CLEAN DEVELOPMENT MECHANISM
PROJECT DESIGN DOCUMENT FORM (CDM-PDD)
Version 03 - in effect as of: 28 July 2006

CONTENTS

SECTION A. General description of project activity

A.1. Title of the project activity:

>> Gold Standard VER - Up Energy's Uganda Biomass Cookstove Carbon Project

A.2. Description of the project activity:

>> Two of the major causes of deforestation in Uganda are wood harvest and charcoal making for cooking[1]. In addition to the environmental consequences, many Ugandan women and children spend much of their time gathering fuel, instead of putting that time toward more productive purposes.

Up Energy's Uganda project is promoting the sale of improved energy-saving biomass stoves, i.e. charcoal fuelled stoves and wood fuelled stoves. The project will work through local and international organizations as well as local and imported stove distributors to reach Uganda with more efficient cooking technologies. The project will sell improved biomass stoves, investing revenues from carbon finance in subsidies, social marketing, and the development of robust distribution channels. Impact Carbon will manage the development of the carbon asset.

The Ugandan Context

According to the United Nations, between 1990 and 2005 Uganda has lost 26.3% of its forest cover and has a current deforestation rate of over 2% per year[2]. While urban wood demand for construction and furniture plays a large role in this situation, the problem is also exacerbated by 97% of the rural population collecting firewood for basic needs[3].

Around 95%[4] of households in Uganda cook using traditional cookstoves that are inefficient and very polluting. Improved biomass cookstoves are built that reduce wood and or charcoal consumption and indoor air pollutants from incomplete combustion (CO and PM). This project will reduce greenhouse gas emissions by disseminating biomass stoves that have been proven through testing to be more efficient than traditional models.

Project Activity

[1] http://infolib.hua.edu.vn/Fulltext/ChuyenDe/ChuyenDe07/CDe355/62.pdf

[2] http://www.uws.or.ug/program-areas.php

[3] http://www.helio-international.org/uploads/VARUganda.En.pdf

[4] http://content.undp.org/go/cms-service/stream/asset/?asset_id=2205620

The project will provide high-quality, affordable biomass stoves to replace inefficient stoves such as traditional 3 stone fires and traditional stoves to regions throughout Uganda.

All stoves will significantly reduce greenhouse gas emissions while simultaneously offering co-benefits to families such as relief from high fuel costs and/or improved health. Specifically these new kitchen regimes will provide some or all of the following benefits:

- Reduce unsustainable wood harvest and the accompanying deforestation
- Diminish the charcoal and fuel wood bill for households, and schools, and save fuel collection time for other important activities
- Contribute to the preservation of wood resources so as to avoid inter-communal conflict over resources

The project will conduct local testing to identify the most appropriate improved cookstove models for varying Ugandan contexts. The criteria for participation is based on stove performance and availability in the local markets.

The project intends to provide customers with the opportunity to purchase stoves that can be mass produced at a factory, or custom built, depending on the needs..The stoves will be distributed through local partners by building distribution networks all across Uganda.

The Role of Carbon Finance

Carbon finance provides a basis for maintaining a professional commercial relationship between the user and the disseminators, while also introducing a subsidized and affordable price, a quality guarantee, and a warranty system.

The quality assurance strategy is a major benefit of carbon finance. It has the potential to introduce new quality expectations amongst consumers and so shift prevailing practice away from inefficient cooking, which has environmental and health penalties, to a new mass prevailing practice involving reduced GHG emissions and healthier kitchens.

The entire project, and all cookstoves distributed, is financed by investment capital that the project seeks to recapture by generating Voluntary Emission Reductions carbon credits.

Partners

UpEnergy is a private enterprise that makes clean energy technologies available to people in the developing world. By creating partnerships with technology manufacturers, local distributors, and carbon

project developers, UpEnergy creates carbon credits from the distribution of products like high efficiency cookstoves, water purification technologies and solar lights.

Impact Carbon is a non-governmental organisation whose mission is to improve health and the environment through clean energy projects that reduce carbon emissions. Impact Carbon's activities include developing relevant and comprehensive methodologies and instrumentation for evaluating stove performance, quantifying greenhouse gas emission reductions and building business models for reinvesting carbon revenues to increase stove distribution and dissemination.

Up Energy is coordinating the project and providing the necessary carbon finance for project development and stoves subsidies. Impact Carbon is managing the carbon crediting process. Other partners will be advising on carbon import, marketing and outreach. The project will add more implementing partners in its effort to reach more Ugandans with healthy, efficient kitchen technologies.

