant households to switch to intermediate or ultra-efficient ICS.

Furthermore, there is a strong local manufacturing base established from a long-term focus on promoting the firewood ICS, the 'Chitetezo Mbaula'. This manufacturing base coupled with continual improvements on intermediate and ultra-efficient charcoal stoves due to a renewed focus on improving efficiency of charcoal-based cooking, creates an opportunity for intermediate charcoal ICS to be manufactured in Malawi. This further creates a potential opportunity for Malawi to become a regional leader in locally made, efficient charcoal stoves for export. There is also an opportunity to lobby government to reduce or eliminate VAT and incentivize the production of locally certified and produced ICS.

Additionally, cultural and technological barriers to improved cookstoves can be overcome by utilizing appropriate and innovative techniques like social marketing that attempt to connect the new technologies to consumers perception and preference in order to influence positive behavior change. Social marketing research can also provide an intimate understanding the urban consumers targeted for cooking behavior change to determine the best approaches and timing for adoption campaigns.

With regard to sustainably harvested charcoal, a strong focus on improving sustainably harvested charcoal is required because it is a main cause of deforestation, and there is an urgent need to reduce charcoal consumption while not eliminating the primary, viable cooking options for the majority of low-income urban households. Sustainably harvested charcoal can thereby serve as a bridge until viable fuel switch alternatives are available at scale. However, sustainable charcoal must price competitive as with unsustainable charcoal as well as be as accessible and perform as well as the unsustainable, illegal charcoal available in the country.

6.0 BUSINESS ENVIRONMENT

6.1 REGULATION

Regulation of the cleaner cooking sector in Malawi is guided by the National Energy Policy (NEP) 2018 whose goal is to "enhance access to affordable, reliable, sustainable, efficient and modern energy for Malawians by 2030." The policies are administered and enforced by MERA, including the issuance of any required licenses. The Malawi Revenue Authority (MRA) is responsible for all fiscal issues (i.e. import duty and value added tax [VAT]) and ensures enforcement at border points. The Malawi Bureau of Standards (MBS) issues import certificates for products that meet the national standards.

For charcoal, there are currently three private entities licensed to produce sustainable biomass for cooking in Malawi. The process to apply for a sustainable cooking fuel license is managed by the Department of Forestry (DoF), with the National Forest Policy (2016) and Forest Act (1997) allowing for sustainable production and marketing of charcoal under a license issued by the Director of Forestry and based on an operative forest management plan. One of the main critiques of this system is that under the Forest Policy and Act, the enforcement against illegal, unsustainable charcoal and the regulation of biomass and charcoal licensing is inadequate which keeps sustainable charcoal options' unprofitable and unable to compete with illegal charcoal. Further information regarding charcoal regulation can be read in the National Charcoal Strategy.

For LPG, the regulatory environment is still largely under-developed. Consequently, regulations to fill the regulatory gaps are extrapolated from Europe where the market is more mature. While these standards promote LPG safety, they also allow high barriers to entry. Additionally, the current LPG regulation in Malawi follows closely to the regulation and distribution of gasoline, which is a different type of fuel and should have different requirements. LPG regulations such as licensing and high duty and VAT on LPG cooking devices such as tabletop stoves also undermine the affordability and access of LPG. Further, the number of LPG importers and distributors remains low due to high standards and certification for LPG distribution. However, MERA continues to explore options to streamline LPG licensing and regulation to create a more enabling environment for potential market actors, and subsequently promote higher adoption of LPG in Malawi.

6.2 DUTY & VAT

On September 9, 2019, the 'Amendments to Customs and Excise (Tariffs) Order' became effective, which significantly changed the taxation requirements for cleaner cooking. The order included the zero rate of VAT on LPG and gas cylinders, solar equipment and wood cookstoves. It also removed the customs duty and excise tax on gas cylinders. However, the amendment maintained the customs duty and VAT on LPG cooking appliances and accessories. These changes have resulted in a lower cost to import LPG.

