

Final Report: Terminal Evaluation of the Developing Energy Enterprises Project in East Africa

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Executive summary

The Developing Energy Enterprise Project (DEEP) has concluded and this document evaluates the achievements of this programme. The Introduction provides a background to the DEEP project, providing an overview of the project's objectives, to improve access to modern energy services in East Africa, which includes a country focus of Kenya, Tanzania and Uganda. The technologies concerned are Improved Cookstoves (ICS), solar PV businesses and biomass briquetting. The use of Micro and Small Enterprises (MSEs) is discussed and its practicability affirmed. In addition this section looks at the general evaluation approach employed, indicating the broader responsibilities of a terminal evaluation as well as the methodology used. The methodology utilised a range of tools including literature reviews, semi-structured interviews and questionnaires. The final section of the Introduction included a review of the project objectives and how these had been adjusted during the course of the project. The evaluation concluded that there had been certain adjustments made, based on project lessons, but that the key project objectives; including 1,800,000 'men, women and children' accessing modern and clean energy remained.

The introduction section is followed by a more detailed section entitled Findings. This section included key issues such as Strategic Alignment where the evaluation determined the extent to which the programme was relevant in terms of its objectives and approaches. The low levels of electrification in the three countries, the high proportion of household reliance on biomass suggested that the off-grid focus was important as was the biomass efficiency associated with improved cookstoves and briquette production. Solar PV provided the only source of access to electricity in this largely unelectrified energy environment. The alignment included reference to the respective energy policies of the three participating countries. The DEEP EA programme resonates with the general policy focus on rural energy access, renewable energy and energy efficiency as well as the important role of small business in the participating countries' economies. The evaluation determined that the DEEP EA project was appropriately aligned.

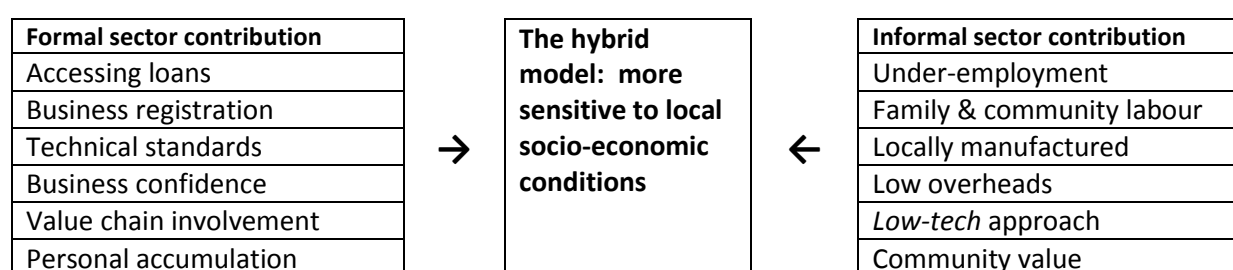
Remaining with the Findings Section, the evaluation then looked at the Achievement of Purpose. Here the extent to which the project achieved its objectives was determined. The question the evaluation asked was whether the DEEP programme could demonstrate that '1,800,000 men, women and children in rural and peri-urban areas accessing energy products and services from supported energy enterprises' which was the quantitative expectation in terms of the performance of the supported businesses. According to the DEEP EA quarterly reports, the number of beneficiaries reached exceeded the 1.8 million expectations at the end of the 17th Quarter (9 months before the conclusion of the project). The current figure is now over 4 million. A second key objective was employment, where the objectives required that '1,300 households are receiving income from employment in supported energy enterprises'. According to employment figures included in the 19th Quarterly report, this target have been exceeded with a total number of permanent (1558) and temporary (1283) amounting to 2841.

The section which follows determines the extent to which the project offers Sound Management & Value for Money. The project has been effectively managed and has exceeded the numerical objectives required. In addition, management has shown the necessary *agility* in terms of adjusting their methodologies and approach to changing environments, unanticipated outcomes and the general 'feed-back' realised through the monitoring and evaluation process. In terms of 'value for money', while the longer-term benefits are not always immediately quantifiable, the report does

indicate that based on the business turnover growth trajectory already established and projecting this 3 years beyond the project's conclusion, that the profits generated will exceed project costs by over US\$4 million. This calculation would exclude the value of benefits associated with investment of the profits (such as in property) as well as the benefits accruing to other, similar initiatives that benefit from the published learning and innovation represented by the DEEP EA project.

The evaluation presents a section entitled 'The Real Value of the DEEP Programme' which looks at the achievements of the DEEP EA programme beyond the explicit objectives. The essence of this achievement is in the project's success in moving people and businesses from 'Artisans to Entrepreneurs'. During the time of the Interim Evaluation in 2011¹, this reality was as evident as it was limiting. It was noted that people could make products but they could not sell them. As the report notes, the situation has improved significantly where people are demonstrating products, are identifying markets, issuing free samples, integrating themselves into value chains, engaging with retailers, doing direct marketing, producing and distributing brochures and pamphlets, providing aftersales service, committing themselves to product quality/standards; in short, they are selling. Underlying this achievement is an approach to MSEs that have emerged out of this project and which is particularly significant; a hybrid approach that incorporates elements of the formal sector as well as the informal sector. The basic features of this approach are depicted below;

Table 1: Hybrid MSE model



The small and micro-business model that emerges here is one that presents a blend between certain defining features of the formal economy and other features with a distinct 'informal economy' feel about them. The outcome is something of a blend that is more in-tune with the socio-economic realities of not only the entrepreneurs themselves but the market they service. This section is followed by a section which reviews the 'Likely continuation of results' which is essentially a sustainability issue. The evaluation identifies a number of ways in which to evaluate the likelihood of the continuation of these results. These include the extent the businesses have been included in broader business networks, the extent to which the businesses and programme has been imbedded within the national and regional MSE frameworks as well as the business tools, skills and capacities that entrepreneurs themselves have been equipped with. Over 60% of the businesses interviewed belonged to some kind of organisation (formal or informal), most of the businesses indicated, through a number of sustainability focused questions, that they have the confidence to take the business forward and had the necessary tools, business and technical, to make this happen. In addition, the evaluation revealed that most businesses were undertaking some form of marketing

¹ Aitken, R. 2011. *Mid-term evaluation of the Developing Energy Enterprise Project – East Africa*

and a significant number of businesses had either accessed finance or now had the confidence and ability to do so in the future.

The evaluation includes a section on 'Customer Survey Results'. The surveys were aimed at gauging customer experience, satisfaction and impact. 212 surveys were administered – 10 of which were "pilot" surveys used to test the tool and train enumerators in Kenya. The survey provides a profile of the DEEP EA customer base, including incomes, decision making, purchase motivations, experience with the product, after sales service, satisfaction, product impact, etc. The following general outcomes were noted;

- Customers are generally satisfied with the DEEP-EA entrepreneurs – specifically also their products and customer service.
- The products/services sold by the entrepreneurs are helping (poor) customers to save (and in some cases generate) money – and this is one of the main selling points. They also seem to improve customers' general quality of life.
- Marketing channels can be increased, diversified and strengthened; there is also a need for product diversification and the retailing of complementary products.
- There have also been concerns raised concerning access to raw materials for briquettes (as well as biogas systems).

The customer survey is followed by a section titled 'Visibility' which evaluates the extent to which the DEEP EA has publicised its activities and achievements. The report noted that the visibility of DEEP-EA has increased substantially over the past 18+ months – both within the East African region, as well as internationally. The appointment of a Communications Officer provided critically needed direction to the public relations actions of the programme – across all communication platforms. DEEP-EA seems to have been relatively successfully in its exploitation of visibility opportunities, including television spots, radio advertisements and interviews, press releases, workshop and conference hosting/exhibitions, online media engagements (newsletter, social media platforms) and specific tailor-made publications. The evaluation noted that while there remains some room for improvement in terms of DEEP-EA's visibility, especially given the programme's significant impacts and important lessons, GVEP-I seems to have achieved a great deal with the resources at its disposal.

The final section of the evaluation is the 'Overall Assessment' which is then followed by 'Conclusions and Recommendations'. The Overall Assessment drew attention towards key issues such as relevance, management flexibility, the hybrid business model amongst other issues which had worked together in ensuring the success of the project. In terms of conclusions, the evaluation notes the following; the overall position of the evaluation is that the Developing Energy Enterprise Project (DEEP) has been a success. The details of the objectives, the in-project re-evaluation of these objectives and the overall project achievements have been discussed in detail under the appropriate section of the evaluation.

Since the project has concluded, the report instead makes a number of observations rather than recommendations including;

- The shift from recruiting start-up to solely focusing on existing businesses had a significant positive impact on the DEEP EA programme.
- The use of full-time, trained mentors was welcomed by the entrepreneurs and seemed to have an overall positive impact on business performance

- The emergence of a more 'hybrid' character incorporating informal and formal sector features appears to reflect the socio-economic realities on the ground.
- A number of business and technical packages were offered by the DEEP EA team which acknowledged the different opportunities and challenges that MSEs faced and provided a means through which lessons might be shared. These include;
 - Entrepreneur to entrepreneur linkages; a number of businesses indicated that they benefitted from the engagement between businesses that was facilitated within the programme. These were particularly beneficial towards the end of the programme when entrepreneurs were more confident and businesses more mature
 - Growth training looked at addressing some of the challenges businesses faced. The benefit here is that GVEP-I was exposed to similar issues within similar businesses in different regions and could bring this insight to bear in addressing obstacles to growth. The programme used successful entrepreneurs to address their peers.
 - Business diversification training was designed to assist entrepreneurs in spreading their income risks and to develop allied opportunities. There were a number of MSEs interviewed that had benefitted from this process. Successful efforts to diversify in one region could be shared in another without impacting negatively on the original businesses.
- The DEEP EA programme started to realise the benefit of professional support towards the second half of the project. Ad hoc technical and business mentors were replaced by permanent, qualified people who were taken on as full-time staff. Fewer in number, these staff members were exposed to a greater number of businesses on a more regular basis and demonstrated greater capacity to convert the failings of one business into improved prospects for another.
- The project demonstrates that the MSE/informal economy can play a significant role in improving access to modern energy supplies in rural areas. This is a significant contemporary challenge and the DEEP EA initiative indicates one possible route to achieving the longer-term aim of Sustainability Energy for All.

Introduction

DEEP background²

The Developing Energy Enterprises Project (DEEP) was designed to improve access to modern energy services in the East Africa region, with a country focus including Kenya, Tanzania and Uganda. Access to modern energy services in the region is particularly low, with only between 15-20% of households having grid access. Grid electrification is concentrated in urban areas, with their rural counterparts registering between 1 – 2% grid electrification in the region. 90% of the total energy consumed in the region is biomass³. The DEEP programme is aimed at improving access to clean and modern energy services through developing MSEs (micro and small enterprises) which procure, produce and distribute modern and clean energy solutions.

The MSE focus ensures that the necessary commercial infrastructure is developed upon which continued and improved access can be assured. Contemporary development projects or programmes tend to employ more commercial, market-oriented approaches to promoting particular outcomes as opposed to more technology-lead approaches that have tended to dominate in the past. The DEEP's support of MSEs is in-line with these more recent developmental approaches⁴. The principle technologies which the programme focuses on include Improved Cookstoves (ICS), solar PV and briquettes⁵.

The DEEP programme provides a range of MSE support services, including technical and business training, mentoring, entrepreneur-to-entrepreneur linkages, assistance with product/service diversification and business growth training, amongst others. These services are intended to deepen and strengthen the participating MSEs, ensuring greater success in improving access to more modern and clean household energy solutions. This evaluation is the terminal evaluation, conducted at the conclusion of the 5-year DEEP programme which ran from 2008 to early 2013, with the official closing at the end of February 2013.

About the evaluation

A terminal evaluation is different to mid-term and other interim evaluations in that the learning stemming from this process cannot be re-invested directly into the programme itself, since this has concluded. While the primary task of the evaluation is to determine the extent to which objectives have been met, it needs to also commit itself to ensuring that the analytic outcomes of the evaluation are in a format that is useful to other interested parties in this and other regions. It needs to balance the assessment of internal project objectives with the responsibilities that initiatives such as DEEP have to communicating experiences to other interested stakeholders. Funder value is not simply realised through explicit project objectives, but also to the extent that it unlocks and encourages other similar types of initiatives based on these communicated experiences. A truly effective return on investment for a funder would not be limited to the outcomes of the directly supported programme, but the extent to which this programme has the ability to promote and encourage others to similarly invest in this sector. In order to do this, the successes, challenges and innovation experienced by the DEEP programme need to be made more widely available by independent evaluations such as this one.

² We have provided this brief overview for those readers who are unfamiliar with the Deepening Energy Enterprise Programme (DEEP).

³ See, for instance, [https://energypedia.info/wiki/East Africa: Overview of Regional Energy Resources](https://energypedia.info/wiki/East_Africa:_Overview_of_Regional_Energy_Resources)

⁴ Indicative of this shift is the increasing involvement of Finance Institutions within this sector as well as a greater emphasis on marketing. See for instance, [http://www.soluzusa.com/documents/NCI-Soluz Innovation in Rural Energy Delivery.pdf](http://www.soluzusa.com/documents/NCI-Soluz_Innovation_in_Rural_Energy_Delivery.pdf)

⁵ Although biogas and solar/fireless cooker technologies are also included, their uptake in the program is very limited.

Methodology

A combination of methods was used in the evaluation. They include:

1. *Literature/desktop review*: the evaluation team reviewed the reports provided by GVEP-I, including quarterly M&E reports as well as the Revised Strategy.
2. *Semi-structured interviews*: interviews were primarily conducted with businesses/entrepreneurs that form part of DEEP EA. This was based on a sample focusing specifically on Category 1 and 2 businesses⁶. In addition, the evaluators interviewed project managers and BDS personnel, amongst others.
3. *Questionnaires (customer impact)*: using the questionnaire (in Annex 1), about 197 customers across the three countries were surveyed by Pan African Research Services (PARS), managed by Restio Energy.

