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International



Global Alliance for Clean Cookstoves
Uganda Market Assessment
Intervention Options

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.

Executive Summary

Project Approach and Background

Intervention Options

Roadmap

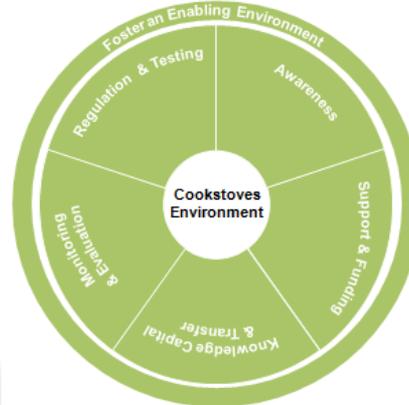
Conclusion

Appendix

Executive Summary

As a result of the Uganda cookstove market assessment, 7 intervention options have been identified through the sections of Fostering an Enabling Environment and 10 intervention options have been identified through the Enhancing Demand and Strengthening Supply

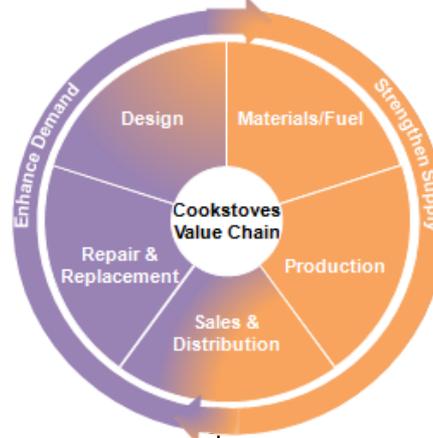
Fostering an Enabling Environment



Fostering an Enabling Environment Intervention Options

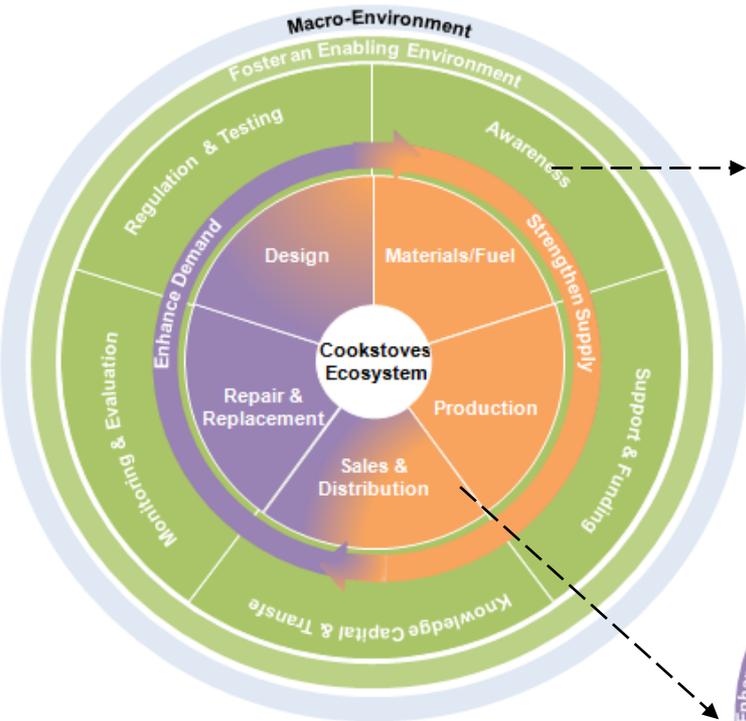
1. Regulation & Testing
2. Awareness
3. Support & Funding
4. Knowledge Capital & Transfer

Enhancing Demand and Strengthening Supply: Cookstoves Value Chain



Enhancing Demand and Strengthening Supply Intervention Options

1. Design
2. Materials & Fuel
3. Production
4. Sales & Distribution



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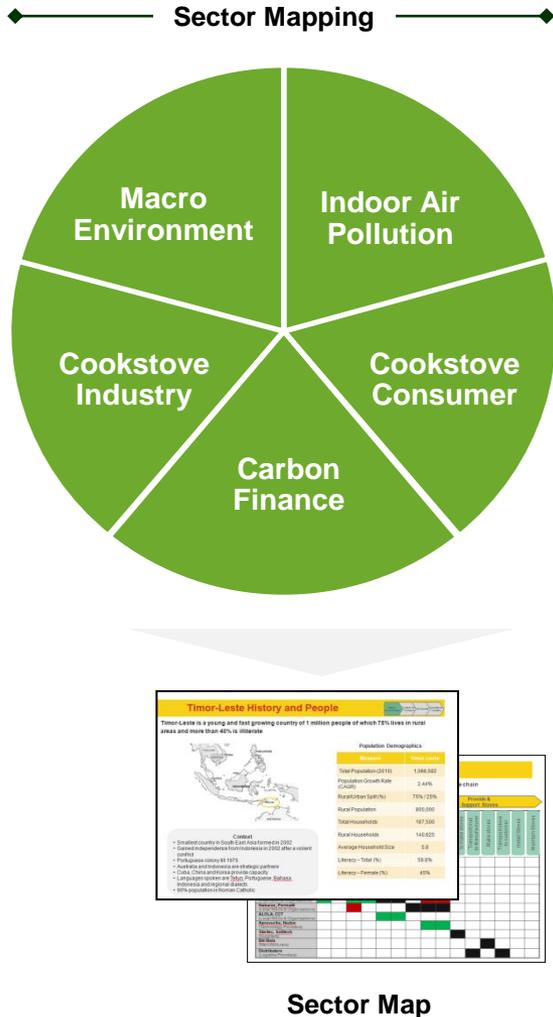
Roadmap

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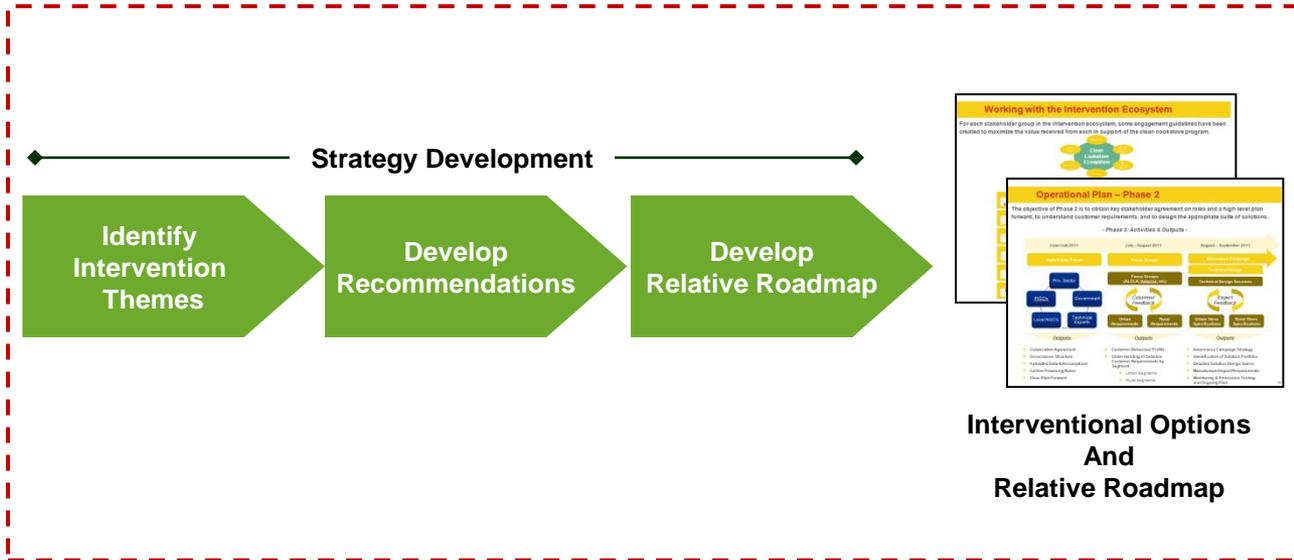
Appendix

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 Relative Roadmap.



