ACCELERATING ACCESS TO ENERGY

Global Alliance for Clean Cookstoves

Uganda Market Assessment

Sector Mapping

GVEP International

GLOBAL ALLIANCE FOR CLEAN COOKSTOVES

Introduction

- This Market Assessment was conducted by Global Village Energy Partnerships (GVEP) International, a non-profit organization that works to increase access to modern energy and reduce poverty in developing countries, and Accenture Development Partnerships (ADP), the NGO-arm of the global business consultancy, on behalf of the Global Alliance for Clean Cookstoves (the Alliance).

- It is intended to provide a high level snapshot of the sector that can then be used in conjunction with a number of research papers, consumer surveys and other sources (most published on the Alliance's website) to enhance sector market understanding and help the Alliance decide which countries and regions to prioritize.

- It is one of sixteen such assessments completed by the Alliance to:

    - Enhance sector market intelligence and knowledge.; and
    - Contribute to a process leading to the Alliance deciding which regions/countries it will prioritize.

- Four assessments were conducted across East Africa in Kenya, Uganda, Tanzania and Rwanda as part of a broader effort by the Alliance to enhance the sector market intelligence and knowledge.

- Each assessment has two parts:

    - Sector Mapping – an objective mapping of the sector.
    - Intervention Options – suggestions for removing the many barriers that currently prevent the creation of a thriving market for clean cooking solutions.

- In each Alliance study a combination of GVEP, ADP, and local consultants spent 4-6 weeks in country conducting a combination of primary (in-depth interviews) and secondary research. They used the same Market Assessment 'Toolkit' for each country so that comparisons can be made. The Toolkit is available free of charge to all organizations wishing to use it in other countries.

- **The Alliance wishes to acknowledge the generous support of the following donors for the market assessments: *Barr Foundation, Dow Corning Corporation, Shell Corporation, Shell Foundation,* and the governments of *Canada, Finland,* and *Spain*.**

This market assessment was produced by Global Village Energy Partnerships (GVEP) International and Accenture Development Partnerships (ADP) on behalf of the Alliance. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of the Global Alliance for Clean Cookstoves or its partners. The Alliance does not guarantee the accuracy of the data.

Contents

Sector Mapping

- Uganda is a Less Developed Country which has made some progress in reducing poverty though large inequalities exist. The country is politically stable and has recently discovered oil reserves.
- Biomass accounts for 91% of total energy used in the country. Biomass use is at unsustainable levels. Wood and charcoal are becoming increasingly scarce and more expensive.
- 3.8 million households cook on open fires in an enclosed space and nearly 1m additional households are exposed to carbon monoxide from traditional charcoal stoves.
- Awareness of IAP amongst the general population is virtually non-existent, though government officials and NGOs have recently become aware of the health implications of existing cooking practices.
- A commercial market for improved stoves exists in the country but many stoves are of poor quality. Most production is done around Kampala and distribution costs can be high Stove manufacture and sale is a low margin business dominated by artisans, carbon developers and 'social ventures' – there are few producers at scale.
- Demand for quality biomass stoves appears to be strong though more could be done to promote quality products in the market. Supply side constraints include access to land/premises, finance, marketing and distribution, and rising raw material costs.
- Urban households aspire to cook with kerosene and LPG (even electric stoves) as cleaner and more convenient, although negative perceptions around LPG exist. There appear to be opportunities for market expansion in these areas which would reduce pressure on biomass.
- Carbon finance has played an important role in reducing the costs of better quality stoves but also imposes a business model which can constrain growth. Insufficient producers/vendors at scale exist to meet current interest from carbon developers.

Implications for Intervention Options

- The government is aware of the issues around biomass use . The EU is planning to fund an updated biomass strategy. Opportunities for coordinated action at a national level exist.
- There is a high level of technical knowledge and experience in the country and a range of institutions which could be part of a coordinated programme of support to the sector.
- Stakeholders such as the government and communities may not view Indoor Air Pollution (IAP) as a priority issue, given the urgency of other priorities. Nevertheless LPG could be made more available and stove designs need to be improved to take account of health issues.
- The potential target market for improved biomass cookstoves probably comprises a population of around 1-2 million households. This leaves a large number of households unlikely to be influenced through market mechanisms.
- Supply side constraints need to be addressed to increase the supply of competitively priced, high quality stoves in the market. Carbon finance is likely to be the main way of subsidising costs to the consumer.
- More research is needed into consumer behaviour within key market segments and more testing of innovative marketing approaches. Stoves could potentially be bundled with efficient cooking utensils and booklets giving 'fuel saving tips'.
- The kerosene and LPG sectors should be studied and strategies developed for expanding use of these fuels. The unsustainable use of biomass fuels needs to be addressed nationally.

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Project Approach

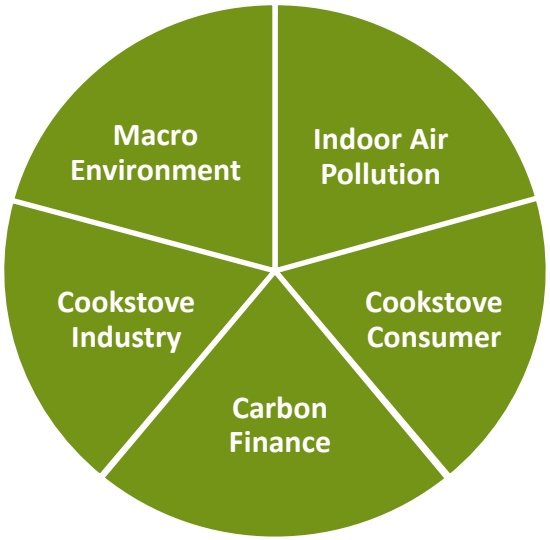
- This Market Assessment was conducted by Global Village Energy Partnerships (GVEP) International, a non-profit organisation that works to increase access to modern energy and reduce poverty in developing countries and Accenture Development Partnerships (ADP), the NGO-arm of the global business consultancy on behalf of the Global Alliance for Clean Cookstoves (the Alliance).
- It is one of more than a dozen Market Assessments completed by the Alliance to:
  - Enhance sector market intelligence and knowledge
  - Contribute to a process leading to the Alliance deciding which regions/countries it will prioritize.

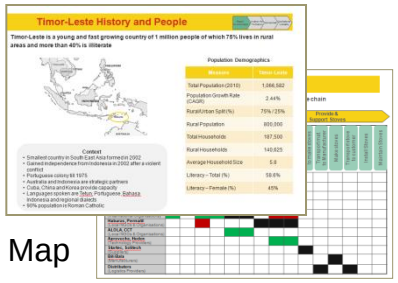
  Other studies include: Bangladesh, Colombia, East Timor, Ghana, Kenya, Nigeria, Peru, Rwanda, Tanzania, Uganda and Vietnam.
- Each Feasibility Study has two parts:
  1. Sector Mapping – an objective mapping of the sector.
  2. Intervention Options – suggestions for removing the many barriers that currently prevent the creation of a thriving market for clean cookstoves and fuels.
- Each study sees a combination of ADP and local consultants spend 4-6 weeks in a country conducting a combination of primary (in-depth interviews) and secondary research.
- They use the same Market Assessment 'Toolkit' for each country so that comparisons can be made
- The Toolkit is available free of charge to all organizations wishing to conduct assessments in other countries.

Project Approach

A structured approach first assessed the market for a cookstove industry and then used the sector mapping output to develop the intervention options and operational plan.

Sector Mapping





Sector Map

Strategy Development

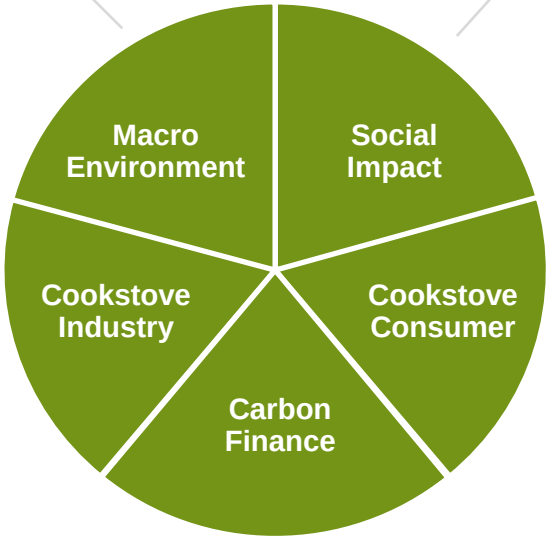
Identify Intervention Themes → **Develop Recommendations** → **Develop Operational Plan**

Intervention Options
And
Operational Plan

Sector Mapping Approach

Sector Mapping of the cookstove sector was conducted across five dimensions:

- *Social:* What is the country demographics & population distribution across regions?
- *Political:* How stable is government & what political risks will any program face?
- *Economic*: How much money do our potential customers have & what is the economic cycle?
- *Technological*: How sophisticated is the infrastructure & what is the plan for progress?
- *Environmental*: How do ecological conditions impact the success of cookstove programmes?



- How do people cook and what fuels are used in the region?
- What is the current IAP exposure profile of our target market? (Primary cause of IAP and size of problem)
- What are the other impacts caused by the use of poor cooking stoves?
- How does the impact of cookstoves stack up against other health & social priorities?

- What cooking devices are currently used within the region?
- Who are the main players active in the cookstove sector?
- What are the opportunities / threats for current & future cookstove programmes?
- How commercially attractive is the sector & what are likely to be some of the industry challenges?

- What carbon financing options exist for the country?
- What structures exist which can be leveraged for future carbon financing components?
- Which entities are likely to fill the required roles in the carbon finance operating model?

- What is the profile of the target population?
- How can the customer population be segmented / categorized?
- How big is each customer segment and what are its characteristics?
- What are the specific needs of each customer segment?

Intervention Options Approach

Strategy Development was conducted by using sector mapping as input to identify intervention areas, develop recommendations and develop operational plan.

- Favorable and unfavorable factors contributing to development of a cookstove industry on following dimensions:
  - Macro Environment
  - Indoor Air Pollution
  - Consumer
  - Current Cookstove Industry
  - Carbon Finance

- Identify possible interventions to promote a clean cookstove industry by:
  - Addressing the unfavorable factors
  - Aligning with the favorable factors

- Customer Segment Strategy:
  - Identify appropriate technology to serve each customer segment
  - Develop holistic customer strategy including marketing, financing
- Overall Strategy
  - Develop strategy for stakeholder engagement across segments
  - Develop strategy for awareness raising across segments
  - Identify possible NGOs and programs to partner with

- Develop operational plan that includes:
  - Detailed immediate next steps
  - Short term (3-6 months) activities and milestones
  - Long term (6 months – 2 years) high level directional plan

Acknowledgements

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- All those people and organizations who generously gave of their time to share their knowledge and insights. A complete list of organizations is available at the end of the report – and a selection of contributing organizations is included below.

Contents

Social Environment

Uganda is a landlocked country bordered by the DR Congo on the West, Sudan in the North, Kenya in the East and Tanzania in the South. It has a population of 31 million with 87% living in rural areas. Uganda has the second highest birth rate in the world.