In summary, unlike the mid-term evaluation where the methodological approach was 'review and adapt', the terminal assessment will follow an approach that 'evaluates and reflects'. While the emphasis is on the evaluation in terms of the project's successes, there will be scope for reflecting on how to take these successes and associated opportunities forward.

Project objectives and interim reviews

The original project objectives and deliverables as outlined in the original DEEP application form are detailed in the table below.

Table 2: Original objectives and deliverables

Overall objectives	To increase the availability of sustainable, affordable and appropriate energy services to those unserved or underserved in rural and peri-urban areas of Kenya, Tanzania and Uganda. To increase employment opportunities in the same areas.
Specific objectives	To enable the development of a sustainable and widespread industry of micro and small energy enterprises providing energy services and employment in rural and peri-urban areas of Kenya, Tanzania and Uganda.
Target groups	1800 micro and small enterprises (MSEs) started-up, diversifying into providing energy services or improving and expanding existing energy services in rural and peri-urban areas with the assistance of the project. 300 business mentors trained, qualified and employed in the project 12,000 rural and peri-urban community members with raised awareness of modern energy products, services and market opportunities
Final beneficiaries	1,800,000 men, women and children in rural and peri-urban areas accessing energy products and services from supported energy enterprises 1,300 households receiving income from employment in supported energy enterprises 1,300 households receiving income from employment in enterprises enabled by energy services provided by supported energy enterprises

⁶ Businesses included in DEEP were placed in either one of three categories following the mid-term review, based primarily on the businesses' success and potential. Business support was differentiated according to the categories, with categories 1 and 2 receiving the most support, while category 3 received the least.

Through the course of the DEEP programme, various assumptions and methods were tested both internally by DEEP staff members as well as externally through independent evaluations. It is important for the purpose of this evaluation to understand the extent to which the original objectives were reconsidered through these processes. Effectively reviewing objectives and deliverables through the course of an initiative such as DEEP is to be expected and is an essential part of any effective monitoring and evaluation process. Effective project management requires some level of *Agility*⁷ in order to accommodate tensions between project design and application and also lessons learnt over time; the latter point being particularly important for a 5-year project such as DEEP.

In terms of the Mid-term evaluation⁸, the following recommendations were made;

- **Avoid multi-partner structures where responsibilities and accountabilities are unclear.** While there was arguably a need for a more multi-partner approach in the initial DEEP EA initiative, it was suggested that this is not carried through into the next phase, which should exhibit a more specialised focus on business and market development and which should be more centrally controlled by GVEP-I.
- **Ensure that the people employed by the program are business-orientated, with appropriate experience at the “Bottom of the Pyramid”.** While technical and academic staff are important, they should not form the bulk or core of the programme’s personnel. What is needed is a staff body familiar with the realities of running businesses in developing countries and who are able to ensure the success of the businesses through applying the lessons learned from their own experience.
- **Ensure a stronger focus on market analysis and the identification of opportunities.** It is important to understand the market and equip entrepreneurs with this understanding – not only with regards to the market size and potential demand, but also with regards to current needs and trends. This should focus on practical opportunities for businesses to more effectively bring their products/services to the market; and to actively create market opportunities through engagements with large-scale product distributors and the like.
- **Ensure the strategic recruitment of entrepreneurs around specific market opportunities.** Here we are referring to having a clearer understanding of the market potential/opportunities with regard to particular products/services and recruiting and developing entrepreneurs in line with these opportunities.
- **Identify people with entrepreneurial ability & drive, and nurture this.** Linked to the 80/20 principle, the subsequent programme needs to have the tools and capacities for identifying successful entrepreneurs and investing more resources and efforts in further developing their prospects.
- **Strengthen links with larger companies active in these markets (where appropriate).** For instance, solar lighting offers a good opportunity, with a number of companies offering high quality products specifically designed for the BOP. A program like DEEP EA needs to ensure that these products travel “the last mile” to the customer through the establishment of strong entrepreneurs.
- **Budget for consumer awareness activities if the program includes nascent markets like briquettes.** Markets need to be informed about emerging technologies such as briquettes (amongst others). **Access to loans and consumer finance is critical.** While the DEEP EA programme made some progress in terms of encouraging the participation of FIs in the renewable energy product market, Phase II of the DEEP EA initiative needed to focus more

⁷ We apply the term with some caveats. This is not to suggest the completely fluid approach of Agile Management, but rather to imply a certain level of flexibility in overall project management. Enough to continually adapt to lessons learnt, etc.

⁸ Aitken, R. 2011. *Mid-term evaluation of the Developing Energy Enterprise Project – East Africa*.

keenly on this requirement. This is a crucial component of improving access to these goods and services.

GVEP-I initiated a number of internal reviews and assessments of DEEP from various different perspectives, including financial access opportunities⁹, technology assessments¹⁰ and marketing challenges¹¹ amongst others. This process, including the interim evaluation which was finalised mid-2011, culminated in the Revised Strategy¹² document which reconsidered some of the methodologies and deliverables outlined in the earlier DEEP documents.

In short, the Revised Strategy document suggested the following;

1. **Strategy for existing entrepreneurs:** In order to effectively provide targeted support, all the trained entrepreneurs were categorised into three levels as a way of understanding their growth levels, challenges and potential and what kinds of intervention may be required. The three categories and associated levels and types of support were as follows:

Category one; High potential enterprises

Category two; Moderate potential enterprises

Category three; Low potential enterprises

These three categories of entrepreneurs would require varying levels of support. Importantly, and this is a key shift in project strategy, the more successful enterprises (i.e. those in categories 1 & 2) would receive greater support than the low potential enterprises included in Category 3. This is an important shift in methodology as the approach going into the DEEP project was more egalitarian, with all businesses receiving similar levels of support. To be sure, this was the start-up phase and the different levels of success and ability were harder to identify. As the project matured however, these differences became more apparent and provided the basis of a shift in approach or emphasis. The rationale is clear; *invest in success*. The need for this was made apparent both in the interim report as well as various GVEP-I documents.

2. **Regional Business Mentors:** while the project has retained the support services of the business mentors, there were a number of qualitative shifts suggested in the Strategic Review. For the first three years of the programme, DEEP utilised voluntary business and technical mentors to support the DEEP enterprises. The review document, along with other interim documents suggested a stronger, more stable approach to mentoring. The Regional Business Mentor (RBM) was introduced, which was based on full-time mentors employed by the project and associated with particular project clusters. These were competitively selected from a larger pool of voluntary mentors, which ensured a higher level of mentor quality. In addition, the new approach would ensure a greater level of control by DEEP management of the mentors as they were no longer volunteers but full-time employees.
3. **Strategy for new enterprises:** new enterprises recruited into the DEEP programme would be done on the basis of a value chain approach. As the Review Strategy document indicates,

⁹ Phyllis Kariuki & Kavita Rai. 2010. Market Survey on Possible Co-operation with Finance Institutions for Energy Financing in Kenya, Uganda and Tanzania. GVEP-I Internal document

¹⁰ [no attributed author]. 2010 Kenya Briquette Industry Study. Kavita Rai, 2009. Cookstoves and Markets: Experiences, successes and opportunities. GVEP-I internal documents

¹¹ Laura Clough. 2011. Marketing challenges and strategies for Micro & Small Energy Enterprises in East Africa. GVEP-I internal document.

¹² Daniel Macharia. 2011. Revised Strategy document. GVEP-I Internal document.

*'Rather than recruit individual enterprises, train them and leave them solely to the vagaries of the market, they will join in the context of a value chain that addresses the particular market challenges and uses links developed by GVEP-I to fit into a structure'*¹³

This new approach reflected the need to look for more commercial opportunities, markets and relationships for new (and existing) enterprises. One of the key challenges raised by the Interim Evaluation and other DEEP/GVEP-I documents was the lack of commercial vigour of the earlier DEEP approach¹⁴. The programme was dealing with artisans rather than entrepreneurs and a number of changes were necessary in order to address this. The revised approach for new enterprises was designed to do just that.

¹³ Revised Strategy.2010. Internal GVEP-I document p16.

¹⁴ This included a more 'strategic recruitment of entrepreneurs around specific market opportunities' – Interim Evaluation

In terms of the overall objectives and how they have evolved, Table 3 below indicates the extent to which the objectives have been revised and how this will influence the evaluation.

Table 3: Revised project objectives

	Original Objectives	Terminal evaluation considerations
Overall objectives	To increase the availability of sustainable, affordable and appropriate energy services to those un-served or underserved in rural and peri-urban areas of Kenya, Tanzania and Uganda. To increase employment opportunities in the same areas.	Overall objective remains
Specific objectives	To enable the development of a sustainable and widespread industry of micro and small energy enterprises providing energy services and employment in rural and peri-urban areas of Kenya, Tanzania and Uganda.	Specific objectives remain
Target groups	<p>1800 micro and small enterprises (MSEs) started-up, diversifying into providing energy services or improving and expanding existing energy services in rural and peri-urban areas with the assistance of the project.</p> <p>300 business mentors trained, qualified and employed in the project</p> <p>12,000 rural and peri-urban community members with raised awareness of modern energy products, services and market opportunities</p>	<p>Less emphasis on numbers although the balance of expectations remain</p> <p>Fewer mentors – permanent and not volunteers</p> <p>Remains the same</p>
Final beneficiaries	<p>1,800,000 men, women and children in rural and peri-urban areas accessing energy products and services from supported energy enterprises</p> <p>1,300 households receiving income from employment in supported energy enterprises</p> <p>1,300 households receiving income from employment in enterprises enabled by energy services provided by supported energy enterprises</p>	<p>Similar reach expected as business success compensates for lower business numbers</p> <p>Similar employment levels expected from better businesses</p> <p>As above.</p>

While the overall objectives have not changed significantly, there has been a distinct shift from quantity to quality. The new business categorisation, RBM and increased focus on market activities seems to have signalled a shift from the frenetic recruitment activity that characterised the first 3 years of the programme's operations to a more measured approach which focuses on developing business sustainability. From the evaluation's point of view, this is a necessary shift. The targets – be

that 1,800 businesses or 1.8 million people benefiting from these businesses - might sound impressive, but it does not guarantee the longevity of this arrangement or 'access scenario'. These are in-project objectives without a clear sense of their relevance beyond the scope of the project itself. A more important outcome would be the longevity and survival rate of these MSEs as opposed to their mere numbers; and this is the tenor of the shift in emphasis discussed above.

Findings

This section focuses more closely on the actual results from the terminal evaluation. It is broken down into a number of sub-sections, addressing the full range of issues, from project relevance to the wider impact of the project.

Strategic Alignment

The evaluation needs to determine the extent to which the programme is relevant in terms of its objectives and approaches. While it is obviously too late to shift the focus of the programme, the evaluation will still determine the resonance of the project design and implementation (including adaptation) with the broader country and regional conditions. The overall DEEP project objective was to

'...increase the availability of sustainable, affordable and appropriate energy services to those un-served or underserved in rural and peri-urban areas of Kenya, Tanzania and Uganda. To increase employment opportunities in the same areas.'

The general national and residential energy situation in the 3 DEEP countries is presented in Table 4 below. Key features of the current situation is: extremely low levels of electricity access, particularly in the peri-urban and rural focus areas of the programme, as well as high levels of biomass usage in all three countries. Perhaps the most important statistic of all is the extent to which the residential sectors – the focus of the DEEP programme – contribute to the overall national energy consumption figures. The importance of the residential sector reflects the potential significance of the impact of interventions in this sector.

Table 4: Energy statistics for DEEP countries

	Kenya	Uganda	Tanzania
Population	41 Million	32 Million	44 Million
Total installed capacity	1 419 MW	539 MW	1 051 MW
Electrification Rate	18%	9%	15%
Urban	65%	46%	46%
Rural	5%	3%	4%
Contribution of Residential Sector to National Energy Consumption	81%	66%	73%
% Population relying on biomass	85%	95%	94%

Sources: REEGLE, EnergyPedia, AFREPEN, IEA

The DEEP focus on improving sustainable, affordable and appropriate energy services in the rural/peri-urban sector appears very well aligned with the energy realities of the residential sector. The focus on biomass briquetting from existing carbon/biomass residues¹⁵, the promotion of improved cookstoves which reduce biomass consumption through thermal efficiencies and importantly reduce in-door air-

¹⁵ Reliance on existing carbon residues such as charcoal powder and/or existing biomass residues such as saw dust does not result in additional biomass harvesting.

pollution¹⁶ and solar PV services and retail¹⁷ offers a relevant technology focus given the energy profile of the residential sector.

So while the project clearly speaks to the energy access realities on the ground, the evaluation needs to determine the extent to which the programme ties in with the country-specific policies. Policy alignment is important in two respects; first to ensure that the challenges identified by the programme are shared by the host country and secondly, to ensure that the methods of addressing these challenges are compatible with the approaches and realities on the ground of the host countries. In short: what key energy-access features are the countries' policies designed to address (and is there convincing overlap with DEEP objectives); and is the DEEP MSE-based approach relevant and supported in the DEEP host countries?

In terms of energy policies, the most significant national policy and strategy document in **Kenya** is the new Energy Act 2006 whose broad objective is to ensure the provision of adequate, quality, cost-effective, affordable supply of energy while ascertaining environmental conservation. In addition, due to increasing greenhouse gas emissions, Kenya's Climate Change Response Strategy¹⁸ is committed to reduce these impacts through various avenues, including promoting the use of environmentally friendly energy. In terms of the identified strategic actions that need to be taken in terms of achieving overall policy objectives, the Kenyan government has identified the following:

- Training and technology transfer – to build up local/rural capacity for small scale development which could subsequently be built up and strengthened.
- Campaigns for identifying exploitable schemes and establishing feasibility
- Technical support for and financing of demonstration schemes to familiarize local personnel with the various technologies
- Permit gaining operating experience as well as provide an initial basic electricity supply for the local population
- Develop skills Project planning, implementation and monitoring.

The DEEP programme addresses many of these actions through its MSE-led approach to promoting the commercialization of various clean and efficient energy technologies.

