
*Carbon financing
mechanisms as
source of funding
for energy access
for the poor in Sub-
Saharan Africa*

ENERGY FOR ALL 2030

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INTRODUCTION

Making energy supplies secure and reducing carbon emissions from fossil fuels are two very important issues faced by the energy sector. Lack of access to modern energy services is a serious constraint towards economic and social development in developing countries, particularly in the less developed countries. On the other hand, much of the energy supply worldwide is based on fossil fuels.

Currently 2.7 billion people in the world cook with solid biomass and 1.35 billion have no access to electricity; these people are trapped in the vicious poverty cycle. Lack of access to energy access, and therefore electricity, deprives people from income generation opportunities and from access to other basic services such as clean drinking water, health services, communication, education and others. Cooking with solid biomass using simple, low-efficiency cooking technologies (such as three stones) have a negative impact on people's lives. Indeed, it is claimed that approximately 2 million people a year die due to respiratory illnesses, mostly caused by the smoke.

Although progress has been made towards overall energy access, trends are not consistent across continents; in sub-Saharan Africa (SSA) population growth is exceeding the supply of new grid connections. (IEA, 2011) Forecast shows that the increase of investment from US\$ 9.1 by 2009 to an average of US\$ 14 billion from 2010 to 2030 will still leave 1.0 Billion people without access to electricity (60% of this in Sub-Saharan Africa) and 2.7 Billion will remain without access to clean cooking facilities.

INTRODUCTION

Developing countries need to substantially increase their energy supplies in order to alleviate energy poverty. Conversely, the issue of climate change requires a substantial reduction of fossil fuels consumption worldwide. Increasing the use of renewable energy sources, in order to reduce greenhouse gas emissions and attenuate the climate change impact in the near future, will only be possible if transition policies are designed and implemented, and the appropriate funds are available.

In poor countries one of the barriers that stops governments to opt for the use of clean energy sources, is the extra investments required, especially when it comes to the provision of energy for the poorest sectors of the population (energy access for the poor), where the government have to subsidise it. Energy is an expensive commodity, the IEA estimates the need for an investment of US\$ 38 trillion between 2010 to 2035 to have a long term increase of 3.5 degrees Celsius, while a stronger policy scenario to reduce more drastically the emissions and have a long term temperature increase of 2 degrees Celsius requires an extra investment of US\$ 15.2 trillion on top of that estimated for the previous scenario.

RATIONALE FOR THE PAPER

One transition policy tool is carbon finance; in the form of carbon credits. A carbon credit is a generic term for any tradable permit or certificate that represents the right to emit, usually, one tonne of carbon dioxide. Carbon markets are used nationally and internationally to mitigate the growth of greenhouse gases (GHGs).

There are two basic policy tools for generating carbon credits; firstly the allowance-based credits which are created and allocated under a “cap-and-trade” regime such as the EU-ETS or Chicago Climate Exchange. Secondly the Project-based credits, which this paper will focus on, where emissions credits are the result of a specific carbon offset project under the Kyoto’s Clean Development Mechanism and the voluntary market.

At its most basic level, greenhouse gas emissions are capped, within certain countries that have signed the Kyoto Protocol; markets are then used to allocate the emissions between countries and between sectors. Market mechanisms can help push low carbon technologies to mitigate carbon emissions since regulations create a cost for producing GHGs.

Rural communities without energy access can take advantage of the abundant local renewable energy sources to meet their energy needs and generate carbon credits to help finance investment costs of their energy systems. It is believed that small community based energy projects in developing countries, designed to expand access to energy services and increase fuel efficiency, have the potential to contribute towards emission reductions as well as local and national development objectives. In recent years a number of authors written about the role of energy access to achieve most of the Millennium Development Goals (MDGs), (Modi et al, 2005, GNESD, 2007) suggest that energy services have very important links with most, if not with all, Millennium Development Goal (MDG) targets.

