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GVEP
International



Global Alliance for Clean Cookstoves
Tanzania 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.

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Project Approach and Background

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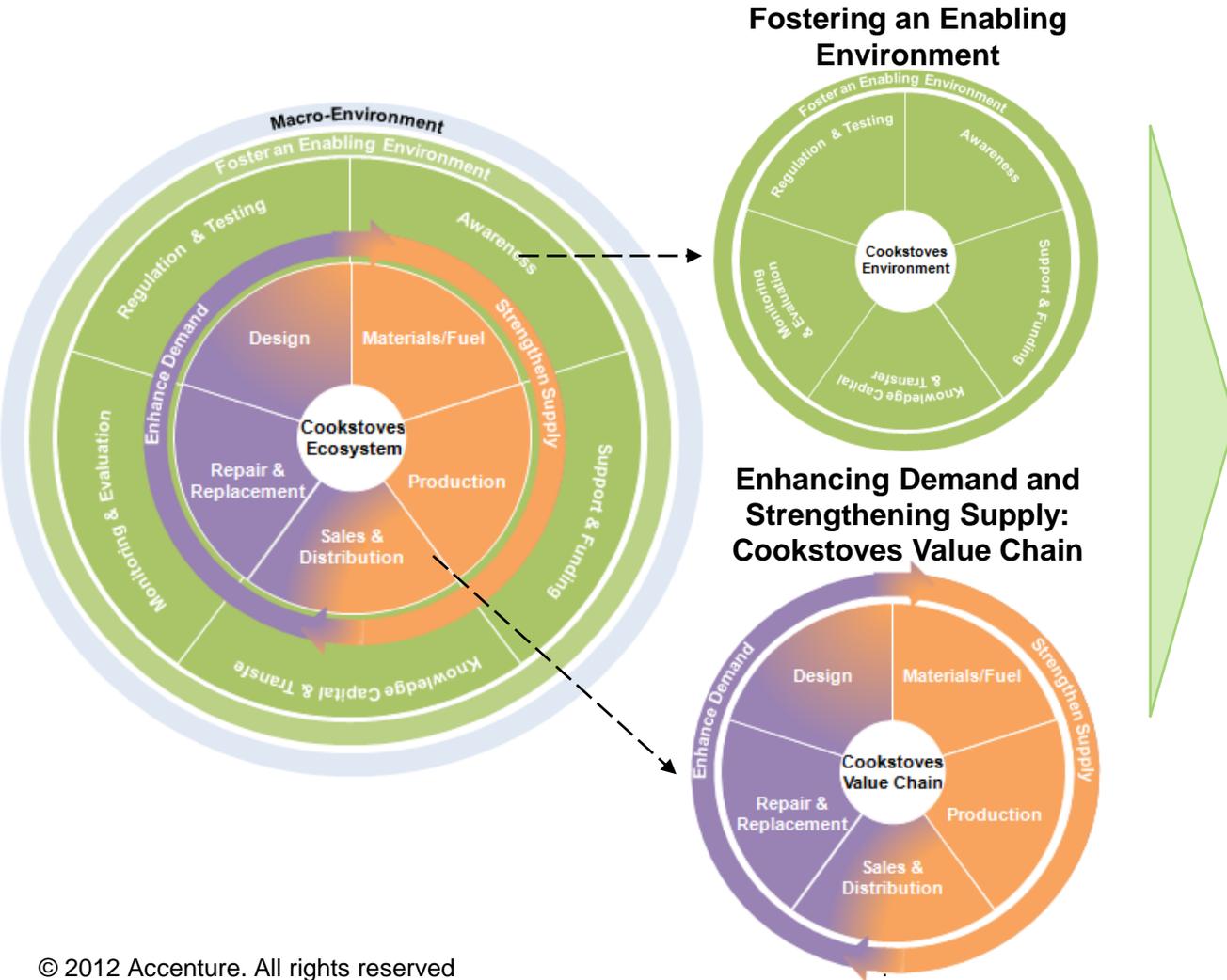
Roadmap

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Executive Summary

As a result of the Tanzania cookstove market assessment, 7 intervention options have been identified through the Enabling Environment Framework and 10 intervention options identified through the Cookstoves Value Chain.



Fostering an Enabling Environment Intervention Options

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

Enhancing Demand and Strengthening Supply Intervention Options

1. Materials/Fuel
2. Production
3. Sales & Distribution

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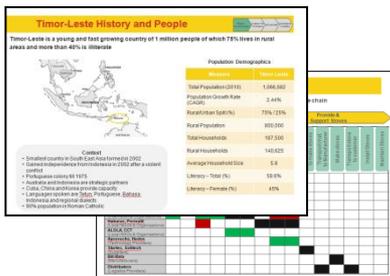
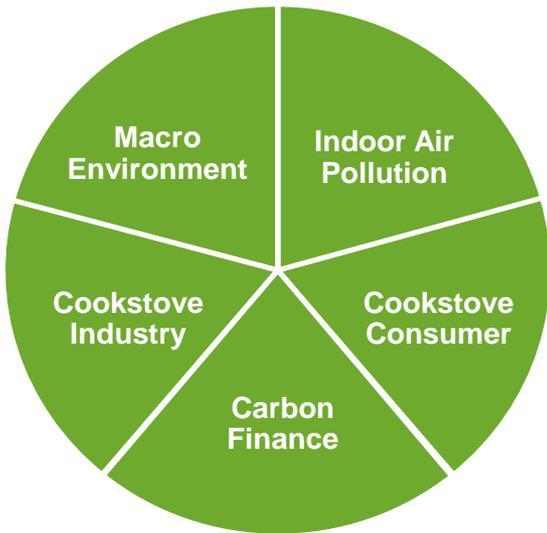
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Project Approach

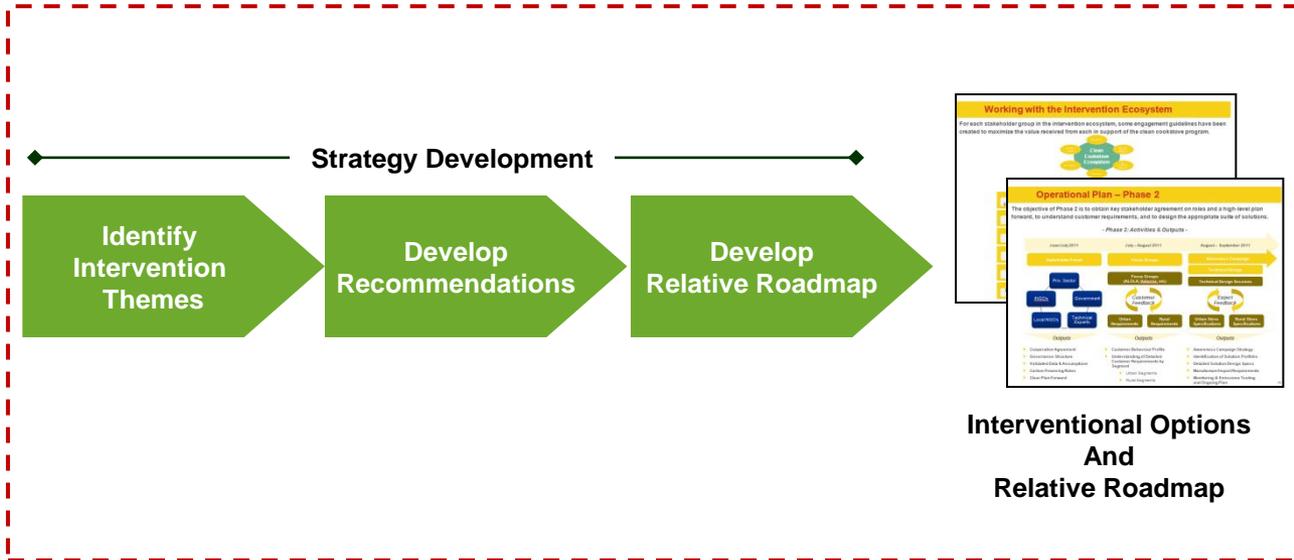
A structured approach first assessed the market for a cookstove industry and then used the sector mapping output to develop the intervention options and Relative Roadmap.