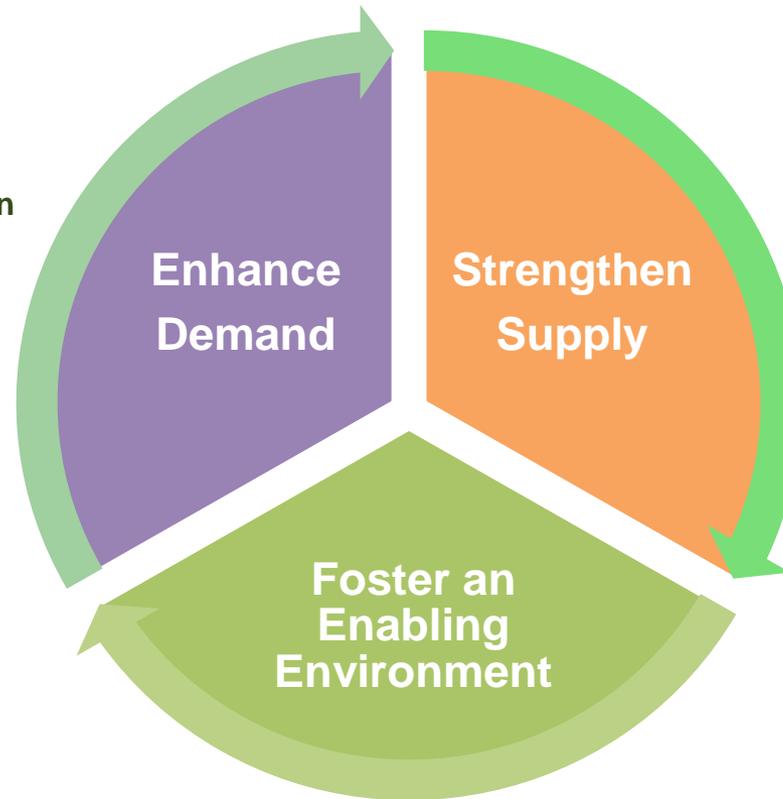
Focus of This Deliverable



A three-pronged strategy has been developed to spur the clean cookstoves market*

Project Approach and Background

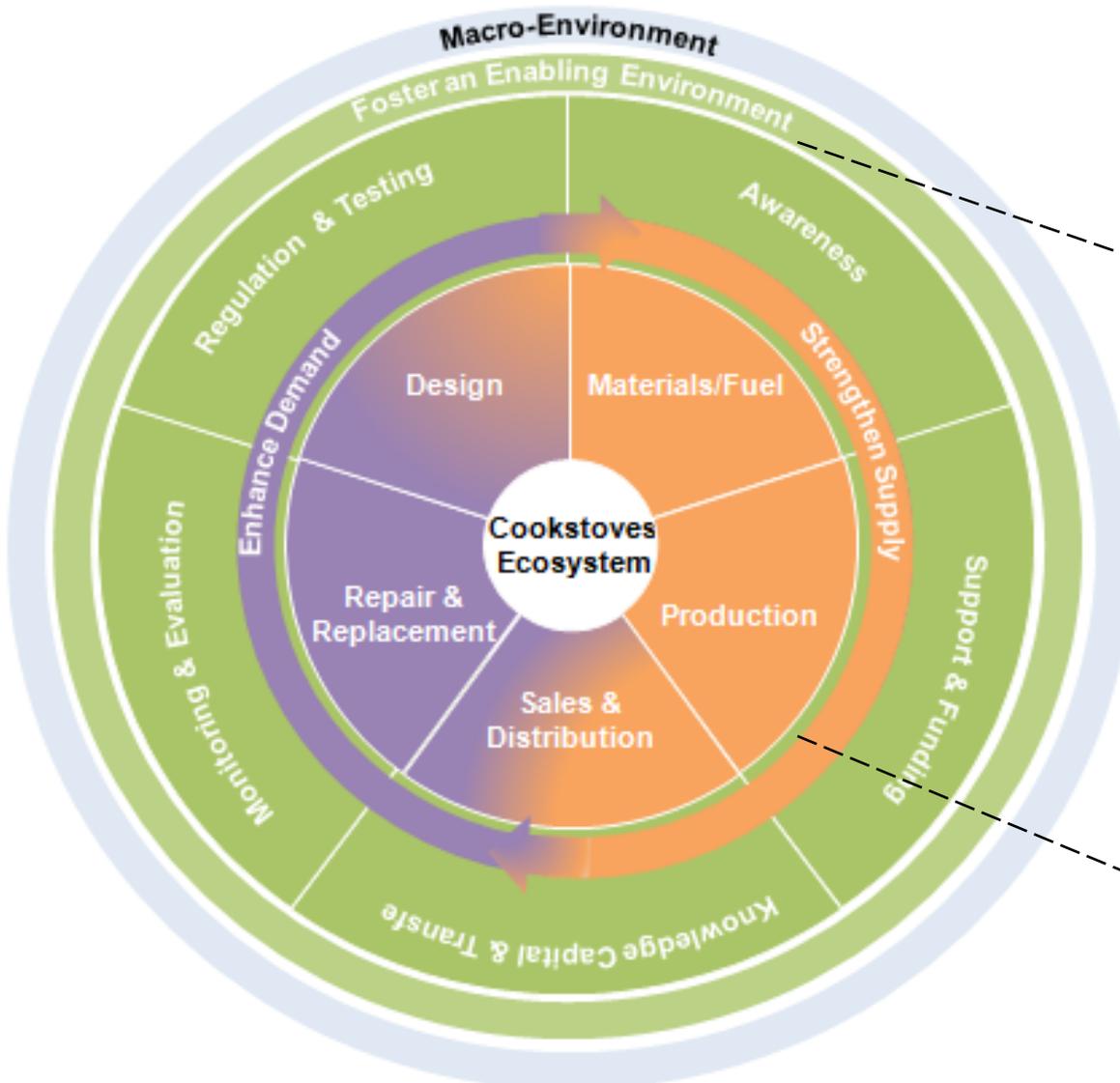
- Understand and motivate the user as a customer
- Reach the last mile
- Finance the purchase of clean cookstoves and fuels
- Develop better cookstove technologies and a broader menu of options



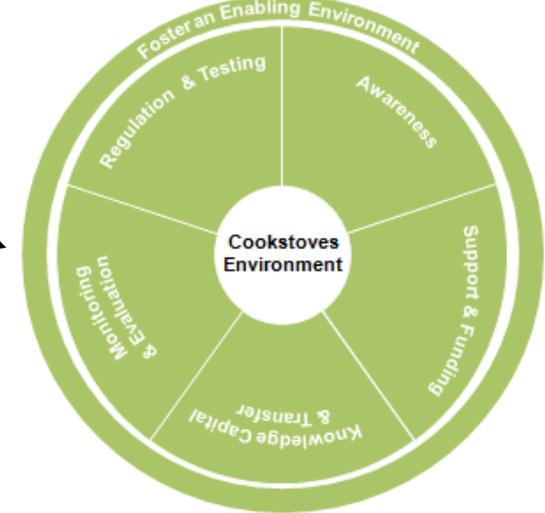
- Finance clean cookstoves and fuels at scale
- Access carbon finance
- Build an inclusive value chain for clean cookstoves and fuels
- Gather better market intelligence
- Ensure access for vulnerable populations (humanitarian)

- Promote international standards and rigorous testing protocols, locally and globally
- Champion the sector to build awareness
- Further document the evidence base (health, climate, and gender)
- Engage national and local stakeholders
- Develop credible monitoring and evaluation systems

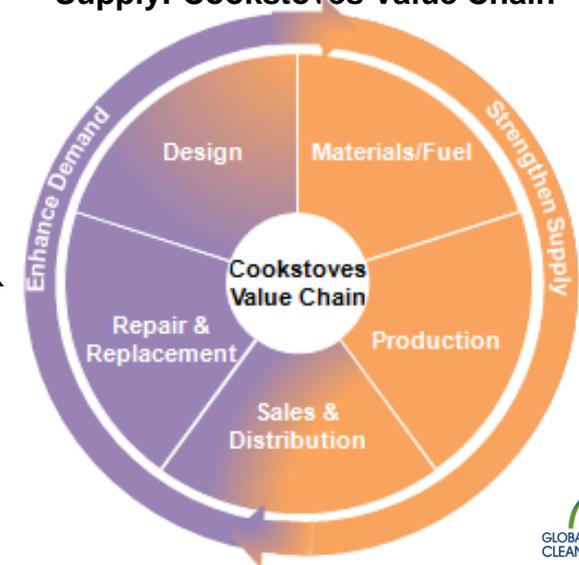
The Interventions are analyzed according to their impact to the three-pronged strategy



Fostering an Enabling Environment



Enhancing Demand and Strengthening Supply: Cookstoves Value Chain



Macro-Environment: Not in Scope for Intervention Options

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. IAP is not a strong case for change - there are many other adverse effects of inadequate cookstove technology – deforestation being the main one. But 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.

The Case for Action

The Ugandan market has potential, with 2m+ rural households on \$1+ per day, but ICS penetration is low. The need for access and use of clean fuels is increasing, as deforestation reaches critical levels.

- The Case for Action -

What's Happening?

There is only an ~8.5%¹ (~600,000hh) penetration of ICS in Uganda despite a potential market of ~ 2.65m - ~3.8m hhs².

There are few large producers & most ICS sales are concentrated in urban areas.

Deforestation is a serious issue at -2.2%³pa. while 26.4% of forest cover has been lost since 1990. 91% of consumers still rely on biomass to cook.¹

So What?

Centralised production, low demand in rural areas & challenging distribution processes, deters stove businesses from selling outside of urban areas. A large % of the market does not have access to ICS.

Firewood & charcoal are becoming increasingly expensive & scarce.

Many consumer groups are unaware of the benefits of ICS & cleaner fuels so willingness to pay amongst these segments is low.

Why Now?

There is a clear demand for ICS & an incentive for consumers to switch fuel, given the rising cost & unavailability of biomass.

Increased government involvement may accelerate the switch to cleaner fuels.