Carbon financing should, in theory, provide a “win-win” opportunity for sub-Saharan Africa and its potential investors by way of developing energy projects to attend the increasing energy demands of the continent and combat climate change whilst reaping the financial rewards. Africa is in a favourable position to benefit from carbon financing as it possesses abundant renewable energy resources. The World Bank (2003) estimated that with an investment of \$200 billion, sub-Saharan Africa has the capacity to generate 150 GW of energy based on renewable sources, which is more than twice the current installed generation capacity of SSA (World Bank, 2003). The World Bank (2011)

RATIONALE FOR THE PAPER

estimates that such projects would have the potential to generate \$98 Billion in CDM revenue at a carbon offset price of \$10/ CO₂ tonne.

Carbon financing should, in theory, also provide a unique opportunity to reach the energy needs of Africa's rural populations by using renewable energy sources. Small-scale, standalone renewable energy is generally the most cost effective option to power small rural villages, communities and scattered populations.

This paper investigate whether or not the carbon financing mechanisms are currently playing a significant role in helping low income households in sub Saharan-Africa, gain access to modern energy services by using local energy sources and through standalone or mini-grid systems.

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01.

CDM AND THE VOLUNTARY SECTOR

One transition policy tool is carbon finance; in the form of carbon credits. A carbon credit is a generic term for any tradable permit or certificate that represents the right to emit, usually, one tonne of carbon dioxide. Carbon markets are used nationally and internationally to mitigate the growth of greenhouse gases (GHGs).

The Clean Development Mechanism (CDM) and Voluntary Carbon Markets (VCM) are seen as the primary markets for generating project based carbon credits rather than the heavily sectorally focused EU ETS. However there are overlaps, since the EU ETS laws does allow operators to use CDM credits up to a certain percentage of their total emission mitigation, which is determined in the National Allocation Plans (European Union, 2010). Carbon markets have had a consistent evolution from a global market carbon value of US\$ 11 billion in 2005 to US\$ 143.7 billion in 2009 followed by a slight decline in 2010 to US\$ 141.9 billion (World Bank, 2011)

The CDM allows the Annex I countries that are signed to the Kyoto Protocol to meet their emissions reduction targets by generating credits from emissions reduction projects in Annex II countries (developing countries). The projects generate emissions credits called Certified Emissions Reductions (CERs) which can then be bought and traded. One CER is equal to one tonne of carbon dioxide equivalent. In order to be recognised in the CDM, projects have to demonstrate savings against the business as usual (BAU) scenario of implementation a concept known as 'additionality'. Additionality has to be proven and certificated; stringent criteria and methodologies have to be followed by every project to be certified.

The voluntary carbon market is one which has developed independently of government targets and policies and is one where any organisation or individual can participate in the carbon offsetting. Carbon credits in the voluntary markets are not tradable under the Kyoto flexible mechanisms. There are several standards created by Voluntary offset retailers under the generic term of Verified Emission Reductions (VERs)¹. The standards for these verified emissions reductions vary widely with respect to how the project baselines are calculated, how additionality is tested and how verification is carried out. Consequently voluntary and compliance credits are neither comparable nor tradable. However, the less stringent standards in the voluntary market brings about much lower transaction costs and reduced time frames for registration, which is why the voluntary market is the preferred choice for small scale projects. For the purpose of this study we only analyse the "GoldStandard" "Verified Emission Reductions" which are seen as the principal standards in

¹ They share their acronym with Voluntary Emission Reductions. This can cause confusion as in "Verified Emission Reductions" saving have been verified, whereas in the "Voluntary Emission Reductions" this is not necessarily the case.

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the voluntary market. This is primarily because the GoldStandard methodology borrows many aspects from the CDM framework which brings with it a sense of robustness which ensures a good price for the credits (Ashford, 2010).

The project typology for carbon emission reduction for both the CDM and the VCM is wide ranging; from improved stove efficiency projects to the substitution of fossil fuels for renewables.