Further, clean cooking sector actors are lobbying for additional tax relief for the cleaner cooking sector, especially to remove:

- Customs duty, excise tax and VAT on LPG cooking appliances and low wattage electric cooking appliances.
- Excise tax on LPG imported from outside the COMESA and SADC regions.
- Customs duty, excise tax and VAT on improved firewood, charcoal and alternative biomass cookstoves.
- Customs duty, excise tax and VAT on biogas systems and components and machinery used to produce biomass pellets and briquettes.

6.3 BUSINESS ESTABLISHMENT

The Malawi Ease of Doing Business ranking is 110, which is lower than the sub-Saharan Africa average (World Bank, 2018). In an effort to improve this ranking and promote investment in Malawi, the Malawi Investment and Trade Center (MITC) provides a one-stop service center for new investors entering the country. Within MITC, all relevant GoM entities (e.g. Ministry of Immigration, Registrar of Companies, MRA, Ministry of Lands) are co-located in order to expediate establishment of new business ventures. For a normal business, it typically takes only 28 days to register a new business. MITC's investment approval committee also approves investment certificates, and if approved, provides further support to obtain any additional licenses and permits required to start operations.

6.4 RELEVANT BUSINESS ESTABLISHMENT CONTACTS

Malawi Investment and Trade Centre (MITC)
Tel: +265 (0) 770 800 / +265 (0) 771 315
Email: ossc@mitc.mw
Website: www.mitc.mw
Address: Aquarius House
1st Floor Capital City

Malawi Energy Regulatory Authority (MERA)
Primary Contact:
Mgawa Mkandawire, CEng MIChemE
Senior Gas Regulation Specialist
Tel: +265 (0) 997 95 6391 /
+265 (0) 880 09 1422
Email: mmkandawire@mera.mw

Central Region
Macjessie Muula
Gas Regulation Specialist
Tel: +265 (0) 994 20 5030 /
+265 (0) 882 72 2339
Email: mmuula@mera.mw

Northern Region
Gift Chimbu Chikabvumba
Gas Regulation Specialist
Mzuzu Regional Office, Box 1151, Mzuzu.
Tel: +265 (0) 999 65 7358
Email: gchikabvumba@mera.mw

Southern Region:
Nomalha Winn Wittika
Gas Regulation Specialist
Tel: +265 (0) 994 46 7851
Email: nwittika@mera.mw

Department of Energy Affairs (DoEA)
Mr. Cornwell Chisale
Principal Energy Officer
Tel: +265 (0) 995 10 9814
Email: cornwell.chisale@gmail.com

Department of Forestry (DoF)
Teddy Kamodo
Deputy Director
Email: teddiekamoto@yahoo.co.uk
Nkhalango House, Lilongwe 3, Malawi
Tel: +265 (0) 1 773 462 / +265 (0) 1 770 584
Email: forestry@dof.gov.mw /
forestry@mnrem.mw

Malawi Bureau of Standards
Head Office Moirs Road, P.O Box 946,
Blantyre, Malawi
Tel: +265 (0) 1 870 488
E-mail: mbs@mbsmw.org

National Cookstove Steering Committee (NCSC)
Khadija Sungeni Mussa
Programme Advisor for Improved Cookstoves
Tel: +265 (0) 998 32 3177
Email: khadija.mussa@giz.de

Lloyd Archer
Programme Manager - Energy
United Purpose Green Heritage House, First Floor, Area 13, PO Box 159, Lilongwe, Malawi
Tel: +265 (0) 888 34 61 26
Email: lloyd.archer@united-purpose.org

Cooperation Network for Renewable Energy in Malawi (CONREMA)
Secretariat c/o Renew'N'Able Malawi
P.O. Box 31219 – Blantyre 3, Malawi
Tel: +265 (0) 999 60 8501
Email: contact@conrema.org

7.0 FINANCING

7.1 SAVING AND CREDIT COOPERATIVE SOCIETIES (SACCOS)

Less than 1% of the Malawi's population is registered with the Saving and Credit Cooperative Society (SACCOS). In total, there are 116,122 members across 47 registered SACCOs in Malawi. Typically, SACCOS are rural-focused and inclusive of teachers, police, hospitals, and organizations such as women's groups.