Carbon finance projects are reasonably advanced, providing smaller producers with investment opportunities to lower costs for consumers & scale up business.

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Fostering an Enabling Environment

Background on the sector

The cookstove sector emerged in Uganda in the 1980s as a result of concerns over desertification and deforestation. The newly established Ministry of Energy (MoE) pushed the agenda at the first National Stoves Workshop, held in 1987¹.

As a result, improved cookstoves (ICS) adoption targets were set at 2.45m hhs but limitations in technology and resources prevented the government from achieving this target. Uganda is yet to sustain a commercial ICS market, unlike its neighbor, Kenya which has seen successful production and adoption of the Kenyan Ceramic Jiko (KCJ) stove.

The market today

The government has implemented some promising policies and projects to address the past and present environmental challenges that the country faces.

Priority is undoubtedly electrification, with only ~12% of the population currently able to access to the grid ². However, the Renewable Energy Policy (2007) set out to 'increase access to energy in Uganda' and includes initiatives to significantly increase ICS adoption and incentivize

consumers to switch to modern fuels. Significant funding (\$75m) was required to put these targets into action under the 'Energy for Rural Transformation Project' (ERT) but the status of implementation is currently unknown.

In conjunction with these policies, the Uganda National Bureau of Standards (UNBS) has established some energy regulations. These currently focus on bio fuel manufacture and production. UNBS has limited ICS regulations and no indoor air pollution (IAP) standards. The Kenyan Bureau of Standards (KEBS) regulates efficiency standards and testing protocol for products sold in supermarkets. Whilst some KEBS standards apply to the Ugandan market, it is not believed to be the case for cookstove standards.

As previously mentioned, Uganda is yet to sustain a broadly commercialized ICS market. There are only two prominent cookstove businesses in Uganda, each producing between 1500-4000 stoves per month. The largest, UgaStove, has been involved in the market since 1994 and is registered as a Gold Standard carbon project already receiving credits. Both UgaStove and International Lifeline Fund (ILF), the second largest ICS producer, face challenges with distribution, marketing and financing, despite support from NGOs and carbon developers.

Fostering an Enabling Environment

Much of the cookstove sector is made up of entrepreneurs and SMEs. Some are members of supportive groups such as Private Sector Foundation Uganda (PSFU) or Biomass Energy Efficient Technology Association (BEETA) with 50+ members. Most produce under 100 stoves per month and make local portable models with varying levels of quality¹.

Additionally, the market benefits from a number of NGO, donor and carbon developer led initiatives, the most established being GIZ's 'Rocket Lorena' stove dissemination program, PREEP, in which 'installers' were trained to distribute them. A year after the program's start in 2005, GIZ had implemented over 200,000 stoves.

A natural challenge in a market with limited standards and high degrees of fragmentation, is variable and unknown quality. Many stoves which have been tested, e.g. the Rocket Lorena tested by GIZ², have demonstrated little to no efficiency improvements over a traditional three stone fire in cases where the stoves were badly made. Worryingly, there have also been situations where harmful emissions have actually increased. With no consistent testing protocol, results often vary and are therefore inconclusive. Contributing to this, is the fact that testing, for many is prohibitively expensive. Some local testing centers charge up to \$1500 for a complete stove test.

Finally, consumer research indicates a demand for quality stoves amongst certain urban users, and aspirations to switch to modern fuels³. Research illustrates that many consumers in low income rural areas actually spend a considerable amount on household items, but nothing on ICS – perhaps indicating a lack of understanding and awareness of the benefits that an improved cookstove would bring. In addition, many consumers have demonstrated an aversion to LPG because of concerns around its safety.

Shell conducted some useful research into consumer behavior in their Breathing Space paper from 2007. Additionally, the GoU collects data on ICS adoption every three years in its household survey. However, there are still some gaps in the market knowledge, particularly with regards to rural >\$3 segments, the north of the country, urban firewood users and the extent of improvement and use of the "ICS" in Ugandan households³.

Fostering an Enabling Environment

Building the market for the future

The intervention options presented in this paper focus on four areas initially; Regulation & Testing, Awareness, Support & Funding and Knowledge Capital & Transfer.

Given the context of the market, and the challenging situation of unknown and inconclusive quality levels, it's proposed to work towards an extension of UNBS' energy standards. There are already promising beginnings, in the GoU's Renewable Energy Policy, but these require development. For some of the producers involved in carbon finance, there is already an appreciation for improving stove quality in relation to emissions. Carbon developers offer credits based on the levels of efficiency so there is a clear incentive here. The intervention proposes a set of standards which builds on the requirements of carbon projects alongside the other stakeholders developing regulations, for instance the Renewable Energy and Energy Efficiency Programme (REEEP).

It will not be sufficient to develop a set of standards and enforce with a 'top down' approach. Stakeholders are sceptical of the success that this would have, and share a view that enforcement could encourage forgeries or a 'black market'. Instead, it's proposed that access to testing

facilities is improved by working with upcoming organizations such as country's Stove Manufacturers Association, and CREEC's Stove Testing Service to subsidize the cost of testing to SMEs.

It is essential that test results, benchmarked against cohesive cookstove standards are also put into action. SMEs may need more of an incentive to test their stoves than a reduction in price. So, it's proposed that in addition to stove testing, a package of support in 'decoding' test results, and links to technical expertise to support product improvements. This intervention could be executed directly, or in conjunction with micro-finance institutions that are already exploring energy portfolios such as the Foundation for International Community Assistance (FINCA) or Wekembe SACCO, for example.

Whilst regulating quality is an important step in the development of a commercial cookstove market, it's also proposed that efforts are made to increase the sector's appreciation for quality and improved fuels. This way, as product quality is driven up, producers have a potential market for their products.

Fostering an Enabling Environment

Awareness campaigns could cover three main areas; 1. Health implications of high emissions, with stove producers as the primary audience, 2. LPG safety campaign, piloted with potential LPG markets such as urban charcoal users outside of Kampala and 3. Benefits of improved cookstoves, focussing on desired qualities such as cleanliness¹ and reduced cooking time and aimed at the end consumer, mainly female cooks and institutional staff. These campaigns must be delivered in parallel to the appropriate changes in the market. For example, an LPG safety campaign should be delivered in association with interventions increasing the access to this fuel.

A useful addition to the previous intervention options, would be access to more comprehensive data on the cookstove market. For this reason, the third set of interventions propose further research to close some of the gaps that currently exist in common knowledge of the sector. There is an opportunity to work with the GoU to take advantage of the already established ICS data collection, as part of the UBOS household survey. Further information could be gathered on exact energy use and the extent of improvement that the “ICS” has. For instance, estimates by the cook on how long food takes to cook, brand of stove, issues with repair or replacement,

discomfort levels faces by smoke. The second stage in increasing the amount of knowledge held on the market, is to conduct research into the needs and behaviours of particular consumer groups. It’s proposed that, given the gaps in the previous research¹ and the high potential of each of these markets, that a focus be placed on the rural >\$3 segment, the north of the country and urban firewood users. Population size for each of these segments can be found with the details of the specific intervention.

Finally, the Renewable Energy Policy targets for improved cookstove consumption sit at ~2.5m hhs using an improved charcoal stove by 2017. Although progress against this target is not currently known, there is a potential opportunity to bridge gaps in funding and support with putting these policies into action.

Foster an Enabling Environment

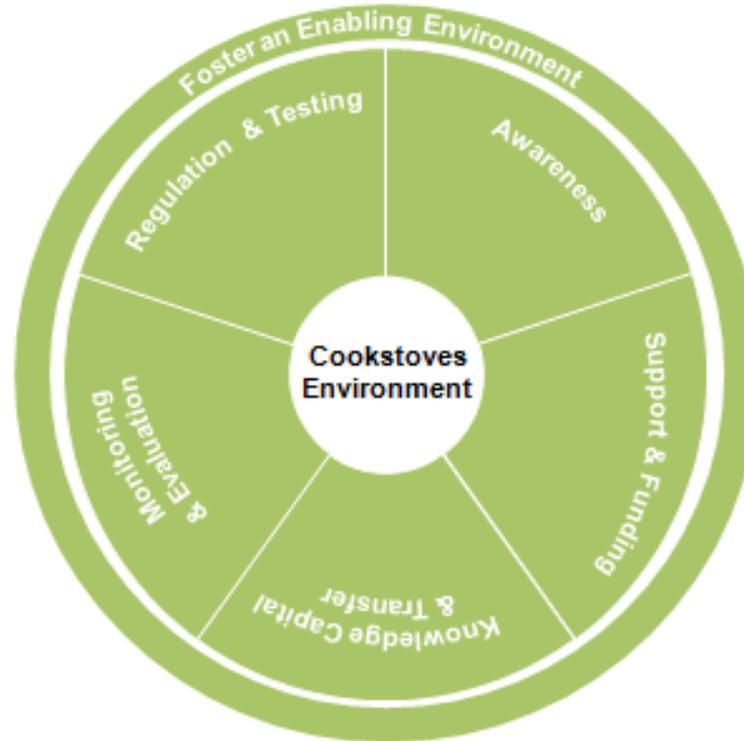
Through gaps identified in the Enabling Environment Framework, Intervention options will focus on Regulation & Testing, Awareness, Support & Funding and Knowledge Capital & Transfer.