According Ecosystem Marketplace in 2008 the total carbon trade worldwide amounted at 4.269 billion tons of CO₂ valued US\$ 118.3 billion, 4.146 billion tons of CO₂ was sold by the regulated market valued US\$ 117.6 billion and 0.1234 billion tons of CO₂ by the voluntary sector valued US\$ 0.705 billion. In the regulated sector the UTS was the dominant force selling a total of 2.982 billion tons of CO₂ valued US\$ 94.8 billion; CDM (primary and secondary markets) sold 1.022 billion CO₂ tons valued US\$ 21.7 billion. In the voluntary carbon market the two dominant schemes were the Chicago Climate Exchange (CCX) which sold 43.5% of and the Over the Counter (OTC) sold 56.3%; all the other voluntary carbon schemes only accounted for 0.2% of the VCRs.

02.

CARBON FINANCING CONTRIBUTION TOWARDS SMALL SCALE HOUSEHOLD ENERGY

As stated before, carbon financing in the SSA should in theory provide a “win-win” opportunity for investors by a way of developing energy projects to combat climate change whilst reaping the financial rewards and promoting development.

However this opportunity is not being exploited and there is a great divergence between the different carbon markets in their ability to exploit the market potential in SSA. As a percentage of the total numbers issued, SSA only accounts for 0.4% of the total number of CERs sold. These figures are marginally contrasted within the voluntary market where 12% of the total carbon credits (VCRs) sold was from SSA.

With regards to the energy access for the poor within SSA, small scale household energy project types account for a very small percentage within the compliance market. If we look at table 1.1 we can see that, between the periods of 2008-2011, the only types of projects linked to energy access were those of biogas, which account for 9% of the total market within SSA and equates to 0.2% of the total number of CERs sold worldwide (IEA, 2011).

With regards to the voluntary market (VERS) there is a high proportion of projects aimed at the domestic energy efficiency (40%) mostly comprising of improved cook stove projects. However the data does not represent the whole story. Currently there are only 5 (3%) registered standalone projects specifically designed to improve energy access for households (micro hydro and solar PV), which only make up 0.3% of the total VERs sold worldwide (Gold Standard project registry 2012). This means that neither the compulsory market nor the Gold Standard Voluntary markets are facilitating small scale energy access projects in SSA (it should be noted that the Gold Standard figures does not represent the entire voluntary market, only the Gold Standard Verified market).

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TABLE 1.1 PERCENTAGE BREAK DOWN OF TYPES OF PROJECT REGISTERED IN SUB-SAHARAN AFRICA

Registered CER Projects from 2008 to 2011		VER Projects from 2008 to 2011	
Types of projects	%	Types of projects	%
Methane recovery and Utilization	28	Energy Efficiency -Public sector	29
N2O Decomposition	18	Energy efficiency domestic sector	40
Fuel switch	18	small low impact hydro	11
Energy efficiency	18	solar thermal heat	11
Waste gas/heat Utilization	9	solar PV	3
Biogas	9	other	6

Source: <http://www.cdmgoldstandard.org/our-projects/project-registry>

Investments towards SSA in both carbon markets are low compared to other continents. The low number of SSA credits sold from both markets indicates a low overall investment climate. It has been well documented that Institutional capacity barriers within host countries play an important factor that can hinder project developments (APF, 2008). Although it is beyond the scope of this paper to explore the issues of capacity barriers, the general arguments are based around the issues of the effectiveness of the Designated National Authorities (DNA's) particularly regarding staffing, funding, methodologies, training and structure. A DNA is the official body granted responsibility to authorise and approve participation in CDM projects. The main task of the DNA is to assess potential CDM projects to determine whether they will assist the host country. In addition DNA's also oversee the Gold Standard VCM due to the close alignment to the CDM methodologies.

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In most SSA the status of DNAs is low despite having well informed and highly engaged staff. Insufficient staffing and funding stemming from financial constraints or lack of political will have frequently been highlighted as issues facing CDM capacity building in SSA (Byigero, Clancy, & Skutsch, 2010). It has been suggested that some countries lack of interest in building CDM capacity is linked to the lack of certainty about carbon financing. Despite the Kyoto protocol being extended for another 5 years, the lack of certainty over the long term framework of the carbon market has raised fears in the international markets. However it is also true that some people have lost interest in the CDM or believed that this instrument cannot bring benefits to Africa and especially to Sub-Saharan Africa due to structural, and the fact that CDM is a market mechanism which subsidises for profit activities, making them yet more advantageous to multinational corporations which are mostly based in developed countries or in the so called economies in transition such as South Africa.

