



Best practices for promoting Improved cook stoves in the ACP Region

Experiences from EU-supported projects in ACP countries 2007-2019



7 AFFORDABLE AND
CLEAN ENERGY



The ACP-EU Energy Facility (<http://energyfacilitymonitoring.eu>)

This discussion paper is one in a series of discussion papers based on experiences from the ACP-EU Energy Facility (EF).

The EF was established in 2005 to co-finance projects on increasing access to modern and sustainable energy services for the poor in African, Caribbean and Pacific (ACP) countries, especially in rural and peri-urban areas. 173 project proposals have been granted co-funding from the EU for a total of 0.4 billion euros; 50% of the total project-budgets of 0.8 billion euros.

The projects have been, and are being, implemented in the period 2007-2021 with 90% of projects completed in 2019. The projects cover a wide range of technologies:

Electricity grid-extensions in rural and peri-urban areas, hydro-powered mini-grids, solar and hybrid-solar mini-grids, stand-alone solar solutions for businesses, households and public institutions, portable solar equipment mainly used for lighting, clean energy solutions for cooking such as improved firewood and charcoal cook stoves as well as biogas, biofuels for electricity generation, and capacity development of public institutions in the energy sector.

Among the 173 Energy Facility projects, 24 directly involved the promotion of improved cooking stoves.

Danish Energy Management (DEM) has been granted the contract of providing technical assistance for the monitoring of the EF projects in the period 2011-2019. This discussion paper is based on information and data gathered during this period as well as current research and experience from other development interventions.

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Introduction

This discussion paper identifies the key elements needed to increase uptake of improved biomass cook stoves in the ACP-region, primarily in Sub-Saharan Africa. It addresses the key aspects to ensure i) continued over a long period of time, ii) scaled-up uptake after project end, and iii) strong linkages to poverty reduction.

An estimated 700 million sub-Sahara Africans (82%) primarily meet their heating and cooking needs through use of solid biomass (World Bank, 2014a); a number that is estimated to grow by 20% by 2050 (Corfee-Morlot, et al, 2019). This population is exposed to indoor air pollution which affects their health¹. Additionally, the laborious task of gathering and collecting wood fuel, crop residues and animal dung is reserved for women and children. At the same time, women and children are predisposed to air contamination as they spend most their time near the domestic hearth (WHO, 2018).

Addressing issues around biomass and clean cookstoves will address 7 of the 17 SDGs:

SDG1 (No Poverty):

Through income generation by production, distribution and retail of cookstoves.

SDG3 (Good health and well-being):

Development and use of efficient cookstoves reduces indoor pollution.

SDG4 (Quality education):

Instead of fetching firewood, school going children can have quality education.



SDG5 (Gender equality): Men and women can both gainfully be involved in the cookstove sector.

SDG7 (Affordable and clean energy): Reduction in wood consumption for cooking.

SDG13 (Climate Action): Reduction on quantity of firewood and charcoal reduces on deforestation.

SDG15 (Life on land): Reduction of pressure on forest resources.

¹Household air pollution causes non communicable diseases such as stroke, ischaemic heart disease, chronic obstructive pulmonary disease (COPD) and lung cancer.

To succinctly address issues surrounding biomass cookstoves in sub-Saharan Africa, this paper will be limited to Tier 1 and Tier 2 cookstoves that use either firewood or charcoal or both and efficiencies above 15% and below 35%². This is informed by the “bottom of the pyramid”³-end users that do not have access to other fuel options owing to their limited incomes.

Given the relatively low levels of dissemination of clean biomass cookstoves in Africa (Figure 1), and the projected increase in the number of people relying on biomass, the potential for clean biomass cookstoves is significant.

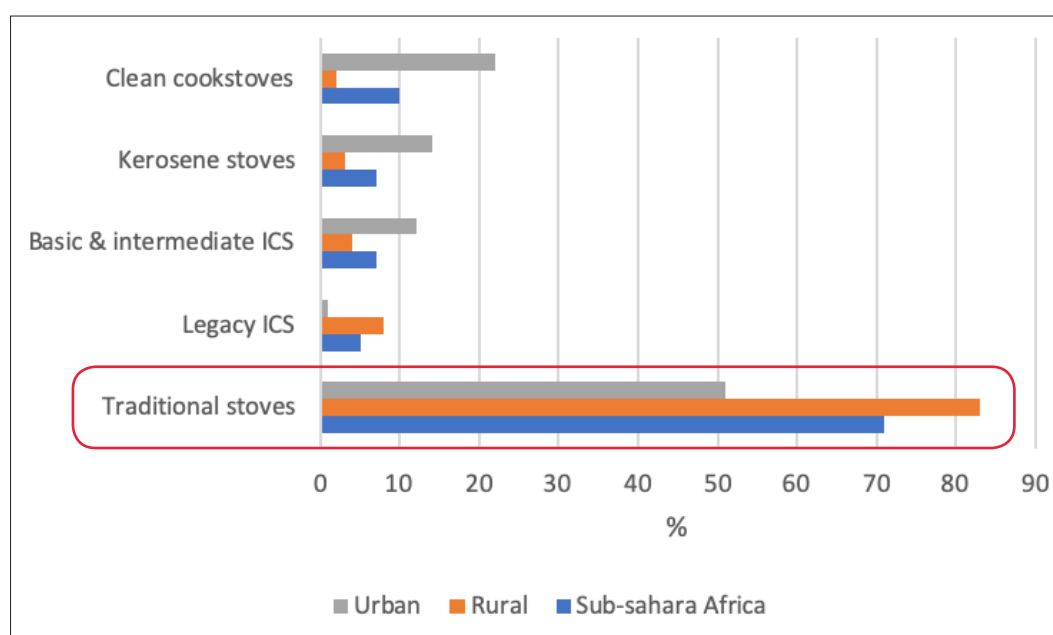


Figure 1: Africa clean and improved stove penetration (2011–2013)⁴

Despite the many national and regional efforts that have been instituted to scale-up access to improved biomass cookstoves, traditional stoves still dominate, and the policy targets are yet to be achieved as Figure 1 above illustrate. Thus, there is an urgent need to address best practices for promoting improved biomass cookstoves on a large scale. This paper, with the help of experiences from the Energy Facility projects, goes a long way in shedding light on how best to direct interventions to better meet the large biomass cookstove demand.