Chronology

Carbon finance was formally leveraged for project development on 15th April 2011 (signing of the first Voluntary GS ERPA of this project). Discussions about distribution with our local partners began in January 2011 and distribution networks were established from April 2011. The project began to identify the appropriate stove requirements in February 2011. Two stakeholder consultation meetings were conducted in May 2011, and a follow-up process took place as part of the feedback round. Project technology installation is planned to begin during the summer 2011, with initial sales of household wood stoves.

Impact Carbon is acting in the capacity of carbon asset developer.

We are reviewing household and institutional stoves locally made and assessing the possibilities to build local capacity to manufacture them along with opportunities to import high quality stoves.

A.3. Project participants:

>> The project owner is Up Energy Group Inc.

The following are the project participants being registered in relation to the PA.

Name of Kyoto Party involved (host party)	Public or private entities Project Participants	Parties involved wish to consider as project participant?
Not Applicable to GS VER activities.	Up Energy Group Inc. (private)	No
Not Applicable to GS VER	Impact Carbon (private)	No

activities.		

A.4. Technical description of the project activity:

A.4.1. Location of the project activity:

>>Republic of Uganda.

A.4.1.1. Host Party(ies):

>> N/A to Gold Standard VER Project. Any country can host a Gold Standard voluntary carbon market project. This is not a CDM project, hence there is no formal "host party" and no DNA approval is required. Currently, Uganda is not subject to any GHG emission caps.

A.4.1.2. Region/State/Province etc.:

>> The PA promotes sales of improved biomass stoves in the nation of Uganda.

The country is located on the East African plateau lying mostly between latitudes 4°N and 2°S and longitudes 29° and 35°E.

All technologies included in the PA will be implemented within such a boundary, which is formed by 4 administrative regions (Northern, Eastern, Central and Western).

A.4.1.3. City/Town/Community etc.:

>> The PA will reach an unlimited number of cities/towns/communities, etc throughout the crediting period.

A.4.1.4. Details of physical location, including information allowing the unique identification of this project activity (maximum one page):

>> A stove distribution record will be maintained specific to this project.

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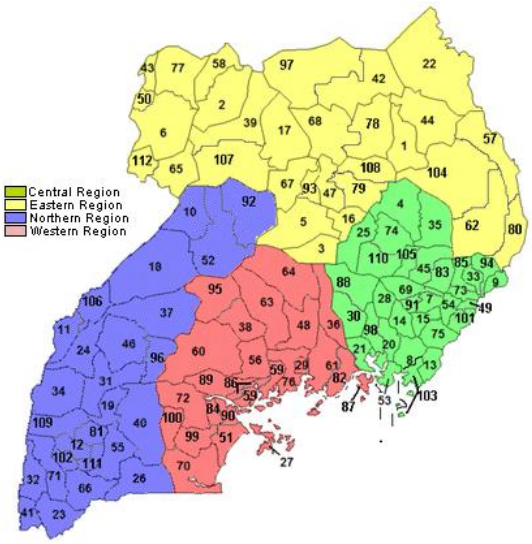

The project boundary, target areas, and fuel collection area are defined nationally as the country of Uganda. Local distribution partners that are familiar with local conditions and have access to remote communities will be progressively added to the project throughout the crediting period. This model of distribution allows project technologies to reach households in all regions of the country, further enabling access to improved technologies that otherwise would not be available. The project's country-based management team continually seeks new distribution partners to further provide access to the project's improved technologies. The project facilitates the distribution and delivery of technologies through CBOs and NGOs, and ensures transparent and verifiable sales, as well as end-user follow-up and technical support.

The fuel collection area is also defined nationally as it follows the national pattern of deforestation that permeates all regions of Uganda. Biomass fuel is part of a national market that forms a fungible market for fuel; as demand pressures on forests grow in one region they are transferred to other regions as supply and availability of fuel wood shifts to meet the needs of the country. National data and fuel assessments are described in the non-renewability of biomass (NRB) section of the PDD.

A.4.2. Category(ies) of project activity:

>>As follows:

Project Type: Large-scale Gold Standard (GS) Voluntary Emission Reduction (VER) Project

Category: End use energy efficiency improvement

Sub Category: Energy Efficient Cooking Stove Technologies

A.4.3. Technology to be employed by the project activity:

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The project intends to make available to all districts of Uganda each of the project technologies. The activities will promote stoves that reduce the biomass use of Ugandan cooks compared to traditional stoves. The project activity will continually assess biomass stove technology options with the goal of providing the highest performing, most affordable, and most locally appropriate technologies to Ugandans when possible[5].