← Sector Mapping →



Sector Map

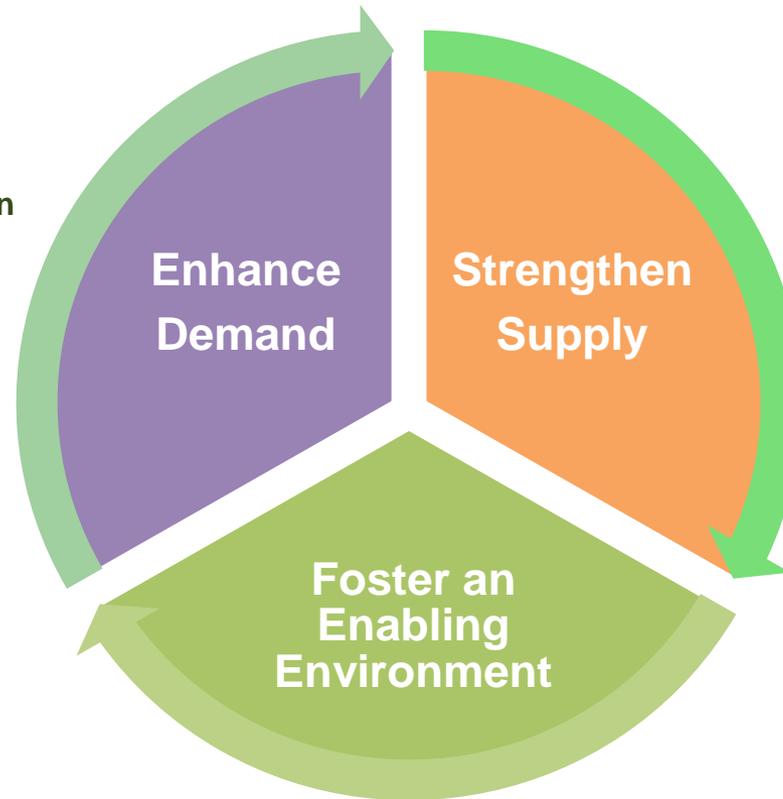
Focus of This Deliverable



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

Project Approach and Background

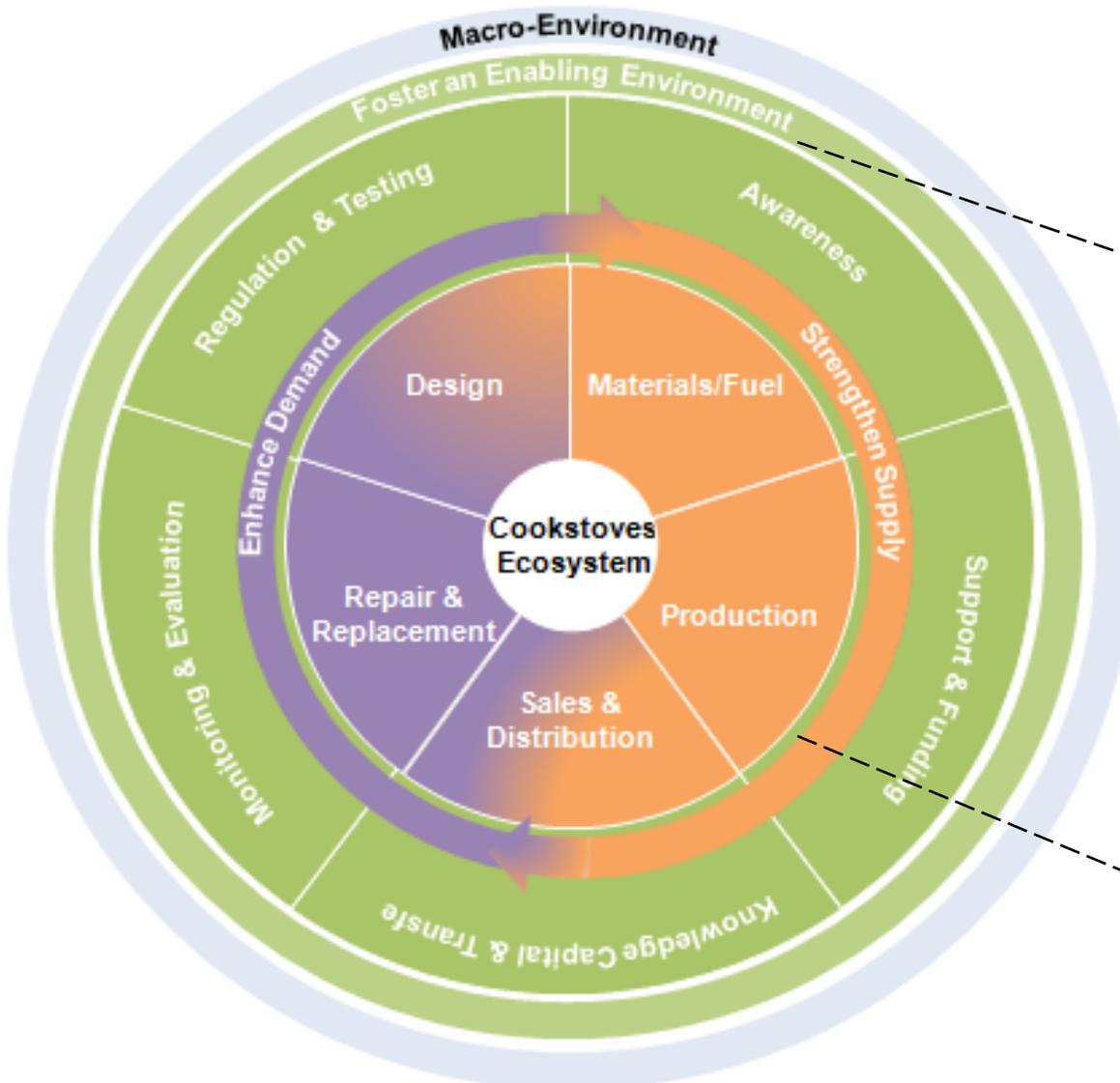
- Understand and motivate the user as a customer
- Reach the last mile
- Finance the purchase of clean cookstoves and fuels
- Develop better cookstove technologies and a broader menu of options



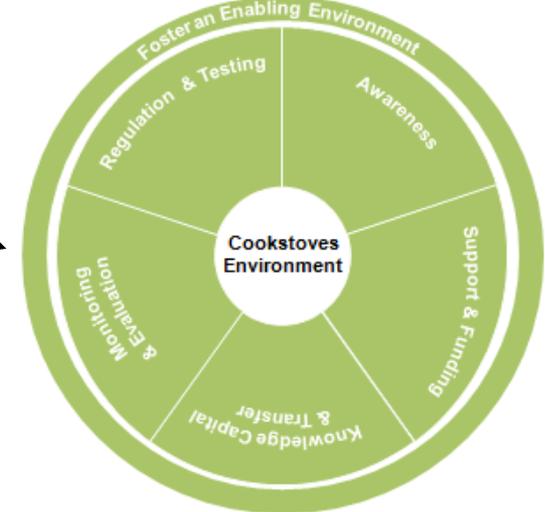
- Finance clean cookstoves and fuels at scale
- Access carbon finance
- Build an inclusive value chain for clean cookstoves and fuels
- Gather better market intelligence
- Ensure access for vulnerable populations (humanitarian)

- 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

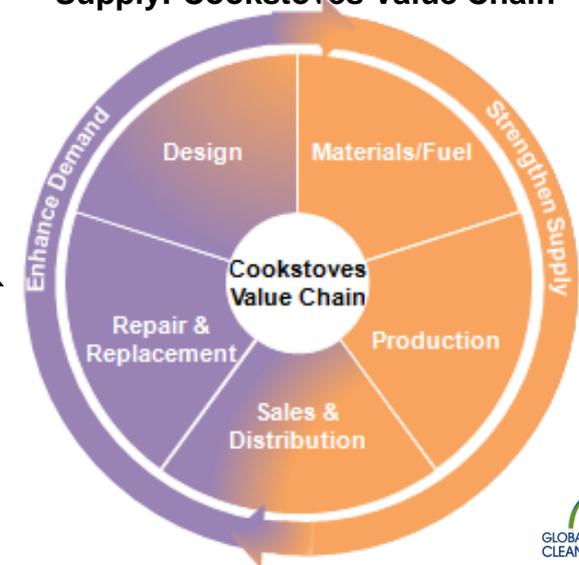
The Interventions are analyzed according to their impact to the three-pronged strategy



Fostering an Enabling Environment



Enhancing Demand and Strengthening Supply: Cookstoves Value Chain



Macro-Environment: Not in Scope for Intervention Options

- Tanzania is a Less Developed Country which has made some progress in reducing poverty, though large inequalities exist. The country is politically stable and has gas reserves in the south.
- In 2007 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 long term health risks from IAP amongst the general population is virtually non-existent, though government officials and NGOs have recently become aware of the implications of existing cooking practices.
- There is increasing pressure on natural resources and significant increase in the price of domestic fuel which could open up new markets for energy efficient stoves.
- Cookstove production is done mainly in the informal sector around urban centers and products are often substandard. Pockets of production exist around the country and sales tend to be localized.
- A few producers of quality stoves exist in the market but sales have been limited due to lack of demand and reluctance by consumers to pay a higher price. Where demand does exist, mechanisms to link the market are missing.
- Several NGO and parastatal organisations with experience in the cookstove sector exist, but previous initiatives have lacked commercial success.
- Distributors of imported stoves have entered the market with mixed results. Many distributors find it a resource intensive activity with low margins made.
- Several carbon projects are in the pipeline but registration is a slow and bureaucratic process.