Regulation & Testing

- ✗ Indoor Air Quality Standards
- ✗ Cookstove Standards
- ✗ Fuel Standards
- ✗ Standard Enforcement

Monitoring & Evaluation

- ~ Monitoring implementations
- ~ Tracking and Quantifying Success



Awareness

- ✗ Consumer Awareness
- ~ Stakeholder Awareness
 - ~ Government
 - ~ Private Sector

Support & Funding

- ~ Government
- ✓ INGOs and Associations
- ✓ Local NGOs and Associations
- ~ Private Sector
- ~ Academics

Knowledge Capital & Transfer:

- ✗ Health
- ✓ Environment
- ✗ Gender
- ~ Consumer Research

KEY: ✓ Advanced/ Favorable ~ Has Potential/ Neutral ✗ None/ Unfavorable □ Focus Area

Regulation and Testing

Carbon projects currently provide incentives for increased stove efficiency & durability. National standards & access to testing may expand the focus on holistic stove quality for smaller producers.

Situation

Cookstove producers involved in carbon financing, have focused on achieving high levels of thermal efficiency. Testing for stove emissions is expensive and mostly conducted by larger organizations & donors who can afford it. Uganda National Bureau of Standards' (UNBS) energy regulations do not yet cover indoor air quality.

Rationale

- A complete stove test costs up to ~\$1500¹, a significant amount for many producers
- Recent tests in IDP field settings reported a 6 brick stove (e.g. Okello Cuc) has ~14.4% thermal efficiency³
- The rocket Lorena stove (GTZ) has ~6.5% thermal efficiency in some field settings. Half that of an open fire⁴
- 57,000 institutional cooks & helpers have been exposed to IAP⁵

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
1. Pilot a subsidy scheme for ICS testing	Alliance, Academics & SME producers	Medium	Small	1 year
2. Promote cohesive cook stove standards (domestic & institutional)	Alliance, GoU, UNBS, Industry & Academics	Small	Large	2 years

Ref:1 – CREEC

2 - Uganda National Bureau of Standards

3 & 4 - USAID Fuel efficient stove programmes in IDP settings

5 – Practical Action Consulting

Regulation and Testing

For many small producers, stove testing is prohibitively expensive. By lowering costs & simultaneously developing standards, there is opportunity to raise quality across the market.

- Intervention Options-

1. Pilot a testing subsidy scheme for ICS

2. Develop cohesive cook stove standards (domestic & institutional) & enforcement process

- Actions -

- Identify test facilities (e.g. *Makarere University*) & benchmark costs
- Support testing organizations (e.g. *Centre for Research in Energy and Energy Conservation (CREEC), Centre for Integrated Research & Community Dev. (CIRCODU)*) to subsidize costs for SMEs
- Market testing subsidy to SMEs
- Support SMEs to understand results & improve stoves

- Develop cohesive standards w/stakeholders (e.g. *UNBS, Uganda Carbon Bureau (UCB), Alliance, Ugandan Ministry of Energy (UMoE), Promotion of Renewable Energy and Energy Efficiency Programme (PREEP & GTZ), Join Energy Environment Projects (JEEP), CREEC*)
- Work with UNBS, Kenya Bureau of Standards' (KEBs') & GoU to formalise & regulate

- Outcomes-

- Cost benchmarking for market
- Reduced ICS testing costs for pilot SMEs
- Evidence base to inform scale up of testing subsidy schemes for SMEs
- SMEs understand testing results and have an appreciation of quality standards

- Development of single set of standards to regulate quality of ICS in the market
- Development of benchmark for pilot SMEs involved in testing subsidy scheme
- Identified channel to localise & disseminate Alliance global standards

In certain segments, there appears to be a high ability to pay for items \$15-30. Very low numbers of consumers see stove purchase as a priority, indicating a need to build awareness and motivation.

Situation

Many consumers & producers don't appear to be adequately aware of the health implications of low quality stoves. Some NGOs & the GoU have recently become more engaged with this issue¹, but there is an opportunity to improve the market through increased awareness & motivation from all parties. The GoU energy policies have specific commitments to run consumer awareness campaigns for ICS.

Rationale

- 64% of rural firewood users bought an item of \$15-30 in the last year, yet no segments (except urban >\$3) spent between \$15-30 on a stove²
- 71% of urban charcoal consumers earning >\$3 per day, want to switch to more modern fuels²
- Consumers often cite 'safety' as a reason not to switch to LPG³

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
3. Build awareness across the entire sector to address the health impacts of emissions	Alliance, Private sector, NGOs, GoU	High	Medium	2 – 4 years
4. Develop consumer awareness campaign for LPG & ICS benefits	NGO, Private sector, Alliance	Medium	High	1 year

Ref: 1- Energy Network & Gender and Energy Alliance, 2012

2 – Shell, Breathing Space, 2007

3 – Peter Lokeris, Stake Minister for Minerals

There is an opportunity to increase the adoption of LPG and ICS through education and raising awareness across the value chain, from producer to end user.

- Intervention Options-

3. Build awareness across the entire sector to address the health impacts of emissions

4. Develop & roll out consumer awareness of LPG as a clean fuel & overall ICS benefits

- Actions -

- Create a 'health awareness group' with GoU, NGOs, producers & distributors
- Regularly educate /communicate on health impacts of IAP & emissions
- Support dissemination of information to employees & communities

- Work with oil companies, trade associations. (e.g. ULPGas), GoU, cookstove stakeholders & a marketing company to develop LPG sensitization & ICS benefits campaign
- Pilot campaign in the \$1-3 urban charcoal segment
- Roll out successes to LPG affordability pilot area (see I#)

- Outcomes-

- Increased awareness of health emissions amongst stove producers
- Established network of health conscious businesses
- Communication network to wider stove value chain

- Effective coordination between GoU, cookstoves stakeholders, oil companies & NGOs
- Increased awareness of LPG safety by consumers in pilot segments
- Increase in consumer demand for ICS and LPG in pilot areas
- Evidence base to scale up campaigns to other areas

Support & Funding

91% of consumers rely on biomass & Uganda has lost 26% of its forest since 1990. Stakeholders recognize the need to encourage more efficient cooking methods to reduce this burden.

Situation

In 2007 the GoU completed its Renewable Energy Policy (REP), outlining proposed plans to improve biomass use across the country, in association with the Ministry of Energy and Mineral Development (MEMD) and through the ERT Project. ICS targets have been set for 2017, and with this date fast approaching there may be an opportunity to support these plans.

Rationale

- ERT targets 2.5m charcoal and 4m firewood hhs using ICS by 2017, the baseline adoption rate is 20,000
- The MEMD has publicly recognized that the efficient use of biomass must improve
- There is currently a \$17M funding gap in the Modern Energy Services Programme, a component of the REP

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
5. Support the development & resourcing of GoU biomass plans to help achieve their policy targets	Donors, GoU, Alliance	Low	Medium	2 years

Support & Funding

Ambitious targets have been set as part of the Renewable Energy Policy. Supporting the GoU could help to overcome resource issues could increase likelihood of success.

- Intervention Options-

5. Support the development & resourcing of GoU biomass plans to help achieve their policy targets

- Actions -

- Work with GoU and its donors to identify opportunities to support their Renewable Energy Policy through the Project Coordination Unit (PCU) at MEMD
- Develop programs to address any prominent gaps in the Modern Energy Services Plan
- Support government to help bridge the existing \$17m funding gap

- Outcomes-

- Close alignment between existing government policy and potential market interventions
- Greater resources to support the implementation of the GoU's existing policies

Knowledge Transfer & Sharing

There is limited comprehensive, recent research into consumers' behaviour, needs & purchasing power. Data is collected on ICS adoption & there may be benefits to building on this research.

Situation

National data on 'ICS' in hhs is available, although the ICS definition could be refined further*. The Shell Foundation research conducted in 2007 does not focus on a number of promising consumer segments. Translating Research into Action (TRAction, USAID) have conducted promising research into consumer buying behaviour.

Rationale

- The GoUs' Bureau of Statistics' (UBOS) household survey collects data on ownership & use of ICS* every 3 years
- Current consumer research excludes; Northern Uganda (>900k hhs), rural >\$3 (>150k hhs) and urban firewood segments – all with a potential ICS demand¹

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
6. Conduct / support research into consumer behaviour & demand	Academic, Donors, Private sector producers	High	Medium	6mths
7. Improve collection & use of data on ICS & indoor air quality in the household survey	Govt., Alliance, private sector, NGOs	High	Low	3 years

*ICS is defined as a clay lined stove / one with a chimney

Knowledge Transfer & Sharing

The needs and behavior of over 1m potential ICS consumers is not yet understood. A comprehensive understanding of these segments may open up new opportunities in the market.