² It is important to note most of the Energy Facility projects report cookstove efficiencies of 50 – 70%. This, most of the time, is not independently verified by any of the cookstove testing centres thus may highly be exaggerated.

³ An economic term referring to the largest but the poorest socio-economic group constituting more than 2.5 billion people that live on less than \$2.50 a day. Does this cover Tier 1, Tier 2 or both?

⁴ The definition of Clean cookstoves in this graph includes LPG/natural gas (<5%), electricity (<6%), small renewable fuel segment of largely secondary stoves (biogas, solar, ethanol <1%), and ACS (<0.1%); kerosene historically categorised with clean modern fuels, but is broken out here given evidence that kerosene’s clean status is questionable in sub-Saharan Africa context.

Background: The cook stove value chain

The improved biomass cookstove value chain and essential services that support it is provided in the Figure 2.

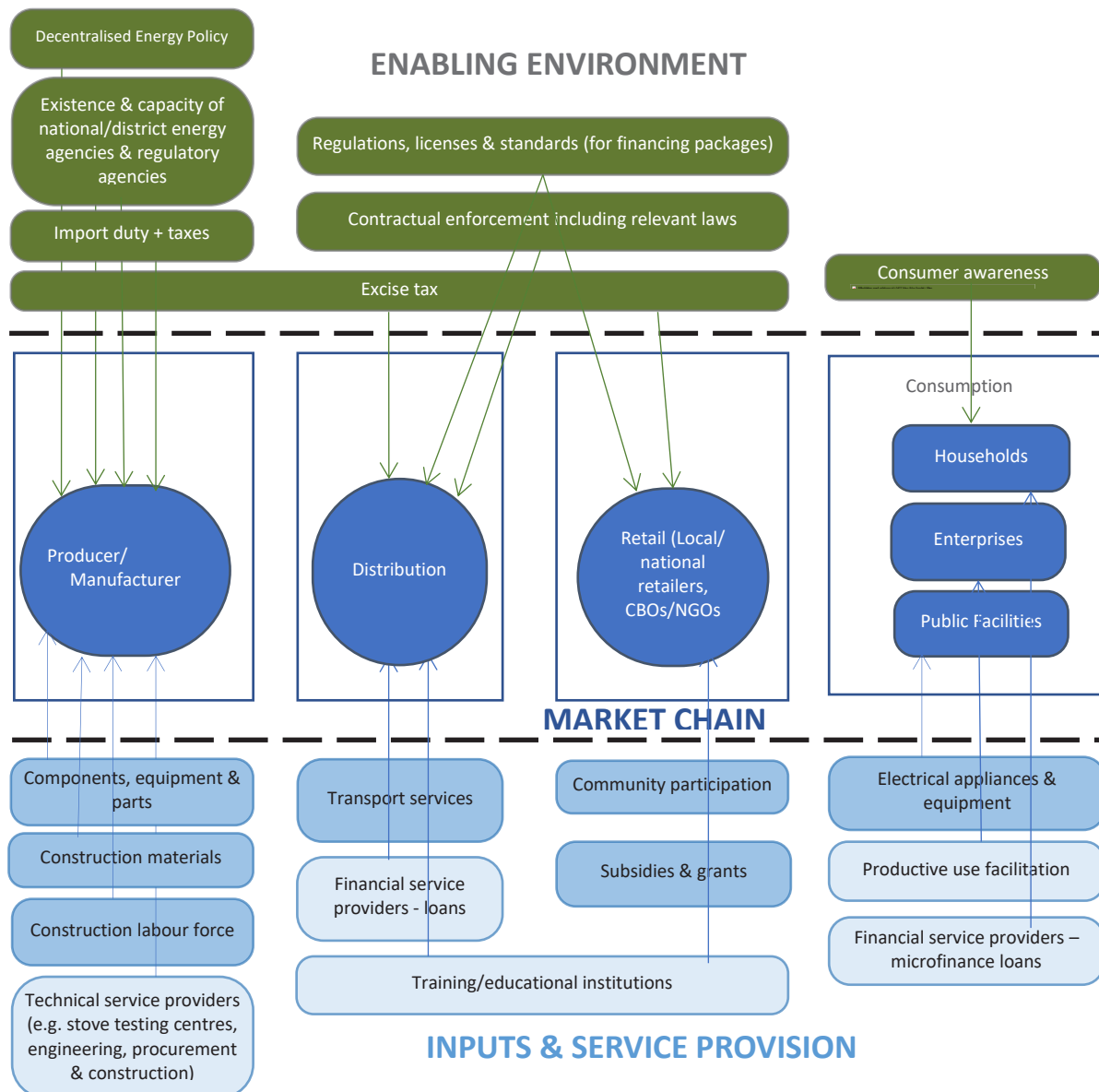


Figure 2: Improved Biomass Cookstove Market System (Source: EnDev)

The production, distribution and retail of cookstoves is the “market chain” in the middle of Figure 2. The improved biomass cookstove market chain incorporates the local producers, distributors, retailers, consumers and most recently, international manufacturers. The end of the market chain comprises households, enterprises and public facilities. Owing to the bulky nature of biomass cookstoves (both for raw materials and finished products), the biggest challenge is the high cost of transport. With organic production centres located where there is availability of clay soil for ceramic lining, there is an urgent need for an innovative mode of transport⁵. Another challenge is the seasonality of the demand affecting mostly rural areas.

⁵ Some stove models are built on location and not transported. This paper focusses on larger scale promotion of cook stoves where the stoves are manufactured in one location and distributed in a larger area.