In **Tanzania**, the Revised Energy Policy was launched in 2003. The Policy focuses on market mechanisms as a means to reach its objectives and achieve an efficient energy sector¹⁹. In terms of the policy objectives, the focus is on ensuring 'availability of reliable and affordable energy supplies and their use in a rational and sustainable manner in order to support national development goals'. In terms of the specific objectives, these include;

- To promote development and utilisation of appropriate new and renewable sources of energy;
- To reduce deforestation through efficient wood fuel conversion and end-use technologies & techniques;
- To promote energy conservation and efficiency.

¹⁶ Indoor air-pollution purportedly results in the premature death of approximately 2 million people every year <http://www.who.int/mediacentre/factsheets/fs292/en/>

¹⁷ Given the low access to grid, solar PV is useful for small business functions, lighting, education, cellular phone charging, etc.

¹⁸ A strategy produced by the Government of Kenya http://cdkn.org/wp-content/uploads/2012/04/National-Climate-Change-Response-Strategy_April-2010.pdf

¹⁹ https://energypedia.info/wiki/Tanzania_country_situation#Policy_framework

These tie in very closely with the objectives of the DEEP programme. In addition, one of the key challenges acknowledged by the policy includes ‘reaching rural households’ which is at the heart of the DEEP programme.

In the case of **Uganda**, there are two key pieces of legislation, the Energy Policy for Uganda (2002) and the Renewable Energy Policy for Uganda (2007) that the evaluation needs to consider. The objectives of the Energy Policy for Uganda include:

1. To increase access to modern affordable and reliable energy services as a contribution to poverty eradication.
2. To improve energy governance and administration.
3. To stimulate economic development.
4. To manage energy-related environmental impacts.
5. To increase the role of private sector in the power sector operations and future development.

There are important references to improving access to modern energy as well as the role of the private sector in doing so. In terms of the subsequent Renewable Energy Policy of 2007, the Ugandan government committed itself to, amongst other things;

1. To promote research and development, international cooperation, technology transfer and adoption of standards in renewable energy technologies’
2. To utilize biomass energy efficiently so as to contribute to the management of the resource in a sustainable manner;
3. To promote the sustainable production and utilization of bio-fuels;

In each case, the objectives of DEEP resonate closely with the policy commitments and acknowledged challenges faced in the DEEP host countries. In addition, the focus on developing an MSE infrastructure is aligned with the stated objectives of improving sustainable access through promoting private sector operations.

The MSE focus

MSEs are an important tool for economic development in the East Africa region. MSEs in Africa account for over 75% of all employment in manufacturing²⁰ and are increasingly regarded as a profitable market for banks in East Africa. In addition, Article 80(1)(c) of the Treaty for the Establishment of the East African Community (EAC)²¹ provides that one of the ‘strategy and priority areas for regional cooperation in investment and industrial development in the EAC region shall be facilitating the development of small and medium scale industries including sub-contracting and other relations between larger and smaller firms’. MSEs make a significant contribution to the GDP of the East Africa region²² and therefore are crucial to the development of the regional economy on the whole. While the DEEP’s focus is on ‘micro’ as opposed to small and medium enterprises (MSEs), this is where successful MSEs generally emerge from.

Some of the important DEEP activities which will be discussed in greater detail in subsequent sections include the formalisation of small and micro-businesses, which includes business registration as well as encouraging the application of ‘technical standards’ to energy products. These

²⁰ <http://www.afdb.org/en/news-and-events/article/east-african-small-and-medium-sized-enterprises-a-strategic-priority-for-banks-finds-new-afdb-study-8991/>

²¹ <http://www.ugandainvest.go.ug/index.php/MSE-division/MSE-research/item/343-the-study-on-the-promotion-of-micro-small-and-medium-enterprises-mMSEs-in-the-east-african-region>

²² In fact, the informal sector contributes about 55% of sub-Saharan Africa’s GDP and 80% of the labour force <http://www.howwemadeitinafrica.com/recognising-africas-informal-sector/25278/>

are important steps in the road to formalising and supporting the informal sector in East Africa. While the lines are somewhat blurred between the formal and informal sector in the region, it does make sense (for a number of reasons) for MSEs to formalise and benefit from improved access to government support and financial services, as well as providing the necessary confidence for other businesses within the relevant value-chains. In short, the use of MSEs as the vehicle through which improved access to energy services is facilitated is relevant in this region where MSEs play such an important role in the local economy, as is DEEP's efforts to register and formalise these small businesses. The latter will empower these businesses going forward in terms of improving access to finance, information and development opportunities²³.

Technology choices and global priorities

The technology focus of the DEEP programme is in-line with global initiatives. The Global Alliance for Clean Cookstoves²⁴ is an increasingly influential lobby group which actively promotes the manufacture, uptake and use of improved cookstoves. The ICS component of the DEEP project is a very important one and shares its objectives with the wider development community (including the Alliance) in terms of ensuring that 100 million households adopt clean and efficient stoves by 2020. In terms of charcoal briquettes, there are leading East African institutions²⁵ promoting the use of alternative sources of raw materials for charcoal production – which is in-line with DEEP's focus on using charcoal powder, saw dust etc. as alternative raw materials. With regard to solar PV, the World Bank/IFC 'Lighting Africa'²⁶ initiative is assisting in improving access to better lighting in areas not yet connected to electric grid. This shares a similar focus to a number of the solar PV business that DEEP is supporting. Looking beyond lanterns, the general development of the solar PV economy in East Africa is desirable given the low levels of grid access in rural areas. With the costs of PV modules coming down drastically over the past few years²⁷ and the fact that there is really no other clean electricity technology that can compete with solar PV suitability for distributed applications, DEEP's support of solar vendors and technicians is particularly relevant. A strong retail and service infrastructure which DEEP is contributing to through their business support of solar PV retailers/installers is necessary for the development of a longer-term solar PV economy.

Importantly, 2012 was the year of 'Sustainable Energy for All' (SE4ALL), launched by the UN Secretary-General Ban Ki-Moon²⁸. This global initiative has secured significant commitments from all sectors of society, including governments, development agencies, banks, the private sector and several global leaders. SE4ALL is driven by the following set of ambitious targets:

- Universal access to modern energy sources by 2030;
- Doubling the contribution of renewable energy to the global energy mix by 2030; and
- Doubling the global energy efficiency rate by 2030.

DEEP-EA speaks directly to all three of these objectives and is quite probably one of the most realistic and relevant interventions in the developing world that can make a significant contribution to reaching these targets. In addition, the UN General Assembly has declared 2014 – 2024 the 'Decade of Sustainable Energy for All', adding further impetus to this global campaign.

²³ <http://www.howwemadeitinafrica.com/recognising-africas-informal-sector/25278/>

²⁴ <http://www.cleancookstoves.org/>

²⁵ For instance, Government of Kenya (Ministry of Energy) 2002, the UNEP supports actions to overcome unsustainable charcoal production <http://www.charcoalproject.org/tag/unep/> etc.

²⁶ <http://www.lightingafrica.org/>

²⁷ For instance, module (crystalline) prices at the end of 2011 were a massive 45% lower than they had been at the end of 2010. http://www.pv-tech.org/guest_blog/pv_module_costs_and_prices_what_is_really_happening_now_5478

²⁸ <http://www.sustainableenergyforall.org/about-us>

Achievement of purpose

Here the evaluation considers to what extent the DEEP programme achieved its objectives over the 5 years of implementation.

Achievement of project's specific objectives

The project's specific objectives are described as the following: 'To enable the development of a sustainable and widespread industry of micro and small energy enterprises providing energy services and employment in rural and peri-urban areas of Kenya, Tanzania and Uganda.' In Table 5 below, the total number of businesses recorded at the end of Quarter 19 was 955. These businesses show a reasonably even spread across the host countries and operational clusters.

Table 5: Total number of DEEP businesses

	Categories			
Region/Cluster	I	II	III	Total
Kenya	71	85	50	206
Cluster 1: Coast	17	33	8	58
Cluster 2: Central	11	12	21	44
Cluster 3: Kisii	13	14	3	30
Cluster 4: Kisumu	30	26	18	74
Tanzania	72	123	134	329
Cluster 1 Magu	17	42	34	93
Cluster 2 Misungwi	17	19	26	62
Cluster 3 Mwanza	27	39	32	98
Cluster 4 Shinyanga	11	23	42	76
Uganda	55	233	132	420
Cluster 1 Wakiso	17	26	36	79
Cluster 2 South Buganda	11	89	0	100
Cluster 3 N/E Uganda	8	35	29	72
Cluster 4 Kampala	19	83	67	169
Total	198	441	316	955²⁹

As indicated earlier, the original quantitative objectives of the DEEP programme included '1800 micro and small enterprises (MSEs) started-up, diversifying into providing energy services or improving and expanding existing energy services in rural and peri-urban areas with the assistance of the project'³⁰. However, as presented in Table 5 above, the DEEP-EA Revised Strategy document suggested that less emphasis would be placed on recruiting businesses into the DEEP programme and more resources would be invested in strengthening existing businesses. The evaluation accepts that 1,800 businesses were assumed to be the *reasonable number* required to provide a certain level of service (or output) to the targeted rural and peri-urban communities. The key issue is the level of service achieved as opposed to the number of businesses achieving this service. The question the evaluation needs to ask is whether the DEEP programme can demonstrate that '**1,800,000 men, women and children** in rural and peri-urban areas accessing energy products and services from supported energy enterprises' which was the quantitative expectation in terms of the performance of the supported businesses. According to Table 6 below, the number of beneficiaries reached exceeded the 1.8 million expectation at the end of the 17th Quarter (9 months before the conclusion of the project). The current figure is now over 4 million.

913 entrepreneurs submitted data in Q19 while data for 42 entrepreneurs was not submitted (15 from Kenya, 16 in Tanzania and 11 from Uganda)

³⁰ Grant application form ACP-EC Energy Facility Annex 1A

Table 6: Number of DEEP business beneficiaries³¹

Implementation Quarter	Kenya	Uganda	Tanzania	Total
9	11,624	4,516	19,554	35,694
10	3,592	1,682	6,490	11,763
11	15,356	4,807	31,738	51,901
12	15,356	20,444	31,493	67,293
13	61,560	116,985	111,645	290,189
14	57,808	133,950	147,364	339,122
15	127,146	97,018	153,517	377,681
16	177,639	115,647	190,690	483,976
17	185,988	206,358	256,886	649,232
18	276,437	217,062	273,502	767,001
19	278,029	406,269	265,528	949,826
TOTAL	1,210,535	1,324,738	1,488,407	4,023,678

The evaluation acknowledges that it is difficult to independently verify the stated beneficiary impact but does accept that, based on the interviews with DEEP entrepreneurs that included access to their written records; these overall beneficiary figures are realistic. For instance, Joseph Muriuki, an ICS entrepreneur from the central cluster in Nyeri, Kenya, sold 700 units in January according to his sales records. Assuming that the average rural household in Kenya is five (5) persons/household³², this single business has impacted 3500 'men, women and children' in a single month. If sales performance was maintained over 12 months then the business would benefit 42,000 individuals. Extrapolating from this, it appears feasible that the DEEP programme has benefitted over 1.8 million 'men, women and children' through the performance of 955 businesses. In terms of the number of 'men, women and children' that have benefitted from the energy goods and services provided by the supported businesses, the evaluation agrees that the original target of 1.8 million people has been achieved.

Employment

The original objectives suggested the DEEP programme would ensure that '1,300 households are receiving income from employment in supported energy enterprises'. According to employment figures included in the 19th Quarterly report, this target have been exceeded with a total number of permanent (1558) and temporary (1283) amounting to 2841 as indicated in Table 7 below.

³¹ This table was taken from GVEP-I's narrative report 'Developing Energy Enterprise Programme: Quarter 17'

³²

http://www.fao.org/fileadmin/templates/riga/docs/Country_survey_information/04_Kenya05_Components_of_Income_Aggregate.pdf

Table 7: Employment numbers in DEEP businesses³³

	Quarter 17			Quarter 18			Quarter 19		
Countries	Temp	Perm	Tot	Temp	Perm	Tot	Temp	Perm	Tot
Kenya	187	254	441	184	237	421	411	397	808
Uganda	671	513	1184	674	555	1229	654	522	1176
Tanzania	215	598	813	204	645	849	218	639	857
Total	1073	1365	2438	1062	1437	2499	1283	1558	2841

Temp = Temporary employment, Perm = Permanent employment, Tot = Total numbers

Based on the engagement with entrepreneur businesses supported by DEEP, these employment statistics seem reasonable. Many of the businesses interviewed responded to a question regarding business growth and success in terms of the number of employees they had taken on (as opposed to, for example, growth in productivity). Close to 50% of the businesses interviewed regarded business growth in terms of employees, spouses joining and/or old business group members returning. The increase in the number of employees was the more common reference for business success than was changes in productivity and/or income³⁴. Based on the nature and frequency of these references, the evaluation agrees that the stated employment levels are realistic and that the DEEP programme has achieved this particular objective.

Business mentors

The original project design indicated that one of the outcomes would be ‘**300 business mentors** trained, qualified and employed in the project’³⁵. However, as indicated in the Mid-term Evaluation as well as the ‘Revised Strategy’ document, the recruitment of *ad hoc* mentors was inadequate in terms of the levels of knowledge the mentors possessed and the lack of control that DEEP Management could exercise over ‘volunteer’ mentors. The 300 mentors mentioned was based on the recruitment of these *ad hoc*, volunteer mentors and not the permanently employed mentors which is the situation that now obtains. According to the evaluation, based on interviews with over half of the mentors as well as the DEEP businesses, the current strategy of permanently employed mentors is far more effective in terms of supporting businesses with internal business management (book-keeping, pricing, business planning, etc.) and external business engagements (supplier interaction, accessing finance, taking goods to markets, sales, etc.) than the previous ‘ad hoc’ system was. Fewer business (and technical) mentors that are permanently employed and accountable to DEEP appear to be a far more effective strategy. The failure to achieve the 300 figure is therefore not an indication of falling short of objectives, but rather a more efficient mechanism for achieving improved outcomes.