Population Demographic	Uganda
Total Population (2010)	33,424,683
Population Growth Rate (CAGR)	3.2%
Rural/Urban Split (%)	87% / 13%
Rural Population (2010)	28,979,200
Average Household Size	4.7
Literacy – Total (%)	66.8%
Literacy – Female (%) (2002)	57.7%
Life Expectancy (years)	53.45
Population below poverty line (2009)	24.5%

Context

- Former British colony which gained independence in 1962
- This was followed by a long period of political unrest into Yoweri Museveni came to power in 1986.
- Languages: English (Official), Luganda, other Niger-Congo languages, Nilo-Saharan languages, Swahili, Arabic
- Roman Catholic 41.9%, Protestant 42% Muslim 12.1%, other 3.1%, none 0.9% (2002 census)

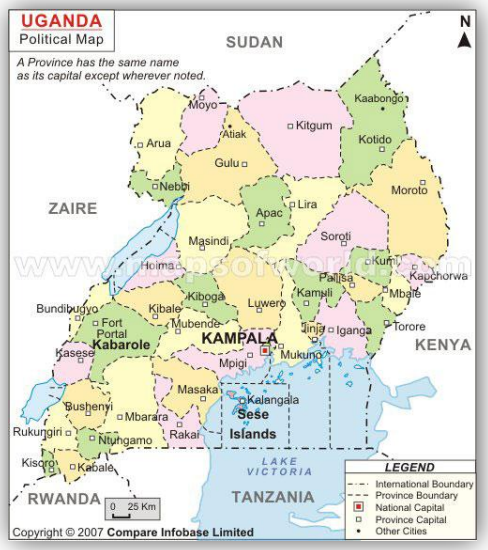
Sources: World Bank, UNBS, CIA World fact book

-Implications-

High population growth rates and increasing urbanisation are driving up fuel prices

Political Environment

Since coming to power in 1986, President Yoweri Museveni established relative political stability and economic growth.



Administrative Map

- Kampala is the capital city
- Uganda is divided into 112 districts across 4 administrative zones.
- Each district is further divided into sub-districts, counties, sub-counties, parishes and villages.

Current Government

- President Yoweri Kaguta Museveni has been in power since 26 January 1986.
- Vice President - Edward Ssekandi, Prime Minister - Amama Mbabazi.

Working with the Government

- Several government policies address issues related to the ICS sector and biomass use.
- Uganda is a relatively easy place to do business by sub-Saharan Africa standards, though challenging by international norms.

Political Structure

- Parliamentary Democracy
- The president is both chief of state and head of government. The cabinet is appointed by the president from among elected legislators.
- The president is reelected by popular vote for a five-year term; election last held on 18 February 2011 (next to be held in 2016)

-Implications-

Cookstove programs should seek support from the government and try to link into current policies. Private sector involvement is officially encouraged

Sources:
CIA World fact book

Economic Environment

Uganda has substantial natural resources. Agriculture is the most important sector of the economy, employing over 80% of the work force. The global economic downturn has hurt Uganda's exports; however, Uganda's GDP growth is still relatively strong.

Key Economic Indicators	
GDP (2010)	$17,010,765,767
GDP Per Capita (PPP) (2010)	$509
GDP Growth Rate (2010)	5.2%
Inflation Rate (2011 est.)	13.7%
Unemployment	4%
Household income by percentage share – Lowest 10%	2.4%
Household income by percentage share – Highest 10%	36.1

Key Economic Indicators	
Exports	$2.582 billion (2011 est.): coffee, fish and fish products, tea, cotton, flowers, horticultural products; gold Major markets: Sudan, Kenya & Rwanda
Imports	$4.771 billion (2011 est.): capital equipment, vehicles, petroleum, medical supplies; cereals Major suppliers: Kenya, UAE, China, India,
GDP composition	Agriculture: 21.8%, Industry: 26.1% and Services: 52.1% (2011 est.)

Sources: World Bank, CIA World fact book

-Implications-

Rising incomes for some plus rising fuel prices mean more households are potentially in the market for improved stoves

Gender

Uganda is traditionally a patriarchal society. Discrimination and violence against women is common although the government has enacted new laws to improve the equality disparities.

Policy & Employment

- The Ministry of Gender, Labour and Social Development and the National Gender Policy 2007 aim to promote equal gender relations and mainstream gender in all sectors.
- Most women work in agricultural subsistence work, particularly crop production, marketing, and processing of agricultural products. They also engage in microenterprise and represent almost 40% of business owners
- Men predominate in the formal economy making up 61% of employees.

Cultural Background

- Women are responsible for domestic tasks , providing water and firewood and caring for the elderly and sick. There working day can be double of that of a man.
- Traditionally women do not have the right to inherit, but widows have the right to inherit 15% of a deceased husband's property.
- Domestic violence has wide social acceptance, even by women.

Gender Equality Statistics		
	Male	Female
Primary school attendance	83%	82%
Secondary school attendance	17%	17%
Youth Literacy (15-24 yrs)	90%	85%
Labour participation rate	91%	78%
Seats held in national government (2011)	65%	35%

Sources: UNICEF, Wikigender, ENERGIA

- Implications -

Cookstove programs must be sensitive to the cultural factors around gender in order to effectively involve and empower women

Technological & Infrastructure Environment

Uganda faces challenges in access to energy and improving maternal healthcare. The improvement of infrastructure in transport & energy and private sector development are government priorities.

	Healthcare	Infrastructure	Education	Energy
Current Situation	• Infant mortality rate is 61 deaths / 1000 live births • Only 48% of the population has access to improved sanitation (2008) • HIV/AIDS prevalence in the country among adults is 6.5% (2009)	• Mobile cellular service has increased rapidly to 12.8 million user • 4.1 million internet user • 150 radio and 35 TV stations (2007) • 3 main ports and 5 paved airports	• 66.8% literacy rate • Net enrollment in primary education is 91% • Primary education completion rate is 57%	• Around 11% of the population have access to grid electricity • 91% of the total energy used in the country is derived from biomass. • Government subsidies exist on kerosene but not on LPG.
Government Priorities	• Improving access and quality of maternal services • Controlling diseases such as TB, Malaria and Leprosy • Improving the coordination of funding of the health sector	• Improving transport infrastructure • Improving access and lowering cost of telecommunication services • Promoting ICT	• Ensuring that all children enroll in primary education • Ensuring pass rates in literacy and numeracy at primary level • Ensuring equal access to education	• Increasing rural electrification and electricity generation • Strengthening energy sector governance • Promoting alternative sources of energy

Sources: World Bank Indicators, CIA fact book, AllAfrica, government website

-Implications-

Government priorities in energy focus on expansion of the grid and less on biomass energy

Environment

Much of the Ugandan population relies on biomass resources although alternative sources of energy are been sought. Over exploitation, population pressure and poor policy have led to environmental problems.

Photo source: zambezi.co.uk

Climate

- Uganda's climate is bimodal with two rainy seasons
- The country experiences moderate temperatures throughout the year with 28 the mean daily temperature.
- The rainfall level ranges from 400 to 2200 mm per year

Natural Resources

- Biomass resources include firewood, charcoal, shrubs, grasses, forest and agricultural crop waste and agro-industrial residues and account for 91% of total energy used.
- Solar energy has potential in the form of solar water heaters and power generation.
- Other renewable energy sources include: - Geothermal, peat, wind, fuel-cell technology and Biofuels.

Emissions

- Uganda is a low emitter of carbon with CO2 emission at 0.1 metric tons per capita.
- Exhaust fumes from motor vehicles and industries contribute to air pollution in the urban areas.

Environmental Problems

- Draining of wetlands for agricultural use; deforestation; overgrazing; soil erosion; water hyacinth infestation in Lake Victoria; widespread poaching.
- There are incidences of drought and flooding occasioned by climate variations

Sources: GIZ, NEMA, CIA World fact book

-Implications-

Cookstove programs have the potential to contribute to wider environmental issues

Contents

Indoor Air Pollution in Uganda

The use of biomass with basic cooking devices combined with unsuitable cooking spaces is the main cause of IAP in Uganda

	Scenes	Comments
Cooking Fuel		• Low grade biomass and agricultural residue used as cooking fuel increases the exposure.
Cooking Device		• Open wood fires and traditional cook stoves at both the residential and institutional level are the primary cause of indoor air pollution in rural homes. • Traditional charcoal stoves, and even improved stoves, burning poor quality charcoal cause of exposure to carbon monoxide
Housing Structure		• Women keep small children near them during the preparation of meals • 2/3 of the kitchens are in a separate hut or makeshift shelter. • Use of poor quality kerosene “candles” that generate a lot of soot is widespread in the rural areas

-Implication-

Increased use of improved stoves and better cooking practice can significantly reduce IAP.

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Health Impacts of IAP

Female cooks and children are the main groups exposed to IAP which is linked to acute respiratory infections responsible for 8.2% of infant deaths.

Who is Exposed to IAP

Group	Numbers Exposed
Households using traditional open fires in built kitchens	3.8 million
Female cooks	3.8 million
Children under the age of 5	4 million
Institutional cooks and kitchen helpers	57,000
Secondary students age 13-19 who study with the Kerosene "candle"	2.4 million
Urban women & children exposed to carbon monoxide by using charcoal stoves	944,000

IAP Effects

- ARI caused by wood smoke and other substances is responsible for 8.2% of infant deaths.
- In addition, harmful gases in wood smoke (e.g. sulphur dioxide and carbon monoxide) cause conditions such as mental impairment and cardiovascular disease.
- Over two million cases of ARI were reported in 2001.
- The 2002 National Household survey identified that 28% of the 27.4 million population fell ill in the preceding 30 days and that of these 14% were cases of ARI.
- Low awareness of ARI despite the fact that this is the second most important cause of morbidity and accounted for 16.3% of outpatient visits in 2001 and 19.8% in 2005.
- IAP exposure is expected to grow in line with Uganda's predicted population growth (approx. 3.2 % p.a.)

-Implications-

Switching to cleaner fuels would bring health benefits to women and children

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IAP Programmes

Although often not the primary objective, many cookstove programs aim to reduce indoor air pollution through their activities. In addition programs in other sector have aimed to tackle this problem. Below are some of the main programs that have focused on IAP in Uganda.

Current	Past	Other Outreach Programmes
Uganda Efficient Stove Project	GTZ Energy Advisory Project	Biomass based-Briquetting Project
Biomass Energy Initiative for Africa (BEIA) project in Uganda	Energy Solutions Solar Assembling Project	The Energy for Rural Transformation (ERT) Programme
TRACTION	The Uganda Photovoltaic Pilot Project for Rural Electrification (UPPRE)	Energy Advisory Project
Promotion of Renewable Energy and Energy Efficiency Programme		Development of the water sector
Developing Energy Enterprise Programme		

-Implications-

Cookstove programs should build on existing experience and link in with other initiatives related to IAP

IAP Programmes

Several lessons can be learnt from past initiatives that have targeted reduction of IAP

Lesson Learned

•Most programmes focused on energy efficiency. Reducing smoke and IAP was a side advantage and in some cases not an explicit objective at all. It is unclear to what degree health benefits are being achieved.