The market chain is supported by “an enabling environment” (shaded green in the top) which may include supportive policy and regulatory framework, existence of regulations and standards which govern the cookstove sector in a country or region. Another important enabling environment that is critical for the uptake of cookstove is consumer awareness. The market chain is also supported by “Inputs and services” (shaded blue in the bottom). These entail training/educational institutions, financial service providers (microfinance institutions, savings and credit cooperative organisations [SACCOs], village savings and loans), transport services, community participation, etc. Inputs and services are mostly private sector driven which implies that they respond to demand and supply pull from the cookstove value chain.

What the figure illustrates is that a vibrant cookstove sector in a country has the implication that it receives crucial support from the inputs and services actors, while an enabling environment is also crucial, it cannot kick start the market alone. Without inputs from these actors, projects as those supported by the ACP-EU Energy Facility will find it more difficult to sustain the results achieved.

Regional differences in Sub-Saharan Africa

Cookstoves and cookstove market chains are not equally vibrant in all parts of Africa. Cultural habits play a role so does the enabling environment as well as a range of other factors.

Regional differences in Sub-Saharan Africa are described below.

West Africa

The Economic Community of West African States (ECOWAS) Renewable Energy Policy has a target of completely banning the use of inefficient cookstoves by 2020. The region aims for its member states to embrace high-efficient firewood and charcoal cookstoves with an efficiency of at least 35% (ECREEE, 2017). In line with this, several countries in West Africa have national programmes aiming to promote improved cookstoves. Figure 3 shows the current access to clean biomass cookstoves in West Africa.

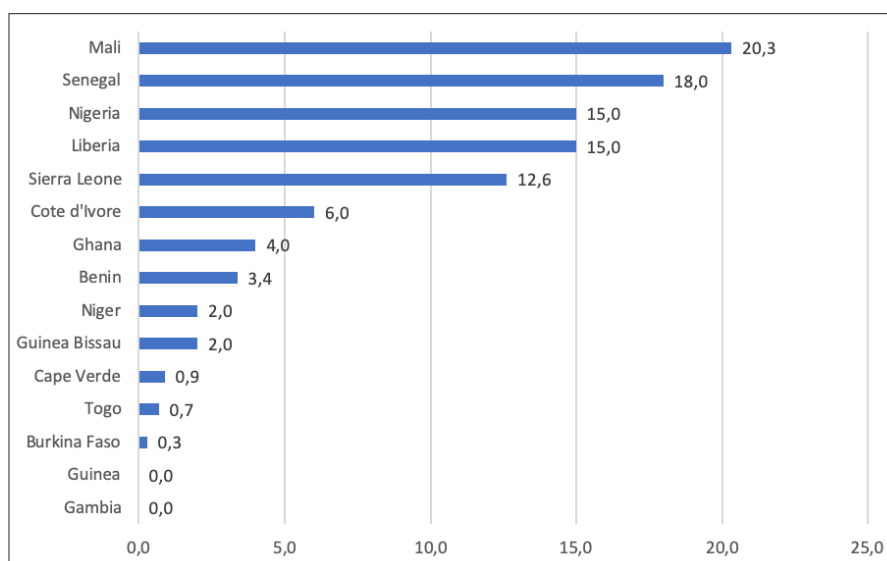


Figure 3 West Africa Current Access to Clean Biomass Cookstoves (%)⁶

Source: ECREEE, 20170

⁶ No data was available for Guinea as well as Gambia and thus were allocated zero.

Nigeria has a target of disseminating improved cookstoves to 10 million households by 2020 which is equivalent to 25% penetration. The programme adopts a market-based approach in the scaling up of improved cookstoves. There is heavy emphasis on use of clean fuels including green charcoal and promotion of rocket firewood cookstoves.

In the case of Senegal, the national programme aims for 60–70% cumulative penetration of improved cookstoves. Different programmes such as programme for the promotion of sustainable energy, rural electrification, and sustainable supply of household fuels (PERACOD) and PROGEDE have had significant impact on access to improved cookstoves in Senegal.

As a region, West Africa has adopted policies that are pro-improved cookstoves. Nationally, many states are, however, equally or more inclined to scaling up of liquefied petroleum gas (LPG). For instance, to check on deforestation that was taking place in Senegal, the government came up with an LPG programme where it subsidised its cost. Unfortunately, when the programme came to an end, the cost of the LPG was too high for vulnerable communities to afford. These communities reverted to traditional way of cooking.

While the enabling environment is relatively strong in West Africa, the inputs and services are much less developed. There is, for instance, limited participation of financial institutions to provide much needed credit to the cookstove sector.

Predominant cookstoves in West Africa include vita, rocket, jambar and jiko.



Eco-stove
Photo: DEM

Eastern Africa

Anecdotal evidence suggests that the East African region is the most developed in terms of clean biomass cookstoves production and uptake.

The Kenya Ceramic Jiko (KCJ) is one of the most successful cookstove projects in Africa. Success story of the KCJ (Figure 4) is attributable to local input and international agency involvement. It was the result of research on stove design, efficiency and patterns of usage initiated in the 1970s and actively continued through the 1980s. It extensively enjoyed constant feedback from groups of users particularly women's cooperatives during its development. KCJ-type improved stoves are widely used in most of sub-Saharan Africa.



Figure 4: KCJ on Sale in the Western part of Kenya

The Clean Cookstoves Association of Kenya (CCAK), which is closely associated with Clean Cooking Alliance (formerly Global Alliance for Clean Cookstoves), has a target of 5 million households in Kenya using clean biomass cookstoves by 2020. This is to be achieved through increased innovation in design, testing, production, marketing and use of clean cookstoves, and fuels through better government policies, increased public awareness and capacity building.

Uganda has had a national cookstove programme which targets 5 million households to be using clean and efficient cookstoves by 2020 - equivalent to 55% penetration.

The programme also led to establishment of the Uganda

National Alliance on Clean Cooking (UNACC) whose mandate is establishing an enabling environment for equitable universal access to clean cooking solutions by facilitating increased innovation in design, testing, production, marketing, and use of clean cookstoves and fuels; advocacy on favourable biomass policies and increasing public awareness on improved biomass cookstoves and downstream access to affordable credit.