³³ This table appears in the DEEP 17th Quarterly report

³⁴ This is not to say productivity and income did not improve – indeed they had. However, growth in terms of employees was the more commonly referred to indicator of business success.

³⁵ Grant application form ACP-EC Energy Facility Annex 1A

Sound management & value for money

Efficiency criterion

A key distinction exists between the proposed mechanisms intended to achieve the results indicated in the original project documentation and those currently employed. As pointed out above, while 1.8 million people have benefitted from sales and services of the supported businesses, this has been achieved through (the mechanism) closer to 1,000 as opposed to the originally envisaged 1,800 supported businesses. Furthermore, only 630 of these businesses are classed as category I and II businesses³⁶, suggesting an even smaller effective contributing base. As discussed below, the DEEP programme refocused resources on Category I and II businesses as opposed to Category III businesses and still achieved the intended outcomes. If the same resources had been invested across all Categories and if 1,800 businesses had participated, it is questionable if these outputs would have been achieved and, importantly, whether there would have been as many successful businesses overall. The overall number of successful businesses in the DEEP programme is 630 out of 955, which represents close to 64% of all businesses.

Management agility

Following on from above, DEEP management has demonstrated considerable agility over the past 5 years, ensuring monitoring mechanisms within the programme identify obstacles and challenges, and the management team (and support staff) have the ability to implement the necessary changes. In many cases, what this and other projects are dealing with is the 'design-actuality' gap³⁷ which requires some adjustments once the assumptions in the programme plan are tested on the ground. Some of the adjustments that the DEEP management have made include:

- *Slowed recruitment and invested in existing businesses;*
The temptation would have been to carry on recruiting further into the programme to ensure the figure of 1,800 businesses was achieved. However, it was clear that 'not all entrepreneurs were equal'³⁸ and that certain entrepreneurs offered better returns on investment in terms of performance than others. The Programme reviewed the situation and eased up on recruitment, but still achieved the required project outputs.
- *Categorised businesses;*
Linked to the point made above, the categorisation (I, II & III) of businesses determined the level of support businesses would receive from DEEP. This more targeted approach enabled greater returns from specific businesses. A more meritocratic approach than the more egalitarian approach which treated all, good performers and bad, the same in terms of time and resources invested.
- *Changed ad hoc for permanently employed RBMs*
The old system of ad hoc, volunteer mentors proved difficult to manage and produced questionable results. DEEP management changed their approach and employed permanent regional mentors (principally business but also technical) in each of the regional clusters. This has produced improved results in terms of business performance as well as data on supported DEEP businesses. The ad hoc mentor idea was a mistake and the DEEP

³⁶ Category III businesses are significantly less productive.

³⁷ The concept emerged in ICT studies but is used here more generally to refer to the planning assumptions implicit in 'applications' and the realities programmes confront on the ground.

³⁸ Reference made in the 'Revised Strategy' document p11.

management had the courage to acknowledge this and put a more effective solution in place.

- *Shift from business skills focus to market-based focus;*

One of the observations made in the Interim Evaluation Report was that the mentors focused too much on the technical skills of the businesses rather than the 'last mile' requirements of bringing the product to market. There was too much emphasis on record keeping, business planning, product improvement, etc. as opposed to sales; of bringing the product to market. However, the RBM and the nature of the support given by DEEP has demonstrated a stronger market emphasis than before³⁹ and the results have started to filter through in terms of significantly improved product sales.

These examples are presented to illustrate that DEEP management demonstrated the necessary management agility within the DEEP project. There will always be 'design-actuality' gaps; the challenge is to ensure that management has the courage to acknowledge that these problems exist and the wherewithal to develop and implement effective solutions.

Management structure

There are effectively three levels of management within the DEEP programme, including the GVEP Management team, the DEEP programme management and the project implementers. Based on interviews at all levels, the evaluation notes the following:

Management level	Tasks	Appraisal
Global GVEP-I management	<ul style="list-style-type: none"> • Not exclusive to DEEP • More strategic than day-to-day • Client centred • Work directly with DEEP senior management • Responsible for all financial decisions above certain threshold 	<p>The GVEP-I team – including both Dr Rai and Mr Collins – provided strategic leadership to the DEEP EA programme based on international experience in project management, technology and MSE/SMEs. Ensured the project could link into and get exposure through international channels.</p> <p>Appeared to be misunderstanding over delineation of roles between GVEP-I team and DEEP EA management. Inadequate devolution of decision making powers to DEEP EA</p>
DEEP senior management team (project manager, Operations Manager, M&E manager)	<ul style="list-style-type: none"> • All project operations • Day-to-day DEEP management • Strategic partner recruitment • Partner management • Reporting 	<p>Only positive comments received from mentors and individual management team representatives about senior DEEP EA management. Difficult project to manage in terms of space, activities and period. Management was effective.</p> <p>May have been opportunities to</p>

³⁹ This includes market development sessions such as; 'Gaining an understanding of different marketing techniques', 'Product demand stimulation', 'Demonstrating the Existence of Markets', Formation of business networks, etc. DEEP support also includes having supported businesses be trained by product suppliers as part of the value chain approach. See, for instance, Q17 DEEP Report, Internal GVEP-I document.

	<ul style="list-style-type: none"> Financial management and decisions below certain threshold 	further empower local DEEP EA senior management but project objectives were achieved.
Field operatives (RBM & RTM)	<ul style="list-style-type: none"> Business mentorship & training Collect ME data Develop business plans and prep for access to finance 	The evaluation noted significant improvements in knowledge and attitude of fulltime mentors over the original part-time volunteers. In addition, MSEs acknowledged this improvement/

Value for money

Certain impacts are easier to qualify than others. It is difficult to determine, for instance, the value of the pride associated with being able to send your children to school or the value associated with the increased confidence and civic commitments of a successful entrepreneur. It is also difficult to determine the future value leveraged by DEEP through inspiring other related MSE activities in this and/or other regions. What the evaluation has done is to reflect on three 'levels of value' in determining the overall value for money that the DEP programme represents.

- Improved incomes;** based on the figures resulting from the M&E process, the turnover of DEEP businesses has been steadily increasing (see Table 8 below). Using this as the initial value accumulation and trajectory, we can estimate the value generated by the DEEP businesses in US\$ starting at Quarter 16 and ending four years later (3 years beyond project closure), the DEEP businesses would have generated over US\$30 million in turnover⁴⁰. If profits are estimated at 30%, that would be US\$9.2 million in profits based on a 4 million Euro project with a US\$5.2 million value⁴¹.

Table 8: Quarterly turnover for DEEP businesses (Euros)

Country	Q15	Q16	Q17	Q18	Q19
Kenya	134,032	156,131	188,506	204,686	229,346
Uganda	131,106	198,788	265,496	292,355	366,004
Tanzania	350,938	477,200	557,696	693,343	736,594
Total	616,076	832,119	1,011,698	1,190,384	1,331,944

In addition, there are also multipliers to consider. Many of the respondents have used their improved incomes to secure loans (principally through KIVA, but through other institutions as well) which they have invested in business improvements whether through stock, premises and/or equipment. Others have invested increased profits directly back into the business, with a number of entrepreneurs interviewed having purchased equipment and

⁴⁰ See Appendix B.

⁴¹ The US\$ was valued at \$1.31 to the 1Euro at the time of writing.

vehicles (motor cycles and other small vehicles) to enhance the efficiency of their operations and to make them more competitive.

- **Non-numerical considerations;** as suggested, the DEEP had a number of impacts the value of which are difficult to determine. Of the 42 entrepreneurs interviewed, over 60% of the respondents (25) identified 'paying school fees' as one of the ways in which the business has improved their lives. It is obviously very difficult to quantify the value of this. Of course, the money paid to the school is already accounted for in the form of profits mentioned above, but the value of a more consistent and better education is more challenging to quantify. Suffice it to say here that the fact that entrepreneurs prioritised this 'spend' suggests that the returns are worthwhile. About 33% of the respondents had also invested in either new homes and/or plots which provided additional business/family stability.
- **Extra project benefits;** these would include the benefits that the DEEP programme offers to other parties entering the MSE sector. The DEEP programme is pioneering in many respects and has learnt, sometimes the hard way, about what it takes to establish successful small and micro-businesses in East Africa. The project has become something of a regional flag bearer for energy access and MSE development. To a considerable extent they have paid the *school fees* of many current and future MSE/energy initiatives in the region as much of what they have learnt and shared will assist these initiatives in achieving their objectives in a more efficient manner. The GVEP-I/DEEP programme has published a considerable body of research and worked with a range of partners in the region⁴². For instance, their work with Micro-Finance institutions such as KIVA, FINCA and various SACCOS has paved the way for greater involvement by Micro-Financiers in the field of rural energy access. Limited access to finance has been identified as a significant restraint to both small business and energy access in Africa⁴³ and there are other important achievements around MSEs and energy access which are discussed in subsequent sections. Suffice it to say here that the programme, if it articulates and shares its outcomes effectively, has the capacity to improve the success and effectiveness of future MSE/energy access initiatives across this and other regions, and the value of this would be significantly more than any quantification of business turnover.

⁴² While we acknowledge this, we also suggest in subsequent sections that more could have been done to raise awareness around the DEEP project.

⁴³ See, for instance, <http://www.howwemadeitinafrica.com/recognising-africas-informal-sector/25278/> and http://centerforfinancialinclusionblog.files.wordpress.com/2011/12/110929_cfi_rpt_energy-links-full_final.pdf

The real value of the DEEP programme: from artisans to entrepreneurs

The evaluation has so far addressed the explicit outcomes of the DEEP project, but not so the less explicit achievements or successes of the programme. With 5 years of working with entrepreneurs across three countries, there is much that the DEEP programme has learnt and much that it needs to share. Not all learning, however, has been the explicit intention of the programme, but is rather more circumstantial as it works with entrepreneurs across different technologies, regions and, indeed, competency. The key achievement of the programme is that it has discovered how to develop people from artisans to entrepreneurs. During the 2010 mid-term evaluation, the main challenge noted was that businesses were essentially artisanal rather than entrepreneurial. They could make products but they could not sell them. There has been a profound evolution in the integration of these businesses into the market. People are demonstrating products, are identifying markets, issuing free samples, integrating themselves into value chains, engaging with retailers, doing direct marketing, producing and distributing brochures and pamphlets, providing aftersales service, committing themselves to product quality/standards; in short, they are selling. There has been an effective non-technical shift in business performance which (along with the technical abilities) has raised the performance of a not too insignificant number of these DEEP supported businesses. Overall, the DEEP programme has developed a deeper and more textured understanding of the challenges of entrepreneurship in East Africa. These issues need to be better researched, understood and articulated and that is not the function or responsibilities of the Terminal Evaluation. However, some of these issues have been raised below in pointing to arguably the most important accomplishment of the project.

- **Understanding the context of the opportunity;** statistics abound with regard to meaningful income generating opportunities that make one question the value and sustainability of those livelihood opportunities that generate less than this accepted threshold⁴⁴. However, we need to look at the impact of DEEP from a more socio-economically nuanced perspective. Many of these DEEP participants are subsistence/micro-scale farmers with an existing level of 'sustenance wealth' which offsets their absolute income requirements. Their challenge is generating enough cash as and when it is required (out of harvest time). For many it is a case of under-employment rather than unemployment and what the DEEP programme has offered them is a part-time opportunity to generate some income and to offer it in a way that is accessible to them from an educational, wealth, etc. perspective. About 40% of businesses interviewed remained involved in agriculture.
- **Increasing access to appropriate finance;** there are a large number of businesses within the DEEP programme⁴⁵ that have accessed loans through the KIVA/GVEP-I partnership as well as other micro-lenders such as FINCA. The manner in which these loans have been issued has been fairly unconventional, with GVEP-I standing surety for their value. To be sure, this arrangement has facilitated a greater entry of MFIs into the small-scale energy access arena; which may result in a greater level of more conventional loans being offered to the MSEs on a business-to-business basis. But more to the point, GVEP-I has identified a way to enter the market on terms that are far more sensitive to the conditions of micro-enterprises. The lower interest rates

⁴⁴ Here referring the living requirements of \$1 and \$2 per day.

⁴⁵ Thirty-four out of 42 businesses interviewed (80%) have received loans while supported by the DEEP programme

offered by MFIs based on the surety provided may become the more mainstream approach while lenders, service providers and other players in the sector establish themselves in this sector over time. Access to relatively small loans can and does make a significant difference to the performance of these businesses and the livelihoods they support. It is a temporary condition, but may be in operation longer than one thinks.

- **Reliance on local labour – family and local community;** businesses remain labour intensive and while entrepreneurs do speak about technology efficiencies, this discourse tends not to be offered at the expense of manual labour. There is not only pride and status attached to recruiting family and community members into the business, but there is also a sense of responsibility. The notion of success has a broader, more inclusive feel to it as entrepreneurs talk about how success impacts/benefits others (through employment opportunities) and not just themselves. As Stella, an entrepreneur from Kisumu, Kenya, noted when asked about business performance: ‘the community has noticed that I am doing well as I have employed three youngsters from the community’⁴⁶. There is a tendency towards efficiencies and growth, but not in a particularly industrialised, *high-tech* manner.
- **Business registration;** most of the Category I and II businesses are now registered businesses. This registration means that they can participate in public MSE initiatives, improve their prospects of accessing finance but, just as important, is the pride and responsibility that goes with it. As Joseph Roberts, a solar technician and retailer in Tanzania noted, ‘business registration has made me known and I need to perform better because of it’. In many cases registration has the makings of a social contract between the business and the market.
- **Technical standards;** Janet Odeyo has earned approval from the Kenyan Bureau of Standards (Kebs) for her improved cookstoves. To date, 49 entrepreneurs have participated in the standardisation process across the three countries. While only a limited number have achieved this level, this is an innovative and pioneering approach to opening opportunities for MSEs⁴⁷. There are many consumers who make purchasing decisions based on these standards. It is an important quality intervention that offers a more consistent, recognisable standard than what can be expected by the commitment of individual entrepreneurs themselves. This is an important step in building the confidence of the market and supporting institutions in the small and micro-business sector.
- **Business confidence;** what the DEEP initiative has done particularly well, showing a significant improvement from 2010, is building confidence within the entrepreneurs. It about building technical knowledge, taking entrepreneurs to markets, developing business networks, encouraging entrepreneur to entrepreneur linkages, encouraging engagement with the value chain, etc. that steadily increases the overall confidence of these entrepreneurs. During the time of the interim evaluation, there was a patent lack of confidence which manifest in low sales⁴⁸, with most people no more than very average artisans, developing products more as a hobby than an income stream. This has changed considerably with most entrepreneurs stating that their success had much to do with their ‘business confidence’. For instance, Farouk from

⁴⁶ Comments made in an interview with the evaluation consultants.