It should be highlighted that within SSA there is a disparity between the different country capacities for supporting the implementation of project funded by carbon financing funds. South Africa, which was an early ratifier of the Kyoto Protocol, has a well-established DNA and consistent domestic and external funding, has good communication channels (See Byigero et al 2010), and have engaged Investment Promotion Agencies (IPAs)¹ such as the Development Bank of South Africa; in other Sub-Saharan countries this is not the case, most lack the required institutions and confront barriers of lack of capacity and funding.

At the heart of both carbon markets is a presumption that the conditions in the host country are conducive for foreign direct investment. However in many instances the money expected from the sale of carbon credits may only constitute a small proportion of the total finance required for CDM and VCM projects; and that this finance is not immediately available. Therefore, some equity or loan is usually required for the project to pay for the lengthy registration process. Some projects which have a quick payback period, such as methane recovery and flaring, could be provided with local up-front financing whilst other technologies may not be able to access such funds, such as wind power, due to the longer payback periods (IEA, 2011).

¹ The IPAs act as intermediaries for the identification of possible projects as well as providing initial capital but they do not provide technical assistance for the technical assessments.

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CARBON FINANCING CONTRIBUTION TOWARDS SMALL SCALE HOUSEHOLD ENERGY

The types of projects associated with energy access and development are generally not profitable or are marginally profitable, require large sums of initial investment and are expensive to operate (unless alternative ownership and management models are considered), for these types of projects CDM contributions are not enough to make them profitable, or they have long payback periods if they have at all; hence are not appealing foreign investors. Another important reason for the lack of investors in South Saharan Africa (including carbon financing projects) is the investment climate. The share in Foreign Direct Investment index (FDI) of SSA, which is often seen as an indicator of the investment climate of country/region is still relatively low compared to other developing nations (Byigero, Clancy, & Skutsch, 2010).

Overall, the original format of the CDM only facilitated the attraction of large scale projects. Large project generally have lower transaction costs than smaller ones.

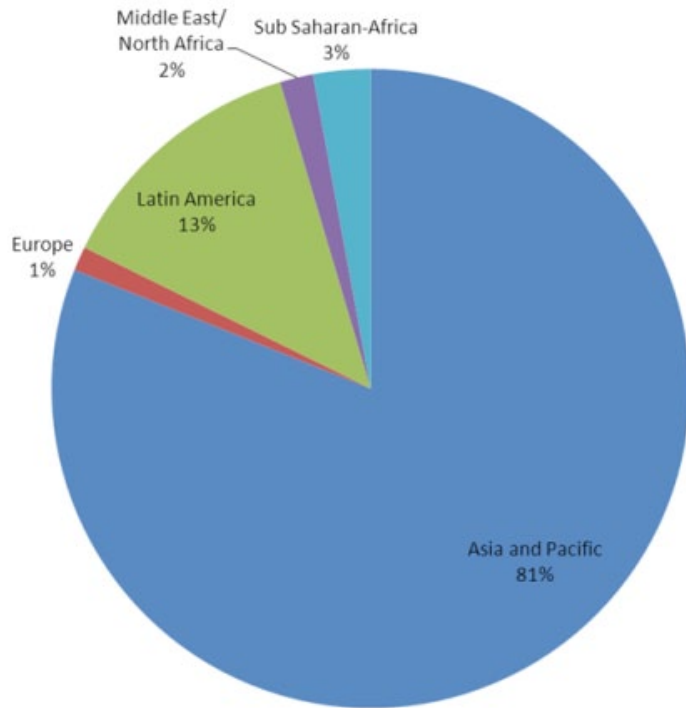
Small scale energy projects suffer from particularly high transaction costs which may deter investment due to the potential risks of lower rates of return and high set up costs. One key issue relates to the fact that many of the prescribed methodologies cannot directly measure the emissions reductions but must be made upon estimates based on a small sample size. The decentralised nature of many small scale SSA projects can create an obstacle to effective monitoring and accurate estimation over the amount of carbon reductions achieved. Also for such projects there can be the issues of additionally, which may be difficult to assert, particularly within SSA due to its already low carbon output, directly related to the regions lack of energy access. This is one of the key principles why there is such a low adoption rate of household energy projects within the compliance market (Byigero, Clancy, & Skutsch, 2010).