Typical project technologies

Examples of the initial technologies considered at the validation stage are described below. However, their implementation timeline may vary and/or be discontinued during this project, and other qualifying technologies may be introduced at a later stage:

Non-institutional stoves:

These stoves primarily serve households and restaurants. Examples of these technologies include but are not limited to the JikoPoa designed in Kenya, the Uganda Improved Charcoal Stove design in Uganda, and the Envirofit G3300 designed by the international NGO Envirofit.

Envirofit G3300[6]

Jiko Poa Rocket Stove[7]

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

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[5] See annex "focus groups - evaluation forms" in the LSC report.

[6] http://www.envirofit.org/cookstoves/g-3300.html

[7] http://www.rocketstove.org/index.php?option=com_content&task=view&id=27&Itemid=86

Crediting Period	Estimate of emission reductions in ton of CO2e per annum
2011	3,000
2012	12,000
2013	23,000
2014	30,000
2015	32,000
2016	32,000
2017	32,000
Total estimated reductions (tCO_2e)	164,000
Total number of crediting years	7
Estimated emission reduction per annum over total crediting period (tCO2e)	23,400

Per GS VER Methodology, adoption of new fuels and stoves *"...Shifts in technology may occur in a gradual manner and adoption can increase over the project period. The project activity is implemented by a project proponent and potentially with* additional project participants." (GS VER Methodology v3, Pg.3, Section 1).

For the purposes of the PDD and the validation period, the project estimates sales based on the current findings on model stoves identified for participation in the project activity and their expected expansion. With assistance from carbon revenues, the project hopes that expanded R&D, social marketing, and increased awareness of improved stoves will increase sales for other improved technologies and manufacturers. As new technologies are phased into the project activity, the project will adjust sales projections based on the types of technologies and locations being credited during appropriate future verification periods.

A.4.5. Public funding of the project activity:

>> No ODA financing is used. See Annex 2.

SECTION B. Application of a baseline and monitoring methodology

B.1. Title and reference of the approved baseline and monitoring methodology applied to the project activity:

>> The following methodology is used for the PA: "Technologies and Practices to Displace Decentralized Thermal Energy Consumption" version 3.

B.2. Justification of the choice of the methodology and why it is applicable to the project activity:

>> As per the GS VER this methodology is applicable to programs or activities introducing technologies and/or practices that reduce or displace greenhouse gas (GHG) emissions from the thermal energy consumption of biomass users.

As in this case examples of these technologies stated in the methodology include the introduction of improved biomass or fossil fuel cook stoves.

As allowed by the methodology the term technology refers to single or multiple technologies and/or practices.

Finally, the GS VER methodology is applicable to the project because the following conditions apply:

See pertinent annex "Justification of methodology" accompanying this PDD.

B.3. Description of the sources and gases included in the project boundary:

>> Emissions from fuels may occur during fuel production, transport, and consumption for all the technologies implemented along the crediting period.

	Sources	Gas	Included?	Justification/Explanation
Baseline	Heat delivery, production of fuel, and transport of fuel	CO2	yes	Important source of emissions
		CH4	yes	Important source of emissions
		N2O	yes	Can be significant for some fuels
Project	Heat delivery, production of fuel, and transport of fuel	CO2	yes	Important source of emissions
		CH4	yes	Important source of emissions
		N2O	yes	Can be significant for some fuels

B.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

>> Baseline generalities

The project aims to reduce biomass use as this fuel is a primary driver of deforestation. According to a recent study[8], 78% of Uganda's total national fuelwood consumption can be attributed to households, and households are also responsible for 100% of national charcoal consumption. The use of biomass is nearly universal in households in rural areas and to a lesser extent in urban areas.

Baseline identification

The project proponent considers the baseline fixed by default.

Additionally, whenever the project applies for a renewable crediting period, the baseline must be reassessed as per the rules on renewal of crediting period.

Baseline and project scenarios description

In order to assess the woody biomass used in the absence of the project activity, it is necessary to group the targeted project beneficiaries. Given that a baseline scenario is defined by the typical baseline fuel consumption patterns in the population that is targeted for adoption, the project initially identifies 2 different baseline scenarios. The independent baseline studies determine when sub-groups are applicable to any of the baseline scenarios, as described in the annex "baseline studies":

- Baseline scenario: "Non-institutional biomass users", which consists of people using biomass at any other non-institutional use, excluding industrial use.