⁴⁷ This is an important step that has been introduced through the DEEP EA programme. Subsequent MSE initiatives should focus closely on this process as it will open up opportunities to national and regional markets and strengthen the position and growth prospects of this sector.

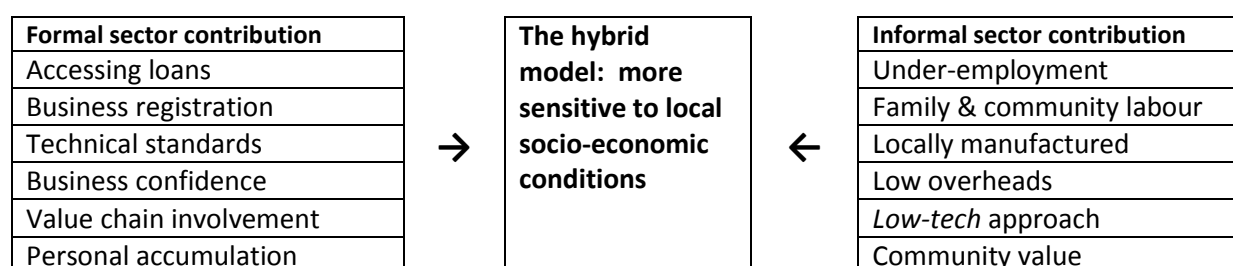
⁴⁸ The Interim Evaluation noted ‘the need for a stronger focus on sales and marketing at the business level’ p6

Kampala, Uganda, now has the courage and confidence ‘to approach and service up-country markets’ while Joseph Robert from Mwanza, Tanzania, says he can now ‘face financial institutions and get loans’, a sentiment shared by Dominic Donald, Tanzania, who says that he can now ‘approach banks as he now has quality products and records’⁴⁹.

- **Locally manufactured;** most of the ICS and briquette products and technologies are locally manufactured. There are of course associations/alliances between distributors (of imported technologies such as lanterns), but the bulk of the sales volumes have to do with locally manufactured products. Fifty-five percent (55%) of gross turnover value over the last three reported quarters came from ICS and briquettes which are entirely locally manufactured. In the case of ICS, the clay, moulds, liners, cladding, kiln, woodfuel, etc are all produced/sourced locally and the same can be said of briquettes, which are produced using charcoal powder (waste residue from charcoal) and/or wood-shavings/saw dust. Even the extruder technologies are locally manufactured or fabricated⁵⁰. The use of local materials and value adding processes not only has spin-offs for the local economy through the manufacturing value chain, but importantly pitches these business opportunities at a level which is accessible to the DEEP-type of small/micro-business. It’s not about import, freight, customs, etc. but rather about local economic transactions between local members of the value chain.

The small and micro-business model that emerges here is one that presents a blend between certain defining features of the formal economy and other features with a distinct ‘informal economy’ feel about them. The outcome is something of a blend that is more in-tune with the socio-economic realities of not only the entrepreneurs themselves but the market they service. For instance, while there is value placed in efficiency, the strategy is more labour-intensive than ‘high-tech’. While loans are offered, they are very small-scale and involve organisations and, indeed, terms that are compatible with the socio-economic realities. In terms of the different contributions the two approaches (formal and informal) make, we would propose the following representation:

Figure 1: Hybrid MSE model



While the model is interesting and has evolved – intentionally or otherwise – over the course of the programme’s 5 years, the real statement of success is in the performance and, importantly for those longer-term DEEP businesses, the improvement of performance over the programme’s life.

⁴⁹ The above statements were made by the entrepreneurs during the MSE interview process.

⁵⁰ One of the DEEP entrepreneurs (Dominic Donald) fabricated extruder equipment in Tanzania which is sold to other businesses both within and outside of the DEEP programme.

Improvements in productivity

While the steady increase in the quarterly turnover contained in Table 8 above clearly shows an increase in the overall value of sales amongst DEEP supported businesses, what it does not indicate is the distribution of these improvements. Are a couple of businesses improving while the others remain fairly static? According to the business interviews, a question was asked about the improvements in income over the past two years. Most businesses interviewed have increased sales and turnover remarkably over the past two years. Indeed, the increase ranges from 30% to well over a 1000% increase. The escalations appear to capture the shift many businesses have made from artisans to entrepreneurs. The changes in business performance have been presented in Appendix 3.

Likely continuation of achieved results

There are a number of way in which to evaluate the likelihood of the continuation of these results, or more to the point; the sustainability of these businesses. These include the extent the businesses have been included in broader business networks, the extent to which the businesses and programme has been imbedded within the national and regional MSE frameworks as well as the business tools, skills and capacities that entrepreneurs themselves have been equipped with.

Business networks

Where businesses belong to production groups, industry associations/organisations, SACCOS, etc. they arguably have access to greater business support resources. The majority of businesses (60%) within the sample are members of one or another organisation.

Table 9: Organisational membership of entrepreneurs

Organisational type	#	%
Business associations	5	12%
Co-operative membership	17	40%
SACCOS	3	7%
No membership	17	40%

Public sector integration

The DEEP initiative is not really imbedded within the national and regional MSE/energy initiatives of the host countries. In interviews with project management, it was noted that working with governments has been challenging in terms of continuity, punctuality and general interest. So while it would be advantageous it integrate the project in public initiatives and institutions, the evaluation concedes that this is not always possible and the choices that the project makes should always facilitate rather than stall in programme.

Entrepreneurial sustainability legacy

As indicated in Appendix D, the evaluation asked a number of questions relating to the prospects of these businesses continuing to exist. The following questions were asked;

1. What business tools have you been left with post-DEEP
2. Do you do any marketing
3. Do you think you can grow the business post-DEEP
4. Do you have more business confidence?
5. Have you ever had a loan?

The results have been captured in Appendix D. The overall view of the evaluation is that the entrepreneurs themselves believe, providing various explanations for this, that they have the confidence to take the business forward. There are a few that expressed willingness for DEEP to continue their support but by far the majority believed they could now go it alone. In terms of the business tools that remain post-DEEP, frequent reference was made to technical and business skills, customer service, record keeping, product quality, etc. With regard to marketing, most businesses carried out some or other form of marketing including, demonstrations, market days, consignments, distributing fliers, offering samples, etc. The value of marketing appears to have been embraced by the DEEP entrepreneurs. With regard to the question about growing the business post-DEEP, while a handful of respondents hoped the DEEP programme would continue their direct support, the majority were confident they would continue with many of these indicating their plans. The majority of the sample MSE have already had a loan through the programme (all of which were serviced or are being successful service) which means their likelihood of getting another loan is high.

Customer survey results

Pan African Research Services (PARS) carried out surveys of GVEP customers in all three DEEP-EA countries during February 2013. The surveys were aimed at gauging customer experience, satisfaction and impact. 212 surveys were administered – 10 of which were “pilot” surveys used to test the tool and train enumerators in Kenya. The table below provides a breakdown of the number of surveys by country.

Table 10: Customer Survey Numbers according to country

Countries	
Kenya	65
Tanzania	70
Uganda	77

To find customers, the enumerators depended on the entrepreneurs (and GVEP mentors) to guide them to some of their previous customers. The inability to use random selection for the surveys therefore introduces a possible element of bias into the answers provided. The figure below provides an overview of the types of customers interviewed, based on the product they bought or service they used.

Products/Services

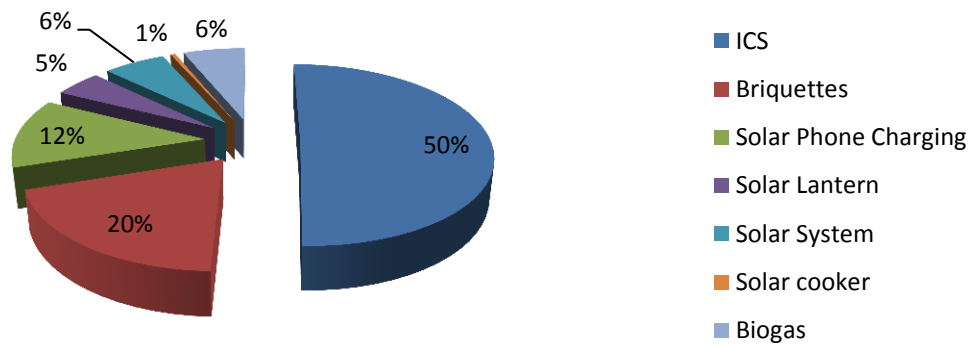


Figure 2: Products/Services bought by surveyed customers

The customer income profile presents a mix of income sources, notably including business owners, farmers, formal employment etc. Average per capita daily income is below the official poverty line of US\$2 for all product/service categories; it is however interesting to note that the income levels for customers using solar lanterns is much lower than the other categories, while the income levels of customers who bought solar systems and biogas systems are, as expected, higher (on average) than the other product categories.

Income Sources

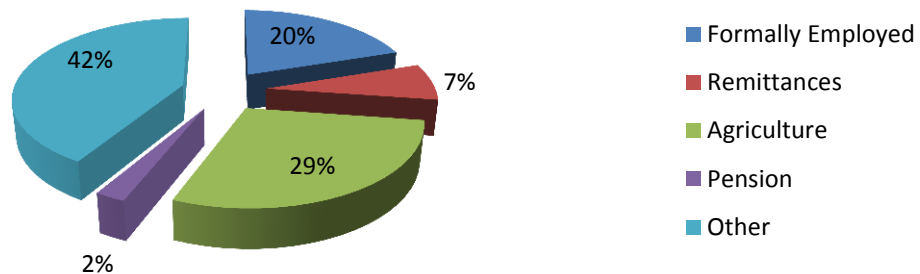


Figure 3: Income Sources

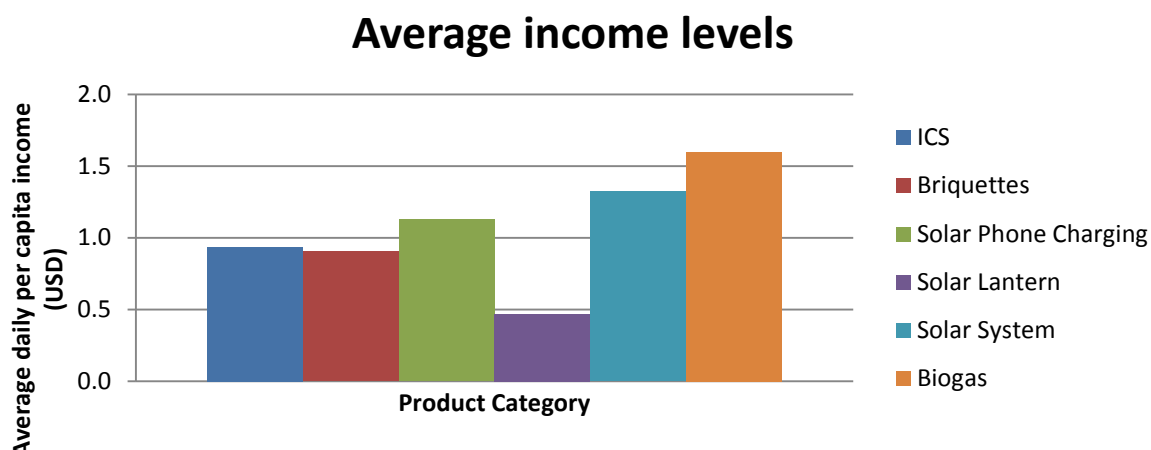


Figure 4: Average Income Levels

There seems to be a general gender balance (slightly male-dominated) when it comes to purchase decision making; reasons provided for buying the product mostly revolve around savings. This is confirmed by the results from cost-benefit questions regarding energy spending before and after the purchase of the product/service, showing average savings between about US\$2,5 and US\$4,5 per week. This saving represents about 2% - 3% of households' monthly income.

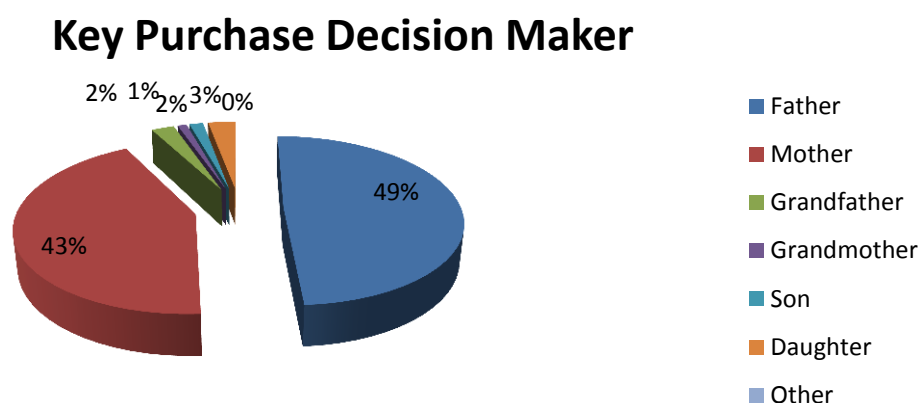


Figure 5: Key purchase decision-maker

Why did you buy the product/use the service?