Implications for Intervention Options

- The government is aware of the issues around biomass use. The EU is funding an updated biomass strategy (led by Camco). Opportunities for coordinated action at a national level exist.
- There is some technical knowledge and experience in the country and institutions exist 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. Nevertheless 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 less than 1 million households. This leaves a large number of households unlikely to be influenced through market mechanisms – mainly in rural areas.
- Supply side constraints, such as lack of working capital, need to be addressed to increase the supply of competitively priced, high quality stoves in the market.
- Carbon finance needs to be unblocked as a 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 Case for Action

The Tanzania cookstove market is fragmented and penetration rates appear low across several segments. However, there is renewed momentum within the sector that should be capitalized on.

- The Case for Action -

What's Happening?

The market is extremely fragmented and operates on a small scale, informal basis. No one has reached scale.

The use of biomass is huge at 96%¹ while the burden of IAP is also significant, with an estimated 18,900² deaths every year.

Only an estimated 400K HHs own an ICS, a penetration rate of 47–68%³ for urban charcoal segments with practically no sustained presence in rural areas.

So What?

Numerous stove programs have operated since the 1980s but these were typically reliant on donor funding & had particularly poor uptake in rural areas.

In certain urban areas & places with localised deforestation, biomass prices are increasing rapidly, creating a stronger economic case around stove usage.

Why Now?

Following a recent SNV study, a cookstove taskforce has been set up to coalesce the industry and drive the sector forward. There is an opportunity to take advantage of this renewed momentum.

There are signs of new, promising companies entering the market so these should be nurtured to help support their growth.

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Fostering an Enabling Environment

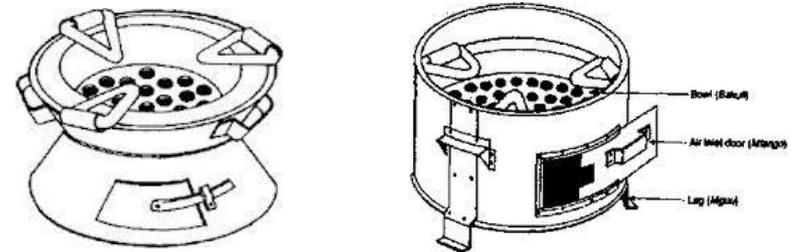
Background on the sector

As in much of East Africa, the improved stove sector in Tanzania started in the 1980s with the development of the Morogoro wood and charcoal stoves. Since then, many stove types, both consumer and institutional, have been introduced by a variety of NGOs, parastatal organizations and more recently, private sector importers. The local designs were often based on models from other countries, such as the successful Kenya Ceramic Jiko (KCJ). When this design was introduced by the government, Tanzanian Commission for Science and Technology (COSTECH) and Tanzania Traditional Energy Development and Environment Organization (TaTEDO) modified the design to create the KUUTE & Jiko Bora stoves. Shortly afterwards, TaTEDO took on responsibility for the promotion of the technology.

The market today

The market today is very fragmented and dominated by the informal sector. There are numerous stove designs in the market and several prominent players operating in the sector. However, no one appears to have successfully commercialized at scale yet. Following the end of the Program for Biomass Energy Conservation program (ProBEC), the Rural Energy Agency (REA) has taken over

all activities in an effort to sustain its impact. However, it is reported that many artisans stopped working when the program finished and the indirect subsidies ended. That said, numerous other players are active and supplying a broad choice of stoves. The quality of these varies and some are perceived as low performing products¹. Part of the challenge for these producers is the low consumer awareness of ICS² and willingness to pay for more expensive stoves in urban markets and almost any stove in many rural areas.



In terms of the market knowledge, research on the Tanzanian market is much more sporadic and limited than its neighbors in East Africa. The Shell Foundation Breathing Space research is a valuable starting point but a much greater analysis of the market is needed to help tailor interventions.

Fostering an Enabling Environment

In addition to the numerous NGO and development organizations that have played a role in the sector, several government and parastatal organisations have also contributed. The list of initiatives is long but there hasn't appeared to be a great deal of coordination in these activities.

Part of the reason for this is that when it comes to biomass usage, four government bodies are responsible & involved; Ministry of Natural Resources and Tourism (MNRT), the Ministry of Energy and Minerals (MEM) Division of Environment within the Vice President's Office and Prime Minister's Office – Regional Administration and Local Government. This level of representation presents both an opportunity and a challenge, in that engagement & experience is high, yet ownership is divided.

Outside of these official government department, there are several other parastatal organizations that have been involved in the development and dissemination of stoves. Some of the most prominent of these are the Rural Energy Agency (REA), COSTECH and the Tanzanian Industrial Development and Research Organization (TIRDO). The REA is influential due to its leading role on energy initiatives across the country and close link to the Rural

Energy Fund, while the latter two are focus on ICS R&D.

Finally, the Tanzania Bureau of Standards (TBS) is the authority on the formulation & enforcement of standards in the country. TBS has just recently become involved in the sector as it is now working closely with TaTEDO and the University of Dar es Salaam to develop a quality standard for the Jiko Bora (KCJ) and Okoa stoves.

A recent study by SNV and Roundtable Africa has generated a great deal of renewed interest in the sector. SNV and the Tanzania Renewable Energy Association (TAREA) have already coalesced a broad range of stakeholders and formed a taskforce, led by TAREA, to drive the sector forward. Following an initial delay, the taskforce has now secured funding from SNV to commission three reports to improve their understanding of the market and help inform their planned interventions. These three studies will look at the products in the market, consumer behavior and the policy framework in which the sector operates. These 3 assessments are due to be complete by September when the taskforce's planning will commence.

Fostering an Enabling Environment

Building the market for the future

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

For regulation & testing, the current development of stove standards should be encouraged. However, it is important that these standards go beyond the two stoves proposed and cover other designs such as the institutional models. This will ensure a greater impact in the market and help provide a benchmark for all producers to aspire to. It's also proposed that the upcoming work of the taskforce should be supported. In particular, the policy review will provide the ideal platform to discuss opportunities for the sector and then work with the government to align these with their upcoming 2030 biomass strategy. On the testing front, the taskforce has already moved forward with plans to baseline the sector but there is a clear need to support the capacity building of the academic institutions that will carry this out. Providing funding for equipment and partnering these with other leading institutions will allow them to develop quickly throughout this process.

There are two other important areas that it's recommended to work with the taskforce on; broader consumer

awareness and securing a sustainable source of finance. The latter in particular will be vital as they look to move the sector forward, yet also away from the fragility of programmatic funding cycles. For the former, once coordinated interventions have been developed, there is an undeniable need for increased consumer awareness campaigns. Large sections of the country appear completely unaware of the benefits of ICS so coordinated action can help address this and stimulate greater consumer acceptance.

As mentioned previously, there are some prominent gaps in the market intelligence around the sector that are important to address. The taskforce is already looking to assess three of those and that program should be supported. It would be useful to compare the results of these studies to others in the region, therefore it's recommended that a similar approach is adopted.

Fostering an Enabling Environment

Beyond those assessments, there is also a need to improve understanding of gender issues in the country. A recent ProBEC study reported that the achievement of female producers who participated in their program, was limited. This is cause for concern as female participation in the sector is an important way of increasing adoption rates, ensuring that products are fit for purpose and providing economic opportunities to a group where these can commonly be lacking. It's proposed that a feasibility study is commissioned in partnership with the National Gender and Sustainable Energy Network (NGSEN) to identify any issues that are preventing women from taking a larger role in the sector. Based on this, gender specific interventions may be developed and piloting with the expert support of this network.