This baseline scenario captures the characteristics that distinguish the different end-users found in national assessments and reflect user profiles based on previous experience from similar initiatives.

A baseline or project scenario does not necessarily apply uniquely to one technology. Thus, different improved stove models may be compared to the same baseline scenario.

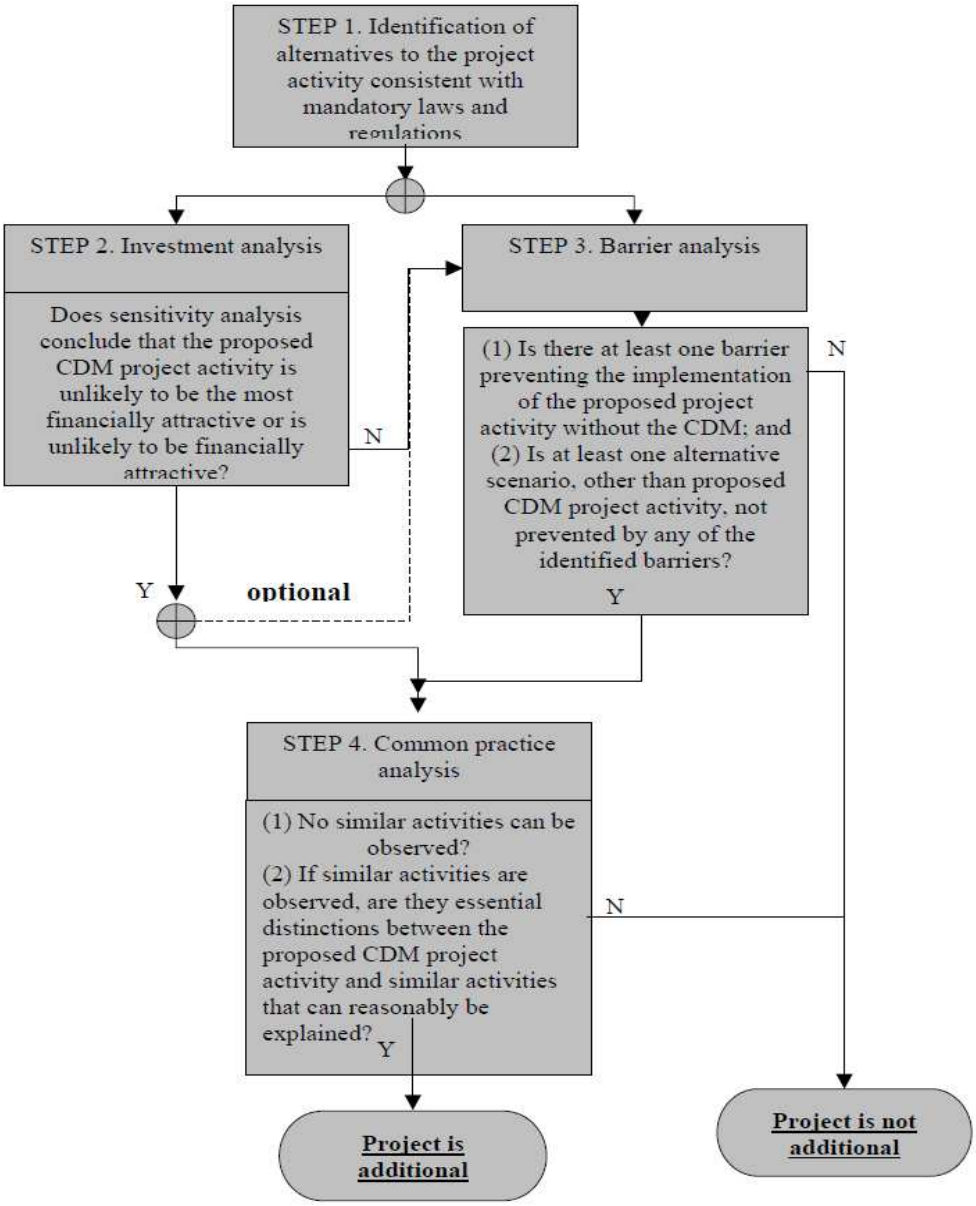
[8] http://www.fao.org/docrep/009/j8227e/j8227e00.htm page 63

Additional baseline and project scenarios may be added to a project activity at any time during the project period upon approval of a request for design changes. Emission reductions will not be credited for a new project scenario or in relation to a new baseline scenario until the respective project studies or baseline studies have been conducted. Appropriate studies will be conducted prior to verification. Alternatively, adjustment factors may be applied to existing baseline and project scenarios to account for less significant variability in fuel consumption or technology, without the need to create a new baseline or project scenario.