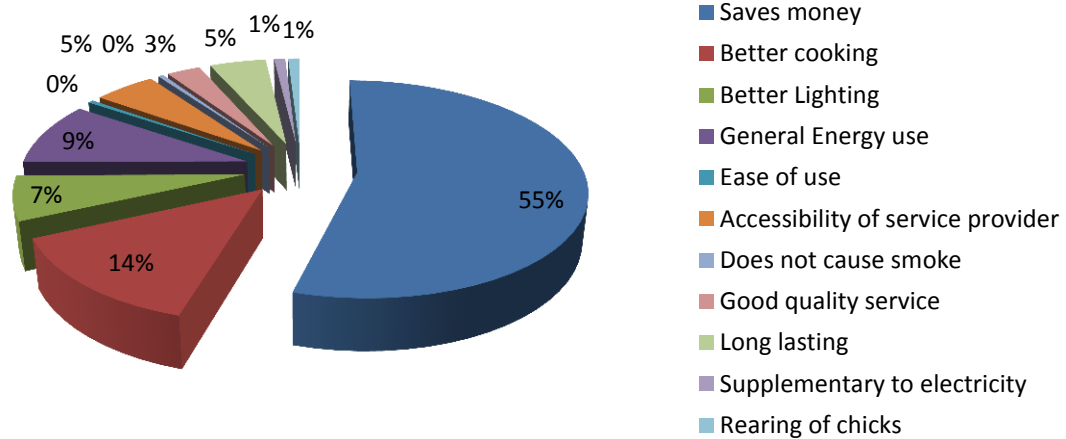


Figure 6: Reasons for buying the product/using the service



Figure 7: Average savings due to product/service

Most marketing happens through word of mouth – confirming the earlier results from the entrepreneurial surveys which indicated that very little active marketing is done. Follow-up or complementary sales seem limited (20%), indicating the need for further diversification of products/services and engagement with customer needs.

How did you find out about the product/service?

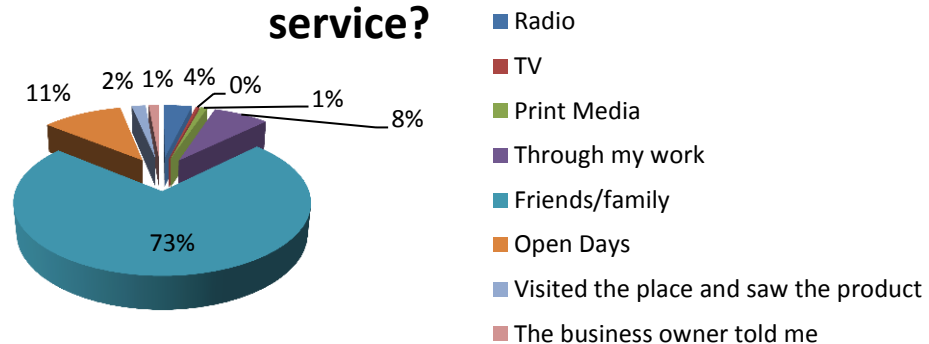


Figure 8: How did the customer find out about the product/service?

Did you buy other products from this business?



Figure 9: Follow-up purchases

Only a small portion of customers (19%) have had problems with the products, and of those the vast majority have been sorted out. Together with the results indicating the high prevalence of word-of-mouth marketing, the willingness of customers to refer others, general satisfaction levels and the fact that almost everyone considers their purchase to be helpful, it seems that product quality and after-sales service is an area where important results have been achieved. Against, this result might be tempered by the sampling problem mentioned earlier, but it is still a significant result for a difficult and normally poorly serviced market.

Have you had any problems?



Figure 10: Problems with the product/service?

Was the problem resolved?

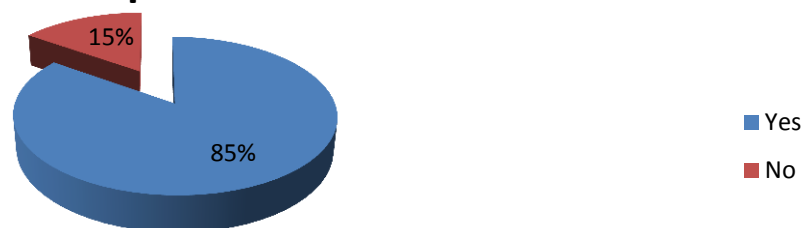


Figure 11: Was the problem resolved?

Will you buy from this business again, or encourage others to buy there?

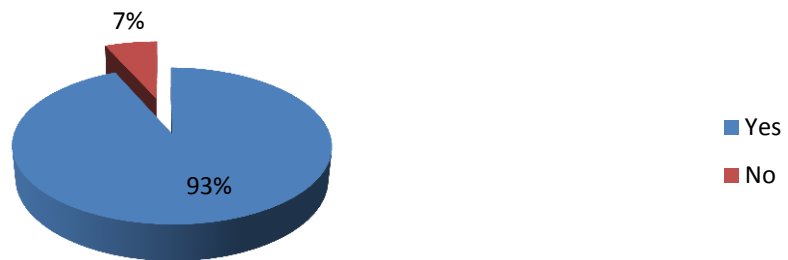


Figure 12: Would customers buy again/refer others?

Are you satisfied with the product/service?

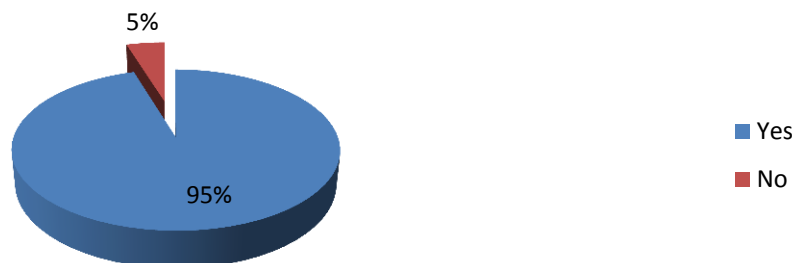


Figure 13: Satisfaction with the product/service?

Is the product/service helpful to you?

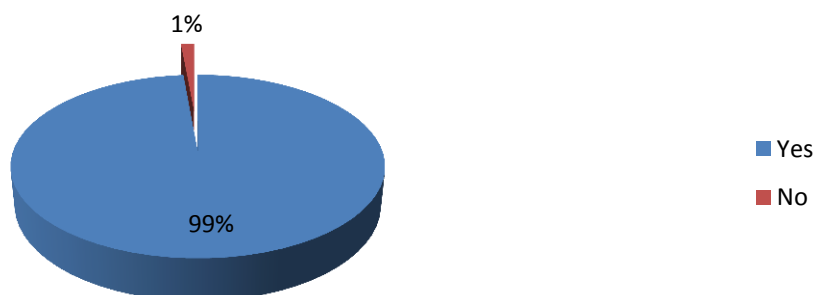


Figure 14: Helpfulness of product/service?

In terms of other practical impacts, about 16% of respondents indicated that they are able to increase their income through using the energy product/service. For those using solar products, 87% indicated that the products improved their children's ability to study. Family health impacts are not as pronounced, but still about 50% of respondents reported a positive health impact from using the products/services.

Do you do extra, income-generating activities thanks to the product?

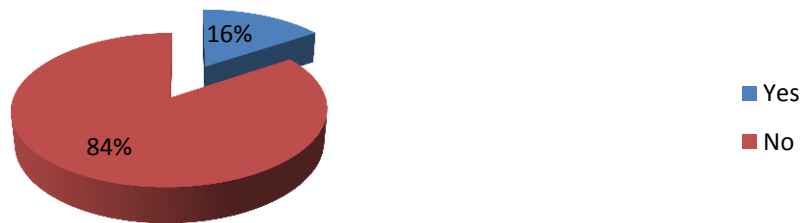


Figure 15: Income generation from product/service?

Does the product improve your child's ability to study? (solar products)

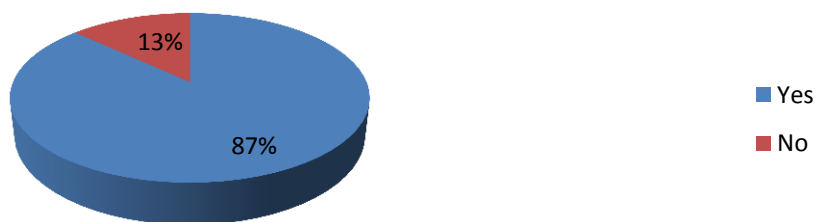


Figure 16: Impact on children's education (solar products and biogas only)

Is your family healthier thanks to the product/service?

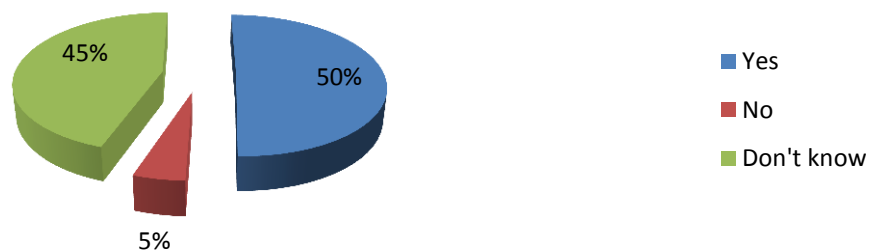


Figure 17: Impact on family health

This also corresponds with the high ratings awarded to not only the products/services purchased, but also the entrepreneurs' customer service.

Please rate the quality of the product/service

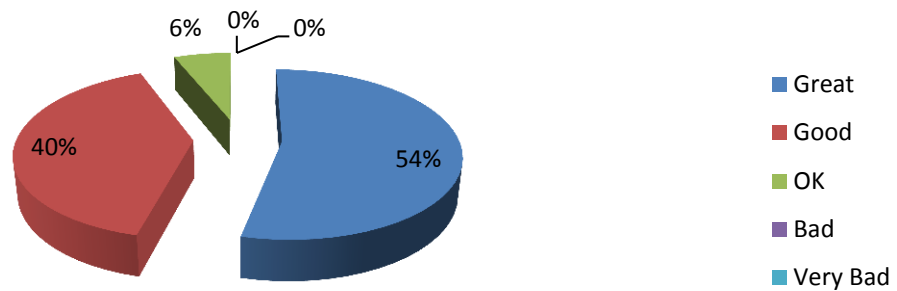


Figure 18: Quality rating (product/service purchased)

Please rate the quality of the service that the entrepreneur provided

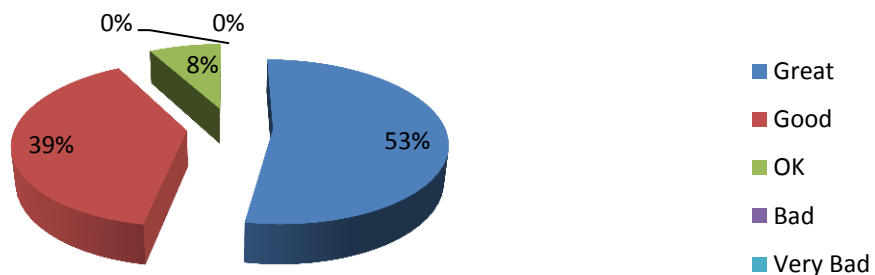


Figure 19: Quality rating of entrepreneur's customer service

This relatively high level of performance seems to have come about, for almost 80% of the entrepreneurs, over the last 5 years – confirming that there is at the very least a correlation between the GVEP program and business improvement. The fact that most of the reported improvement is around increased clientele, better and more products as well as improved customer service, seems to point to a causal link between DEEP-EA and these businesses' performance.

Has the business improved its performance over the last 5 years?

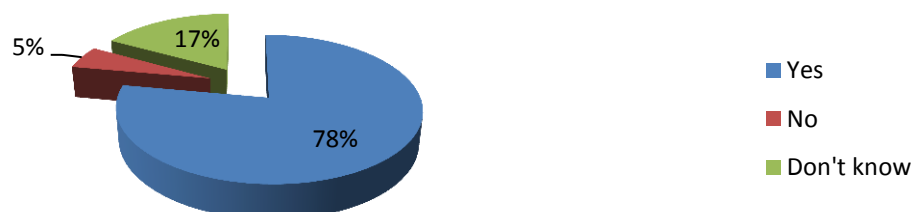


Figure 20: Business performance improvement during GVEP program

How has the business improved its performance?

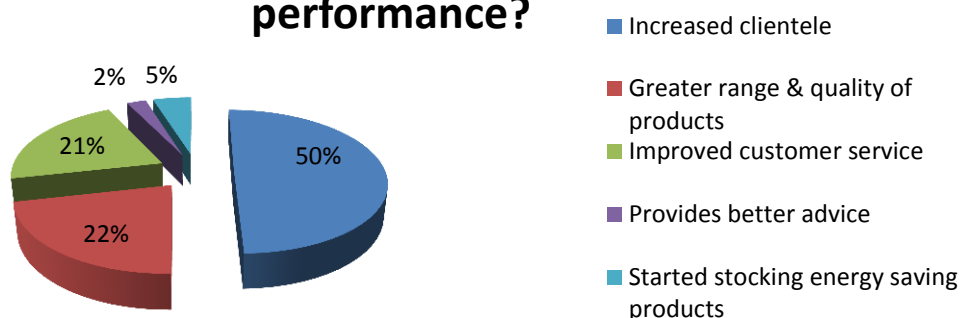


Figure 21: Business improvement categories

Another important result is the fact that not only has business performance improved, but (possibly as a result) so has energy access as well.

Has it become easier to access energy products and services?