Ethiopia national programme for improved household biomass cookstoves had a short-term target of deploying 9 million improved cookstoves by the year 2018 and a long-term goal of disseminating 31 million cookstoves by 2030. The programme's mandate includes building institutional capacity, promoting improved cookstove with an aim of creating demand; and, providing support to cookstove producers.

Rwanda has stepped up its efforts to regulate use of biomass and promoting energy efficient cooking solutions. It is also providing a subsidy to the National Cookstove Programme. So far, it has disseminated a total of 30,000 cookstoves through the subsidy programme. A National Cookstove Programme Roadmap has been instituted with a target of disseminating 2 million improved cookstoves by 2020. Rwanda still needs to streamline its policy framework as exploitation of clay is restricted for environmental protection purposes. There are also restrictions on the production of charcoal irrespective of whether it is being done sustainably. Other countries that have restrictions on charcoal production include Malawi, Chad and Kenya.

Except for Tanzania, the rest of the Eastern Africa countries have policies that are pro-improved cookstoves⁷. Moreover, the vibrancy behind cookstoves in Eastern Africa is as a result of active participation of the private sector in the cookstove value chain. This has been through provision of inputs and services.

The Eastern Africa region provides the best enabling environment for cookstove projects and programmes compared with West Africa. But perhaps the greatest difference between East and West Africa is found in the "inputs and services" of the biomass

⁷ The current draft Tanzania Energy Policy is inclined towards provision and scale up of LPG to its population.

cookstove value chain. The cookstove sector in the region has over the time piggybacked on the SACCO⁸ movement to ensure credit reaches the end-users as well as producers and retailers of cookstoves. SACCOs provide an avenue through which members can access affordable credit. This has been instrumental in the adoption of improved cookstoves in the rural areas.

Predominant cookstoves in Eastern Africa include KCJ, uhai, upesi, rocket stoves (Kenya); ugastove, okelo kuc, rocket mud stove (Uganda); secco charcoal stove, camartec charcoal stove, fixed rocket wood stove, fixed masai wood stove (Tanzania); and, mirt stove, tikikil stove institutional rocket stove, aprovencho stove (Ethiopia).



Improved cookstove
Photo: DEM

Central Africa

There is limited presence of a national or regional cookstove programme to propel the cookstove sector in this region. Despite this, Chad presents a novel case of controlling wanton forest destruction. Buoyed by concerns on the ever-shrinking forest cover, the Chadian government banned the production, transportation, distribution, and utilization of wood-charcoal in December 2008. This led to a myriad of innovations in fuel supply in the country. One Chadian non-governmental organisation (NGO) – Enterprise for Vocational Development [ENVODEV], was instrumental in this innovation. In collaboration with local and international partners, ENVODEV developed rice straw-based (an agro-residue) eco-charcoal that effectively reduced overdependence on firewood and charcoal for fuel supply. The eco-charcoal reduces cooking time by 60%. Similar projects have been implemented in Batouri in the Eastern part of Cameroon⁹. There have been programmes instituted in multiple countries and countries such as Democratic Republic of Congo and Burundi. For instance, Energizing Development Program (EnDev) and Biomass Energy Initiative for Africa (BEIA) and Programme for Basic Energy and Conservation (ProBEC) greatly benefitted DR Congo.

Southern Africa

Malawi has a national cookstove programme with a target of promoting improved cookstoves to 2 million households by 2020. This will guarantee a 50% penetration of cookstove in the entire country. Amongst other aims, the programme is geared towards conducting a national cookstoves market assessment as well as scaling up current cookstove and carbon credit activities.

According to a study (Pailman, et al, 2018) conducted in South Africa, Mozambique, Malawi and Zambia to investigate fuel and stove preferences; experiences with clean biomass cookstoves amongst other indicators, found highest use of clean cookstove in Mozambique at 33%. Figure 5 shows the clean biomass cookstove in the Southern Africa region.

In terms of main fuels used, the study found South Africa used more of biomass pellets, charcoal in the case of Mozambique and Malawi while in Zambia, the predominant fuel is firewood. Figure 6 shows the main fuels used in sampled southern Africa countries.

⁸ It is important to note that most SACCOs organically grew from table banking and village savings and loans.

⁹ These are case studies that were submitted by the project implementers in Chad and Cameroon under the United Nations Human Settlements Programme project 'Global Energy Network for Urban Settlements (GENUS)' which run from 2011 to 2013.

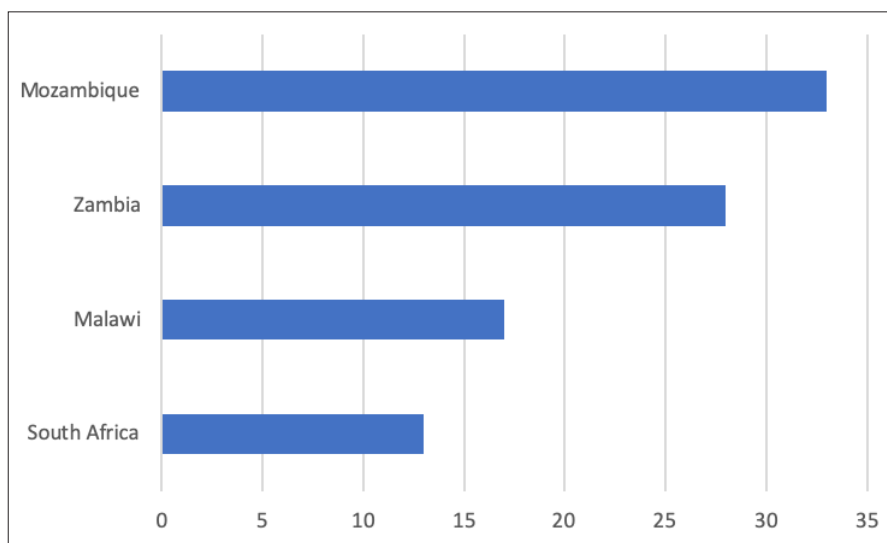


Figure 5: Clean Biomass Cookstove Use in Southern Africa (%)

Source: Pailman, et al, 2018

The Southern African region has a more diverse fuel preferences. South Africa uses more of biomass pellets at 33%, albeit with the lowest uptake of clean biomass cookstoves in the southern Africa region. Biomass pellets is non-existent in either Mozambique, Malawi or Zambia. In the case of Malawi and Mozambique; fuel of choice is charcoal at 55% and 43% respectively. It is important to note Mozambique has the highest clean biomass use of the analysed countries. The most dominant cooking and heating fuel in Zambia is firewood at 72%.