The combination of capacity and financial barriers both contribute to SSA's low involvement in the carbon markets and also favour large scale, non-domestic projects. Practical Action believes that the active participation of the users themselves through their social networks can contribute to simplify the implementation and reduce costs of implementation and monitoring substantially.

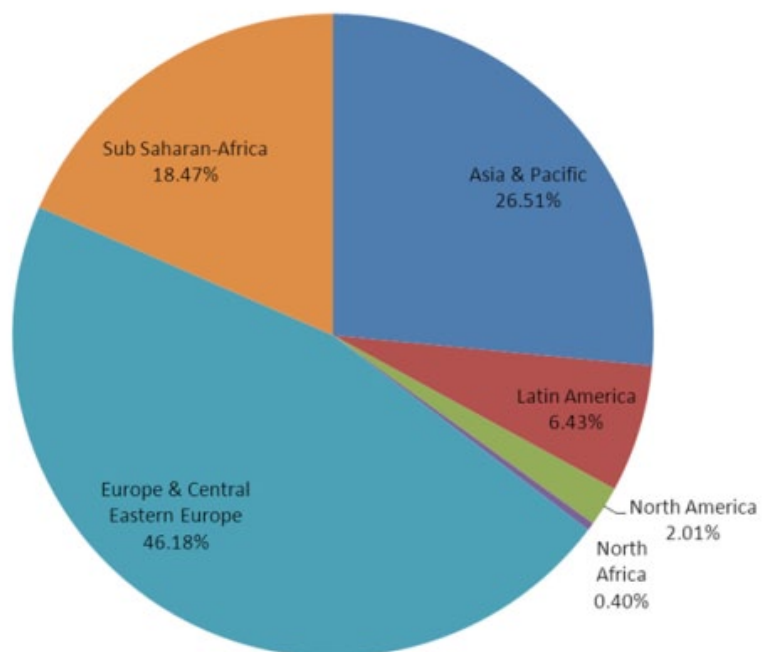
03. FUTURE PATTERNS OF INVESTMENT

FIGURE 1.2

CER Project Pipeline (% total numbers)



VER Project Pipeline (% total numbers)



03.

FUTURE PATTERNS OF INVESTMENT

Attempts are being made within the compliance market to reduce the transaction costs within small scale projects by. One such evolution in the development of the compliance market is the emergence of the new programmatic approach. The Programmatic CDM, introduced officially as the Program of Activities” (PoAs) during COP/MOP1 in 2005, has evolved as a mechanism to address the issues of asymmetries in participation. Especially in very small-scale project activities in key areas, and countries with great Greenhouse gas reduction potential that have not been reached via the traditional approach of the CDM; mainly due to issues discussed previously such as low reduction volumes against high transaction costs.

Implementing this approach has however taken longer than expected, due to a lack of understanding the complexities and limitations in the early drafts of the official guidance; however, the perceived benefits for small scale projects has meant that SSA will receive a much higher overall participation percentage in PoA compared to individual projects (see figure 1.2. Because of the lag-time there are currently 103 SSA PoAs in the pipeline out of 374, with 74 of them being aimed at off grid solar, small wind, improved cook stoves, lighting and energy efficiency programmes.

Under this modality a PoA acts as an umbrella under which an unlimited number of individual projects (of a specific methodology) can be registered. The advantages for small-household projects are that the costs of registration are significantly lower than for standalone projects. In addition, registration times can be a few months rather than a year or more for standalone projects.