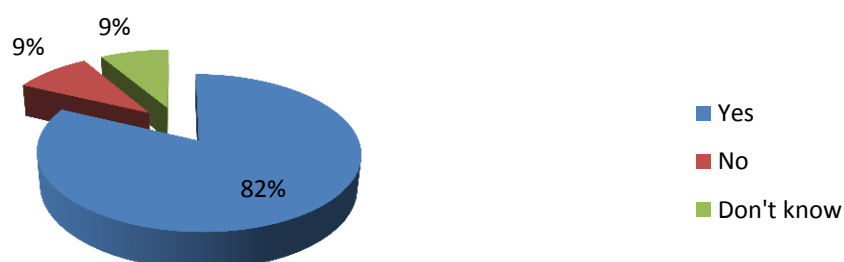


Figure 22: Improvement in energy access

Summary

The following results emerge from the survey:

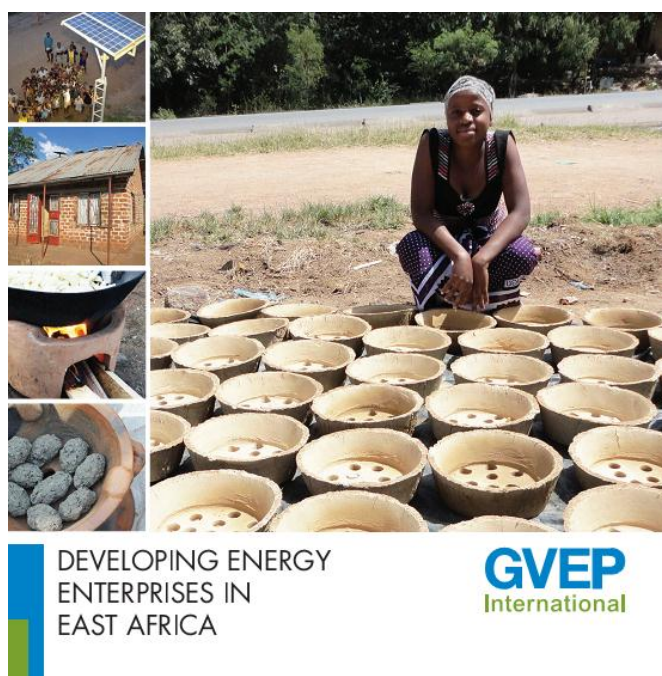
- Customers are generally satisfied with the DEEP-EA entrepreneurs – specifically also their products and customer service.
- The products/services sold by the entrepreneurs are helping (poor) customers to save (and in some cases generate) money – and this is one of the main selling points. They also seem to improve customers' general quality of life.
- Marketing channels can be increased, diversified and strengthened; there is also a need for product diversification and the retailing of complementary products.
- There have also been concerns raised concerning access to raw materials for briquettes (as well as biogas systems).

Visibility

The visibility of DEEP-EA has increased substantially over the past 18+ months – both within the East African region, as well as internationally. The appointment of a Communications Officer provided critically needed direction to the public relations actions of the programme – across all communication platforms. DEEP-EA seems to have been relatively successfully in its exploitation of visibility opportunities, including television spots, radio advertisements and interviews, press releases, workshop and conference hosting/exhibitions, online media engagements (newsletter, social media platforms) and specific tailor-made publications. Visibility actions were aimed at different audiences (entrepreneurs, policy-makers, development practitioners, mass media audiences) with different communication aims (brand-building, training, awareness raising, education); DEEP-EA navigated the complexities inherent in communicating effectively with these audiences quite well.

There seems to have been a strong reliance by the project on existing communication infrastructure and networks, such as that of the Global Village Energy Partnership (GVEP) and the EU, frequently mentioned throughout the quarterly reports. Leveraging these existing networks and platforms greatly enhanced the visibility, reach and impact.

While quite a number of brochures, flyers and other information materials were been produced throughout the course of the project, especially during the first phases, most of this was understandably aimed at the entrepreneurs already in the program. Even though a number of press releases were produced, and DEEP-EA featured on numerous East African media platforms, it unfortunately seems from the customer survey feedback that the project has very limited visibility “on the ground” – with only a few customers reporting that they’ve ever heard of DEEP-EA.



DEEP-EA’s communication activities and publications still appear to have reached a sizable audience, at least internationally. The EU’s involvement, as funder of the project, was consistently highlighted in these. While there remains some room for improvement in terms of DEEP-EA’s visibility, especially given the programme’s significant impacts and important lessons, GVEP-I seems to have achieved a great deal with the resources at its disposal.

Overall assessment

The overall assessment of the DEEP EA programme is positive. The objectives have been met and in many cases exceeded and the impact will be lasting. Perhaps the most important issue behind the programme's success is its relevance. With access to modern and clean energy sources in this region particularly low (average 15% grid connection) the project is very well positioned to improve access in the medium to long-term and to do so on a particularly auspicious platform; MSEs. Rural and peri-urban sectors in East Africa do not attract much direct investment and opportunities for formal sector economic growth are few. Instead, local economies and opportunities are founded on MSEs (and SMEs) which is where the DEEP EA programme pitches its approach.

However, being relevant and being effective are two separate things. It is no simple task to facilitate the emergence and growth of businesses, no matter the size. The DEEP EA team have shown adequate management flexibility in ensuring that any constraints within the approach and methodology have been worked out the system and the process has been adapted to these experiences. The shift from recruiting interested (but 'non-practicing') entrepreneurs to rather working with existing small businesses was one such example. Instead of remaining committed to a methodology that may have achieved the numbers upfront but not provided the sustainability beyond that, the programme re-focused to include existing businesses that provided a more stable platform going forward.

A further interesting innovation is the way in which the DEEP EA programme has developed what is something akin to a 'third-way' or hybrid model of small business. The informal sector predominates in terms of employment and opportunities within East African economies – as it does across most of Sub-Saharan Africa. It holds this prominent position because it is accessible in terms of capital and education and provides the only real off-farm livelihood opportunity for most of the regions rural and peri-urban residents. The downside of the informal economy is that product quality is unreliable (there are no standards), it cannot access finance, it is overlooked by governments in terms of procurement of goods/services and it cannot really be regulated and supported. Which ensure that growth prospects are minimal. What the DEEP EA programme has done is develop a hybrid model for MSEs in the region, incorporating the useful elements of both the formal and informal sector into their approach to supporting businesses. The approach retains the informal and accessible character of the informal sector in terms of cottage industry, family labour, low technology, local manufacturing, etc but at the same time includes important formal sector characteristics such as technical/national standards, business registration, access to finance, etc. While the businesses remain accessible and true to their socio-economic context, they do offer considerably more scope for growth and stability.

The growth in these businesses has been encouraging. As indicated in Table 11 below, business turnover grew notably from one quarter to the next towards the end of the programme. While it would have been reassuring to see a greater number of businesses with membership in industry, trade and regional associations as well as more direct overlap/integration with government MSE/SME programmes, one cannot argue that the project appears to have instilled, based on these growth figures, the necessary sustainability in most of these MSEs.

Table 11: Growth in Business Turnover

Country	Q15	Q16	Q17	Q18	Q19
Kenya	134,032	156,131	188,506	204,686	229,346
Uganda	131,106	198,788	265,496	292,355	366,004
Tanzania	350,938	477,200	557,696	693,343	736,594
Total	616,076	832,119	1,011,698	1,190,384	1,331,944

2012 was the International Year of Sustainable Energy for All. It will require a significant global effort if this goal is to be achieved. The easy part is the drafting of a vision and setting of goals. The hard part is operationalizing this vision. What the DEEP EA does is demonstrate how MSEs, the mainstay of the accessible economy, can be utilised for operationalizing this vision. As an approach, they will never achieve 'sustainable energy for all' on their own, but they must be an important component of this and the lessons from DEEP need to guide how MSEs are utilised as a means of improving access to energy for all.

Conclusions & recommendations

The overall position of the evaluation is that the Deepening Energy Enterprise Project (DEEP) has been a success. The details of the objectives, the in-project re-evaluation of these objectives and the overall project achievements have been discussed in detail under the Achievement of purpose section above. Table 12 below summarises the objectives and the extent to which they were achieved.

Table 12: Summary of objectives and achievement

Target groups/Final beneficiaries	Achievement
1800 micro and small enterprises (MSEs) started-up, diversifying into providing energy services or improving and expanding existing energy services in rural and peri-urban areas with the assistance of the project	955
300 business mentors trained, qualified and employed in the project	+/-30
12,000 rural and peri-urban community members with raised awareness of modern energy products, services and market opportunities	4,000,000 people benefiting from renewable energy products
1,800,000 men, women and children in rural and peri-urban areas accessing energy products and services from supported energy enterprises	4,000,000+
1,300 households receiving income from employment in supported energy enterprises	2841

The under-achievement on the number of businesses and mentors was not regarded as a failure by the evaluation. These numbers were intended to facilitate the achievement of ‘1,800,000 men, women and children’ utilising renewable and efficient energy products through the DEEP programme. This target has been exceeded through the reliance on fewer, more established businesses and through the utilisation of a smaller cohort of full-time, professional mentors as opposed to a large number of *ad hoc* which was the initial approach that was later revised.

Since the project has concluded, what follows are observations rather than recommendations;

- The shift from recruiting start-up businesses to solely focusing on existing businesses had a significant positive impact on the DEEP EA programme. Avoiding the need to filter out opportunists as opposed to emergent yet committed entrepreneurs saved much time/resources and facilitated outcomes.
- The use of full-time, trained mentors was welcomed by the entrepreneurs and seemed to have an overall positive impact on business performance. The use of volunteers was innovative but ultimately difficult to control in terms of knowledge transfer and planning.
- The emergence of a more ‘hybrid’ character incorporating informal and formal sector features appears to reflect the socio-economic realities on the ground. The profile of a successful business that emerges from the DEEP EA is one that incorporates elements of

both the formal and informal sector. The retention of significant informal sector characteristics demonstrates the need to allow local circumstances and experiences to contribute towards shaping success.

- A number of business and technical packages were offered by the DEEP EA team which acknowledged the different opportunities and challenges that MSEs faced and provided a means through which lessons might be shared. These include;
 - Entrepreneur to entrepreneur linkages; a number of businesses indicated that they benefitted from the engagement between businesses that was facilitated within the programme. These were particularly beneficial towards the end of the programme when entrepreneurs were more confident and businesses more mature
 - Growth training looked at addressing some of the challenges businesses faced. The benefit here is that GVEP-I was exposed to similar issues within similar businesses in different regions and could bring this insight to bear in addressing obstacles to growth. The programme used successful entrepreneurs to address their peers.
 - Business diversification training was designed to assist entrepreneurs in spreading their income risks and to develop allied opportunities. There were a number of MSEs interviewed that had benefitted from this process. Successful efforts to diversify in one region could be shared in another without impacting negatively on the original businesses.
- The DEEP EA programme started to realise the benefit of professional support towards the second half of the project. Ad hoc technical and business mentors were replaced by permanent, qualified people who were taken on as full-time staff. Fewer in number, these staff members were exposed to a greater number of businesses on a more regular basis and demonstrated greater capacity to convert the failings of one business into improved prospects for another.
- The project demonstrates that the MSE/informal economy can play a significant role in improving access to modern energy supplies in rural areas. This is a significant contemporary challenge and the DEEP EA initiative indicates one important route to achieving the longer-term aim of Sustainability Energy for All.
- The innovations and outcomes of the DEEP EA project need to be shared more widely. There was clearly effective learning taking place within the programme as processes became more streamlined and effective during the course of the project. While this programme was certainly innovative and pioneering, there have been similar kinds of projects in the past and there will be further in the future (probably more so based on the success of DEEP EA) so it's important that GVEP-I shares these lessons and innovations in an accessible format.

Annex A: Draft Customer Impact Questionnaire

Field Identification

Interviewer:	Date:	Country:				
Cluster:	Region:					
Name & Surname of Respondent						
Survey Number:						
Energy Product(s) Purchased	ICS	Briquettes	Solar Phone Charging	Solar Lantern	Fireless/Solar Cookers	Biogas
	Other:					
Product Brand & Model						
Entrepreneur/Business who sold the product	Name:				EntCode:	

Household Profile

Household Size	Male:		Female:			Total:			
Income Sources:	Formally employed	Remittances	Agriculture	State Support	Other				
Amount (per month)									
Main Dwelling (mark)	Traditional		Bricks			Other			
Other dwellings (amount)	Traditional		Bricks			Other			
Wealth Indicators	Vehicles	Satellite	TV	Hi-Fi	Radio	DVD player	Fridge	Freezer	Mobile Phone

Sales & Marketing Questions

Purchase Decision	Father	Mother	Grandfather	Grandmother	Son	Daughter	Other
Why did you buy the product?							
How/where did you find out about the product?							
When did you purchase your product							
Did you receive a receipt?	Yes			No			
Where did you purchase the product?							
Did you pay once-off, or in parts/pieces?							
If payment in instalments , please describe: (number of instalments and value)							
How much did your product cost?							
Have you brought more products from this business? If yes, please list							
Does the business market its self; signage, demonstrations, etc.							
Do you know of other households that have bought products from this business?							