7.2 MICROFINANCE

Malawi's Microfinance Network (MAMN) was established in 2001 has 21 member institutions. Key microfinance institutions (MFI) lend at least up to 40% in urban areas and include: Opportunity Bank of Malawi, FINCA Malawi Ltd, NBS Bank Limited (Small-Medium Enterprise Department), Finance Trust for the Self Employed, the Centre for Community Organization and Development, CUMO Microfinance Ltd., and Finance Savings and Credit Cooperative (Transparency Pricing Initiative in Malawi, 2013).

7.3 BANKS

The Malawi banking sector consists of nine (9) deposit-taking banks. National Bank of Malawi Plc, Standard Bank Malawi Ltd., and FDH Bank Ltd account for 65% of the market share. The remaining 35% is composed of six other banks: CDH Investment Bank Ltd., Eco Bank Ltd., First Merchant Bank Ltd., NBS Bank Ltd., Nedbank Malawi Ltd., and New Finance Bank Ltd. (Reserve Bank of Malawi, 2018).

7.4 INTERNATIONAL FUNDERS

There are several international lenders that could be considered if an enterprise meets their specific requirements. Some examples include:

- Kiva – Based in San Francisco, United States, Kiva provides zero interest loans to established social enterprises with a three-year track record (www.kiva.org)
- LendAHand – Based in the Netherlands and already active in Malawi, LendAHand provides crowdfunded lending to established microfinance and social enterprises (www.lendahand.com)
- Shared Interest – Based in New York City of the United States and already active in Malawi, Shared Interest is a private loan guarantee provider (www.sharedinterest.org)

7.5 GRANTS AND FACILITATION OPPORTUNITIES

There are also several grant funders that have been active in Malawi and could possibly fund cleaner cooking solutions. Some examples include:

- USAID Development Innovation Solutions: www.usaid.gov/div
- Energy and Environment Partnership: https://eepafrica.org/
- Cleaner Cooking Alliance: www.cleancookingalliance.org/
- Segal Family Foundation: www.segalfamilyfoundation.org/
- United States Development Finance Corporation: www.dfc.gov/
- USAID Development Credit Authority: www.usaid.gov/what-we-do/economic-growth-and-trade/development-credit-authority-putting-local-wealth-work.

- Global Innovation Fund: www.globalinnovation.fund/
- Innovate UK (Impact in Developing Countries Windows): www.gov.uk/government/organisations/innovate-uk
- Global Distributors Collective: https://globaldistributorscollective.org/

8.0 REFERENCES

Key Reference Document

United States Agency for International Development (2018) Power Africa Southern Africa Energy Program (SAEP) Market Entry Information Pack.

Other Documents Referenced

African Development Bank, African Union Commission and Economic Commission for Africa (ECA) (2016). African Statistical Yearbook.

African Development Bank Group, (2020). African Economic Outlook: Malawi Economic Outlook. Paris: OECD. https://www.afdb.org/en/countries/southern-africa/malawi/malawi-economic-outlook

African Development Bank, Organization for Economic Cooperation and Development (OECD) and United Nations Development Programme (UNDP). (2016) African Economic Outlook. Paris: OECD.

Bruce NG, Aunan K, Rehfuess EA, Liquefied Petroleum Gas as a Clean Cooking Fuel for Developing Countries: Implications for Climate, Forests, and Affordability, Materials on Development Financing, No. 7, March 2017, KfW Development Bank, Frankfurt, Germany.

Drigo, R. (2019) Woodfuel Integrated supply/demand overview mapping (WISDOM) Malawi. USAID.