However the PoA is still a relatively untested framework with only a handful of applicants. Indeed, when the authors conducted interviews with the applicants, who wish to remain anonymous, in Uganda, they commented that the registration times for current PoA are taking longer than the average registration time for standalone projects, at around 300 days (however it is expected that additional CPAs under a PoA, will have a much shorter registration period due to much of the leg work being done at the initial registration stage and there being a streamlined process for additional CPAs). Much of the delay has been directed at the validators and the DNA due to their unfamiliarity with the new modality coupled with the capacity barriers already facing the registration institutions. It has been reported that uncertainty on how to deal with a multi-country PoA along with the use of unfamiliar methodologies has created delays. Letters of Approvals have been difficult to obtain due to a lack of a stan-

03. FUTURE PATTERNS OF INVESTMENT

standardised framework for dealing with PoA applications and a lack of knowledge surrounding the PoA concept, which have led to slow and delayed responses from DNA. In some cases the number of countries included within a PoA has had to be reduced due to a lack of approval from some country states, which again stems from a lack of knowledge and a lack of a formal framework for such programmes.

However most applicants have been vocal about the potential of PoAs and most donors, DOE and DNAs see these issues as merely teething problems for the new CDM modality. But, there are suggestions for some augmentations to current rules which would greatly help DOE and DNAs in PoA registration process.

Standardized baselines, which are methodologies based upon uniform methods and procedures that are applicable to multiple projects of the same type (IETA, 2010), is one of the pivotal policy changes which would have a huge impact upon CDM uptake in low emission countries.

In the CDM there can be standardized methodologies for:

- > The establishment of additionally
- > Determination of baseline emissions of a programme/project, which is the crediting baseline
- > Determination of actual emissions after the project has been implemented to request credit issuance

Commentators have stated that even a set of standardized recommendations, rather than a full set of standardized baseline would be advantageous as it would help guide DOE and DNAs in the assessment and approval of PoA, especially in multi-country PoA.

A fundamental issue, relating to baseline measurements and the issues of additionally, relates to the idea surrounding Suppressed Demand Baselines. Fundamentally baseline calculations for poor countries are low because of a lack of energy use. This means that the levels of greenhouse gas emissions are fundamentally lower than their western counterparts. Thus projects cannot generate sufficient carbon finance to have a significant impact upon GHG reductions.

03.

FUTURE PATTERNS OF INVESTMENT

It is well documented that basic energy needs in poorer countries are not being met; in such places demand for emissions credits are being artificially suppressed due to a lack of economic resources and energy access. It is very likely that such demand would naturally increase with development, which means that baselines established upon historical energy consumption or current emission levels are not always best placed to account for future increases in emissions and energy demand (CDM Executive Board, 2011)

The idea of crediting future increases in demand, where it is currently being suppressed is not a new concept however it is recently during the 62nd Executive Board meeting the [Guidelines on the Consideration of Suppressed Demand in CDM Methodologies](#) were approved, which provide the methodological approach for establishing a baseline in circumstances of suppressed demand. Under such baseline scenarios, the project would be able to credit for emissions reduced from current level emissions as well as from emissions stemming from increasing levels of demand for energy (please see Guidelines for further details).

Under the Guidelines the concept of a 'minimum satisfied service level' was established. The minimum service level is a baseline of emissions where the minimum human needs for basic energy services (including lighting and cooking) are met. A Suppressed Demand Baseline is appropriate when basic energy services are below the minimum satisfied service level at the time of implementation of the CDM project activity.

However, the CDM Executive Board does not provide a definitive methodology for defining the “minimum service level” and there is not a prescriptive list of key performance indicators to help establish such baselines.

Current indexes are being developed, for example Practical Actions Total Energy Access Minimum Standard (Practical Action, 2012), therefore greater collaboration between NGO's and research institutes could help contribute towards a better standardized measurement for establishing suppressed demand baselines which would in turn create a mechanism to facilitate Pro-poor: enabling energy projects whilst simultaneously providing a climate mitigation mechanisms.

04.

CONCLUSIONS

Carbon credits have long been seen as the double edged sword which can facilitate greenhouse gas reductions, as well as providing a means for helping and financing development.

Current investment in the compulsory market is directly moving towards Asia and the Pacific, with a small proportion aimed at SSA.