Foster an Enabling Environment

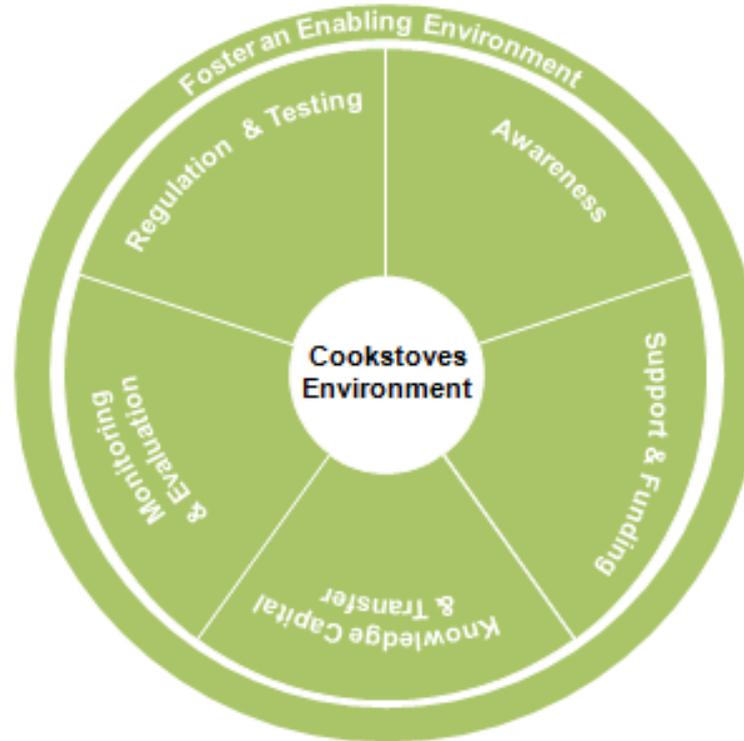
Through gaps identified in the Enabling Environment Framework, Intervention options will focus on Regulation & Testing, Awareness, Support & Funding and Knowledge Capital & Transfer.

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 & Testing (1/2)

The lack of stove standards and integrated policy has contributed to the low penetration of high quality stoves in the market. New standards and closer collaboration with the government could help address this.

Situation

Barring a few higher end producers, the quality of stoves in the market is commonly perceived as in need of improvement. There are no standards currently in place to address this, however, TaTEDO & others are working with TBS to develop some for the Jiko Bora and Okoa stoves. There is no integrated national policy addressing cookstoves, although the government is developing a biomass strategy in partnership with GIZ & EUEI PDF.

Rationale

- 39% of school chefs stated durability related issues when asked for the main disadvantage of ProBEC stoves¹
- Although no solid evidence exists, the quality of stoves produced in the informal, artisanal sector is widely perceived to be questionable

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
1. Develop standards in line with global movements	TBS, Academia, TeTEDO TAREA, Alliance	Medium	Small	2yrs
2. Contribute to upcoming policy review & work with Govt. to align the sector with their biomass strategy	Taskforce, NGOs, TAREA	Medium	Small	3 - 12mths

Regulation & Testing (2/2)

Academic institutions currently lack the full range of stove testing capabilities. The upcoming baseline assessment presents an ideal opportunity to help build these institutions.

Situation

The upcoming baseline assessment of the stove sector will require the involvement of leading academic & research institutes in Tanzania such as the University of Dar es Salaam. These institutes appear to have the knowledge but lack the necessary equipment and certain expertise to holistically test stoves across all performance criteria.

Rationale

- Existing facilities do not appear to have the necessary capabilities to test stoves in the market

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
3. Support capacity building of academic institutions	Academic Institutes, Taskforce, TBS, Alliance	Medium	Medium	1yr

Regulation & Testing

Recognized stove standards, improved testing capabilities and closer alignment with the government can all help promote and enforce the importance of quality in the sector.

- Intervention Options-

- Actions -

- Outcomes-

1. Develop standards in line with global movements

- Support TaTEDO, TBS and the University of Dar es Salaam in developing stove standards for the entire sector in line with global standards
- Investigate options for enforcement of these standards across the sector

- Clear stove standards for Tanzania that the larger producers can aspire to and eventually adhere with

2. Contribute to upcoming policy review & work with govt. to align the sector with their biomass strategy

- Support the taskforce in its upcoming policy review
- Work with the government, as with other East African countries, to align any future interventions with their biomass vision & strategy

- List of policy opportunities to help support the sector and increase ICS adoption
- Closer alignment between planned government initiatives and any market interventions

3. Support capacity building of academic institutions

- Provide the funding for equipment and training for the University of Dar es Salaam
- Partner with other regional testing centers in Nairobi and Kampala to speed up the capacity building process

- Established testing facilities that can test both the efficiency and emissions of ICS

Although reliable research is limited, consumer awareness appears to be very low based on anecdotal evidence. A more coordinated, sector wide approach to promotions and awareness campaigns could help increase this.

Situation

Recent work by SNV & Roundtable Africa has generated renewed interest in the sector. The new taskforce, involving most major players, has provided a forum for driving the sector forward. On the consumer side, awareness is still extremely limited in many areas despite the compelling economic benefits for certain segments.

Rationale

- Less than 6% of consumers from every segment have shown an intention to purchase a higher end stove (\$15 - \$30)¹.
- Av. penetration rates for charcoal users are ~50% despite a strong economic case: e.g., ProBEC charcoal stoves can save users 50% on their fuel expenditure²

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
4. Work with the taskforce to coordinate promotional activities & education campaigns to raise consumer awareness of ICS	Private Sector, NGOs, Alliance	Small	Medium	1 - 2yrs

Greater coordination between different stove players can help increase awareness of ICS and prepare the ground for stove specific sales & marketing.

- Intervention Options-

4. Work with the taskforce to coordinate promotional activities & education campaigns to raise consumer awareness of ICS

- Actions -

- Work with the Taskforce to initially coordinate promotional activities across the sector to target certain high potential segments
- Develop longer term plans to run an awareness campaign with all major players involved
- Pilot awareness messaging and measure the impact on demand

- Outcomes-

- More effective marketing spend from stove organisations
- Evidence that shows which messaging is most effective amongst consumers

Support & Funding

The sector remains dependant on program funding and requires support to access sustainable sources of finance. As the newly formed taskforce builds its plan to develop the sector, global expertise should help guide the process.

Situation

The stove sector has historically been donor driven in Tanzania with limited success in commercializing the many smaller stove businesses. Since ProBEC finished, the sector’s funding has been unpredictable. The stove taskforce has already generated great interest and ambition for scaling up the sector but it lacks some of the necessary expertise and funding to implement their ideas.

Rationale

- The taskforce struggled to secure funding until SNV filled the gap, which has already caused a 12 month delay in their program
- Taskforce members have shown a desire for expert global advice

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
5. Contribute to the taskforce’s planning & help increase its access to sustainable sources of funding	Taskforce, Gov, Alliance	Medium	Small	12 - 18mths

Support & Funding

The taskforce will need substantial yet targeted funding over the coming years to help stimulate consumer demand and increase penetration rates across the country.

- Intervention Options-

5. Contribute to the taskforce's planning & help increase its access to sustainable sources of funding

- Actions -

- Once the initial studies are complete, work with the Taskforce members to develop relevant interventions for the sector.
- Support the taskforce in securing resources for these interventions
- Promote sustainable models such as carbon finance or market based approaches to ensure that the sector's long term resilience improves

- Outcomes-

- Agreed interventions for the sector modelled around the central tenet of sustainability
- Increased resources into the sector for these market building interventions

Knowledge Capital & Transfer

Accurate research on the Tanzanian stove sector is very limited although the sector taskforce is planning to address this during the summer of 2012.

Situation

Accurate data around stove demand, consumer needs & ICS usage is extremely limited in Tanzania. Studies commissioned by Shell Foundation & ProBEC provide useful insight but large gaps remain. The recently appointed sector taskforce plans to commission 3 studies around stoves, consumers and policy to inform their planning for future interventions. There is an outstanding need to understand the role of gender within the sector.

Rationale

- Data around stove demand, local fuel prices & regional variation is extremely limited
- A recent ProBEC study reported that the achievement of female producers who participated in their program, was limited. This should be investigated.

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
6. Help structure upcoming studies to align with the region	Taskforce, Alliance	Medium	Small	6 - 12mths
7. Work with NGSEN to investigate the role of women in the sector	NGSEN, Alliance	High	Medium	1yr

Knowledge Capital & Transfer

The upcoming studies present an excellent opportunity to build market intelligence across the Tanzanian stove sector.