After-sales Service Questions

Does your product come with a warranty?	Yes		No		
How long is this warranty valid for?					
Have you had problems with your product/service?	Yes		No		
<i>If yes, please describe:</i>					
How many times has this happened?					
What did you do about it?	Contact business	Talk to other customer	Fix it yourself	Nothing	Other
If you told the entrepreneur, how long did it take for him/her to respond?					
Was the problem resolved?	Yes	No	Other		
<i>If NO, please explain the current state of the problem</i>					
Have you had to replace any components/the product?	Yes		No		
<i>If yes, how long after purchasing the product did you have to replace the component?</i>					
How much did it cost?					
Will you buy from this business again, or encourage others to buy there?	Yes		No		
Please explain					

Impression of the Product/Service

Are you satisfied with the product/service?	Yes		No	
<i>Please explain</i>				
Is the Product/service helpful to you?	Yes		No	
Please explain				
Do you do extra, income-generating work thanks to the Product?	Yes		No	
<i>If yes, please describe these activities:</i>				
Does the Product/service improve your/your child's ability to study?	Yes		No	
<i>If yes, please describe how the Product has improved this:</i>				
Is your family healthier after starting to use the Product/service? For instance, less smoke in the HH, less candles/kerosene lamps...	Yes	No	Don't Know	
<i>Please explain</i>				
Please rate the quality of the product/service (1=great; 2=good; 3=ok; 4=bad; 5=very bad)				
Please rate the quality of service that the entrepreneur provided				

(1=great; 2=good; 3=ok; 4=bad; 5=very bad)	
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Costs/Benefit: Improved Cook Stove (ICS)

How much did you spend each week on charcoal/wood before you had the ICS?		
How much do you spend each week on charcoal/wood since you have the ICS?		
Do you still use another stove/open fire?	Yes	No
<i>If yes, why do you still use these other cooking appliances?</i>		

Costs/Benefit: Briquettes

How much did you spend each week on charcoal/wood before you used briquettes?		
How much do you spend each week on briquettes?		
How many briquettes do you use to cook a meal?		
Do you still use charcoal/wood to cook with?	Yes	No
<i>If yes, why do you still use charcoal/wood?</i>		

Costs/Benefit: Solar Lantern

What did you use for lighting before you had the solar lantern? (e.g. candles, kerosene, torches)		
How much did you spend per week on lighting before you had the solar lantern?		
How much do you spend per week on lighting after you got the solar lantern?		
Do you still use other lighting sources?	Yes	No
<i>If yes, why do you still use other lighting sources?</i>		
Do you use the solar lantern for any other applications? Please describe		

Costs/Benefit: Solar PV product (i.e. NOT a solar lantern)

What did you use for lighting before you had the solar product? (e.g. candles, kerosene, torches)		
How much did you spend per week on lighting before you had the solar product?		
How much do you spend per week on lighting after you got the solar product?		
Do you still use other lighting sources?	Yes	No
<i>If yes, why do you still use other lighting sources?</i>		
Do you charge your phone with the solar product?	Yes	No
How much did you spend per week on phone charging before you had the solar product?		
How much do you spend per week on phone charging after you had the solar product?		
Do you use the Solar product to power a radio/TV?	Yes	No

What did you use before, and how much did it cost?	
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Costs/Benefit: Biogas

What did you use for cooking before the biogas		
How much did you spend per week on cooking fuel before you had the biogas system?		
How much do you spend per week on cooking fuel after you got the biogas system?		
Do you still use other cooking fuels?	Yes	No
If yes, why do you still use other cooking fuels?		

Costs/Benefit: Solar PV Phone Charging

Where/how did you charge your phone before the solar system?		
How much did you spend per week on charging your phone before the solar charging system?		
How much do you spend per week on charging your phone after the solar charging system?		
Do you still charge your phone elsewhere?	Yes	No
If yes, why do you still charge your phone elsewhere?		

Level of Awareness: DEEP EA Program

Would you say that the business you purchased from has improved its performance in the last 5 years?	Yes	No
Please explain (quality/range of products/services; marketing; professionalism; after-sales service etc)		
Would you say that it has become easier to access energy products and services?	Yes	No
Please explain		
Any recommendations?		

Comments

Thank you for your time!

Appendix B: Accumulative profit generated

	Project year 5				Post project yr 1				Post project yr 2				Post project yr 3			
	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29	Q30	Q31	Q32
Turnover	\$1 011 698	\$1 193 804	\$1 337 060	\$1 457 395	\$1 573 987	\$1 684 166	\$1 785 216	\$1 874 477	\$1 968 201	\$2 066 611	\$2 169 941	\$2 278 439	\$2 392 360	\$2 511 978	\$2 637 577	\$2 769 456
% increase	-	18%	12%	9%	8%	7%	6%	5%	5%	5%	5%	5%	5%	5%	5%	5%
Acc value	\$1 011 698	\$2 205 502	\$3 542 562	\$4 999 957	\$6 573 944	\$8 258 111	\$10 043 327	\$11 917 804	\$13 886 005	\$15 952 615	\$18 122 557	\$20 400 995	\$22 793 356	\$25 305 334	\$27 942 912	\$30 712 368
	Red = actual recorded numbers															
															30% profit margin	\$9 213 710

Appendix: C: Business improvements

Country, region #	Cluster	Business type	Improvement over past 2 years?
Kenya, Nyeri	Central	Briquettes	30% increase
Kenya, Nyeri	Central	ICS	sales increased from about 300 to over 1000/month
Kenya, Nyeri	Central	ICS	from about 50/month to 1500/month
Kenya	kisumu	ICS	More than doubled - also complete ICS makes more money
Kenya	kisumu	ICS	"it has gone up tremendously" more than doubled
Kenya	Central	ICS	From about 20,000KSH to 45,000KSH
Kenya	Central	ICS	Revenue increased from 5000KSH - 20000KSH
Kenya	Central	ICS	More than doubled
Kenya	Central	ICS	Output up 20x
Kenya	Central	ICS	Has more than doubled since 2010
Kenya	kisumu	ICS	Up 80%
Kenya	kisumu	ICS	Profit has improved and business expanded
Kenya	kisumu	ICS	Sold 200 pieces in 2010 now 700 pieces a month
Kenya	kisumu	ICS	from KSh3000 - KSH15000
Kenya	kisumu	ICS	Sales up from 200 units to 600 units/month
Kenya	Kisii	ICS	Selling more and better quality (less wastage)
Kenya	kisii	solar	Sales up from 1 lantern/week to 3/week
Kenya	kisii	solar	Charging 8 phones/day now 30 phones/day
Kenya	Kisii	charcoal briquettes	Sold 2 bags/month 2010 now 30 bags/month
Uganda	Kampala	ICS	Sales up from 400k UGS - 900k UGS/month
Uganda	Kampala	ICS	More than doubled
Uganda	Kampala	ICS	sales up from 500 units to 2000 units/month
Uganda	Kampala	ICS	His business has increased significantly from 2010
Uganda	Wakiso	Briquettes	Sales more than doubled
Uganda	Wakiso	ICS	Small increase in charcoal stoves but institutional up from 1 every 3 months to a couple a month
Uganda	Wakiso	Briquettes	Earns about 750k UGS/month - up 50%
Uganda	Wakiso	charging phones	From 6-10 phones/day to 30 phones/day
Uganda	Wakiso	solar	Used to sell 1/month now 6-8/month. Makes 20,000/unit
Uganda	South Buganda	retails solar, briquettes & ICS	7 to 20 stoves/month + sales improved from lanterns to modules
Uganda	South Buganda	Charcoal briquettes	Began making for home use and now sells to neighbours, restaurants and other areas
Uganda	South Buganda	Charcoal briquettes	From home use to 350kgs/month
Uganda	South Buganda	sell and install solar	Only did phone charging now do solar install as well and lantern sales
Tanzania	Misungwi	ICS + briquette machines	in 2008 - 200k TSH/month now 1.5 million TSH/month
Tanzania	Misungwi	ICS	100k TSH/month to 400k TSH/month
Tanzania	Misungwi	solar based phone charging	was charging 3-5 phones/day now charging 50 phones/day. Charges 200TSH instead of std 300TSH
Tanzania	Magu	ICS	2008 - 10/month - 2013 - 200-500/month
Tanzania	Magu	solar charging	up from 20 phones/day to 150 phones/day (300TSH each)
Tanzania	mwanza	solar	Sales are increasing
Tanzania	mwanza	battery charging business	used to charge about 15 batteries/day now up to 30-45/day. Charges 1500-2000 TSH/battery
Tanzania	mwanza	Briquettes and fireless cookers	they have reached about 80kg/month
Tanzania	mwanza	solar	0-2 systems/month now 4-6 systems/month now getting larger tenders - profit about 300k TSH/month
Tanzania	mwanza	charging batteries	was charging 5 batteries/day now charging 10-15/day
Tanzania	mwanza	briquettes and full ICS	from 1-2/month to around 20/month + 50kgs briquettes at 200TSH/kg

Appendix D: Business sustainability

What business tools has DEEP left you with?	Do you do marketing	Can you grow the business?	Levels of confidence?	Had a loan?
Keeping records, customer and aftersales service	Not really necessary	Yes, DEEP has set the ball rolling and he will continue	Was not confident, just a tinkerer, now entrepreneur	Yes
Keeping records, how to run the business	Takes products to markets and relies on word of mouth	Yes - will visit more markets	Yes - would not be here without empowerment	Yes
Saving, keeping records and accessing finance	cannot meet demand so does not market or will disappoint customers	Yes, have plans to buy land with current income, larger shed, more labour - has business plan	Yes - more comfortable with trying to access finance	Yes
Keeping records, marketing networks	Yes - visit market days	Yes, will focus more on assembly	Yes - get to markets on my own, hire vehicles, make profit, etc. could not do that before	Yes
Marketing skills, to access the market on their own	Yes - takes product to markets	yes, plans to expand production. Challenge is cladding	Has had prior training (ITDG) but DEEP has enhanced it	Yes
Business planning, anticipate what lies ahead and what needs to be done	Takes samples to potential retailers - can't match demand at moment	He has a plans	Yes - can source other business and approach financial inst	Yes
Technical and marketing skills	Does consumer education on ICS	Currently looking for more finance to expand businesses	Yes, I believe in myself	No
Records and entrepreneurship	Take products to markets	Yes - will be carrying on	very much so	Yes (2)
Knowledge, diversification	Phones, follow-ups, looks for new markets	Can do - but would like to see DEEP stay	Yes - "I can find new customers"	Yes
Business skills	Approaches wholesalers	Yes	No comment	No
Knows markets - "has that knowledge"	Takes the product to markets + relies on referrals	Yes - has plans for expanding workshop, more materials and more artisans (has two permanent workers)	yes "I am somewhere"	Yes
Product costing, marketing	Has been on TV, radio, also goes to markets	Yes we can - but would like DEEP to stay	yes - can now market directly, have Kenya Bureau of standards now	Yes
We now have business skills	More passive/referral approach	Have plans to invest in workshop - yes	Yes, I am better now	Yes
Business management skills	Give out samples, offers consignments	Currently building shed - so yes	Still have a lot to learn	No
Knowledge on how to go on	visits new areas and new markets	Considering loan to buy and transport stoves	Can trade in the 1000s if necessary [scale]	Yes
Left with business knowledge	Reputation! And visiting markets	Yes - looking at getting involved in assembly	yes I am	Yes
Records, locate & source best quality products	Local radio but markets as well	Could carry on but more assistance would be good	Yes - am busy organising own loan	Yes
Knowledge & skills	Not really necessary	Yes - plans to expand premises	Yes, feels comfortable in business	Yes
Real business skills	Uses a PA system and visit markets	Have a lot of plans - capital a concern and looking at electric machine	Yes - comfortable with entering the market with new product	Yes
Business knowledge - will never leave her!	Doesn't have to - markets come looking for her	Yes she can. Doesn't have immediate plans as this is working for her	She has, for instance, re-negotiated prices	Yes

Appendix D: Business sustainability (cont.)

What business tools has DEEP left you with?	Do you do marketing	Can you grow the business?	Levels of confidence?	Had a loan?
Training and knowledge	Did initially but now has enough	Feels she can grow business - biggest obstacle is kiln (lack of)	Yes, has confidence - has maintained customer base	No
Keeping records and product quality	Give out samples, leave units on consignment at retailers	She would like to open own shop within 5 years	I am now very confident	Yes (2+)
Polished up business skills all round	Took products to natural concentrations of people, sold on roadside, etc.	Yes - looking at purchasing kiln	Yes, never had courage to look at up-country markets but now do	Yes
Technical and business skills	Dos demonstrations at functions. Gives small samples to passers by	Yes of course	No comment	Yes (2)
Determination	Participate in energy week also joins mobile markets	We have a vision, making a resource centre, teaching people skills	Yes, helped us promote ICS, we even deal with people from universities	Yes (2)
DEEP gave him everything	Yes - takes products to towns, markets and other local gatherings	We have a plan	No comment	Yes (2)
Customer service and keeping records	Sign post on the road - also, customers talk	Started business on own and will carry on post-DEEP	Yes, ability to succeed through business, morals, etc.	Yes
Business planning, record keeping and marketing	Takes products on his bike to town centres, evening markets, etc.	It must grow' - keen on a more wholesale position	Very much so	Yes
I can find markets and new suppliers	takes product to large concentrations of people	Looking at additional shop/outlets - capital is the challenge	Yes - knows how to handle returns, how to look for quality products, etc.	Yes
Yes - feel equipped	Word of mouth currently but have given out samples, etc.	Goal is 2000kgs/month	I feel 'empowered'	Yes
Technical and business knowledge	Door to door - sensitising people	Next step is to diversify - fuel and briquettes	I trust what I am selling'	No
Business knowledge and how to access loans	Yes - visit churches and traditional leaders - makes traditional leaders agents	Yes - but would be easier if they continued	yes	Yes
Record keeping, retail diversification, marketing skills	Business cards, trade fairs, promotional visits	Will retain focus on RETs, keep eyes out for new technology	yes - I can approach banks/MFIs now that I have quality products and records	Yes
A market! And record keeping & marketing	Works with retailers & wholesalers	Wants to increase production by 20%	Yes	No
Record keeping, technology training	Customer service, sign-board and loud music	Yes - next step is to include phone accessories	I have much confidence from DEEP	Yes
Knowledge, education and ability	Goes and looks for markets, open markets, looks for tenders	Possibility of partnership created through business linkages - with other ICS business - could be marketing and transport benefits	Yes, I can do all the business activities myself, promotions, etc.	Yes (2)
Financial management and customer service	Yes - fliers, business cards	Yes - looking at opening another outlet once he has enough income	Yes - business knowledge supports his confidence	Yes
Through the knowledge shared he has been empowered	Fliers and business cards	Wants to be able to grow company to compete for larger tenders	Yes, can compete for tenders	Yes
Record keeping and marketing	Big sign outside, fliers, issues receipt	Yes - loans are more accessible, based on records and performance	He is able to implement what he has learnt	Yes
Record keeping	DEEP takes them to market	Yes - but capital is the challenge	No response	No
Technical training and record keeping	1. Name outside, 2. Registered business. 3. MDA/business cards/word of mouth	Has plans - joined TERE - wants to start training young people, new company with training focus	Yes - can now face financial institutions, get loans etc	Yes
Records	Customer service is his approach	That is obvious'	He has a lot more confidence in how he manages his business	No
Keeping records, customer service, diversification	Gave out samples of briquettes - with ICS he played around with pricing	I will stand with the knowledge given'	Yes, I know I will succeed	No