The CDM investment that does go towards SSA is primarily aimed at larger energy infrastructure projects rather than small project aiming at benefitting households or small villages. With regards to the voluntary market, there is a greater level of investment within SSA and specifically in household energy.

The poor levels of investment for household energy services in the compulsory market have been primarily attributed to the high transaction costs that small project have compared to transaction costs of large projects. The voluntary market appears to be the primary route for small scale energy technologies, due to lower transaction costs and relatively robust methodologies.

Under the new PoA modality, it is expected that there will be a greater uptake of the compulsory market for household energy projects in the near future as the PoA seeks to minimise the transaction costs for such projects. The new PoA modality combined with the new guidelines on suppressed demand, in theory provide a good potential to increase the amount of carbon credits generated from household energy projects as well as facilitate household energy access within SSA to help satisfy the MDGs.

There are still several issues that require addressing regarding the efficient implementation of PoAs; firstly the institutional capacity of host countries is still relatively weak for the PoA modality. However interviewees, investors and practitioners are optimistic thinking that those issues will resolve themselves over the coming years and there will be a reduction in registration times, transaction costs and reduce the lag times between project registration and carbon credit issuance.

The PoA require a greater level of baseline standardization to help practitioners and host country institutions reduce transaction costs as well as provide a greater level of robustness to the methodologies. In addition further work is required with regards to the “Suppressed Baseline Methodology” guidelines. There is room here for collaborative work between the CDM Executive Board and researchers in helping establish KPI’s regarding the “Minimum Satisfied Service Level” for energy access.

CASE STUDIES:

- > IMPROVED COOK STOVES FOR EAST AFRICA PROJECT (ICSEA)
 - > CLEAN COOKING DARFUR LOW SMOKE STOVES PROJECT, SUDAN
-

CASE STUDY

IMPROVED COOK STOVES FOR EAST AFRICA PROJECT – ICSEA

Improved Cook Stoves for East Africa Ltd (ICSEA) is a carbon finance support “umbrella” for projects which disseminate improved cook stoves based on wood and charcoal. Set up by the Ugandan Carbon Bureau in partnership with the East African Development Bank, the project spans six different countries across east Africa (Kenya, Uganda, Tanzania, Rwanda, Burundi as well as Sudan). The ICSEA is the coordinating/managing entity of a Programme of Activities (PoA), which is a new and efficient way of smaller projects to access the benefits of the carbon market, under the UN’s Clean Development Mechanism (CDM). An unlimited number of projects can be registered under the ICSEA for a maximum of 21 years.

The ICSEA aims to “*To make affordable improved cook stoves available to low-income households on a fair trade basis.*” This means helping improved stove projects earn the maximum amount of carbon finance from their energy saving activities in a quick and efficient way and the money generated is directly transferred to the stove owners.

Introduction to ILF –the first ‘Project or CPA’ in the PoA

The International Lifeline Fund (ILF) Okelo Kuc stove is the first CDM Programme Activity (CPA) of the ICSEA PoA. The ILF provided the ICSEA with logistical support for the formulation of the household baseline studies as well as stove testing and stove costing exercise; The ILF CPA served as the principle framework under which all subsequent activities under the ICSEA umbrella will be evaluated

The ILF has had extensive experience distributing the firewood rocket stoves in Lira and this programme activity sought expand operations to ten other districts within Uganda. The ILF is active in the production, marketing, distribution and sales of the “Okelo Kuc” brand of charcoal improved cook stoves (ICS), which are sold in 3 sizes defined as different models. The emission reductions calculation uses a cluster of all 3 sizes to determine the efficiency improvement based on laboratory tests. It is estimated that 265,224 tonnes of CO₂ will be mitigated from this single activity alone over the seven year crediting period. The ILF CPA operates within the ICSEA’s fair-trade ethos, whereby CPA’s have to demonstrate that a reasonable portion of the carbon revenues are shared amongst the cook stove users and wider community via a combination of lower stove prices, lower maintenance costs, incentive payments and other direct benefits.