- Intervention Options-

6. Help structure upcoming studies to align with the region

7. Work with NGSSEN to investigate the role of women in the sector

- Actions -

- Work with the Taskforce to align upcoming studies with similar ones in the region
- Provide expert advise in helping to analyse the studies and draw out the necessary interventions

- Work with NGSSEN to commission a study into the role of women in the sector
- Help identify the issues and opportunities facing women in the cookstove sector and more broadly in the country
- Develop pilot programs to try and address any issues raised

- Outcomes-

- Studies that are targeted and useful for informing future interventions
- Results that allow for easy comparison of market intelligence, policy and consumer attitudes across the East Africa region

- A greater understanding of the role of women in the sector and the reasoning behind the recent ProBEC findings
- Successful pilot programs to demonstrate the significant contribution women can make across the value chain

Stove designs in the market

There is a diverse range of stoves in the market although it's difficult to determine the penetration rate of each. There is no comprehensive review of stoves in the market but from what is known, there are various improved charcoal & wood stoves present. These include the Kuute, Jiko Bora, Envirofit, portable rocket stove, built in rocket stove, the fixed mud stoves, and an artisan made clay stove. Many of these are only produced in the hundreds per year, although one large producer in Morogoro is said to produce 2,000/month¹. However, this is certainly the exception as most production appears to happen on a small scale with manual tools¹.

Materials/Fuels

For most producers, access to raw materials does not appear to be an issue. The rising cost of certain raw materials such as steel, is a greater concern for many businesses. In relation to fuels, charcoal & wood are by far the most popular in urban areas while wood is dominant in rural areas, where it tends to be collected. For modern fuels, there is promise for LPG but access across the country is extremely low at only 3%². Despite this low figure, LPG is seen as appealing and seemingly affordable to urban charcoal users, in part because charcoal prices have risen considerably over the past decade³. Meanwhile,

access to modern fuels is practically non-existent in many rural areas and due to the vast size of the country, distribution remains a challenge.



Production

Almost all large scale production appears to occur in Dar Es Salaam or Morogoro, especially for clay liner production. Although there are also some smaller production hubs in the Arusha and Kilimanjaro regions as well as near Mwanza and Dodoma. This limited concentration of liner producers in such a large country implies that distribution to the other regions is likely to be challenging and expensive. It also suggests that the all important links between liner producers and metal workers are weakened by those potentially long distances. Moreover, the quality of liner production in those areas is reportedly of a poor standard⁴. As this is based on anecdotal evidence, it's difficult to say whether this is due to low technical expertise, lack of equipment or lack of demand for the higher quality products.

Beyond the liner manufacturers, stove production mainly occurs on a small scale as mentioned previously. Of those businesses, the urban charcoal producers appear to have the largest production levels and reach. Despite the abundance of designs and players promoting stoves in the country, the level of commercialization has been limited so far. This would need to be addressed to ensure the long term sustainability of the sector beyond any programmatic funding.

Sales & Distribution

When considering sales & distribution in Tanzania, the urban and rural markets should be addressed separately as they remain so distinct. In urban areas, production levels are relatively high, especially around Dar es Salaam and the northern regions. The price of charcoal, the most popular fuel, has risen significantly over the past decade¹ making the fuel saving benefits of ICS much more appealing for consumers. This nascent demand shows promise for the sector although price is still a concern, with the majority of people across all income groups showing no intent to make any large purchase².

In rural areas, the potential market can initially be split into two simplified groups based on the level of local

deforestation. Wood is the dominant fuel and is collected by 78% of users³, so convincing them to purchase improved stoves is typically a much harder proposition. That said, there are reports of wood becoming increasingly costly in areas of high local deforestation such as Mwanza, Coastal and central regions⁴. These conditions increase the possibility of a market based approach being successful and so merit further investigation.

For the other rural areas, where communities are typically much lower income and wood is collected for free, a different approach must be adopted to increase the use of ICS. Previous programs have attempted to target certain rural communities with fixed wood stoves made from locally available clay soil. Unfortunately, many of the artisans trained to build these stoves stopped once the programs ended and subsidies were removed⁵. This underlines why typical market based approaches may not be immediately effective when addressing many rural communities such as these.

Carbon finance is still to take root in Tanzania but it shows promise with many projects in the pipeline. Several players already active in other East African countries such as CO2Balance, The Uganda Carbon Bureau and Envirofit intend to grow their presence in the market. This funding presents an important opportunity for producers & distributors to access funds for stimulating further demand in the market and potentially reaching remote, rural communities. However, one concern around the carbon market in Tanzania is the length of time it has taken candidates to get validated and registered. This delay is potentially unnecessary and slowing down the development of the sector.

Finally, looking at the market for institutional stoves, the penetration rate & success of businesses in this area appears limited. The exact size of the market is currently unclear but judging the number of larger institutions alone (schools & hospitals) it ranks at least 4,200. However, even programs with a concerted push and reach such as ProBEC have struggled to reach their targets¹. One issue that has been identified is the high upfront cost, which can range between \$1200 - \$1900. Addressing this will be key to the growth of this area.

Strengthening Supply & Enhancing Demand

The intervention options presented in this paper focus on three areas initially; Materials/Fuels, Production and Sales & Distribution.

The increasing price of charcoal presents an opportunity to push alternative fuels amongst certain consumer segments. For some, briquettes will offer a viable and affordable substitute. There is growing momentum in this area following a recent African Briquette Network workshop in Arusha. East African Briquettes Ltd and Appropriate Rural Technology Institute Tanzania (ARTI) are currently attempting to set up SME briquette making businesses across the country. It's proposed that this effort should be supported to increase its likelihood of success. Historically, many briquette businesses have focused on commercial customers due to the inherent challenges of selling this new, unfamiliar fuel to consumers. Marketing, distribution and business development support can help these promising young businesses overcome this barrier and successfully spread the reach of briquettes in certain segments.

On more modern fuels, the potential for increasing the uptake of LPG amongst urban charcoal users is clear. Research has shown that 30% of those users actually

have the same income profile as existing LPG users¹. This suggests that awareness is the issue and concerted marketing pilots can help overcome this. Finally, with such a fragmented producer base, there is again an opportunity to encourage the formation of groups for purchasing raw materials. This will enable them to initially cut raw material costs which will reduce the barrier to using higher quality clays and metals in their stoves. Should these groups work effectively and show promise, there is the longer term option of linking them to new markets and carbon developers to stimulate demand. This will, of course, depend on the success of earlier efforts to encourage group buying.

On a production level, one immediate opportunity for improvement lies amongst the clay liner producers. Improving the quality of their liners will help feed the entire market with higher quality components. As mentioned previously, it's not clear what the root cause of the lower quality liners is, so a feasibility study would have to be conducted to assess then address this. It's also proposed that these producers, alongside other stove businesses, are given greater access to finance to help fund these improvements. Rocket stove manufacturers appear to be particularly affected by this due to the higher cost of the stove.

Around sales & distribution, three themes of interventions are proposed; increasing demand, improving access to finance and then reaching vulnerable groups. On the first area, there is a clear need to improve producers access to new markets such as those present within the agriculture sector. The issue in Tanzania, more so than elsewhere, appears to be one of demand and not supply. This is particularly relevant given the costs and perceived challenge associated with reaching new markets in such a large, dispersed country. Many of the larger, vertically integrated stove producers such as the Sustainable Energy Enterprise Company (SEECO) should be given specific support to expand their networks and stimulate demand. This intervention will be crucial as it's unlikely that the entire market can grow rapidly purely on the back of artisanal improvements and development.

For increasing demand, it's also proposed that support is given to those active in the institutional stove sector. Involving the Microfinance Institutions (MFIs) and Savings and Credit Cooperatives (SACCOs) in a push to provide financing to certain institutions could help to increase awareness and reduce the eventual barrier to purchase. Any effort in this space would have to be closely coordinated with parastatal organisations and the relevant

government representatives such as the TBS.

Improving access to finance is another vital component to strengthening this section of the value chain. First & foremost, making credit available to distributors is important to allow them to access new markets and fund any large initial orders. Beyond this, improving the links and access to carbon finance is highly recommended. Right now, the large pipeline shows the promise of this source of finance so it's important to link the right producers with the relevant actors in this sector. It is also recommended that options for streamlining the CDM process are investigated. The delays appear longer than other countries in the region, which is limiting the sector's ability to access this important source of funding.

Finally, it's proposed that pilots programs are developed to address the hard to reach rural communities. As mentioned previously, a market based approach may not work amongst certain rural groups so alternative approaches must be investigated. Looking to successful programs in Kenya by CO2Balance and GIZ would be an ideal starting point.