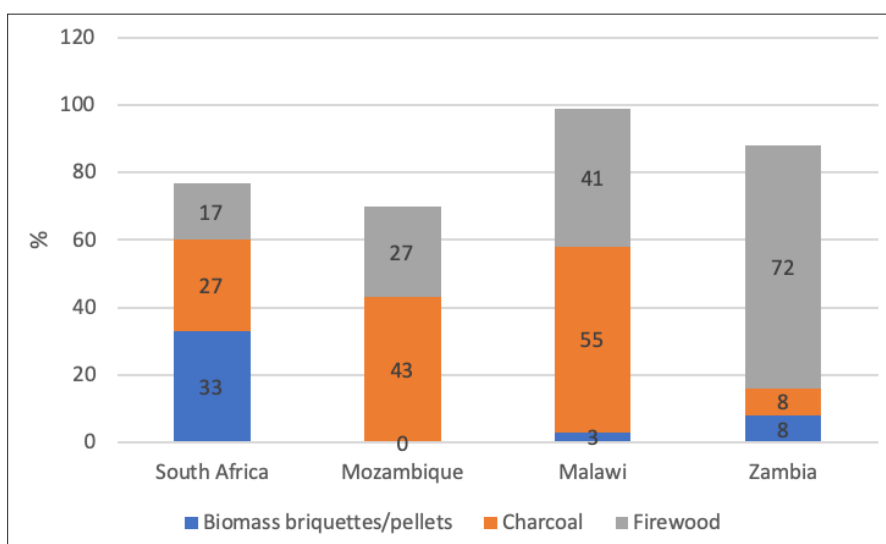


Figure 6: Main fuels used for cooking (%)

Source: Pailman, et al, 2018

Best practices from the Energy Facility projects

The biomass cookstove projects supported by the ACP-EU Energy Facility¹⁰, which have proven most sustainable in the long term, have all adopted a market-based approach. We can identify six critical components that ensure continued biomass cookstove adoption and scale-up, especially amongst the bottom of the pyramid population:

¹⁰ A full list of projects is provided in the Annex.

- Income generation
- Long term commitment by governments and private sector
- Specialised focus on biomass cookstoves
- Use of existing products and market chains
- Local ownership
- Feedback from users



Fuel saving stoves training
Photo: DEM

Strong Income Generation Component

Enhancement of a market driven economy at the local level has the benefit of inducing small entrepreneurs to develop products that can affordably be bought in the rural environment at the very least. The project *“Improved Cookstove for Households and Institutions Project”* in Kenya illustrates this well: The project used a market-based model to disseminate cookstoves in five project areas. The men and women who were trained on cookstove production and repair now – three years after the project came to a successful close – ensures there is always a local supply of quality cookstoves. Another project, *“Community Assisted Access to Sustainable Energy in Rwanda”*, had a very strong income generation component. A total of 8,000 households were exposed to business opportunity in the cookstove value chain. This is in addition to 100 groups of orphan and vulnerable children and youths, where many continued to earn their living from cookstove production and 100 charcoal producers that continue to use modern biomass conversion technologies learnt in the project for the obvious reason that it doubles their revenue. The importance of income generation is also mirrored in *“Providing Access to Modern Energy in Northern Uganda”* where opportunities for income generation in biomass cookstoves was evident.

Training and/or educational institutions play a crucial role in the dissemination of improved biomass cookstoves. Through training, end users are taught how to properly use improved biomass cookstoves while traditional cookstoves artisans are taught how to transition to improved biomass cookstoves making ICS a new revenue stream for them. To effectively address long term needs of the cookstove sector, governments in collaboration with the private sector, should develop and promote a curriculum where village polytechnics and other technical and vocational education and training centres can help alleviate skills-set limited in the market.

Long Term Commitment by Government, NGOs and the Private Sector

There must be a long-term commitment by all the stakeholders in the energy sector starting with the government. Enactment of policies that are focused on pro-poor is a good starting point. For example, the Kenyan government in collaboration with other development partners has deliberately been promoting the development of improved cookstoves since the 1970s. To further insulate the biomass sector from unscrupulous businesspeople, in 2015, it enacted the Energy (Improved Biomass Cookstoves) Regulations¹¹ and it is on this background that the improved biomass cookstoves have been thriving in the country. It is this enabling policy framework that is behind the success of the two cookstove projects in Kenya i.e. *“Improved Cookstove*

¹¹ <https://www.erc.go.ke/wp-content/uploads/2018/04/The-Draft-Energy-Improved-Biomass-Cookstove-Regulations-2013.pdf>

for Households and Institutions” and the “Developing Energy Enterprises Project” where the latter also achieved strong results in Uganda and Tanzania.

Similarly, long term commitment in the biomass cookstoves from NGOs in Eastern Africa has resulted in sustained vibrancy in biomass cookstove sector over the years. Some of these local and international NGOs include Sustainable Community Development Services (SCODE)¹², Hivos, Cooperative for Assistance and Relief Everywhere (CARE¹³) and many others that have since become defunct have had an admirable experience in cookstoves having played significant roles in the development and scale-up of this technology.

Specialized Focus on Biomass Cookstoves

This has proven to be instrumental in reaching a large target group and ability to sustain the impact of almost all cookstove projects in the EU ACP Energy Facility. Preference should be given to specialised initiatives with specific focus on a single option – biomass cookstoves. This was true in the case of “Improved Cookstove for Households and Institutions”, “Community-Assisted Access to Sustainable Energy In Rwanda” as well as “Provision of Efficient, Affordable and Sustainable Energy for Cooking and Heat to Rural Households in Eritrea” projects and “Programme pour l’Energie de Cuisson Economique pour l’Afrique de l’Ouest” implemented in four countries in West Africa.