•Long-term funding and careful planning is required for successful commercialisation.

•The low price of wood reduces the interest of consumers in buying advanced energy technologies. Adoption of improved urban stoves is still low mainly due to continued high cost and low quality of the technology.

•An integrated approach is required that considered health, energy, gender & economic empowerment

•A business-oriented package is also needed to build up capacity in the improved stoves sector and to encourage healthy competition amongst producers.

Risks and Opportunities

- Many past programmes, even where well resourced, resulted in minimal adoption on the ground.
- IAP is not yet a policy priority or political concern
- Multiple stakeholders have been involved in implementing various projects on biomass energy, although in an uncoordinated and intermittent manner.
- There is a lot of technical expertise and potential collaborators at all levels.

-Implications-

Cookstove programs need to take an integrated and coordinated approach which emphasis on commercial aspects

The Role of Gender

The majority of stove businesses are male headed, although women are involved in areas of the business, mainly liner production and assemble, whereas cladding is dominated by men.

Role of Gender in the Household

- Women are far more likely to be exposed to IAP in their role as primary cook.
- Although women are involved in household purchasing decisions, men have more purchasing power and ability to pay upfront.
- 29% of households in rural areas are female headed, compared to 35% in urban areas (UNBS 09/10).

Role of Women in the Cookstove Sector

- Women's involvement in micro enterprises and access to local networks has extended into the cookstove sector.
- Women are mainly involve in liners production and stove assembly whereas metal work is dominated by men.
- Women are integral to any consumer awareness and education campaign as the primary users of cookstoves.

Barriers to further involvement

- Women often have less access to finance and own less collateral, hence finding it difficult to secure a loan for business expansion.
- Women's role looking after the home often restricts their ability to travel long distances and limits them to local activities.

Sources:Interviews, field visits

-Implications-

By improving the ability of women to participate in the sector, cookstove programs can take advantage of existing skills and networking capability.

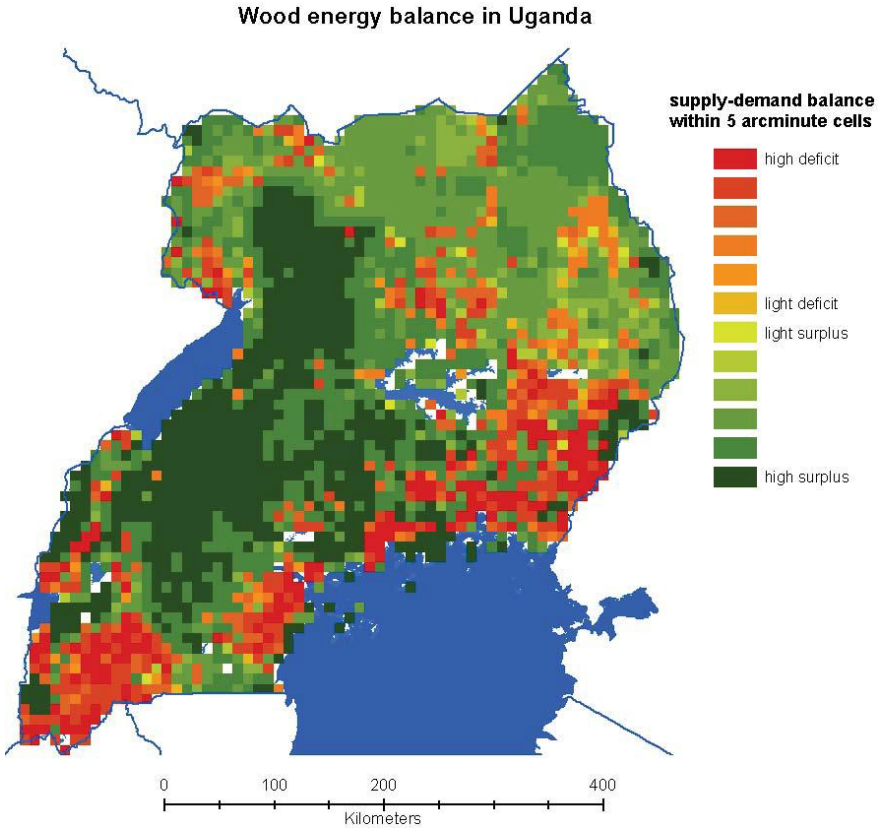
Deforestation

Forest cover is estimated at between 15 - 26% of total land area. Biomass requirements have contributed to the degradation of forests as trees and shrubs are harvested at alarming rates to meet fuel wood demand.

Deforestation

- The majority of wood harvested from forested areas is for household consumption. Wood is also harvested to make wood related products, for building and industry.
- Growing populations are putting large demand on land which is been cleared for agriculture and settlements.
- FAO reported that between 1990 and 2005 Uganda lost 26% of its forests .
- 21.8% of the rural population live in areas of high woody biomass deficit.
- The contribution of firewood and charcoal to Uganda's GDP is estimated at US$48 million and US$26.8 million respectively (UNDP, 2011)
- Depletion of tree cover has contributed to fatal mudslide in Uganda.

Map of wood fuel supply-consumption balance categories (FAO 2006)



-Implications-

Rapid depletion of biomass resources is having environmental, social and economic effects.

Sources NEMA, FAO

Contents

Customer Segmentation

Research conducted in 2007 by the Shell Foundation Breathing Space Programme.

The market for improved stoves comprises mainly urban and peri-urban households living above the poverty line.

The Shell Foundation Breathing Space project conducted research amongst consumers in 2007 when the population of Uganda was 30M (current 33M.) The population was divided according to region, income level and area:

	Rural (HH)			Urban (HH)		
Region	**Poor (<$1)**	**Middle ($1-$3)**	**Upper (>$3)**	**Poor (<$1)**	**Middle ($1-$3)**	**Upper (>$3)**
Central	**314,044**	**766,905**	**56,892**	**32,871**	**325,338**	**63,213**
Eastern	**562,295**	**566,952**	**34,925**	**17,297**	**67,738**	**11,596**
Western	**375,827**	**676,051**	**43,828**	**19,839**	**72,957**	**13,866**
Northern	**541,844**	**275,090**	**16,672**	**27,023**	**35,498**	**6,947**
Total HHs	**1,794,010**	**2,284,997**	**152,318**	**97,030**	**501,531**	**95,622**
Tot W-C-E	**1,252,166**	**2,009,907**	**135,645**	**70,007**	**466,033**	**88,675**
		2,145,533			554,708	

Subgroups of the total population were identified for detailed research. The Northern region was excluded because difficult to reach. Households with income levels lower than $1/day were also excluded on grounds of insufficient purchasing power. This left a total of approximately 2.1M households in rural areas predominately using firewood and .55M households in urban areas the majority presumed to use charcoal as their main fuel. These were the segments considered most likely to include potential customers for stoves.

-Implications-

A market approach needs to be based on an understanding of the existing and potential customers for stoves .

Customer Segmentation

Research conducted in 2007 by the Shell Foundation Breathing Space Programme.

	$1-3/d				$>3/d *
Firewood	Segment 1	Segment 2			
Charcoal			Segment 3	Segment 4	Segment 5
	Rural	Peri-urban		Urban	

The two overall groups of firewood and charcoal users were divided in five segments as illustrated in the table on the left.

Sampling of these groups was carried out using a detailed questionnaire survey. 250 households were interviewed, representative of 5 consumer categories (i.e. 50 households per segment). Locations were picked randomly to cut across areas identified as viable from Stage 1, and geographically spread to ensure social, cultural and economic representation.

Consumer Group no.	Geography	Main Cooking Fuel	Household Income	Locations Sampled	Sampling Incidence*
1	Rural	Firewood	$1-3/day	Kasese (West), Luwero (Central) & Iganga (East)	72
2	Peri-urban	Firewood	$1-3/day	Kinoni (Western) & Busembatia (Eastern)	73
3	Peri-urban	Charcoal	$1-3/day		68
4	Urban	Charcoal	$1-3/day	Kampala & Jinga	75
5	Urban	Charcoal	>$3/day		59

NB. *Although the survey conducted by Shell Foundation is five years old and excluded the rural segment with income over $3/day it contains valuable information about consumers attitudes and aspirations. The following slides summarise the findings of the research.*

Consumer Cooking Habits

Rural firewood users mostly cook on 3-stone fires. Jiko stoves are widely used among charcoal users but less than one third owns a clay lined Jiko. Most meals are prepared using heat-wasting aluminium saucepans sometimes without lids (about a third). People prepare more than one dish at a time in 25% of cases or less.

Typical meals

- Tea and porridge are the two main hot beverages for breakfast. Both require intense heat for boiling water. Roots are also common and fried wheat snacks in urban areas
- Maize meal, but also rice are most often consumed for supper and lunch
- There is variety in the meals prepared, with boiling and simmering being the main cooking methods
- Meat also records high proportions reaching 71% chances among the urban richer

Cookstove requirements

- Ability to generate both high intensity heat to boil water and fry and low intensity simmering
- Need to function in the morning and evening when there is no sun
- Connected water heating system
- Improved cooking tools

-Implications-

Cooking needs do not overly differ across segments. Fast and clean cooking is preferred. More efficient cooking pots and water heating systems may make sense. Solar cooking is not suitable for most needs.

Consumer View of Cooking Systems

Segment	Fuel availability	Issues	Benefits	Other uses	Switching fuels
Rural firewood	36% buy for $8.5/month	Smoke (eyes itching, dirtying utensils) , availability especially in rural areas, cost and inconvenience	Affordability	Heating water, roasting, drying, warm livestock	54% want to switch to better wood
Peri-urban firewood	54% buy for $5.4/month		Speed	Heating water, roasting, drying	56% want to switch to better wood / charcoal
Peri-urban charcoal	$6.8/month	Costs, inconvenience (speed, lighting and regulating, dirtying utensils)	Availability	Heating water, roasting, ironing	17% want to switch to better charcoal / gas
Urban charcoal	$12.5/month		Cleanliness	Heating water, roasting	53% want to switch to kerosene / el /gas
Urban charcoal >$3/day	$15.5/month			Heating water, roasting	71% want to switch kerosene / el

-Implications-

There could be interest in kerosene and LPG for charcoal users. Cost of investment is critical across all segments. Messages around cleanness would appear more likely to resonate with users than health campaigns.

Consumer Purchasing Preferences

Purchases are not frequent and strictly based on household needs. However, almost everyone owns a radio and many have a bicycle/TV depending on location. The most common purchases are for house maintenance, electronics and surprisingly high percentages go to kitchen utensils.

Future purchases are likely to be on furniture/deco/repairs and a good percentage has no plans to spend at all. However, some interest for kitchen items, mostly utensils, is shown across the segments. Buying on credit is fairly common.