Enhance Demand and Strengthen Supply: Cookstoves Value Chain

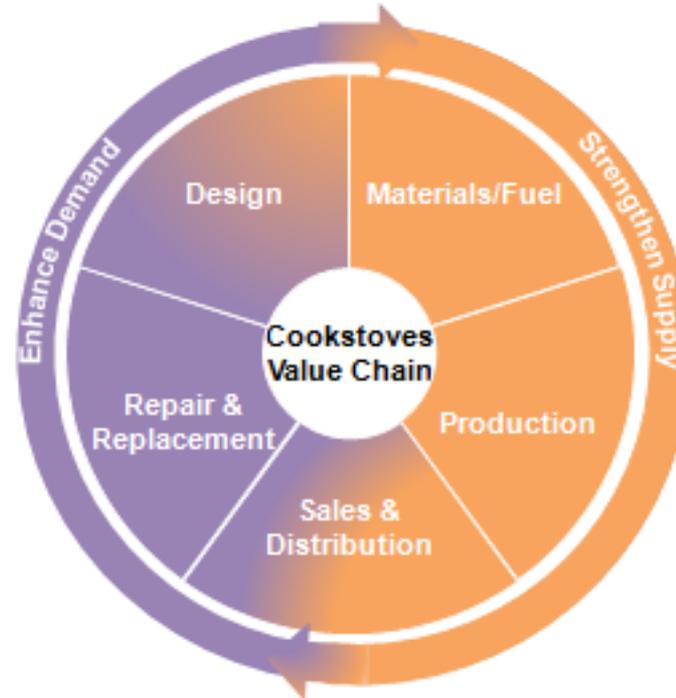
Through gaps identified in the Cookstoves Value Chain, intervention options will focus on **Materials/Fuel, Production and Sales & Distribution.**

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

Materials/Fuels (1/2)

Wood & charcoal prices are increasing rapidly in certain areas making alternative fuels a genuine possibility for many. Improved promotion of these fuels could encourage greater numbers to switch.

Situation

Biomass is the dominant fuel but prices are increasing for both charcoal in urban areas and fuelwood in areas suffering from local deforestation. Modern fuel use is still relatively low (LPG is often perceived as dangerous) despite kerosene now priced comparable to charcoal in urban areas. The potential for affordable, alternative fuels is clear from recent consumer research studies.

Rationale

- Between 2003 & 2008, the price of a charcoal bag increased by 500% in Dar-es-Salaam¹.
- 30% of charcoal users have the same income profile as LPG users².
- 20% of urban charcoal users want to switch to modern fuels³

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
8. Support the expansion of briquette businesses	East African Briquettes, Private Sector, NGOs	Low	Medium	2 - 3yrs
9. Pilot projects to increase the uptake of LPG in urban charcoal segments	Gov, Private Sector, Alliance	Medium	Medium	1 - 2yrs

Ref: 1 – Sector Mapping, 2012

2 – SNV Desk Study, 2011

3 – Shell Foundation, Breathing Space, 2007

High raw material costs pressure small producers to opt for lower quality clay & steel, undermining the final product quality. Forming groups can help them reduce costs & refocus on quality.

Situation

The artisanal producer base is very fragmented so the burden of raw material costs is reportedly high. The consumer demand for low priced stoves pressures producers to choose poorer quality raw materials to reduce costs. This is in part because most artisans operate individually, reducing their bargaining power.

Rationale

- Only 2% of the rural population has access to SACCOs, meaning access to credit is challenging for small, informal businesses¹
- Anecdotal evidence suggests the raw material costs are a serious burden for small suppliers²

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
10. Form artisanal groups to help improve their buying power of raw materials	Private Sector, TAREA, Alliance	Small	Medium	1 - 2yrs

With the rising cost of charcoal, briquettes and LPG can offer an appealing alternative amongst the urban charcoal market. Meanwhile, group buying can help producers refocus on product quality.

- Intervention Options-

- Actions -

- Outcomes-

8. Support the expansion of briquette businesses

- Assess the needs of the emerging briquette businesses with East African Briquettes & ARTI Tanzania
- Promote their use across the taskforce and within government
- Provide marketing and business development support to the SME businesses

- Increasing awareness around the use and potential of briquettes as an alternative fuel
- Increased usage of briquettes in target regions

9. Pilot projects to increase the uptake of LPG in urban charcoal segments

- Work with LPG industry and trade associations to identify the potential barriers to greater adoption
- Fund pilots and/or marketing campaigns targeted at the urban charcoal segment
- Investigate whether innovative models from across the region, e.g. Pima Gas, could be introduced in Tanzania

- Body of research to support greater promotion of LPG as an alternative fuel in urban areas
- Increased use of LPG in target segment

10. Form artisanal groups to help improve their buying power of raw materials

- Work with TaTEDO and other organisations close to the artisanal base to form cooperatives
- Develop program to train them on group buying
- Investigate other potential shared activities such as accessing credit, transport, entering new markets, etc.

- Greater % of producers operating in cooperatives
- Reduced raw material costs for those in groups
- Improved access to other benefits such as credit & new markets due to group membership

Production (1/2)

The quality of liners in the market could be improved further. Targeted production support to identify and resolve the cause will help push up the durability & efficiency of lined stoves.

Situation

Production in Tanzania is small scale and informal, dominated by local artisans. These producers are scattered across the country and often only focus on liner production or metal work. The liner producers, in particular, appear to be producing components where the durability could be vastly improved.

Rationale

- 26% state that clay liner breakage is the top disadvantage of ICS¹
- Small liner producers in Dar Es Salaam build ~20,000/month, many of which are anecdotally reported to be of poor quality²

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
11. Work with the groups such as the Jiko Bora Cooperative to improve the quality of their liners	Private Sector, Producer Co-Ops, Academic Institutes, TBS, Alliance	High	Medium	1yr

Production (2/2)

Credit facilities are poor and expensive for many producers so this limits their ability to manage working capital. Improved SME finance will help support the day-to-day operations and any expansion into new markets.

Situation

Commercial loans are prohibitively expensive for smaller businesses in Tanzania, with rates >15%. Certain stove manufacturers, such as rocket stove producers, need significant access to working capital to run their businesses effectively. In addition, distributors of stoves need access to the same credit facilities to meet new orders.

Rationale

- Of 94 rocket stove producers trained by ProBEC, only 12 survived largely due to the high working capital requirements¹
- Only 2% of the rural population has access to SACCOs, meaning access to credit is challenging for small, informal businesses²

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
12. Help producers & distributors access various funds and credit groups for working capital	Private Sector, MFIs, SACCOs, Govt.	Medium	High	2 - 3yrs

Improvements in liner production can help drive up quality for the various stoves that use them. Increasing access to affordable finance will support producers looking to enter new markets.

- Intervention Options-

11. Work with the groups such as the Jiko Bora Cooperative to improve the quality of their liners

12. Help producers & distributors access various funds and credit groups for working capital

- Actions -

- Assess whether liner quality is indeed the issue that anecdotal evidence suggests
- Identify large producers or groups where they appear to be struggling with the quality of their products
- Partner technical liner production experts with producers to help improve their processes and ultimately liner performance
- Link with improved access to credit (see below) to support improved production methods.

- Work with MFIs and SACCOs to investigate the feasibility of small loans to promising stove businesses
- Secure these loans to reduce lending risks and increase the appetite of lenders
- Encourage lender to promote these facilities across their entire network

- Outcomes-

- Improved liner quality across a number of producers and the cascade effects of improved stove performance for several popular models

- Increased lending rate from SACCOs and MFIs to stove businesses
- Increases sales at the businesses receiving those loans

Sales & Distribution (1/3)

With low consumer demand outside urban areas, stove businesses often lack the network and ability to grow beyond their local base. Linking them to new markets is crucial to enhancing demand.

Situation

Consumer demand appears lower than neighboring countries and heavily focused on urban areas. Rural demand is perceived as poor due, in part, to the limited economic benefits of ICS for those segments. Distribution networks are not yet fully developed with the majority of producers selling locally due to the high transportation costs of selling further afield.

Rationale

- The market demand is challenging for stove businesses with 52 – 78% of consumers displaying no intent to make a large purchase (\$15-30)¹
- ProBEC failed to reach their 400 institutional stove target for Dec 2009, citing “a lack of stove marketing campaigns outside Dar es Salaam”²

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
13. Link producers & distributors to new markets to help stimulate demand	Private Sector, NGOs, Taskforce, Alliance	Medium	Small	2yrs
14. Create credit facilities for institutional stoves & support increased marketing campaigns	SACCOs, MFIs, Govt, Private Sector, NGOs	Medium	Small	2yrs

Sales & Distribution (2/3)

Carbon finance has not yet had the same impact on Tanzania that it has had in neighboring countries. Streamlining the process and linking developers with producers will help ease access.