- Intervention Options-

6. Conduct / support research into consumer behaviour & demand

7. Improve collection & use of data on ICS & indoor air quality in the household survey

- Actions -

- Consolidate available data (from e.g. UBOS, Shell)
- Conduct/support consumer research into new segments e.g. >\$3 rural, Northern Uganda, urban firewood
- Link research to high potential producers and distributors (Ugastove, ILF, Energy Uganda Foundation, PETSD, Hajjati Joweria) as an incentive for quality focus
- Support stove enhancements

- Assess existing UBOS ICS data & survey process
- Work with GoU to enhance data collection (e.g. ICS definition, consumer identification of ICS)
- Form a review body with the (rural energy commission) to review and take action on UBOS data

- Outcomes-

- Understanding of behaviours and needs for >\$3 rural, Northern & urban firewood segments (>1M hhs)
- Alignment of quality ICS producers/distributors and demand opportunities
- Supply of stoves which meet consumer demand

- More comprehensive market data on ICS adoption
- Action based review of data to inform interventions

Products in the Market

The range of products available in the Ugandan market is fairly broad but arguably not as diverse as other East African countries. The limited use of any energy outside of biomass (only 9% of the country uses an alternative to biomass¹), means that the majority of stoves are designed to be used with either charcoal or firewood. Within these categories, are fixed 'rocket' stoves, mainly promoted by NGOs and installed by local artisans, a 6 brick stove (as used in ILF's Okello Cuc model), and several portable versions such as the improved ceramic, metal clad stove (as used in the Ugastove). Biogas is also promoted under the Uganda Domestic Biogas Program, it is believed that approximately 3000 digesters have been installed, out of a target of 12,000 in the next 5 years.

The entrepreneurs and SMEs, who contribute towards a large proportion of the stove producers in the market (if not the stove volumes), make a variety of models with differing levels of quality. These include locally made charcoal and wood models. Finally, the popular Envirofit wood stove is beginning to be imported by Up Energy, a branch of the Impact Carbon initiative.

Those producers who are making a quality product, find it hard to stand out in the market. There have been some

successful results from simple branding initiatives, however 70% of producers questioned in Uganda had no branding for their product.

Availability of Materials & Fuel

As the environmental context outlined, one of Uganda's priority issues is to reduce the burden on biomass. Although forest coverage is higher than neighbouring countries, its depletion rate is alarming (at 2.2% per year).

The fuel situation has already led to a drastic increase in charcoal. In 2004 a kg of charcoal cost 200 US\$, compared to 1500 US\$ per kg in 2011. Between 2009 and 2011 the price rose 140% from \$10 – 24³. Currently only 36% of firewood consumers interviewed as part of Shell's Breathing Space research in rural segments actually pay for their fuel. . Although cost is therefore not an issue currently, with over 80% of the population using firewood to cook, resources are diminishing and rural communities are finding it more difficult to collect wood. This is especially prominent in humanitarian settings e.g. Nakivale refugee camp⁴.

Ref: 1 – UBOS Household Survey 2009/10

2 - FAO Uganda Country report

3- UBOS 2010 Statistical Abstract

4- Safe Access to Firewood & Alternative Energy Uganda – WFP

Comparatively, the weekly cost of alternative modern fuels such as LPG is competitive. 80,000 US\$ worth of LPG is estimated to last between 4 and 10 weeks, compared with only 2 weeks for the same amount of charcoal¹. Although the weekly cost is competitive, LPG is still an inaccessible option for many consumers. Canisters are large and heavy, and the market is yet to adopt innovations seen in other countries such as a 1kg gas canister, transparent skins or lightweight options.

Unfortunately, there are other barriers currently preventing the uptake of LPG as an alternative source of fuel. The ULPGas explains that capacity to store the fuel and regulate demand from Mombasa is insignificant, when compared to the monthly consumption. Distribution is also problematic, with the majority of distribution centres and LPG companies centralized in Kampala. UBOS reported a 9% fall in the adoption of LPG in 2010³ potentially due to issues with supply. As addressed in the enabling environment section, there is also a barrier relating to consumers' perceptions of LPG as a safe fuel.

Another alternative showing promise in Uganda is the production and distribution of briquettes. The GoU recognizes briquettes as an alternative to biomass in the

Renewable Energy Policy, calculating that 1.2m tons of agricultural waste are available each year for this purpose. One company; Kampala Jellitone Suppliers has diversified from coffee production into this field, and achieved strong initial results selling 1530 tons of briquettes in their first year of operation, and winning an Ashden Award in 2009². GVEP are working with 139 briquette businesses in Uganda, with 68% of these being female headed. GVEP explain that the low start up costs involved in the briquette business are ideal for female entrepreneurs.

As with entrepreneurs and SMEs in the stove production sector, briquette businesses also cite marketing, access to finance & technology and quality regulation as their main challenges.

Production

Many producers are centralized in Kampala, where the demand is likely to be higher for their product. As illustrated throughout this report, a wide range of producers, from the large ones such as UgaStove through to small entrepreneurs, are struggling to get the necessary finance and marketing expertise to scale up and enter new, more disparate markets. Access to finance for producers appears to be particularly problematic. Whilst some institutions are beginning to develop energy portfolios, they lack adequate technical knowledge and education¹

It is reasonably common for women to be involved in cookstove production, although less so for the metal cladding work which is normally carried out by men. Female headed businesses however, appear to be more rare with only 3 of the 50 businesses registered under the Biomass Energy Efficient Technology Association (BEETA)¹. Both PREEEP and GIZ are focussing on increasing opportunities for women to gain technical and managerial knowledge, as well as increasing linkages with micro finance institutions.

Sales & Distribution

Penetration of improved cookstoves in the market is reasonably low. Only 3.7% of households in Eastern Uganda own an ICS, compared to 8.7% in central Uganda²

Although no national data is available, it is believed that the uptake of institutional stoves is also particularly low in Uganda, with most institutions using a traditional fire or improved stoves that do not offer the full fuel saving benefit. Again, affordability is the driving factor here, with institutional stoves being very expensive, and few micro finance institutes offering credit options.

A USAID research project, TRAction, recently achieved promising results from a marketing pilot. The study tested a 'free trial' of cookstoves to encourage consumers to make a purchase. 5% of consumers bought a cookstove when offered the 'traditional' cash payment method, whereas 47% of consumers made a purchase on the innovative 'free trial' method.

Cookstoves Value Chain

Interventions

The intervention options presented in this section focus on four areas initially; Design, Materials / Fuel, Production and Sales & Distribution.

It's proposed that standards, regulation and stove testing receive more focus from the GoU and the cookstoves sector in Uganda. As briefly mentioned in the previous section, this will not be enough to raise the quality in the market. There is an opportunity for an intervention that supports high potential producers to translate results and standards benchmarks to improvements for their products. Criteria should be developed to identify high potential producers, so that investment goes to the right place. Carbon developers such as UCB and Impact Carbon are also in the process of identifying high potential businesses, so it would be worthwhile to link up with these programmes for identifying such businesses.

Programs, such as Improved Cookstoves for East Africa, UCB and Impact Carbon all state challenges in finding producers with a commitment to quality. It may also be interesting to investigate the effects of supporting producers and distributors with innovative branding, by partnering high quality stove producers with designers and marketers.

It may also be interesting to pilot some of the marketing

techniques explored by TRAction. The intervention could support a pilot in a high potential area, linking with an MFI or SACCO to provide the consumer financing or 'payback scheme'. If adoption rates prove to be as powerful as the initial research, this could be a very promising intervention to roll out to other segments, producers and finance companies.

Within the Materials / Fuel section of the cookstoves value chain, it's proposed that several initiatives contribute to removing some of the barriers to consumers switching to cleaner fuels; particularly LPG and briquettes. In order to address the barriers to LPG, the first intervention looks at some of the broader issues of LPG access. Issues with supply through Mombasa and Dar es Salaam are clearly higher level strategic issues for the GoU, however supply could be regulated by supporting or investing in increased storage infrastructure. The current gap between storage and consumption is approximately 300 tons per month.

By working with the GoU, the ULPGas, oil companies and retailers, the distribution network could be enhanced. It is proposed that regional distribution centres are piloted in high potential areas where earnings are high, but outside of Kampala where LPG is already quite accessible. Links should then be forged with retailers to support the dissemination of LPG into the market.

Cookstoves Value Chain

The LPG infrastructure should not be improved in isolation. As outlined in the context section of the cookstoves value chain, there are also some consumer level barriers for the adoption of LPG. Earnings and an aspiration to switch to modern fuels are favourable conditions for this set of interventions. However, more affordable solutions should first be explored within a pilot market. Solutions could consider the Pima Gas 1kg canister model as used in Kenya, as well as considering see through and lightweight options which address concerns of trust and access. The proposed intervention for increasing consumer awareness of LPG should also support increased demand for the fuel.

The final proposal within Materials / Fuel is to support briquette businesses in scaling up production and reaching new markets. Companies such as Kampala Jellitone Services, Green Bio Energy or Eco Fuel Africa could be supported under this initiative. Support packages could be developed in association with NGOs to deliver training on business skills. These businesses also need help to find financing opportunities to fund the investments that are often needed to buy briquetting equipment.