The initial unit cost of a domestic Okelo Kuc stoves manufactured in Lira was slightly above \$20 (UGX 42,202 to 43,116 in April 2010), which did not allow for sufficient profit margins for dissemination efforts to be handed over to a private sector partner. The stoves were retailing at approximately \$10 (UGX 20,000) in urban and peri-urban areas (with a bulk price from ILF to vendors at around \$7). The net loss was roughly \$13 per unit which had to be absorbed by private grants from ILF in the past. This was not a sustainable strategy to achieve large scale sales. The retailing in rural areas would have also required even lower pricing, especially for fuel wood stoves

From the generation of carbon revenues, the ILF are now able to offset the high production and distribution costs of the stoves, which the ILF had initially subsidised, to ensure lower costs and increase market access to those wishing to purchase the stoves.

CASE STUDY

CLEAN COOKING DARFUR LOW SMOKE STOVES PROJECT, SUDAN

Practical Action, in Collaboration with the “Women’s Associations Development Network- WADAN” of Darfur, is implementing a project on the dissemination of LPG for cooking. It aims to reduce carbon emissions through the dissemination of the use of LPG for cooking in households in Darfur Sudan.

This project is implemented with the financial support and guidance of Carbon Clear. In this case Carbon Clear is making a direct investment in this project and in exchange it will gain ownership of the carbon credits produced by the use of LPG to reduce emissions from burning unsustainable biomass (fuel wood and/or charcoal), which is the fuel of the great majority in Darfur.

The Low Smoke Stoves project reduces greenhouse gas emissions by facilitating the switch to more energy efficient stoves and cleaner-burning fuel in low income communities. This initiative replicates and scales up a successful pilot project of the promotion of LPG as cooking fuel that was funded by the UK Department for International Development (DFID) which started in July 2002 and ended in March 2008.

The dissemination of LPG stoves and LPG containers is made through a system of loans. Carbon Clear provides the financial support against the carbon credits, Practical Action manages the project and provides training and channels the financial resources for loans through to WADAN; WADAN provides credits to households through its associations. The leaders of the different associations are responsible for providing loans to households and recovering the loan recovery. This project started in November 2008; so far more than 5,000 poor families have been benefiting with loans and are now cooking with LPG in Darfur.



CASE STUDY

CLEAN COOKING DARFUR LOW SMOKE STOVES PROJECT, SUDAN



The project objectives are to:

- > Reduce greenhouse gas emissions associated with burning non-renewable biomass in a resource-deprived region.
- > Improve the livelihoods of poor families and address energy poverty by switching to a clean energy source, LPG, for cooking purposes.
- > Reduce indoor air pollution from burning firewood and charcoal, thereby improving the health and quality of life for women and of children below age five.
- > Contribute to environmental conservation by reducing pressure on dwindling forest resources in Northern Darfur

LPG can help the shift towards a low-carbon economy because the fuel features significantly lower greenhouse gas emissions (CO₂, N₂O and CH₄) than other commercially available fossil fuels such as coal and kerosene, or biomass fuels like dung, firewood, and charcoal.

This project helps to improve local health by reducing indoor air pollution. Biomass solid fuels such as wood, crop residues, and dung release large amounts of particulates, carbon monoxide and other pollutants when burned in simple inefficient traditional stoves. According to the World Health Organization, prolonged exposure to biomass smoke is a major health risk, contributing to acute respiratory infections in children and other ailments.

The growing scarcity of biomass fuel (firewood and charcoal) in North Darfur increases the energy poverty faced by poor women and their families, and exacerbates the problems caused by local conflicts. The switch to modern fuels helps to improve living conditions and reduces the environmental impact of unsustainable wood harvesting practices.

Practical Action was founded in 1966, as ITDG (the Intermediate Technology Development Group), by the radical economist Dr EF Schumacher to prove that his philosophy of 'Small is Beautiful' could bring real and sustainable improvements to people's lives. Practical Action is a charity registered in the United Kingdom which works directly in four regions of the developing world – Latin America, East Africa, Southern Africa and South Asia, with a strong presence in Peru, Kenya, Sudan, Zimbabwe, Sri Lanka, Bangladesh and Nepal. Practical Action has worked in Sudan since 1974, with offices in Khartoum, Kasala, and El Fasher.

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