% / Segments	Rural firewood	Peri-urban firewood	Peri-urban charcoal	Urban charcoal	Urban charcoal >$3/day
Bought item $15-30 in the past year / bought expensive item $30+	64 / 12	39 / 21	31 / 25	55 / 24	53 / 8
Bought stove $15-30/ plans to buy	0 / 6	0 / 2	0 / 0	0 / 4	8 / 2
Bought kitchen utensils $15-30/ plans to buy	13 / 7	13 / 2	23 / 4	18 / 12	46 / 6
No plans to buy at all	20	46	55	20	20
Ever bought on credit	70	63	67	73	69

-Implications-

The habit of buying stoves seems absent and would need to be nurtured. New stoves should offer clear cost advantages in such a tight market. Fuel efficient utensils capable of speeding the cooking time could be appealing to customers.

Consumer Segments (1/2)

Both firewood segments substantially rely on collecting solid fuels but might have some willingness to pay. Better quality firewood is seen as an important improvement with regard to smoke related problems (eyes itching in particular). Fuel availability is experienced as a problem especially in rural areas.

	Segment 1 Rural Firewood	Segment 2 Peri-urban Firewood
No of HH	Not available from source data	Not available from source data
Income	$1-3day	$1-3day
Rural / Urban	Rural	Peri-urban
Willingness to pay	Minimal (mostly collects)	Minimal (half collect)
Stove ownership	6% improved firewood stove	14% improved firewood stove (majority installed free)
IAP awareness	Low	Low
IAP exposure	High	High
Fuel choice	Firewood Wish for dryer firewood, possibly chimneys	Firewood Wish for dryer firewood

-Implications-

Purchase of efficient stoves is not common in rural areas. Woodstoves would need to offer excellent value for money to attract customers.

Consumer Segments (2/2)

All fuel is purchased and cost is indicated as the major issue. Around one quarter own clay lined charcoal stoves. Convenience of cooking is seen as very important while smoke is barely an issue.

	Segment 3 Peri-urban Charcoal	Segment 4 Urban Charcoal	Segment 5 Urban Charcoal $>3/d
No of HH	Not available from source data	Not available from source data	Not available from source data
Income	$1-3day	$1-3day	$>3day (av $5.4/day)
Rural / Urban	Peri-urban	Urban	Urban
Willingness to pay	Moderate to high (already pays for charcoal)	Moderate to high (already pays for charcoal)	Moderate to high (already pays for charcoal)
Stove ownership	Jiko, approx 30% clay lined	Jiko, approx 30% clay lined	Jiko, approx 30% clay lined
IAP awareness	Low	Low to moderate	Low to moderate
IAP exposure	High	High	High
Fuel choice	Charcoal	Charcoal Some consider to switch to Kerosene or Electricity/Gas	Charcoal Many consider to switch to Kerosene, or Electricity/Gas

-Implications-

An urban/peri-urban market exists for improved charcoal stoves offering better efficiency to reduce fuel costs, improved cleanness and convenience in other aspects of cooking. For urban dwellers there could also be an appetite for kerosene or in less degree for LPG and electricity.

Consumer Segments Summary

Each customer segment has different characteristics and needs

Consumer Segments	Size (N of HH)	IAP Exposure	IAP Awareness	Affordability	Willingness to pay	Access to alternative clean fuel source	Alternative Use	Distribution access
Rural	?M	●	◔	◑	◔	◔	◕	◑
Peri-urban firewood	M	●	◔	◑	◔	◔	◕	◕
Peri-urban charcoal	M	●	◔	◑	◕	◔	◕	◕
Urban	M	●	◔	●	◕	◕	◕	●
Urban >3$/d	M	●	◔	●	◕	◕	◕	●

Legend:

- ◔ Minimal
- ◑ Moderate Low
- ◕ Moderate High
- ● High

IAP exposure is high as use of chimneys is not diffused

High awareness of smoke provoking eyes itching but low on long term risks. Chimneys, ventilation and better quality / different fuel seen as solution

Cost is an issue but customers seem willing to buy where there is a clear benefit

Kerosene, gas and electricity are some possible alternatives, in urban areas

Alternate use for water and room heating is high

Generally fair but transport cost may increase in remote areas and in the rainy season

How Big is the Existing Market?

The total existing market – households owning an improved stove – is around 600,000 households.

UNHS
561,000

- According to the Uganda National Household Survey 2009/10 8.5% of households have an improved stove. The population was around 33m with average household size of 5 giving 6.6m households in the country. This gives a figure of 561,000 households with an improved stove. The survey shows no overall increase in ownership of improved stoves compared to 2005/6.

Shell Fdn
ca. 400,000

- In the Shell Foundation research 6% of rural firewood users had bought an improved stove, 14% of peri-urban wood users had a stove (mostly supplied by others) and around 27% of charcoal users had a clay lined jiko. This equates to something like 200,000 improved woodstoves and 135,000 improved charcoal stoves. The rural >$3 a day segment (152,000 households) is missing and this segment would include further stove users. These numbers (around 400,000) are slightly lower than the figure given by the UNHS report.

Other
600,000+

- Reports from businesses and NGOs involved in the sector suggest sales of around 600,000+ stoves in the past 10 years. Some of these will be replacements for worn out stoves.

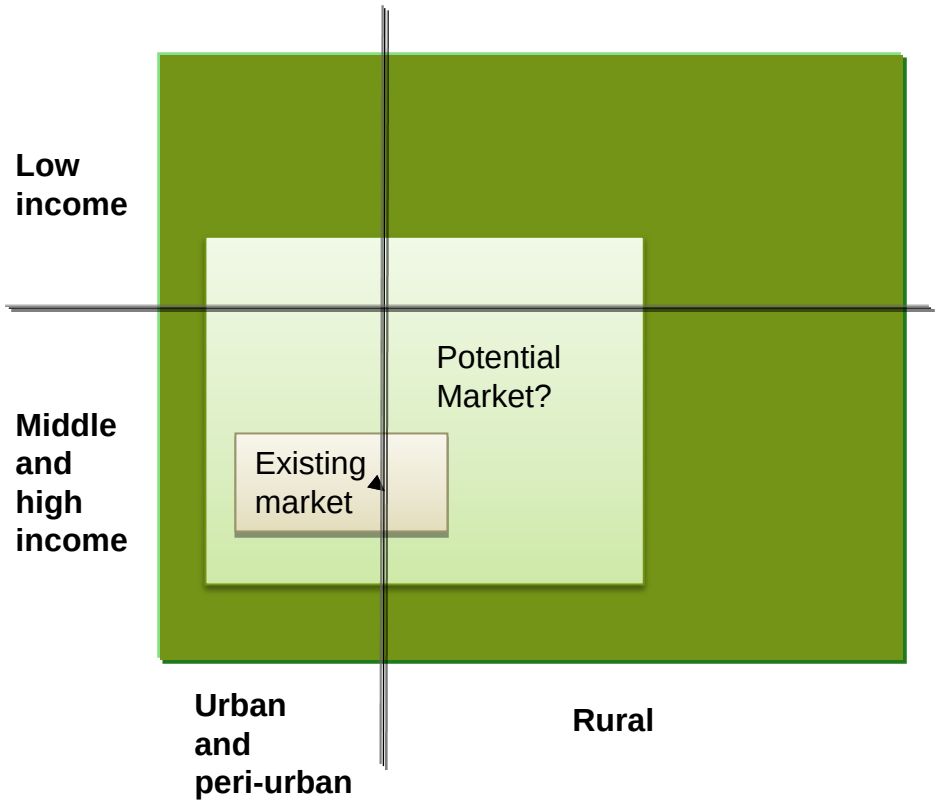
These figures may overstate true market size as some stoves were not purchased. The quality of many of the stoves in use is likely to be poor.

-Implications-

The existing market is fairly small scale – with urban and peri-urban areas predominating.

What is the Potential Market?

The potential market could be significantly larger than the number of households currently owning stoves - though it is difficult to quantify given currently available data.



Evidence of demand

Increasing urbanisation and rising charcoal prices is likely to push up demand for efficient stoves.

Many of the so called improved stoves are of poor quality and could be replaced by more efficient products.

In rural areas penetration of stoves on a commercial basis is much smaller but with wood becoming increasingly scarce in some areas demand for stoves would be expected to grow.

Ugastoves and others report strong demand – there challenge is production and distribution.

In the charcoal using segments researched in the Breathing Space project respondents reported fairly high levels of interest in more efficient cooking devices (30%+ considering a purchase) and they have the ability to pay.

-Implications-

Even with subsidies market based approaches will only reach certain segments of the population. More research is required to identify true market segments and potential for commercial development.

Contents

Available Cookstove Usage and Cost (1/2)

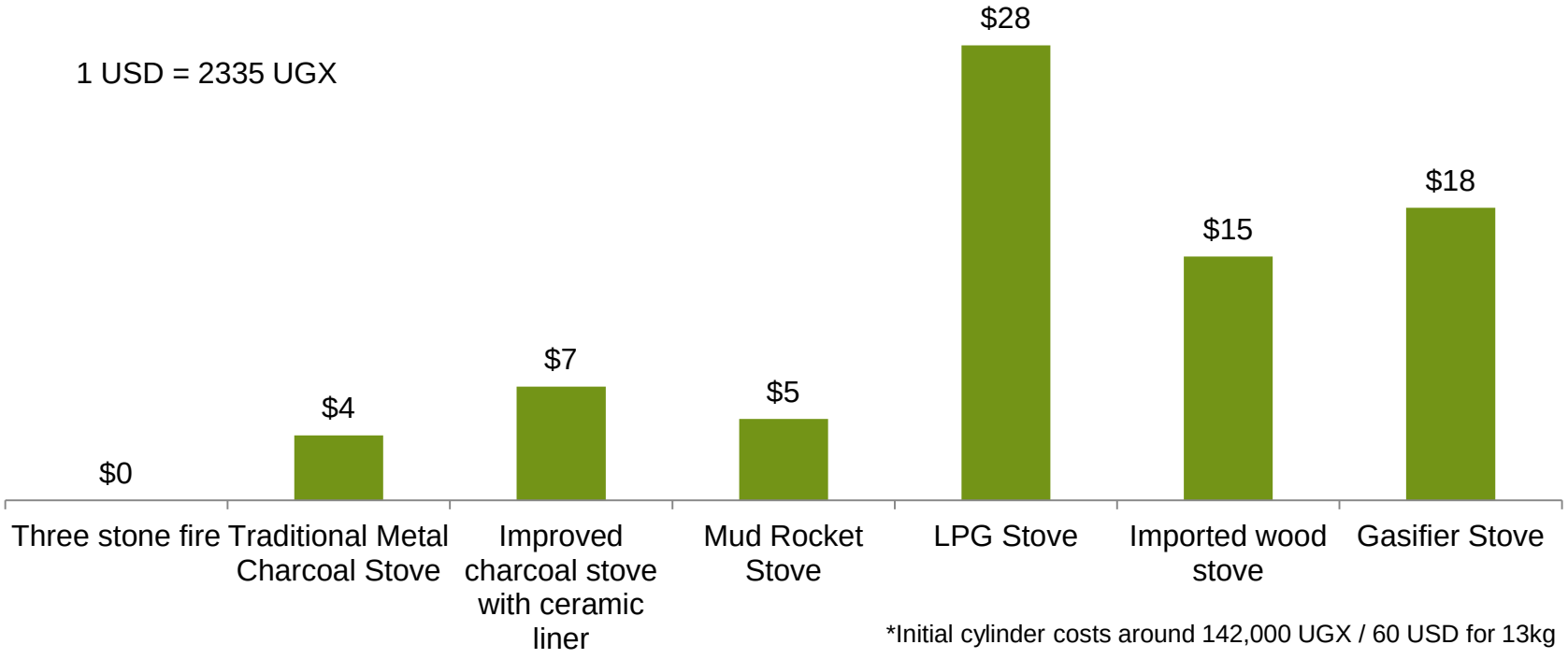
Traditional cooking methods such as the three stone fire and traditional charcoal stove are prevalent. Cleaner and efficient cookstoves have been promoted for many years but uptake and availability is still low especially outside of Kampala.