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

>> The most recent version of the UNFCCC "Tool for the Demonstration and Assessment of Additionality" is to be applied." The Project applies the most recent version[9] UNFCC Version 5.2, EB 39, Annex 10 to demonstrate the project activity would not have occurred due to all of the following barriers below. There has not been a previous announcement that any of the project activities would go ahead without expected carbon finance.

[9] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-01-v5.2.pdf/history_view



Step 1: Identification of alternatives to the project activity consistent with current laws and regulations

Sub-step 1a: Define alternatives to the project activity:

- **Alternative Scenario 1:** The proposed project activity is undertaken without being registered as a carbon project activity.

  Under this scenario the project proceeds as described in this document. In order to remain financially viable the full cost of each technology would be paid for by the end user.

- **Alternative Scenario 2** : Fossil fuel energy such as LPG is provided to households

  Under this scenario stoves using fossil fuels would be installed.

- **Alternative Scenario 3:** Continued use of traditional stoves for HH cooking

  In the absence of the project activity, it is likely that households will continue cooking with traditional stoves.

Sub-step 1b: Consistency with mandatory laws and regulations:

All scenarios are in compliance with mandatory applicable legal and regulatory requirements. In Uganda there exists no rule banning the use of traditional or improved stoves.

Step 2: Investment analysis

The project chooses to assess additionality using Barriers Analysis.

Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CER project activity:

Prevailing Practice: First of its Kind

Alternative 1:
Habitual use of traditional stoves imposes a very strong influence on the baseline scenario, resulting in continuation of use of traditional inefficient stoves. A significant amount of sensitisation, marketing, demonstration and personal anecdote are required to overcome this prevailing practice. Carbon revenues will fund these activities which are required to shift the common practice from inefficient traditional stoves to improved ones under the Project Activity. Publicly available data states that the penetration rate of improved cookstoves in Uganda is only 5%[10], which classifies this project as "first of its kind" and thus a realistic and credible barrier due to prevailing practice can be claimed. The analysis concludes that barriers due to prevailing practice do exist. Additionally, this barrier prevents the implementation of the project activity without registration as a carbon project.

Alternative 2:
Similar barriers exist for Alternative 2 as do for Alternative 1. Projects that are "first of its kind" represent a prevailing practice that will be sustained until further incentives are put into place to switch practices to fossil fuels.

Alternative 3:
Prevailing practice barriers do not exist for Alternative 3. Projects that are "first of its kind" represent the baseline scenario, which is the definition of Alternative 3.

[10] http://content.undp.org/go/cms-service/stream/asset/?asset_id=2205620

Sub-step 3 b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed project activity):

"Prevailing Practice" barriers would prevent Alternatives 1 and 2. "Prevailing Practice" barriers do not prevent Alternative 3.

Conclusion: Alternative 3 is the only viable option in the absence of developing the project activity as a carbon financed project.

Step 4: Common Practice Analysis

Sub Step 4a: Analyze other activities similar to the proposed project activity

In general, projects outside the carbon finance have been non commercial in nature and limited in scope. They have had little impact on the overall cooking market when funded by other than carbon finance.

At the domestic level, aid agencies have continued to improve stove designs and disseminate them, but no improved alternative is currently distributed at mass scale. Though there are some newly engineered stove models with apparent similar performance to the stoves installed in this project activity, these stoves are not currently widely available.

The most notable local manufacturer of wood stoves is the Lifeline Fund which has a factory in Northern Uganda which reportedly produces about 1,000 stoves per month. They are currently contracted as the first CPA in a competing PoA[11] in Uganda and as such will have limited capacity to supply additional carbon projects until further manufacturing capability is created.