Stove on biogas
Photo: DEM



Use of Existing Production and Marketing Networks

Most successful biomass cookstoves develop around an already existing industry. The KCJ which was one of the stoves being disseminated in the ACP EU Energy Facility cookstove projects in Kenya, originally relied heavily on the artisanal industry. The “Improved Cookstove for Households and Institutions” project used the already existing SACCOs which some of the project beneficiaries were members. This synergy made it possible for provision of the much-needed credit especially to the very poor households. Village loans and savings groups were also used in the same way to enhance project impacts. Use of an existing industry dramatically reduces the cost of the project as well as increasing impacts.

¹² SCODE and Hivos were the implementing organizations for the ‘Improved Cookstoves for Households and Institutions Project’ in Kenya.

¹³ Care-International implemented the ‘Community-assisted Access to Sustainable Energy Project’ in Rwanda.

Several ACP EU Energy Facility projects has integrated financing mechanism that has been ongoing for decades in sub-Saharan Africa – village saving and loans groups (VSLGs) which are mostly run by women groups for instance. The Mali and Rwanda project effectively used this approach which enabled end-users to acquire improved cookstoves. The *“Developing Energy Enterprises Project”* on the other hand, financed energy enterprises to scale up their businesses and thus provide additional employment especially in rural areas.

Local Ownership

Use of local champions ensures sustainability of the project long after the campaign period. The *“Msamala Sustainable Energy Project”* in Malawi implemented its activities through local government decentralised structures which ensured that activities were implemented effectively and were sustained long after the project had ended. These decentralised structures included the Village Development Committees (VDC), Village Natural Resource Management Committees (VNRMCs) and Village Forest Committees (VFCs).

“The improved cookstove for households and institutions project” collaborated with SCODE who have been engaged in the cookstove sector in Kenya for the past few decades. In the project *“Access to Sustainable Modern Energy Services in Mali”*, Agronomists and Veterinarians Without Borders (AVSF) used their enormous experience in structuring and supervision of women’s groups and craftsmen to promote improved cookstoves.

There are inherent risks of relying on local champions. To illustrate this, SCODE is presently considered a dominant player in rural cookstove production, distribution and retail. They mostly dictate the price and quality of cookstoves which other players need to mirror or otherwise their businesses collapse¹⁴. When partnering with local champions, it is essential for the ACP EU Energy Facility to assess their technical and financial capability.

Sustained Feedback between Cookstoves Developers and the End-users

Cultural disposition plays a significant role in developing ability of up-take of new technologies. A common problem encountered, for instance, is the size of the cookstove which needs to be able to accommodate the different types of meals prepared in a particular region. This implies a cookstove that is readily adoptable in one region yields different and sometimes opposite results in another.

Constant feedback from end user on cookstove performance as improvements on it are being instituted leads to greater adoption as the final product totally meets the cooking habits and routines of the end-users. Different cultural aspects and habits of end-users should also be considered while rolling out cookstove projects in sub-Saharan Africa.

Best practise to replicate

As mentioned earlier, 24 projects have been implemented improved cookstoves supported by the ACP EU Energy Facility. We have selected the following criteria to assess their potential for replication:

1. **Biomass cookstove project that has continued to have a positive impact over a long period of time** – several biomass cookstove projects in sub-Saharan Africa have a short life span and usually last for the duration of donor or government

¹⁴ Source: key informant interview on biomass cookstoves in Africa.

funding. Once funding is withdrawn, the project fizzles out and, in some cases, is abandoned. One indicator for a successful biomass cookstove project is its ability to continue to expand long after donor support has been withdrawn.

2. **Biomass cookstove project that has resulted in scaled-up uptake of improved energy services** - this refers to the impact of the project on the expanded use of improved energy services by the end users. Biomass projects that result in increased access to energy services by a wider range of end users than the original target population is considered successful.
3. **Biomass cookstove project that has demonstrated strong linkages to poverty reduction** – the link between a biomass cookstove project and reduction in poverty levels is difficult to measure in absolute terms. However, it is possible to assess the impact of a biomass cookstove project on the quality of life of the poor. A successful biomass project is one that results in improved standards of living for the poor - through improved incomes, improved access to opportunities for income generation, improved agricultural productivity and improved social services (health, education).

Each of the above criteria is given equal weight in the comparative assessment of candidate successful experiences. It is important to note that this analysis does not present an exhaustive review of all ACP EU Energy Facility projects in the sub-Saharan Africa region.

Based on the criteria, a range of biomass cookstove projects are analysed in Table 2. Each project is scored on a scale of 1 to 5 denoting significance of the impact. Minimum and maximum impact is denoted by 1 and 5 respectively. The scores denote how a project meets the criteria.

Table 2: The best EU-ACP Biomass Cookstove Projects

Biomass cookstove project	Criteria			Total score
	Continued positive impact over a long period of time	Scaled up uptake of improved energy services	Strong linkages to poverty reduction	
Improved cookstove for households and institutions project	5.0	5.0	4.5	14.5
Community assisted access to sustainable energy in Rwanda	5.0	4.0	4.0	13.0
Providing Access to Modern Energy in Northern Uganda	4.0	5.0	4.0	13.0
Provision of efficient, affordable and sustainable energy for cooking and heat to rural households in Eritrea	3.5	3.5	4.0	11.0
Promoting use of sustainable energy in Wajir District	3.5	3.5	3.5	10.5
Access to modern and sustainable energy services in Mali	3.0	3.5	3.5	10.0



Biomass cookstove project	Criteria			Total score
	Continued positive impact over a long period of time	Scaled up uptake of improved energy services	Strong linkages to poverty reduction	
Support to efficient utilisation of alternative energy sources to improve the livelihood of pastoral and agro-pastoral communities in southern Ethiopia	4.0	3.5	2.5	10.0
Msamala sustainable energy project	3.0	3.0	2.5	8.5
Programme for Economic Cooking Energy for West Africa - ProCEAO	2.5	3.0	3.0	8.5
Developing energy enterprises project East Africa	2.5	3.0	3.0	8.5
Access to energy services in rural and peri-urban areas in Northern Uganda (Teko Wa Project) ¹⁵	2.5	2.5	3.0	8.0

Some of the projects in table 2 have only recently been completed and, therefore, receives a lower score than the projects where a long-term impact has been documented. With this caveat in mind, we find that the *“Improved Cookstove for Households and Institutions Project”* to be the best performed project with an aggregate score of 14.5 out a possible 15. The least performed according to the criteria was *“Access to Energy Services in Rural and Peri-urban Areas in Northern Uganda”*. A case study of the *Improved Cookstove for Households and Institutions* is provided below.