Cookstove Usage

- A variety of stoves exist on the market to serve different consumer segments, however many are of substandard quality.
- Households often own several stoves in parallel and even where improved cookstoves are owned traditional methods will be used for certain cooking tasks.
- Donor programs have targeted selected regions in stove promotion which has contributed to localized uptake.
- Imported stoves such as Envirofit and Jiko Poa have recently been introduced to the market but initial sales have been concentrated in urban and peri-urban areas.
- Low income households favour basic, cheap stoves even when they know they will not last long
- Stoves linked to carbon finance programs are offered to the end user at a subsidised price.
- Cooking with Biogas has been promoted under the Uganda Domestic Biogas Program with the aim to install 12,000 biogas digester in 5 years.
- Uptake of LPG is low due to high up front cost of stove and gas cylinder and availability outside urban centers. Sales of LPG fell by 6% in 2010.
- Stoves are paid for upfront in cash.

Available Cookstove Usage and Cost (1/2)

Approximate Upfront Cost of Cookstove (in USD)
(one pot stoves apart from mud rocket stove)



*Initial cylinder costs around 142,000 UGX / 60 USD for 13kg

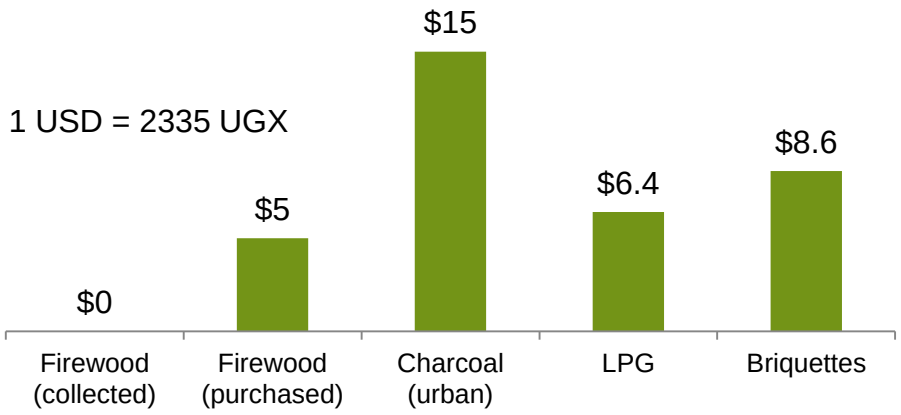
-Implications-

Market interventions need to consider different consumer segments and concentrate on raising the quality and availability of improved cookstoves.

Availability of Fuel and Cost

Whilst cost is a significant factor affecting fuel purchase, availability and minimum quantity sold are also important along with social and cultural factors.

Fuel cost per week (in USD)
(using traditional cooking methods*)



**based on interviews and authors derivations, will vary depending on family size, location and stove*

Fuel	Purchase Unit	Usage	Cost
Firewood	1 bundle	3 days	5000 UGX / $2.1
Charcoal (urban)	40kg sack	2 weeks	70000 UGX / $30
LPG	13kg cylinder	3 weeks	90000 UGX / $38.5
Briquettes	40kg sack	2 weeks	40000 UGX / $17.1

Fuel Usage

- The majority of rural households use firewood for cooking whilst in urban areas households use both firewood and charcoal.
- Over the past year Uganda has seen several hikes in the price of fuel.
- Many households in rural areas can collect firewood for free although it is becoming increasingly unavailable.
- The price of fuel is higher in urban centers and is subject to seasonal fluctuations.
- The type of fuel used can vary depending on the time of day and meal being cooked.
- LPG usage is low and restricted mainly to urban, higher income families. It is often perceived as a dangerous fuel and availability outside urban centers is low.
- LPG receives no government subsidy.
- Kerosene is used by a small percent of the population mainly smaller families in urban areas.
- The government recently removed subsidies on electricity and very few households can afford to cook with this fuel
- Recycled biomass briquettes have been introduced but awareness and uptake is low.

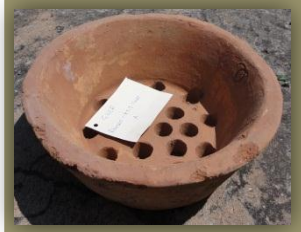
Production of Improved Cookstoves (1/2)

The majority of improved stove production is centered around Kampala. Many stove producers make the complete stove whilst other will source out individual components and assemble. Most production is done by hand with some larger producers trying to introduce mechanization. Apart from the northern regions suitable clay for stove making is available in most parts of the country. Most metallic materials are sourced from Kampala. Recent fluctuations in the price of raw materials is affecting stove producers, often leading to compromises in quality.

Components of a charcoal stove

Cladding

- Made from sheet metal.
- Costs around 10 USD per sheet which will make 10 clads. Price increases are frequent.
- Sourced from suppliers in Kampala
- Painted after complete assemble.



Liner

- Made from clay often mixed with sand, mica or sawdust.
- Clay costs around 40 USD a ton and is source from local suppliers
- Liner often sourced separately for as little as 0.2 USD each
- Additional requirements: liner mould & fuel for firing the kiln

Insulation

- Made from cement and mica
- Cement costs around 12 USD per bag and Mica about 60 USD per ton
- Cement is sourced from local hardware shops whilst Mica is delivered by suppliers.

-Implications-

Small scale production prevents economies of scale and restricts cash flow leading to increased costs driving down quality.

Production of Improved Cookstoves (1/2)

In some areas of the country GIZ has trained artisans to build fixed rocket stoves and has used NGOs to disseminate the technology. Users appear unwilling to pay for stoves being used to 'free' support from the NGO sector. In Kenya more success seems to have been achieved in commercialising the approach compared to Uganda.

Components of a rocket stove[1]

Insulating Mud	Insulating mixture of organic material (sawdust, grass, banana leaves) bound together with mud
Stones / Bricks	The stove can be made from the insulating mud mixture alone or with stones and bricks held together by the mud.
Fire Box Shelf	The fire box shelf is often made from ceramic tiles or metal to reduce wear and tear.

1. Source: GIZ

-Implications-

Fixed wood stoves can be efficient and affordable but it may be difficult to develop a 'market' in Uganda. Heavily subsidised programmes providing 'free' installation might be an option.

Current Cookstove Market

Ugastove and ILF are among the largest stove producers. Other medium size producers exist around Kampala and small production centers exist all over the country, but often producing poor quality stoves. BEETA is a network of local stove producers developed to provide advocacy for stove producers.

	Improved Charcoal Stove		Okelo Kuc Stove		Rocket Mud Stove	
Manufacturer	Ugastove, Kampala		ILF, LIRA		GIZ trained producers, various	
Cost Range	$6.5 - $15		$8 - $11		$5-$20	
Efficiency	36%		34%		25-32%	
Key Features	Ceramic liner with metal cladding. First Gold Standard registered cookstove project.		Ceramic part made from 6 bricks with outer metal cladding		Made from bricks and stones held together with insulating mud. Has two pot burners and a chimney	
Production Capacity	Currently around 4000 a month and looking to increase		Currently around 1500 a month, increasing with new facility		Demand driven	
Distribution Channels	Sell through branches and retailers		Sell through network of stove vendors		Trained installers travel to communities to promote and install. Raw materials available locally.	
Availability and Use	Use ◔ Availability ◔		Use ◔ Availability ◔		Use ◔ Availability ◔	

Key | ○ Minimal ◔ Low ◑ Medium ◕ Medium-High ● High

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Current Cookstove Market

	 **Envirofit Wood Stove**	 **Local portable wood stoves**	 **Local charcoal stove (other)**	 **Basic charcoal stoves**
Manufacturer	Envirofit (Imported)	Ugastove, petsd, various	Many grouped under BEETA network, Various	Various – mainly informal sector
Cost Range	$17	Various	$4 - $20	$1-$2
Efficiency	33%	Various	Various	Unknown
Key Features	Highly engineered wood stove manufactured in China.	Main designs follow rocket stove principles, can be metal cladded or made from mud and clay.	Improved charcoal stoves of varying type, Main design have a ceramic liner and metal cladding.	Basic ceramic stoves with short lifespan.
Production Capacity	Demand Driven	Demand driven, most producers make less than 100 a month.	Demand driven, some ienterprises produce a few hundred per month.	Demand driven
Distribution Channels	New to the market, still setting up distribution networks	Mainly direct sales	Through direct sales, retailers and middlemen	Through retailers and local markets
	Use ○ Availability ○	Use ◔ Availability ◔	Use ◔ Availability ◔	Use ◔ Availability ◑