A similar support package could be offered to female entrepreneurs, to encourage more women to get involved

in the cookstove sector as business owners. It's proposed that this intervention would be conducted in association with organizations such as PREEEP and GIZ, who are already delivering these skills packages. ILF, Solar Sister and Living Goods who also involve women in their value chain, could be other potential stakeholders to work with to identify empowerment opportunities.

Given the potential to implement high numbers of institutional stoves in the market, it's proposed that MFIs and SACCOs are educated and trained in delivering end user finance packages for these stoves.

Enhance Demand and Strengthen Supply: Cookstoves Value Chain

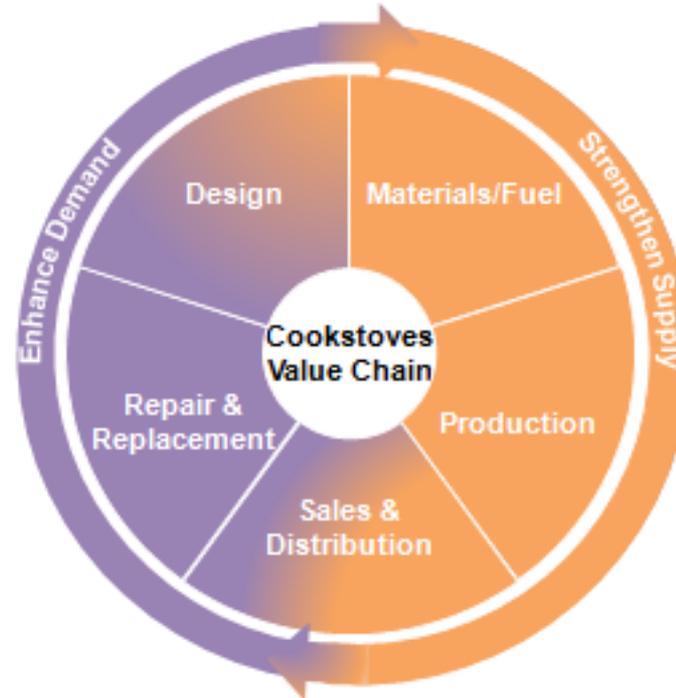
Through gaps identified in the Cookstoves Value Chain, intervention options will focus on **Design**, **Materials / Fuel**, **Production** and **Sales & Distribution**

Design

- ~ Stove Type
 - ~ Fixed
 - ✓ Portable
 - ✓ Biogas Digester
 - ✗ Solar
- ~ R&D
 - ~ Private
 - ~ Gov't/Academics

Repair & Replacement

- ~ Supply of Repair Skills and Parts
- ~ Post-sales Service



Materials/Fuel

- ~ Stove Raw Material Supply
- ✗ Stove Raw Materials Cost
- ✗ Fuel Value Chain
 - ✗ Biomass
 - ✗ Clean Coal
 - ~ Solar/Biogas
 - ✗ Petro based
- ~ Cost of Clean Fuels

Production

- ~ Scalability
 - ✗ Handmade
 - ✗ Masons
 - ✓ Factory
- ~ Producer Fragmentation
- ~ Producer Financing
 - ~ Access to Capital

Sales & Distribution

- ~ Financing Purchasing (micro-credit)
- ✓ Carbon Financing
- ~ Customer Segmentation
- ✗ Last Mile Distribution
- ✗ Reach Vulnerable Populations

KEY: ✓ Advanced/ Favorable Has Potential/ Neutral ✗ None/ Unfavorable ■ Focus Area

Stove quality varies considerably across the market, with some popular models providing little improvements in efficiency or emissions over traditional methods.

Situation

Many SMEs and artisans in the market do not have a way to distinguish their product from others, due to lack of branding and marketing being listed as a general challenge. Initial studies have shown that consumers are willing to pay more for a branded can stove².

Rationale

- 80% of cookstove business have no branding for their products and only 26% are attempting to create one³
- In Kenya, SCODE consumers paid more for stoves when they rebranded their stove with distinctive colours and labels²
- In some settings, the rocket Lorena has been tested to use over 36% more fuel than a 3 stone fire¹

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
8. Test effects of premium brand image on stove sales	Industry, NGOs, Marketing companies	Medium	Low	6 – 12mths
9. Support technical development for stove improvement	Research institutes, NGOs, Industry	Medium	Medium	1 – 2 years

Ref: 1 – A Comparison of Wood burning Stoves Uganda, GTZ, 2002

2 – GVEP & SCODE study, 2012

3 – GVEP Marketing Research

Support with stove branding and technical developments to improve quality could encourage the adoption of global stove standards, and put test results and consumer research into action.

- Intervention Options-

8. Test effects of premium brand image on stove sales

9. Support technical development for stove improvement

- Actions -

- Find quality stoves through benchmark against defined quality standards
- Identify producers and distributors with commitment to securing demand
- Pilot stove branding with private sector, NGOs and SMEs
- Roll out successes

- Identify low quality stoves through testing and benchmarking against standards
- Link high potential producers with research institutes to provide technical development for stoves

- Outcomes-

- Evidence base of effective branding mechanisms in pilot areas
- Incentive for producers to commit to quality and demand
- Increased consumer demand and sales of quality stoves in pilot areas

- Increased awareness of stove quality and standards by stakeholders
- Improvement of low quality ICS on the market

Materials/Fuel (1/3)

As the price of charcoal rises, LPG is becoming a potential alternative: \$10 of LPG can last 2–5x as long as charcoal of the same price¹. It is widely recognized that supply via Kenya can be unreliable, therefore other opportunities to regulate supply can be explored.

Situation

To achieve GoU targets & increase LPG consumption, a number of barriers need to be overcome. There is a lack of storage (175 tons compared to the 500 tons used each month³) and a limited number of regional distribution centers outside of Kampala.

Rationale

- LPG use currently stands at 0.5 – 1% of a population of 33m²
- The GoU's Renewable Energy Policy includes LPG adoption in its target of 61% 'renewable energy consumption' by 2016
- Supply of LPG is unreliable due to distribution issues through Mombasa³
- LPG is anticipated to increase in cost due to rises in charcoal prices¹

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
10. Work with GoU & industry to address some of the broader barriers in the LPG market	Alliance, GoU, Oil co's, Private sector	Medium	Small	2 years

Ref: 1- ULPGas, website

2 – Emmy Wasira, WeS at ULPGas Stakeholders' Conference, 2011

3 – Disan Kiguli, ULPGas Status Report on LPG Usage in Uganda, 2011

Materials/Fuel (2/3)

If the overall supply of LPG to Uganda steadies and strengthens, then the onus will fall on the private sector to develop regional storage and last mile distribution options for consumers.

Situation

There is currently a lack of innovation around affordable LPG options. Several interesting models exist in other markets. With a lack of regional distribution network, LPG businesses struggle to reach opportunity markets outside of Kampala, and instead concentrate in the capital city.

Rationale

- There are 11 registered LPG companies in Uganda, all concentrated in Kampala & nearby areas¹
- Wana Energy has distributed 6000 LPG units on a 3 month payment plan pilot which they are now offering interest free³
- There is a perception that LPG is dangerous and canisters can explode

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
11. Link LPG businesses with new markets	Alliance, GoU, Private sector	Medium	High	1 year
12. Identify & pilot affordable LPG options	Industry, Alliance, NGOs	Medium	Medium – High	2 years

Ref: 1-3 – Disan Kiguli, ULPGas Status Report on LPG Usage in Uganda, 2011

2 – Kampala Jellitone Suppliers (KJS)

3 – Michael Kelly, World LPG Association, 2012 referring to Wana Energy Solutions

Materials/Fuel (3/3)

The GoU identified 1.2m tons of agricultural waste could be used as fuel each year . Supporting briquette business could take advantage of this opportunity.

Situation

The GoU has placed high levies on charcoal burners as part of their forest conservation policy³, one of many causes for an increase in cost. Several Ugandan businesses have established successful models offering briquettes as an improved fuel to consumers and institutions, using agricultural waste such as coffee in production.

Rationale

- Briquette producers require financial support to access equipment in order to scale up production²
- Some promising briquette businesses exist with one company recently winning an Ashden Award, having sold 1,530 tons in 2008²
- Briquette businesses reported challenges in maintaining quality & increasing consumer awareness³

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
13. Support briquette businesses to access markets & scale up	Alliance, Private sector, Donors	Medium	Low	1 year – 18 months

Ref: 1- ULPGas

2 – Kampala Jellitone Suppliers (KJS)

3 – Hamish Ferguson, GVEP Intl – Briquette Businesses in Uganda, 2012

Interventions could explore two pronged approach of addressing broader LPG supply barriers, followed by identifying affordable, safe and trustworthy options to increase consumer demand.