Case Study Project for inspiration and replication

Title of Case Study Project	Improved cookstove for households and institutions project
Country	Kenya (Nakuru, Kirinyaga, Nyeri, Nyandarua and Murang’a counties)
Implementing body	Hivos, ETC Foundation, SCODE
Project Number	FED/2011/231-870
Project Budget	€1,593,774

Project design

Improved Cookstove for Households and Institutions project had the distinction of being properly planned. Division of the project amongst the project partners (known as Project Implementation Committee) was also innovative with each partner given a role that best suits their profile. Hivos was the contract holder, responsible for fund management and contributed the co-financing of the project. SCODE with its experience in production, distribution and retail of improved biomass cookstoves in rural areas as

¹⁵ This project is still under implementation.

well as community mobilisation, oversaw the implementation of the project in the five counties with a total population of more than 4 million. ETC Foundation coached SCODE to transform itself from a project implementer to providing support to other local organisations to be involved in project implementation. The project benefitted from synergies brought together by these partners. Regular meetings of the project implementation committee ensured each partner was kept up to date with the project activities. Challenges experienced were comprehensively tackled at the PIC meeting. A needs assessment that was conducted before project implementation greatly informed its design.

Impact of the project

Highest impact in areas with more economic resources – Even though cookstoves is a technology that is often said to be targeted at the poorest part of the population, highest impact was realised in Nakuru County owing to the very high awareness on cookstoves, highest population with the highest income and availability of numerous cookstove stockists scattered throughout the county. Cost savings on fuelwood were put into other priority needs for example, an additional classroom was constructed at a local polytechnic which allowed more students to be enrolled. Household incomes improved where the women took up cookstove production, repair and/or installation. An installer charges a maximum of €174 to install a kunimbili stove. Basic repair of a kunimbii stove cost €1.3. This additional income has enabled households to afford getting connected to the grid electricity supply and purchase of household goods. The indoor air quality has also improved guaranteeing good health to women and children who are predisposed to acute respiratory infections. Husbands that used to have negative attitudes towards their housewives now respect them owing to their contribution to the household income.

Training on outreach to farmers and other potential clients increased nursery owners' revenues – Tree nursery owners in Nyandarua County reported increased incomes owing to higher sales. Through the project, tree nursery owners could now make visits to farmers and provide advice on the best species for woodlot establishment or fruit trees. Where the farmer is either busy or lacks the capacity to grow and maintain the seedlings, the tree nursery owners were contracted to provide these services at a fee.

Adoption of technology that best addressed energy challenges of the target beneficiaries – Choice of cookstoves targeting households and institutions in the different counties was appropriate for the different beneficiaries in the target areas. The project looked at the entire value chain from awareness creation on benefits of cookstoves which created demand; concentrated production in Murang'a and Nakuru counties and later dissemination of the stoves in all the five counties. Additionally, SCODE trained women and men in cookstove production at their workshop in Nakuru. To cater for the fuel supply in the longer-term, the project also embarked on establishment of woodlots which were mostly on public land such as school compounds, government complexes, church compounds, etc.



Demonstration on the use of RLS and FSS to participants during World Environment Day Commemorations at Pader
Photo: DEM

Success factors

Efficient organisational set-up ensured responsibilities are shared equally – The PIC formed an efficient and effective working mechanism with each of the partners handling a specific role in the implementation of the project. All the partners played a role in the

development of work plans. This partnership brought together experiences drawn from an international non-governmental, international development aid and community-based organisations.

A needs assessment helped with proper project execution – The results of the assessment aided in efficient execution of the project with expected results and impacts in focus. A well-executed needs assessment helped with efficient allocation of resources (both financial and staff) towards the most pressing needs of the community.

Risk management of the ability of poor households acquiring cookstoves created a level playing field for all – To safeguard against further marginalisation of poor households from acquiring a cookstove, the project approached SACCOs which allowed its members to acquire cookstoves on credit. The cost of the cookstoves was checked off against deliveries of produce to the SACCO. Use of SACCOs was an innovative way to help with access of cookstoves especially by the poor households.

A well-coordinated implementation team is a precursor for a successful project – The three partners provided oversight and technical support in the management and implementation of the project. This ensured equal participation of each of the partners as well as bringing forth comparative advantage. Each of the partners had a specific role and contribution to the project. This collaboration enhanced the quality of delivery.

Conclusion and Lessons Learned

A market-based approach is the best starting point to promote and scale up biomass cookstoves in order to ensure sustainability of the activities long after the project ends. One of the main reasons behind this is, that a market-based approach enables all stakeholders within the cookstove value chain to identify and resolve the bottlenecks stagnating the market. A market-led system has two main supporting elements:

Enabling environment: For instance, the regulations that guide the activities of improved biomass cookstoves producers, manufacturers, importers, distributors, technicians and contractors of cookstoves in Kenya. For example, Kenya's Improved Biomass Cookstoves Regulations 2015 and the ECOWAS Renewable Energy Policy aims for its member states to adopt highly efficient firewood and charcoal cookstoves with an efficiency of at least 35% (ECREEE, 2017). One of the biggest concerns for the biomass cookstoves stakeholders in sub-Saharan Africa is adherence to standards owing to limited capacity as well as budgetary constraints. Consumer awareness is also a major challenge.