Energypedia (2017) Carbon Markets for Improved Stoves. https://energypedia.info/wiki/Carbon_Markets_for_Improved_Cooking_Stoves_(ICS)#cite_note-https:.2F.2Fwww.sei-international.org.2Fmediamanager.2Fdocuments.2FPublications.2FClimate.2Fsei-pb-2013-cdm-cookstoves.pdf-0.

Energypedia (2020) Liquefied Petroleum Gas (LPG). https://energypedia.info/wiki/Liquefied_Petroleum_Gas_(LPG)

Fay, J. (2013) Market-based Incentives in South Africa and Zambia: A Comparative Analysis of the Clean Development Mechanism. Development Southern Africa. doi: 10.1080/0376835X.2013.830560

Fourth Integrated Household Survey (IHS4) 2016-2017: Malawi Poverty Report (2017) National Statistics Office.

Global Alliance for Clean Cookstoves (2015) Clean Cookstoves and fuels: a catalog of carbon offset projects and advisory service providers (2nd Edition): https://www.cleancookingalliance.org/binary-data/RESOURCE/file/000/000/381-1.pdf.

Global Petrol Prices, 15 July 2019: https://www.globalpetrolprices.com/lpg_prices/

Gondwe, A.S (2016) An empirical analysis of poverty, inequality and the labour market in Malawi: https://resep.sun.ac.za/wp-content/uploads/2019/07/gondwe_empirical_2016.pdf.

Holmes, C. (2011) Regional Outlook: Sub-Saharan Africa, WLPGA East Africa Summit, Nairobi, Kenya, 6 July 2011.

Kammila, S.; Kappen, J.F.; Rysankova, D.; Hyseni, B.; Putti, V.R. (2014) Clean and improved cooking in Sub-Saharan Africa: A Landscape Report (English). Washington, D.C.: World Bank Group: http://documents.worldbank.org/curated/en/164241468178757464/Clean-and-improved-cooking-in-Sub-Saharan-Africa-a-landscape-report

Kapfudzaruwa, F., Hart, T. & Fay, J. (2017) Improved Cookstoves (ICS) in Africa: Explaining the Adoption Patterns. Development Southern Africa. doi: 10.1080/0376835X.2017.1335592LPG Business Review (2016) Understanding LPG in West Africa: http://www.lpgbusinessreview.com/2016/07/26/understanding-lpg-in-west-africa/.

Malawi Labour Force Survey (2013): http://www.nsomalawi.mw/images/stories/data_on_line/demography/Labour%20Force/Labour%20Force%20Survey%202013/Key%20Finding%20Report_Labour%20Force%20Indicators.pdf.

Malawi Ministry of Finance, Economic Planning and Development (2014) Annual Economic Report.

Malawi National Charcoal Strategy 2017-2027 (2017) The Ministry of Natural Resources, Energy and Mining.

Malawi National Statistics Office (2005) Malawi Second Integrated Household Survey (HIS-2) 2004-2005: http://www.cdeunodc.inegi.org.mx/unodc/wp-includes/js/mapa11/pais/doc/africa/IHS2_HH_resultados_en.pdf.

Malawi Population and Housing Census Main Report (2018) National Statistics Office.

National Statistics Office (2016) Integrated Household Panel Survey. Integrated Household Panel Survey 2010-2013-2016 (Long-Term Panel, 102 EAs), World Bank.

O'Sullivan, K. and Fitzgerald, K. (2006) Household Energy Use in Malawi. World Bank: https://openknowledge.worldbank.org/handle/10986/2191.

Pailman, W., Groot, J., Clifford, M., Jewitt, S., and Ray, C. (2018) Experiences with improved cookstoves in Southern Africa. Journal of Energy in Southern Africa Vol. 29 (4):13-26.