Key | ○ Minimal ◔ Low ◑ Medium ◕ Medium-High ● High

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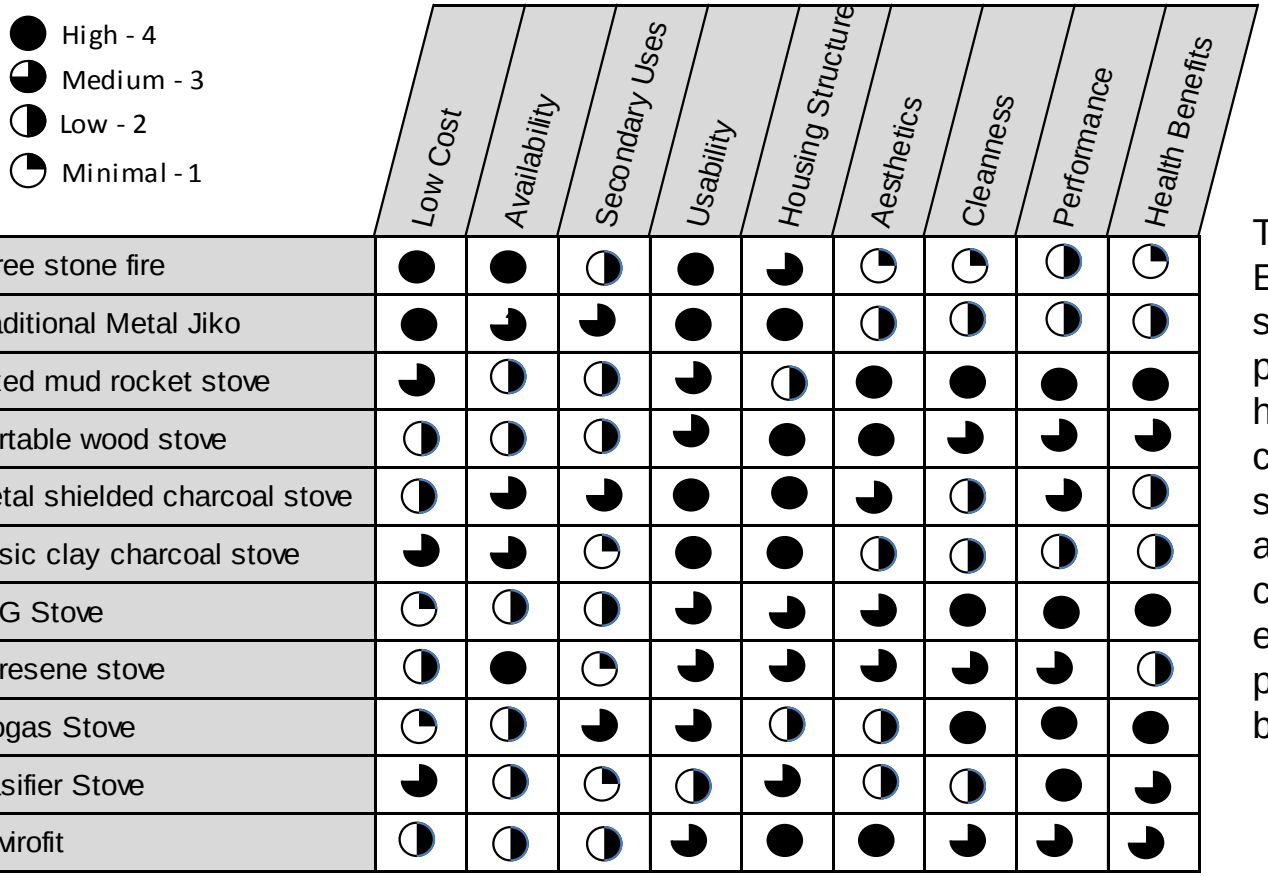
Current Technology Landscape

A variety of stoves are available in the market to suit differing end user requirements



The fixed mud rocket stove, Envirofit, Biogas and LPG stove rate highly on performance, cleanness and health benefits but low on cost, availability and housing structure. The three stone fire and traditional metal jiko are cheap, readily available and easy to use but offer little performance and health benefits to the end user.

-Implications-

Availability of affordable, quality stoves needs to be greatly increased.

Institutional Cookstoves

The majority of institutions in Uganda use inefficient cooking methods such as a three stove fire resulting in high expenditure on wood. Improved institutional stoves are being promoted in the country but uptake has been low mainly due to lack of financial mechanism to make them more affordable.

Institutional Stoves

- Improved Institution stoves can have efficiencies over 40% and save up to two thirds on fuel consumption.
- Improved institutional stoves are disseminated at a price range between 3 to 4.6 million UGX (1200 – 1900 USD) depending on cooking capacity.
- They vary in size from 20 liters up to 300 liters

Challenges

- There is seasonality within the market with orders from schools following patterns in the payment of school fees.
- Lack of end user financing makes the stoves unaffordable to many institutions.
- Lack of government policy to encourage the transition to energy efficient cooking practices in institutions.

Sources: PREEP, CREEC

Promotion of Institutional Stoves

Programs and organizations that are active in promoting institutional stove in Uganda include Promotion of Renewable Energies and Energy Efficiency Programme (PREEEP), Ugastove, JEEP and REEEP as well as smaller stove producer and NGO's either as a specific program or complementary to other livelihood/conservation activities.

-Implications-

Institutional stoves have the potential to reduce biomass consumption and should be supported by appropriate financing mechanisms.

Humanitarian Situations

Collection of fuel and poor cooking practice is a serious problem within humanitarian situations. Some organisations have promoted efficient stoves but efforts are often limited and ad hoc.

The Situation

- There are approximately 165,000 refugees in Uganda.
- On average 7.5kg of firewood per day/ per households are consumed in refugee camps.
- There is often no fuel to buy and refugees go out to collect it themselves putting mainly women and children in vulnerable situations .
- As a result of wood scarcity women often result to measures such as undercooking food, skipping meals or selling rations to buy firewood.

Current Approach

- Efforts have been made to disseminate cookstoves at both household and institutional level free of charge, including the Rocket Loreno stove and small clay stoves.
- Notable efforts have been made by UNHCR and WFP, working with local implementing partners such as GIZ, AAH and ABEK.
- More recently briquettes made from domestic waste have been promoted.

Challenges

- Identifying suitable technology for humanitarian situations where many households do not have proper kitchens and outside cooking is common.
- Changing attitudes towards stoves, and educating users on what is often unfamiliar cooking practice.
- Ensuring skills transfer so stoves can be made and repaired at a local level and provide income generation.

Sources:Interviews, UNCHR, WFP

-Implications-

Programs in humanitarian situations need to provide appropriate technology and end user education to ensure cookstove adoption.

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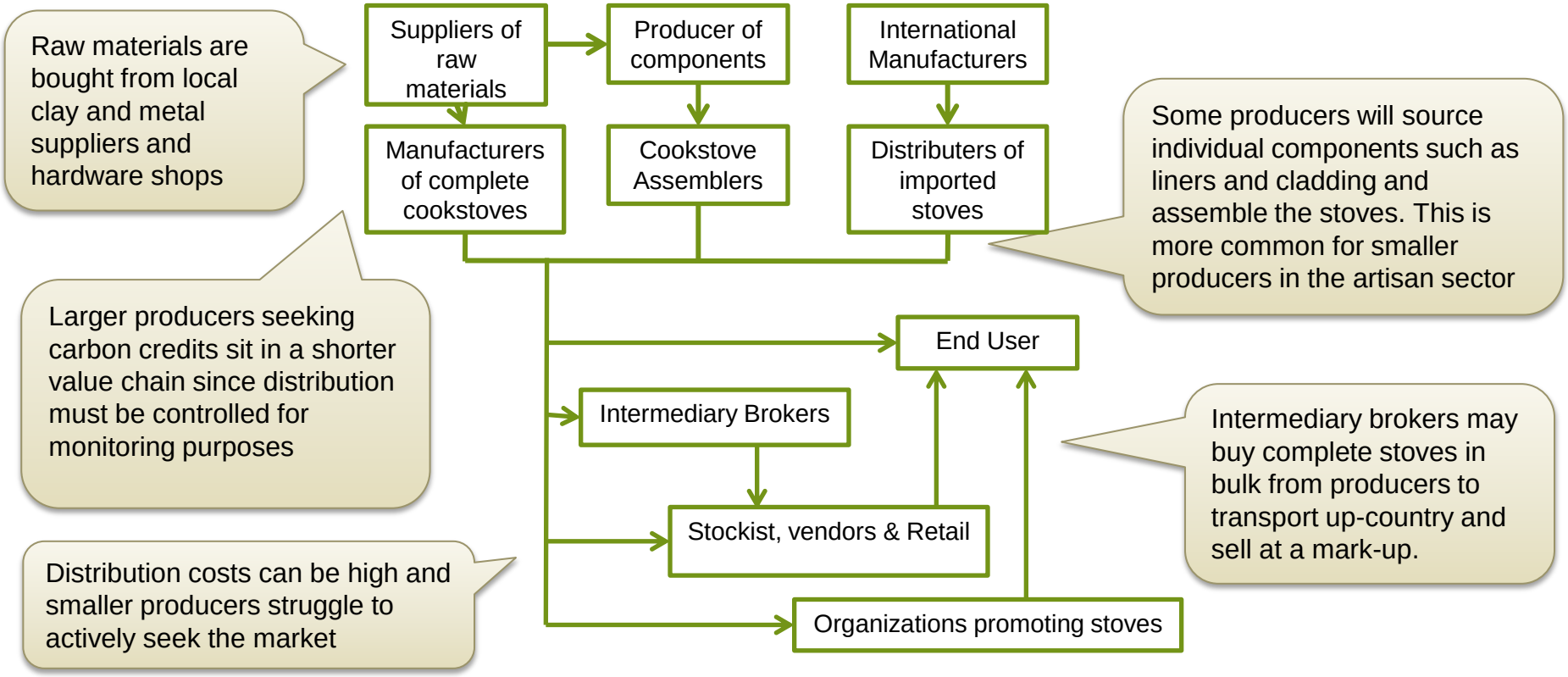
Current Industry Value Chain

Several value chain options exist for the dissemination of cookstoves in Uganda. Larger producers tend to make complete cookstoves and sit in a smaller value chain, whereas smaller producers may source components separately and do assembly.



-Implications-

Interventions must consider ways to strengthen links in the value chain and create distribution channels to reach underserved markets

Stakeholders in the ICS Sector

A variety of stakeholders exist in the cookstove sector although experience and commitment in promoting improved cookstoves may vary.

Government Departments

- Ministry of Energy and Mineral Development
- Ministry of Water and Environment
- Ministry of Agriculture
- Ministry of Health
- National Environment Management Authority (NEMA)
- National Forestry Authority
- Uganda Industrial Research Institute (UIRI)
- Uganda National Bureau of Standards (UNBS)

Donors

- European Union (EU)
- DGIS
- World Bank
- DFID
- USAID
- Shell Foundation
- HIVOS
- German Government
- Global Environment Facility (GEF)
- REEEP
- NORAD
- USEPA

Stakeholders in the ICS Sector

A variety of international and regional NGO's are involved in the cookstove sector through training cookstove artisans on technical and business skills, disseminating improved cookstoves or providing education on related issues.

International NGO's

- Practical Action
- GIZ
- CARE International
- GVEP International
- SNV
- UNCHR
- Millennium Village Projects
- International Lifeline Fund
- World Vision
- UNDP
- Winrock International
- Aktion Africa Hilfa (AAH
- Impact Carbon
- Living Goods
- Mercy Corps
- World Food Program (WFP)
- BRAC

National & Regional NGO's

- Joint Energy and Environment Projects (JEEP)
- Jinga Empowerment Organization
- Integrated Rural Development Initiatives (IRDI)
- EAETDN
- CIRCODU
- Alternative Basic Education for Karamoja (ABEK)
- African Alliance for Clean Cookstoves
- PRIED
- Rural Agency for Sustainable Development
- Ecotrust

Stakeholders in the ICS Sector

There are several private sector individuals and businesses involved in the cookstove sector. Carbon developers are also playing an important role in the Uganda ICS sector.