Situation

Many carbon finance projects are still in the pipeline and awaiting full validation. Numerous projects and PoAs have been pending since 2007-08 so the process appears slower than others in the region. In the meantime, once new carbon developers enter the market, producers will need support to identify and take advantage of these opportunities.

Rationale

- The validation process for CDM applications is relatively slow, with 8 projects & 11 PoAs still in validation. Many have been in the pipeline for longer than in other East Africa countries.¹

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
15. Investigate options for streamlining the CDM process & improve	DNA, Taskforce, Carbon Dvlpers	Small	Small	1yr – 18mths
16. Improve access to carbon finance	TAREA, Taskforce, NGOs, Private Sector, Carbon Dvlpers	Medium	Small	2yrs

Sales & Distribution (3/3)

With extremely low demand and consumer awareness in rural areas, a market based approach may not work in these communities so alternative options must be considered.

Situation

Previous programs that targeted rural communities such as ProBEC, faced sustainability issues once the funding was pulled back. In many rural communities, fuelwood is collected (and free) so persuading consumers of the benefits of ICS can be time consuming and costly.

Rationale

- ProBEC attempted to target certain rural communities with fixed wood stoves made from locally available clay soil. Unfortunately, many artisans trained to build these stoves stopped once the programs ended & subsidies were removed¹

Intervention Options

	<i>Involved Parties</i>	<i>Likelihood of Success</i>	<i>Budget</i>	<i>Estimated Time</i>
17. Investigate feasibility of co-funding pilots that target hard to reach rural communities	REA, Alliance	Small	High	18mnths - 2yrs

Sales & Distribution (1/2)

Improving access to finance, new markets and carbon finance can help catalyse the market and increase the relatively low consumer demand.

- Intervention Options-

- Actions -

- Outcomes-

13. Link producers & distributors to new markets to help stimulate demand

- Develop a program in partnership with TAREA & the Taskforce to link stove businesses to new markets
- Share examples of marketing successes from other countries such as Kenya, with the promising response to a recent SCODE brand revamp

- Increased sales for the producers, distributors and retailers involved
- Increased use of original marketing across various segments

14. Create credit facilities for institutional stoves & support increased marketing campaigns

- Work with lenders, MFIs & SACCOs if appropriate, to extend credit facilities to institutions interested in purchasing a stove
- Work with the government to promote fuel efficient and healthy stoves in all of their major institutions

- Increased adoption of institutional stoves
- Increased promotion of these stoves through the lenders network

15. Investigate options for streamlining the CDM process

- Work with the Tanzanian DNA to investigate options for streamlining the validation process
- If necessary, provide administrative support to projects stalled in validation for long periods of time

- Increased number of registered and active cookstove carbon projects
- Increased flow of carbon credits into the sector

Sales & Distribution (2/2)

Carbon finance and alternative approaches will be key to addressing the hard to reach, and relatively low income rural communities.

- Intervention Options-

- Actions -

- Outcomes-

16. Improve access to carbon finance

- Work with TAREA to link producers to carbon PoAs and developers
- Provide technical expertise to help producers maintain quality control
- Support with any administrative or M&E issues that they may have

- Increased number of operators in the cookstove value chain active in carbon finance
- Reduced price stoves for segments where a pure market based model is challenging (e.g. rural firewood)

17. Investigate feasibility of co-funding pilots that target hard to reach rural communities

- Work with REA, GIZ and TaTEDO to investigation options for improving rural adoption of ICS
- Where possible, pilot small scale approaches to test the response of communities
- If larger programs are required, support the sector in securing finance

- Increased ICS adoption in rural target areas.

Executive Summary

Project Approach and Background

Intervention Options

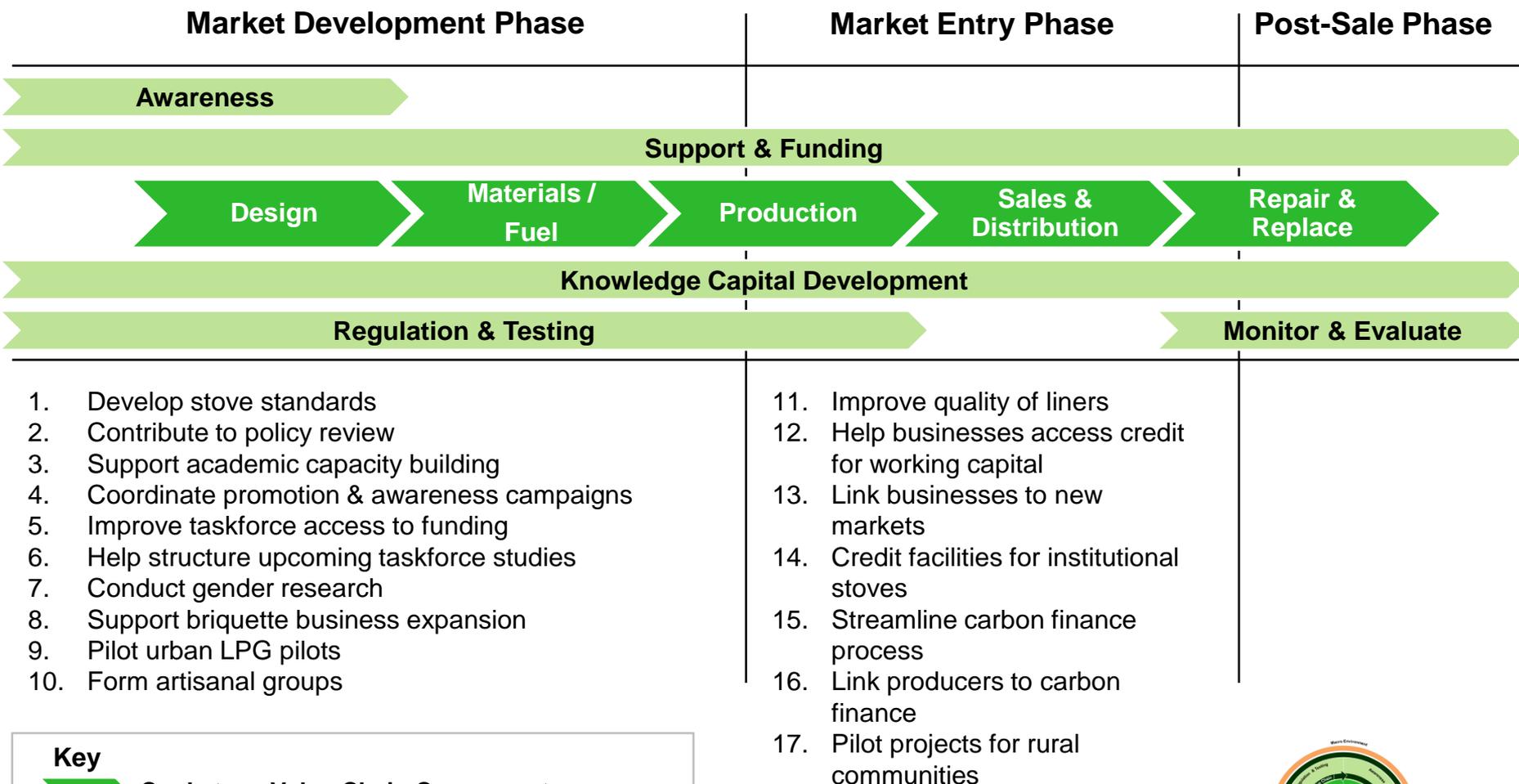
Roadmap

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.