Practical Action (2017) Final Quantitative Report on cost and efficiency of cooking fuels in Malawi: http://conrema.org/wp-content/uploads/2019/01/Final-quantitative-report-on-the-cost-and-efficiency-of-cooking-fuels-in-Malawi.pdf.

Practical Action (2018) Qualitative and Quantitative Research on LPG in Malawi: A Synthesized Final Report, November 2018.

Rockall, J. (2016) The Role of LPG in Supporting African Development Presentation, WLPGA, IGU EXC Workshop, Gas Development Opportunities in Southern Africa, 7 April 2016.

SE4All (2019) Energizing Finance: Understanding the Landscape 2019: https://www.seforall.org/publications/energizing-finance-understanding-the-landscape-2019.

Statistica (2020) Malawi Inflation.

Malawi Country Data (2020) Sustainable Energy for All. https://www.se4all-africa.org/seforall-in-africa/country-data/malawi/

Stevens, L., Santangelo, E., Muzee, K., Clifford, M. and Jewitt, S. (2020) Market mapping for improved cookstoves: barriers and opportunities in East Africa, Development in Practice, 30:1, 37-51, DOI: 10.1080/09614524.2019.1658717.

Stockholm Environment Institute (2015). From theory to practice of change: Lessons from SNV's improved cookstoves and fuel projects in Cambodia, Kenya, Nepal and Rwanda. (Working Paper no. 2015-09). Stockholm: Stockholm Environment Institute.

The Malawi project (2020) Malawi cities population: https://www.malawiproject.org/zzz/geography/districts-cities-villages/cities/.

Trading Economics (2020) Malawi Exchange Rate.

United Nations Program on HIV/AIDS (UNAIDS) Malawi (2019) Country Fact Sheets Malawi, https://www.unaids.org/en/regionscountries/countries/malawi

UNICEF (2019) 2018/19 National Budget Brief: Making Government Budgets Work for Children in Malawi: https://www.unicef.org/esa/sites/unicef.org.esa/files/2019-04/UNICEF-Malawi-2018-National-Budget-Brief.pdf.

UNdata (2020) https://data.un.org/Default.aspx

United Nations Development Programme (2019) Human Development Report 2019. http://www.hdr.undp.org/sites/default/files/hdr2019.pdf

UNFCCC (2019) Carbon Pricing Approaches in Eastern and Southern Africa: https://unfccc.int/sites/default/files/resource/Summary%20of%20East%20Africa%20carbon%20pricing%20report.pdf.

United Nations Economic Commission for Africa Country Profile (2016) – Malawi.

United States Agency for International Development (2018) Development Credit Authority, Malawi Energy. A concept for partial loan guarantees to bolster Malawi's energy solutions. https://www.meramalawi.mw/index.php/news/pressrelease/185-review-of-the-retail-price-of-liquefied-petroleum-gas-lpg-april-2019.

United States Agency for International Development (2020) Malawi Power Africa Fact Sheet. https://www.usaid.gov/powerafrica/malawi

World Bank Country Report, Malawi (2020). https://data.worldbank.org/country/malawi

World Bank (2010) 10 years of experience in Carbon Finance: Insights from working with carbon markets for development and global greenhouse gas mitigation: http://siteresources.worldbank.org/INTCARBONFINANCE/Resources/Carbon_Fund_12-1-09_web.pdf.

World Bank Data (2017) Main Cooking Fuel: Charcoal (2017) and Wood (2017), last updated 26 April 2019.

World Bank (2018) Malawi Systematic Country Diagnostic: Breaking the Cycle of Low Growth and Slow Poverty Reduction. Report No: 132785: http://documents.worldbank.org/curated/en/723781545072859945/pdf/malawi-scd-final-board-12-7-2018-12122018-636804216425880639.pdf.

World Bank (2011) Who Uses Bottled Gas?

U.S. Agency for International Development
1300 Pennsylvania Avenue, NW
Washington, DC 20523
Tel: (202) 712-0000
Fax: (202) 216-3524
www.usaid.gov