Private Sector

- Ugastove
- Friends of Wealthy Environment (FOWE)
- Envirofit
- Ecozoom
- Paradigm Project
- BEETA Network
- The Private Sector Foundation of Uganda
- Uganda Energy Foundation
- Up Energy
- Wana Energy Solutions
- PEES
- PETSD
- AEESS
- Prime Equipment & Co
- KEAN Development Enterprises

Carbon Developers

- CO2Balance
- Uganda Carbon Bureau
- JP Morgan Climate Care

Finance

- FINCA

Research

- CREEC
- Aprovecho
- Berkeley Air Monitoring Group

Cookstoves Initiatives in Uganda

Manufacturers and Distributors*

The following tables list examples of cookstove initiatives in Uganda. A few manufacturers in Uganda are producing at scale and distributors of imported stoves are also entering the market.

	Ugastove – Uganda Efficient Stoves Project	International Lifeline Fund (ILF)	Up Energy
Who	Private company making stoves since 1994. Have been supported by Impact Carbon and Climate Care to access carbon credits to increase production.	US based NGO involved in Fuel Efficient Stove and Clean Water and Sanitation initiatives.	Commercial company created by Impact Carbon to accelerate uptake of stoves in the market.
What	Aims to increase stove uptake and usage in Uganda. Ugastove manufacture complete charcoal stoves at Kampala factory. Distibute through branches and retailers. Carbon revenue generated through stove sales subsidies stove price and and reinvested into business. Over 50,000 stoves sold to date.	ILF have established a stove production facility in Lira producing the Okello Kuc charcoal stove. Stoves are sold through a network of 30 stove vendors. Current capacity is around 1600 stove per month which they are planning to double through a new production facility in Kampala. Registering to access carbon revenue.	Up Energy import and sell Envirofit and Jiko Poa stoves on a commercial basis. Have sold 4500 stoves in first two months through roadshows, dealers and linking with existing distribution networks. Registering to access carbon revenue.
Challenges	Monitoring requirements for carbon credits restrict distribution methods. Further expansion limited by factory space,	Marketing of stoves and raising consumer awareness. Opening up new markets through distribution network.	Still establishing effective distribution models. Stove is expensive for many households.
Partners	Impact Carbon, JP Morgan Climate Care, GIZ	Uganda Carbon Bureau	Impact Carbon, Barefoot, WWF, Premier Green, GVEP International, Pearl Microfinance, Paradigm Project, Envirofit

*list not exhaustive

Cookstoves Initiatives in Uganda

NGO*

Several NGO led programs are currently active in Uganda. These programs often provide technical training and also have an emphasis on commercialization and sustainability that has been lacking in previous programs.

	Promotion of Renewable Energy and Energy Efficiency Programme PREEP - (2007-2014)	Developing Energy Enterprises Program (DEEP) – (2008-2013)	Improved Cookstove for East Africa
Who	Implemented by GIZ working closely with the Ministry of Energy and Minerals and local NGOs.	Implemented by GVEP International with technical support from IT Power.	Collaboration between Uganda Carbon Bureau, Care International and the Nordic Climate Facility
What	The program aims to increase access to modern biomass energy technologies. It works closely with local NGO's to disseminate household mud stoves, provides capacity building to private stove companies and promotes the use of institutional stoves and sustainable charcoal production.	The program provides business and technical support to existing micro energy enterprises through training, mentoring, and market linkages. It also links entrepreneurs to financing through its loan guarantee program to enable them to expand their businesses. The program has trained over 300 entrepreneurs in Uganda.	The project aims to provide sustainable access to affordable and efficient cook stoves. Improving affordability of these cook stoves is achieved by the setting up of a CDM Program of Activities (registered 2011) that will provide stove suppliers with access to revenue from the CDM carbon market.
Challenges	Difficulty in finding markets in rural areas where many households find stove too expensive. Promoting commercial approach to stove dissemination.	Changing mindset of entrepreneurs to realize market potential of energy business.	Delays in registering project in country. Identification of suitable stove producers to work with.
Partners	Ministry of Energy and Minerals, Local NGO's and stove producers.	IT Power, EAETDN	Uganda Carbon Bureau, CARE International, Nordic Climate Facility.

*list not exhaustive

Cookstoves Initiatives in Uganda

Other*

Research initiatives are also ongoing in Uganda to study behavior change aspects and attitudes towards cook stoves with the aim of improving the uptake and use of improved cookstoves.

	Translating Research into Action (TRACTION)	Biomass Energy Initiative Africa (BEIA)
Who	Funded by USAID and implemented by local partners Impact Carbon, CIRCODU & GVEP with support from UCB.	Funded by the World Bank, BEIA is being supported by PATH under the TRACTION project
What	Research project which will test behavior change communication strategies to increase the purchase and use of improved, clean-burning wood stoves in rural regions of Uganda where wood is the primary fuel. Will also conduct baseline survey and test innovative sales & peer marketing strategies.	BEIA looked at several themes including establishing local production and dissemination of (TLUD) gasifier stove. The study with PATH will involve baseline assessments to measure fuel consumption, indoor air quality, and stove usage, followed by formative research on current attitudes and practices related to cookstoves.
Partners	Impact Carbon, CIRCODU, University of California Berkley. GVEP International	Berkley Air, CREEC, JEEP

*list not exhaustive

CO2 Balance are also extending their Improve Cookstove Projects into Uganda with projects planned in Bulamagi and Iganga region.

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Enabling Environment

Several donors and research institutes with experience in the stove sector exist. Government policy and financial access also contribute to enabling the growth of the sector

Government

- Ministry of Energy & Minerals is the lead government body. Other stakeholders include the Ministry of Agriculture, Water & Environment, Health and Local Government.
- Uganda Energy Policy (2002), Renewable Energy Policy (2007) & Uganda Forestry Policy (2001) support the ICS sector.

Donors

- Donors have included - EU, World Bank, German government, Shell Foundation
- USAID currently funding BEIA project
- Funding is often short lived and projects struggle to continue on a commercial basis

Financing

- Many small producers struggle to access traditional source of finance.
- Some institutes such as Finca and Wekembe SACCO are starting to develop energy portfolios
- Carbon credits have opened up new sources of revenue and several developers are helping cookstove producers access this market.

Research

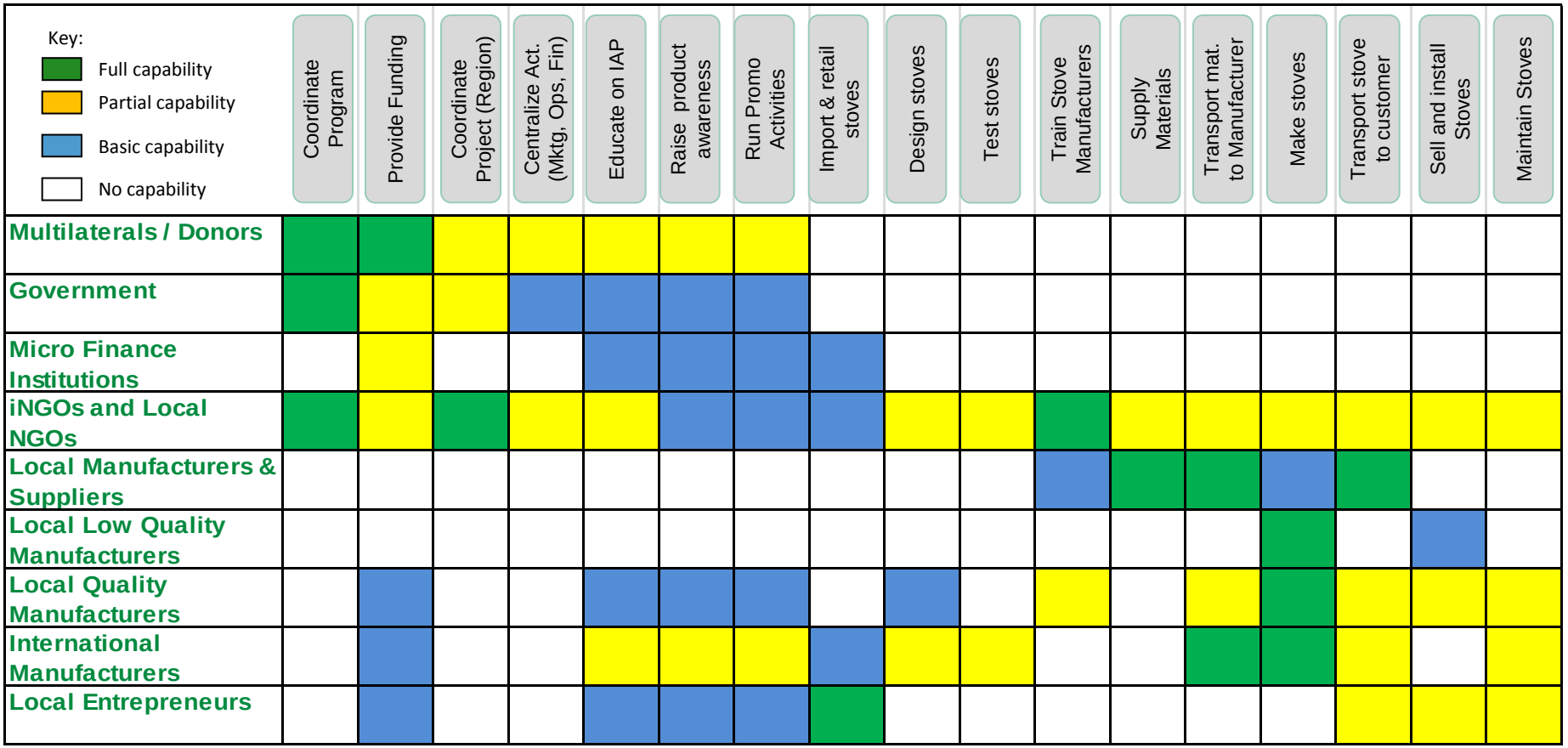
- Universities and government bodies can provide support with stove research
- Several stove testing facilities exist, most active CREEC
- Support provide by international organizations such as Berkley Air and Aprovecho
- International manufacturers linked with research partners.

-Implications –

Creation of an enabling environment is important to support the scaling up of quality cookstove sales

Cookstove Industry Stakeholders

Uganda has some local and international manufacturers that are capable of making and distributing stoves however further capacity to scale up and reach new markets is needed.



-Implications –

There is potential to upscale the existing commercial market and increase sales of quality stoves both to domestic customers and institutions

Contents

Country context on carbon finance

Uganda had some of the earliest stove projects within Africa. There is generally a solid pipeline of CER and VER projects.

Institutions

Country Institutions

9 projects registered under the CDM, 5 of which are on forestry.

Government bodies are in place, but there is often a lack of understanding. There is no DNA website.

Uganda Carbon Bureau are acting as an open PoA for smaller cook stove projects.

Methodology

Carbon Finance Accounting

The Voluntary Carbon Market has been at the forefront of developing stove projects in Uganda with Climate Care and Ugastove as pioneers.

Several CDM Programme of Activities have started in Uganda – one of which is multi-country

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Additionality

Uganda is exempt as a LDC

Projects of less then an equivalent of 5MW of energy are exempt from the additionality test.

-Implications –

Significant potential to exploit carbon revenues already exists in the country

Existing Carbon Finance Projects in Uganda

There are already several carbon projects validated in Uganda and more in the pipeline, with 4 cookstove PoAs awaiting registration.