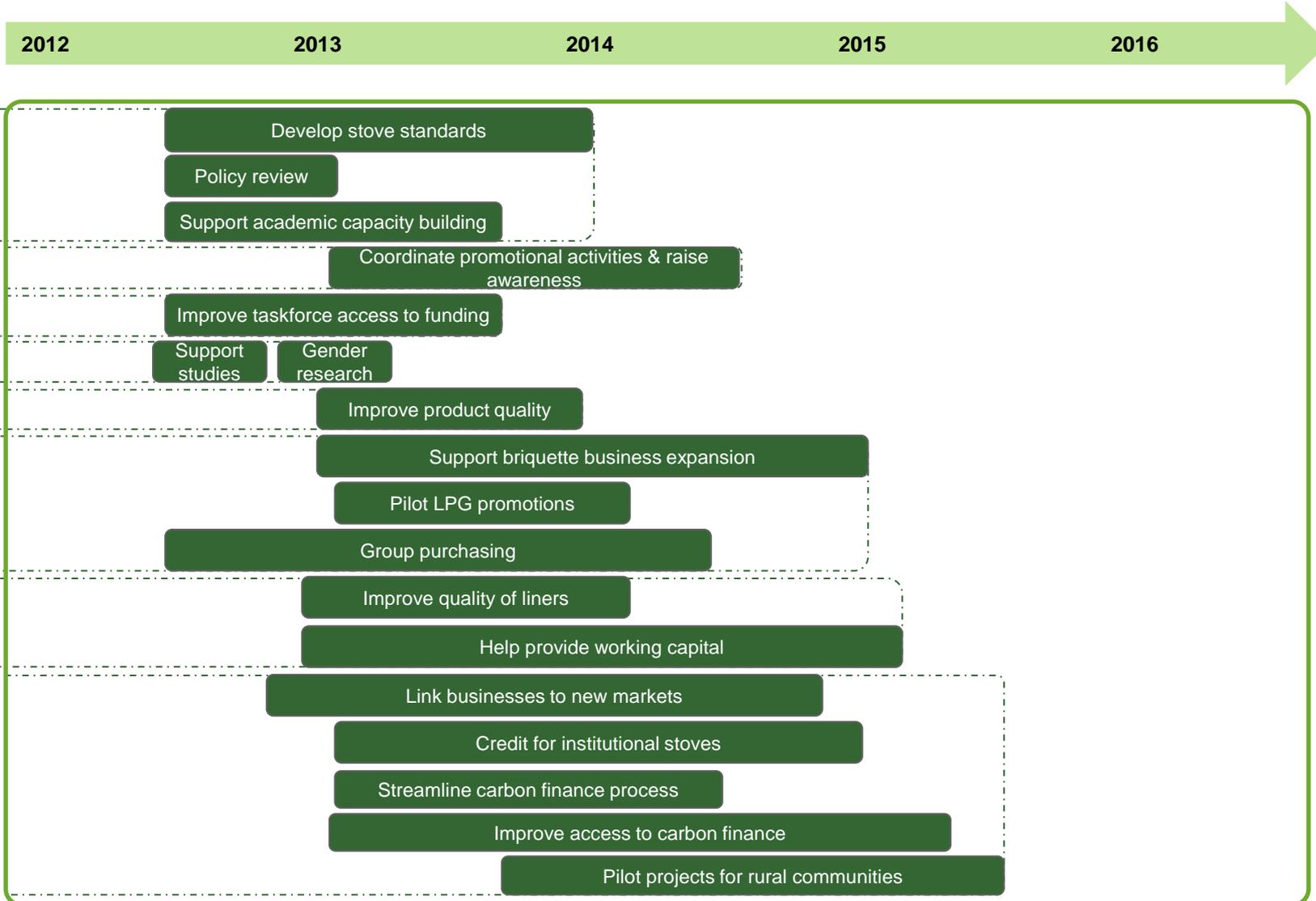


Key

-  Cookstove Value Chain Component
-  Enabling Environment Framework Component



Intervention Roadmap



Executive Summary

Project Approach and Background

Intervention Options

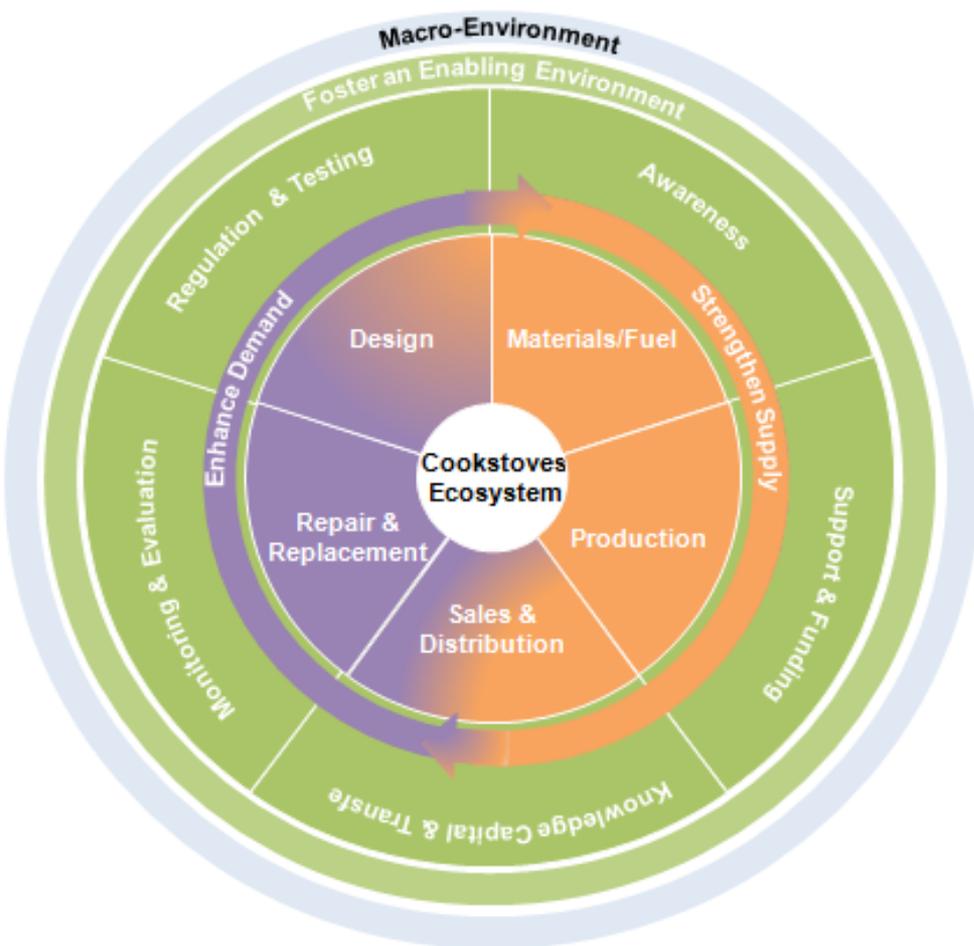
Roadmap

Conclusion

Appendix

Conclusion

In Tanzania, the market is fragmented, the stove quality variable and overall penetration low outside of urban areas. However, the renewed interest in the sector presents an excellent opportunity to reshape and influence the market.



Macro Environment

- The use of biomass is huge (96%) while the burden of IAP is also significant, with an estimated 18,900 deaths every year.
- Rising fuel costs are creating a stronger case for ICS ownership

Enabling Environment

- Standards are being developed and a policy review is underway with renewed interest in the sector following SNV & Roundtable Africa's study in 2011
- The newly formed taskforce presents an ideal forum for influencing and driving the sector forward

Cookstoves Value Chain

- Stimulating consumer demand remains the largest challenge. Linking to new markets, improving access to finance and raising consumer awareness is vital if stove businesses and ICS penetration are to grow
- Simple production improvements can be made to enhance the overall quality of certain stoves in the market

Executive Summary

Project Approach and Background

Intervention Options

Roadmap

Conclusion

Appendix

Glossary of Terms

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

ARTI	Appropriate Rural Technology Institute	MFI	Microfinance Institution
CDM	Kyoto Clean Development Mechanism	NGO	Non-Governmental Organization
CF	Carbon Finance	NGSEN	National Gender and Sustainable Energy Network
COSTECH	Tanzanian Commission for Science and Technology	PoA	Program of Activities
DNA	Designated National Authority	ProBEC	Program for Biomass Energy Conservation
EAC	East African Community	RFP	Request for Proposal
EUEI PDF	EU Energy Initiative Partnership Development Fund	REA	Rural Energy Agency
HHs	Household(s)	SME	Small to Medium Sized Enterprise
IAP	Indoor Air Pollution	UN	United Nations
ICS	Improved Cookstove	UNHCR	United Nations High Commission for Refugees
iNGO	International Non-Governmental Organization	WHO	World Health Organization
KCJ	Kenya Ceramic Jiko	SACCO	Savings and Credit Cooperative
LPG	Liquid Petroleum Gas	SEECO	Sustainable Energy Enterprise Company
MNRT	Ministry of Natural Resources and Tourism	TaTEDO	Tanzania Traditional Energy Development and Environment Organization
MOH	Ministry of Health	TAREA	Tanzania Renewable Energy Association
M&E	Monitoring and Evaluation	TBS	Tanzania Bureau of Standards
MEM	Ministry of Energy and Minerals	TIRDO	Tanzanian Industrial Development and Research Organization