- Intervention Options-

10. Work with GoU & industry to address some of the broader barriers in the LPG market

- Actions -

- Work with the GoU & stakeholders (*MEMD, MESP, ULPG & oil companies*) to improve storage facilities for LPG
- Set up regional distribution centres for non-central urban areas
- Support with GoU to deliver tax benefits documented in policies
- Work with the LPG Regulatory Assoc. to support safety regulations

- Outcomes-

- Improved access to LPG for smaller retailers
- More reliable LPG supply
- More favourable conditions for the LPG market e.g. tax breaks, subsidy schemes
- Improved LPG safety regulations

11. Identify affordable LPG options & pilot these in the market

- Work with LPG industry (e.g. *WeS, Total Uganda, etc*) and trade associations (e.g. *ULPG*) to identify affordable LPG options (e.g. *1kg LPG canister - Pima Gas model, porous canister - Ragasco model*)
- Fund pilots in promising markets such as the urban charcoal segment
- Roll out successes beyond initial pilot areas

- Increased adoption in pilot areas
- Body of evidence to support greater investment in the industry
- Increased awareness of LPG as an alternative fuel by consumers in pilot areas

Government action plans and lower costs of LPG could serve as a catalyst for the switch towards this cleaner fuel. Improving access through better distribution channels may also benefit LPG adoption.

- Intervention Options-

12. Improve LPG distribution networks

- Actions -

- Work with LPG stakeholders & oil companies to identify distribution opportunities in high potential pilot area (e.g. urban charcoal outside of Kampala)
- Work with GoU to link oil companies & retailers to distribution points (e.g. institutions, new regional distribution centres), supporting small distributors with transport costs
- Roll out successes

- Outcomes-

- Relationships built between small distributors, oil companies and institutions
- Increased number of retailers and distributors supplying affordable LPG

Materials/Fuel (3/3)

With 1.2m tons of agricultural residues available in Uganda each year, briquettes appear to be a viable alternative to traditional biomass. Machinery costs >\$20k for certain models with high capacity.

- Intervention Options-

13. Support briquette businesses to access markets

- Actions -

- Identify high potential briquette companies (e.g *KJS*, *Green Bio Energy*, *Eco Fuel Africa*²)
- Support in attracting investment for local machinery (entrepreneur) or importing machinery (midsized businesses)
- Provide training/support in business skills e.g. marketing, quality control, etc to small and medium businesses

- Outcomes-

- Scale up opportunities for briquette entrepreneurs and SMEs
- Increased production and distribution of briquettes

Production of ICS is very centralised, leaving many areas with limited supply. Some larger producers have promising scale up plans but many struggle with lack of finance, proven demand & capacity.

Situation

Stove production is a typically low margin business and producers have limited access to finance to fund scale up. Community lending schemes & MFIs are beginning to expand into energy portfolios. Women are currently under represented in the cookstove industry. A couple of organizations focus on improving their situation but more support would be beneficial.

Rationale

- The Biomass Energy Efficient Technology Association (BEETA) programme only has 3/50 business with registered female heads¹
- Stove businesses cite lack of finance as a challenge³
- FINCA cite lack of technical knowledge in assessment of energy needs as one of their major challenges²

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
14. Provide support to female headed stove businesses	Private Sector	Medium	Medium	1 year
15. Educate & support development of financing portfolios for producers & distributors	MFIs / SACCOs, Private Sector	Medium	Medium	1 year – 18 months

Ref 1 - Prossy Sebunya, BEETA, 2012

2 – FINCA, website

3 – GVEP, DEEP experience

Small entrepreneurs may benefit from additional support to kick-start their development & scale up. A focus on female headed organisations could empower women & provide motivation for greater involvement in the cookstoves value chain.

- Intervention Options-

14. Provide support to female headed stove businesses

- Actions -

- Link private sector organisations (e.g. *BEETA*, *Private Sector Foundation Uganda (PSFU)*) to gender programmes (e.g. *GIZ*, *PREEEP*)
- Create a support package including training, financing, business support to high potential businesses
- Work with private sector organisations to deliver packages to identified organizations

- Outcomes-

- Increased confidence, motivation and empowerment of female business heads
- Inspiration and motivation to other women to encourage involvement
- Increased awareness and focus on female empowerment from private sector organisations such as PSFU

15. Educate & support development of financing portfolios for stove producers

- Educate MFIs / SACCOs involved in energy sector (e.g. *FINCA*, *Opportunity Uganda*, *Wekembe* etc) on the benefits of expanding energy portfolio to financing stove producers
- Provide technical knowledge and educate on how to engage women
- Pilot new portfolio with female headed businesses and roll out successes

- Female headed stove businesses have access to finance in pilot areas
- Opportunities for producers and distributors to finance scale up are increased

Sales & Distribution

Sales are concentrated in urban areas where distribution and demand is less of a challenge. There is however, an opportunity to target other segments at scale and increase the penetration of ICS.

Situation

The rural market for ICS is calculated to be ~2.5m hh³. Out of 600,000 rural hhs in the Eastern region earning >\$1 per day, only 3% own an ICS. The market for improved institutional stoves is currently under developed due to lack of supply and access to finance

Rationale

- There is a perception that institutional stoves uptake is low
- SACCOs have begun to develop energy portfolios to fund solar & biogas¹
- TRAction research demonstrated free trials increased ICS purchase 9 fold vs upfront cash payment²

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
16. Develop institutional stove financing	MFIs / SACCOs, Alliance, Private Sector	High	Low	1yr
17. Support the expansion of promising stove marketing techniques	TRAction, Impact Carbon, MFIs / SACCOs	Medium	Medium	6 – 18mths

Ref 1 – FINCA

2 – SNV Household Improved Cooking Stoves Sub Sector in Uganda

3 - UBOS

Institutional ICS' have up to 40% efficiency, saving up to two thirds on fuel consumption. Consumers need financial support to fund this expensive purchase.

- Intervention Options-

16. Develop institutional stove financing

17. Expand on promising stove marketing techniques

- Actions -

- Educate MFIs / SACCOs involved in energy sector (e.g. *FINCA, Opportunity Uganda, Wakembe etc*) on the benefits / technical requirements of institutional stoves
- Encourage development of portfolio
- Link with institutions & institutional stove producers (e.g. *PREEP, Ugastove, JEEP etc*)

- Work with research organisations (e.g. *TRAction, Up Energy, CIRCODU*) to pilot innovative stove funding to high potential segments
- Secure support from MFIs / SACCOs / M-PESA to support repayment methods e.g. free trial, instalments, loans
- Roll out successes to other segments

- Outcomes-

- Expansion of energy financing portfolios
- Educated and motivated MFIs / SACCOs
- Increased end user financing opportunities to fund institutional stoves

- Comprehensive evidence base of successful stove repayment marketing techniques
- Opportunities for producers and distributors to link with MFIs to roll out successes to consumer segments & increase ICS adoption

Executive Summary

Project Approach and Background

Intervention Options

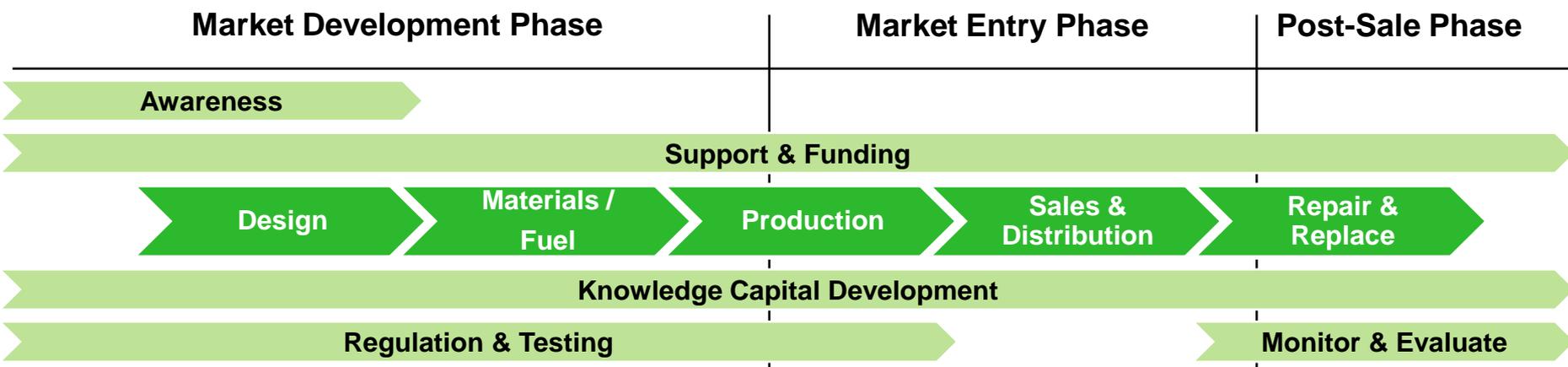
Roadmap

Conclusion

Appendix

Intervention Options Roadmap Overview

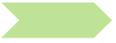
The Cookstove Value Chain is a sequential process, and contains interdependencies. Similarly, the Enabling Environment Framework components should be done in lock-step with the value chain.