CDM Projects

Single CDM projects

9 projects have been registered in Uganda, 5 of these on forestry.

6 projects have entered the validation pipeline since 2009.

However, no cook stoves projects are amongst them.

CDM PoAs

CDM Programme of Activities

11 PoAs are in validation with Uganda as a Host Country but none have been registered. 4 of them are focused on cookstoves, 3 of them with a Ugandan CPA to be validated.

Gold Standard

GS VER Projects

Gold Standard is at the forefront of implementation. The longest operating and only registered carbon finance project, Ugastove,is registered as Gold Standard VER.

Uganda Carbon Bureau plans CDM Gold Standard accreditation.

-Implications-

Existing PoA's may offer producers quicker and cheaper ways to access carbon finance

Existing Carbon Finance Projects in Uganda

A range of international and local actors are working together to register their carbon finance project.

Partner	Activities
J.P. Morgan Climate Care	Working with Ugastove the Uganda Efficient Stove Project is a pioneer project in carbon finance for stoves – aim to create ER of 600,000tCO_2 until 2014 from a mix of stoves
CO_2 Balance	Have 1 micro-scale GS VER project in the pipeline and 1 CPA under their Uganda PoA – estimated at almost 45,000tCO_2 per year in total
Uganda Carbon Bureau	Have a multi-country PoA in validation with the first project based in Uganda reducing about 43,000tCO_2 per year.
Up Energy	Working with Impact Carbon on registering a VER and a CDM PoA in the near future

Implementation Partners

- The Uganda Carbon Bureau established a Stove Support Facility to enable smaller producers to receive carbon credits.
- Level of local management differs widely from project to project

Existing Carbon Finance Projects in Uganda

Both imported and locally produced stoves are used in carbon finance projects but all rely on central manufacturing and quality oversight

Imported stoves

Envirofit as well as Kenya manufactured Jiko Poa stoves are planned to be distributed under the Up Energy project. Wood fuel stoves dominate.

Locally produced stoves

- Ugastove has long been producing stoves and since 2009 with carbon finance. Other actors have since copied or adapted the design of the stove for their purposes. The focus is on charcoal.
- The International Lifeline Fund is producing Okulu Kuc stoves in Lira in the North of the country.
- CZUGA Ltd. produces stoves locally for a CO_2 Balance CDM Project in Kanungu District

4 carbon finance project target the whole of Uganda with larger distribution systems, CO2 Balance focuses on local projects with stoves manufactured in the target area

-Implications-

There is potential for partnerships between international players and local manufacturers, but quality and production issues may need to be overcome.

Uganda Efficient Stoves Project

The Uganda Efficient Stove Project was the first GS registered cookstove program and is an example of how local manufacturing can be scaled up through carbon revenue.

Efficiency:	**36%**
Production Capacity:	**4000 per month**
Retail Cost: (with CDM)	**$6.5-$15**

The Project

- Ugastove are a local family run business producing stoves since 1994.
- Partnered with GIZ who provided technical assistance and later Impact Carbon who have assisted them to scale up and access carbon credits.
- Central production is done from factory in Kampala
- Stoves are distributed through branches and retailers
- The price of the stove is subsidized by around 50% and customers are given a one year warranty

Carbon Finance

- Partner within JP Morgan Climate Care to sell carbon credits
- First Gold Standard cook stove project to be registered
- Carbon revenue allows the price of the stove to be subsidized. It has allowed Ugastove to expand production, improve their facilities and invest in vehicles for distribution.

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Financial Considerations

tCO_2

Emissions Reductions

The stoves in Carbon Finance Projects in Uganda claim to save between 4.6 and 5.8t wood per stove per year.

If all projects are registered and successful 374,000 CERs and 220,000 VERs will be issues per year.

Total Emission Reductions of all CPAs and GS VERs over 7 years is ***1.6 million tCO_2***

Funding

Funding from carbon finance

Historically low market prices of EUR 2.5-3.5 per CER, VERs around EUR 2

Together the Ugandan projects would mobilise EUR 600,000 per year or ***EUR 4.2 million*** *over their 7 year lifetime*

If prices increase to again EUR 10 per CER in the following years the total value of the assets is over ***EUR 16.5 million*** *over the next 7 years.*

Subsidy

Benefit sharing and free stoves

Most projects subsidise the stoves once carbon finance is available in order to reduce upfront costs for the customer and increase uptake

Subsidy for household stove between US$ 4-15

CO2 Balance aims to distribute the stoves for free to the user.

-Implications-

Significant carbon revenue can be generated from cookstove programs but market prices are subject to fluctuations

Operational Considerations

Ugastove is the only cook stoves project with issued credits. Solutions to distribution and scale-up are very important for carbon finance

Manufacturing

Manufacturing capacity

Carbon finance relies on a significant scale-up of production which for some producers is hard to achieve at their current location.

Carbon financing makes outsourcing of production more difficult as the quality needs to be maintained and monitored.

Distribution

Central manufacturing leaves distribution to be solved

To comply with monitoring and allow easy tracking of sales the distribution chains need to be controlled. Accessing markets through intermediary brokers is more difficult to achieve. In some cases the carbon finance requirements are not in line with conventional expansion strategy.

Monitoring

User monitoring

In some cases stoves have been sold to consumers as “subsidised” but no carbon finance revenues have reached the business yet to allow this. Uganda Carbon Bureau aims to sell high value “fair trade” carbon credits.

-Implications-

Cookstove carbon projects must consider the challenges in distribution and monitoring to reach their maximum target market.

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Contents

Cookstove Industry Summary

The Uganda cookstove sector has developed producers at scale , that have demand for products and have utilised carbon finance. There is potential for further scaling up of production of quality stoves to reach further markets.

Macro

- \+ Increasing fuel prices could expand market further
- \+ Government developing biomass strategy
- \+ Uganda is an LDC which has made progress over past years
- − Government focus on electricity generation and grid expansion
- − Challenging business environment compared to international standards

Moderately Favourable

Social Impact

- \+ Number of IAP related premature deaths is large
- \+ Unsustainable biomass use, creates case to reduce this reliance
- \+ Potential to positively impact lives of women
- − Awareness of IAP and related health problems is low
- − IAP is not a policy priority

Moderately Favourable

Consumer

- \+ Similar cooking habits across the population
- \+ Consumers aspire to more modern fuels
- − Stoves are not a high purchasing priority
- − Awareness of IAP is low
- − Market based approaches may not be suitable for all segments

Unfavourable

Cookstove Industry

- \+ Strong and diverse cookstove sector (both NGO & SME)
- \+ Producers at scale with demand for stoves
- − Many low quality products in the market Majority bring limited health benefits
- − Lack of policy support for LPG
- − Investment challenges for business expansion

Moderately Favourable

Carbon Finance

- \+ Strong pipeline of projects exists
- \+ Range of implementation partners available
- \+ Existing PoAs offer opportunity
- − Low market prices poses risk
- − Challenges in distribution and monitoring

Favourable

- Implications -

There is potential for market growth if challenges in quality control, consumer behavior and distribution can be overcome.

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Interviewees

We are grateful to the following individuals and organizations who gave up their time to speak with us during the research for this assessment.

Uganda Carbon Bureau	Bill Farmer, Virginia Echavarria
Wana Energy Solutions	Richard Wasirwa
Jinga Empowerment Organisation	Amberle Reyes
CREEC	Karsten Bechtel
Energy Uganda Foundation	Farooq Kiryowa
UNCHR	Juliet Mwebesa
GIZ	Christine Nakalema
BEETA	Prossy Sebunya
ILF	Vahid Jahangiri, Jessica De Clerck
Impact Carbon	Aneri Patel

Up Energy	Sylvain Romieu
Ugastove	Rehema Nakyaze
CIRCODU	Joseph Arineitwe
Prime Equipment & Co	Semaganda Robinah
Friends of Wealthy Environment (FOWE)	Kasirye Zzimula
Promoters of Efficient Technology	Herbert Bogezi
Solar Sister	Katherine Lucey
African Alliance for Clean Cookstoves	David Mukisa

Glossary of Terms (1/2)

AIDS	Acquired Immunodeficiency Syndrome
ARI	Acute Respiratory Infections
BEETA	Biomass Energy Efficient Technology Association
BEIA	Biomass Energy Initiative for Africa
CDM	Clean Development Mechanism
CIRCODU	Centre for Integrated Research and Community Development
CO	Carbon Monoxide
CO2	Carbon Dioxide
CPA	CDM Programme Activities
CREEC	Centre for Research in Energy and Energy Conservation
DFID	Department for International Development
DGIS	Netherlands Directorate-General for International Cooperation
EAETDN	East Africa Energy Technology Development Network
EU	European Union
EUR	Euros
GDP	Gross Domestic Product
GIZ	Gesellschaft für Internationale Zusammenarbeit
GS	Gold Standard
GVEP	Global Village Energy Partnership
HH	Households
HIV	Human Immunodeficiency Virus
HIVOS	Humanistisch Institut voor Ontwikkelingssamenwerking
IAP	Indoor Air Pollution
ICS	Improved Cookstoves

ICT	Information and Communication Technologies
ILF	International Lifeline Fund
JEEP	Joint Energy and Environment Projects
KCJ	Kenya Ceramic Jiko
KES	Kenyan Shillings
LCD	Least Developed Country
LPG	Liquid Petroleum Gas
MFI	Microfinance Institution
MOE	Ministry of Energy
NGO	Non-Governmental Organization
NORAD	Norwegian Agency for Development Cooperation
PATH	Program for Appropriate Technology in Health
PDD	Project Design Document
PETSD	Promoters of Efficient Technology
PoA	Programme of Activities
PREEP	Promotion of Renewable Energy and Energy Efficiency Programme
PRIED	Participary Rural Initiatives to Environmental Development
REEEP	Renewable Energy and Energy Efficiency Partnership
SACCO	Savings and Credit Cooperatives
TB	Tuberculosis
tCO2	Tonnes of Carbon Dioxide
TLUD	Top Lift Up Draft
TRACTION	Translating Research into Action
UAE	United Arab Emirates

Glossary of Terms (2/2)

UCB	University of California Berkley
UGX	Ugandan Shillings
UK	United Kingdom
UNBS	Uganda National Bureau of Statistics
UNCHR	United Nations High Commissioner for Refugees
UNDP	United Nations Development Program
UNHS	Uganda National Household Survey
USAID	United States Agency for International Development
USD	US Dollars
USEPA	United States Environment Protection Agency
VER	Verified Emissions Reductions
WFP	World Food Programme
WHO	World Health Organisation
WWF	World Wildlife Fund

References

- **http://www.tractionproject.org/content/indoor-air-pollution**
- Gender Mainstreaming In Rural Electrification Projects In Uganda: Initial Scoping Mission, ENERGIA/ETC (Sept, 2011).
- Draft Report on Desk Study on the Household Improved Cooking Stoves Sub Sector in Uganda, IT Power / SNV (March 2011).
- Safe Access to Firewood and Alternative Energy in Uganda: An Appraisal Report, M. Bizzarri, (Nov 2009).