Inputs and service provision: There are numerous players that support the cookstove market chain. Crucial among them is financial services providers. The much-needed credit to ramp up production, higher additional transportation vehicles and increase stock at retail level. Most lending to the biomass cookstoves sector happens from micro-finance institutions (MFIs), providing microcredit to both end-users and small scale cookstove producers. Regrettably, MFIs credit is characterised by high interest rates coupled with a requirement for collateral against the loan. SACCOs and VSLAs or other savings groups provides an alternative on smaller scale.

It is noteworthy to highlight one regional project; the *"Developing Energy Enterprises Projects in East Africa"*, which provided credit to cookstove enterprises with an aim of increasing their production capacity and/or increasing their stocks. This led to providing more employment and increased income generation by these energy enterprises. A total of 955 enterprises benefitted from this project.

The supporting inputs and service provisions are most advanced in East Africa which is the main reason behind improved cookstoves being most advanced in this region in Sub-Saharan Africa.

From the ACP EU Energy Facility projects analysed, projects that have a high-income generating component as well as a long track record of government and private sector support, reported great success. This special focus by the entities on biomass technologies has attracted both public and private finances which were invested in research and development of the technologies. Use of pre-existing distribution networks in addition to ensuring a strong local ownership do not only lower the cost of the project but also makes it possible to scale up the project at a very minimal cost.

To bridge the technical skill-set gap, government in collaboration with the private sector should develop and promote biomass cookstove curriculum in village polytechnics and technical and vocational education training centres. In line with this, governments should make deliberate effort in lowering the cost of cookstoves through provision of subsidy on steel which is used in fabrication of portable cookstoves. This will lower the cost of cookstoves which will make them more accessible to the poor households.

Recommendations

- Cookstove projects and programmes should adopt a market-based approach in scaling up of improved cookstoves.
- Risk of creating a dominant player in the cookstove project should be addressed in advance. Otherwise, this player might crash the entire market with monopolistic tendencies.
- Organisational capacity needs to be established before donor support is provided. A proven track record reduces the incidences of limited project impacts as well as sustainability.
- Development of a curriculum ideal for village polytechnics as well as technical and vocational education and training centres. Graduates from these centres can sustainably meet the technical skills required for production of improved cookstoves.
- Support to policy and regulation development is relevant, but consumer awareness and the capacity of stakeholders supporting the market chain are just as crucial for the uptake of improved cook stoves. Support to the sector should adopt a holistic view on the whole value chain and its supporting elements to be able to strategically target future actions.

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Other useful links:

UNDP & WHO, 2009. The Energy Access Situation in Developing Countries. A Review focusing on the Least Developed.

Countries and Sub-Saharan Africa:
<http://www.who.int/indoorair/publications/energyaccesssituation/en/index.html>

Global Alliance for Clean Cookstoves:
<http://cleancookstoves.org/>

SE4ALL Energy Progress Report:
<https://www.seforall.org/global-tracking-framework>

Annex

List of projects in the ACP-EU Energy Facility that has promoted improved cook stoves

Project No	Project Title	Country	Period
2007/195-954	Community Managed Renewable Energy Program For Rural Ethiopia	Ethiopia	2008 - 2012
2007/195-964	Best Ray (Bringing Energy Services to Tanzanian Rural Areas)	Tanzania	2008 - 2011
2007/195-974	Somalia Energy and Livelihood Project (SELP)	Somalia	2007 - 2011
2007/195-975	Community-assisted Access to Sustainable Energy in Rwanda (CASE-RWANDA)	Rwanda	2007 - 2011
2007/195-984	Providing access to modern energy for northern Uganda (PAMENU)	Uganda	2008 - 2011
2007/195-993	Developing energy enterprises project East Africa	Kenya; Tan-zania; Uganda	2008 - 2013
2007/196-002	Msamala Sustainable Energy Project	Malawi	2007 - 2012
2007/196-006	Appui à la synergie énergie – environnement dans le sud-ouest de Madagascar	Madagascar	2008 - 2011
2008/195-967	Promoting use of sustainable energy in Wajir District	Kenya	2008 - 2011
2011/231-578	Community Based Green Energy Project	Kenya	2011 - 2015
2011/231-870	The Improved Cook Stoves for Households and Institutions Project	Kenya	2011 - 2016
2011/231-887	Provision of efficient, affordable and sustainable energy for cook-ing and heat to rural households in Eritrea	Eritrea	2011 - 2016
2011/232-060	Programme pour l'Energie de Cuisson Economique pour l'Afrique de l'Ouest" – ProCEAO	Burkina Faso; Benin; Mauri-tania; Senegal	2011 - 2015
2011/264-691	Energies durables dans les régions d'Agadez et de Tillabéri	Niger	2011 - 2014
2011/264-697	Energy for All (E4A) – Alternative Energy Solutions for Rural and Peri-urban Timor-Leste	Timor-Leste	2011 - 2014
2011/266-546	Community empowerment for efficient production use and access of renewable and sustainable energy in rural areas in Malawi	Malawi	2011 - 2015
2011/268-372	Support to Efficient Utilization of Alternative Energy Sources to Improve the Livelihood of Pastoral and Agro pastoral Communities in Southern Ethiopia	Ethiopia	2011 - 2015
2011/270-457	Facilidad Sur Solar	Dominican Republic	2011 - 2016
2011/270-635	ProgettoMondo Mlal : - Déployer de nouvelles opportunités de développement socio-économique par l'accès aux énergies du-rables dans le Plateau Central	Haiti	2011 - 2016
2011/275-289	Increase access to efficient stoves among rural households in Northern Uganda	Uganda	2011 - 2015
2014/344-366	Access to energy services in rural and peri-urban areas in Northern Uganda (Teko Wa Project)	Uganda	2014 - 2020
2014/352-925	Somali Energy Transformation (SET) Project	Somalia	2014 - 2018
2014/352-933	Amélioration des conditions de vie des enfants et de leurs familles grâce à un accès à des services énergétiques modernes, propres et abordables dans 30 communautés pauvres du cercle de Kita au Mali	Mali	2015 - 2018
2014/353-422	Light Up Liberia	Liberia	2016 - 2019
2014/353-512	Accès à des services énergétiques modernes et durables au Mali	Mali	2014 - 2018