1. Pilot a subsidy scheme for ICS testing
2. Promote cohesive cook stove standards
3. Build awareness to address health impacts
4. Develop consumer awareness campaign for LPG & ICS
5. Support GoU biomass plans
6. Conduct / support research into consumer behaviour
7. Improve collection & use of data on ICS & IAP
8. Test effects of premium brand image on stove sales
9. Support technical development for stoves
10. Address broad LPG barriers
11. Link LPG businesses with new markets
12. Identify & pilot affordable LPG options
13. Support briquette businesses to scale up

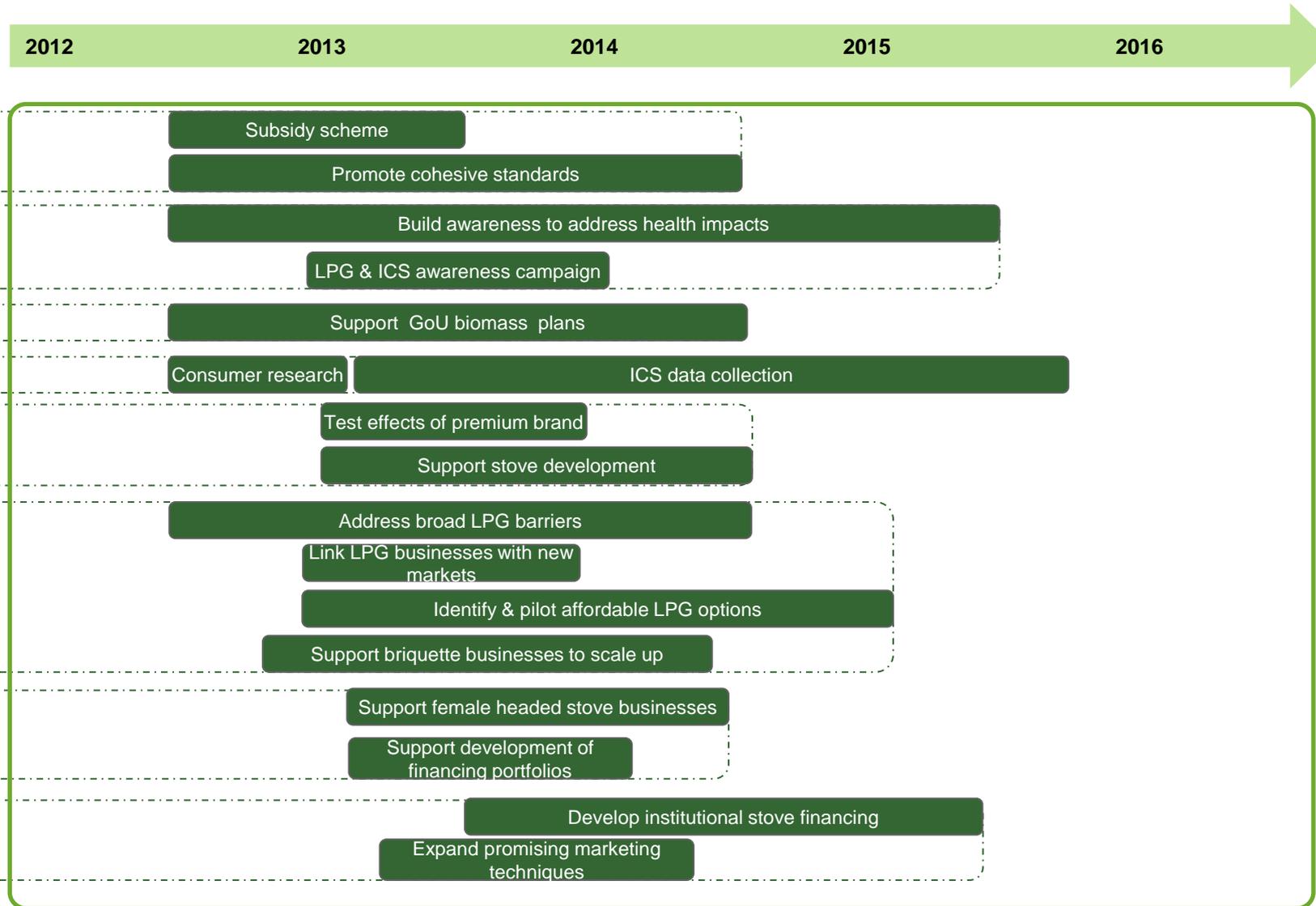
14. Provide support to female headed stove businesses
15. Educate & support development of financing portfolios for producers & distributors
16. Develop institutional stove financing
17. Support the expansion of promising stove marketing techniques

Key

-  Cookstove Value Chain Component
-  Enabling Environment Framework Component



Intervention Roadmap



Executive Summary

Situation

Intervention Options by Customer Segment

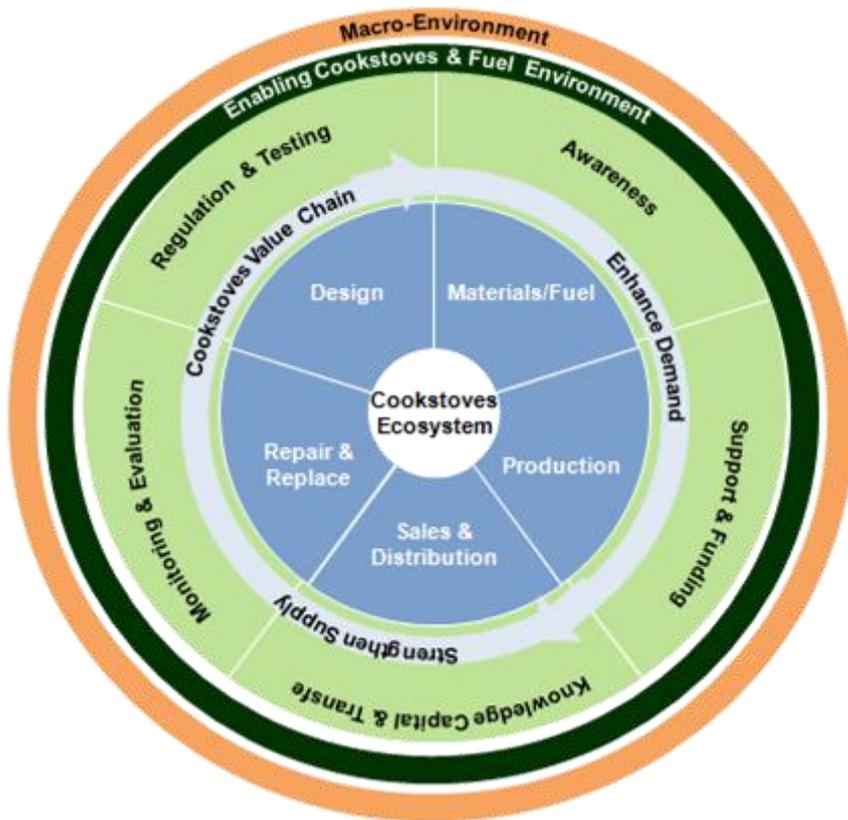
Intervention Options Roadmap

Conclusion

Appendix

Conclusion

The Ugandan market has potential to increase ICS adoption through consumer awareness, supporting producers and the government. There are opportunities to switch to clean fuels to reduce the burden on forests.



Macro Environment

- 3.8 million households cook on open fires in an enclosed space
- Nearly 1m additional households are exposed to carbon monoxide from traditional charcoal stoves
- 91% of the population uses biomass to cook

Enabling Environment

- An absence of regulation and access to testing is contributing to poor stove quality
- There are gaps in consumer research and opportunities to increase knowledge about ICS adoption

Cookstoves Value Chain

- There is significant pressure being placed on biomass and costs are rising
- LPG, briquettes and more efficient cooking with biomass are all options to explore
- Businesses across the sector need support in their operations, with a particular focus on women headed organisations

Executive Summary

Situation

Intervention Options by Customer Segment

Intervention Options Roadmap

Conclusion

Appendix

Glossary of Terms

Below is a list of commonly used acronyms used throughout the report and presentation:

BEETA	Biomass Energy Efficient Technology Association	M&E	Monitoring and Evaluation
CIRCODU	Centre for Integrated Research & Community Dev.	MEMD	Ministry of Energy and Mineral Development
CREEC	Centre for Research in Energy and Energy Conservation	MFI	Microfinance Institution
ERT	Energy for Rural Transformation Project	MoE	Ministry of Energy
FINCA	Foundation for International Community Assistance	NGO	Non-Governmental Organization
GIZ	Gesellschaft für Internationale Zusammenarbeit	pa	Per annum
GoU	Government of Uganda	PoA	Program of Activities
GVEP	Global Village Energy Partnership	PSFU	Private Sector Foundation Uganda
HHs	Household(s)	REP	Renewable Energy Policy
IAP	Indoor Air Pollution	REEEP	Renewable Energy and Energy Efficiency Programme
ICS	Improved Cookstove	SACCO	Savings and Credit Cooperative
IDP	Internally displaced person	SME	Small to Medium Sized Enterprise
ILF	International Lifeline Fund	UBOS	Ugandan Bureau of Statistics
INGO	International Non-Governmental Organization	UCB	Uganda Carbon Bureau
JEEP	Join Energy Environment Projects	UNBS	Uganda National Bureau of Standards
KCJ	Kenyan Ceramic Jiko		
KEBS	Kenyan Bureau of Standards		
LPG	Liquid Petroleum Gas		