Improved institutional stoves are a relatively new market for Uganda and are "first of its kind" in the target population. Limited access to electricity and other forms of modern energy supply makes it likely that charcoal and wood will remain the dominant fuel choice unless strong economic incentives are provided to further support schools with poverty level resources.
In a paper entitled "Gender and Compliance with Technological innovation for the Improved Charcoal Stove in Uganda" by AFREPEN (http://www.afrepren.org/Pubs/articles/wrec/artcl5.htm)**,** it is stated as follows:
"As a single energy source, charcoal in Uganda is very important for both urban and rural areas. While technologists and environmentalists have spent a long time trying to develop more efficient and environmentally appropriate stoves, ordinary households still use traditional metal cased charcoal stoves that burn easily and produce a big fire. In the late 1980's, the Household Energy Planning Programme attempted to identify suitable charcoal stoves, laboratory tested them and qualified them for mass production and dissemination. The aim of the project was to improve economic consumption of

[11] http://cdm.unfccc.int/filestorage/W/F/H/WFH0QRPIOY3AVBSUCK6GMT5LD287E9/Specific-CPA-DD_ICSEA.pdf?t=Y1J8MTMwNjk0NzU2My41Nw==|a7ibTGk60kGNa-_ab63JcUhlr58=

charcoal and improve peoples' lives. The project was however limited by inadequate programmes and poor policy commitment.

The first Ugandan initiative

The first Ugandan National Stoves Workshop[12] took place in March - April 1987. It was convened by the newly formed Ministry of Energy and brought together some 60 individuals, primarily from Ugandan organisations but also from certain Kenyan and European agencies concerned with the problems of wood energy. The workshop proposed the establishment of a National Wood Energy Conservation Committee, consisting of representatives of government and non-government agencies. An ambitious, comprehensive programme of activities was proposed, with implementation to begin immediately in order to achieve the greatest possible impact. To all intents and purposes, however, the workshop appears to have marked the beginning and the end of coordinated activities to conserve Uganda's biomass energy supplies. Few if any of the proposed activities have been taken up; one of the workshop participants speaks of there having been "no funding, no facilities, no follow-up." Activities in the field of household energy in Uganda are limited to a number of private organisations producing fuel efficient stoves for domestic and industrial purposes (see below).

This is clearly a case where a high level of commitment was achieved and expectations were raised among numerous agencies, only to be left unfulfilled. It is vital for Uganda's future energy security that the activities agreed at the 1987 workshop are re-appraised and that a commitment is made by government and donors to implementing those which will have the most immediate, widespread impact on slowing down Uganda's accelerating fuelwood crisis.

According to the "*The Energy Policy for Uganda*" developed by the Republic of Uganda Ministry of Energy and Mineral Development[13], woodfuel, which represents the bulk of domestic fuel in Uganda, is burnt in inefficient traditional stoves. Improved stoves and kilns and substitution fuels (LPG, kerosene) for cooking are not extensively spread due to their cost, lack of awareness and other different socio-economic barriers The use of improved cookstoves is therefore confirmed not to be widespread in Uganda even at government level. However, there have been some improved cookstoves initiatives in the East African region that can shed some light on the common practice with the region.

Main institutions working on improved domestic stoves[14].

In contrast with other countries in the region, improved stove programmes in Uganda were initiated by local NGOs and private entrepreneurs. There was very little external donor assistance except for some limited technical and training assistance.

There are three main institutions working in improved stoves in Uganda: Usika Craft Ltd, Black Power Ltd and Young Women's Christian Association (YWCA). Both Usika Craft and Black Power are private entrepreneurs in the suburbs of Kampala. Usika was started in 1984 as a design group specialising in

[12] http://www.hedon.info/BP29_HouseholdEnergyActivitiesInUganda

[13] http://www.energyandminerals.go.ug/pdf/EnergyPolicy.pdf

[14] http://www.hedon.info/BP29_HouseholdEnergyActivitiesInUganda

ceramics. The result is the "Usika" improved charcoal stove which in many respects, is almost identical to the Kenya improved "Jiko".

Black Power started work on energy in 1984 by making charcoal briquettes from sawdust waste. It later diversified its interest into production of improved metal/ceramic stoves which are essentially the same as the Usika, except in shape.

The YWCA started work on improved cooking appliances as far back as 1972. It started by evaluating the applicability of a variety of improved cookstoves in the context of the cooking habits and requirements of Uganda's rural women. In doing so YWCA succeeded in adopting the Pogbi stove initially developed by the Bellerive Foundation in Kenya and the Rafiki stove designed by UNICEF. The YWCA's stove activities have involved the introduction of two types of stove: the improved charcoal stove and the improved woodstove. The charcoal stove, similar to the Usika stove, is aimed at the urban population and is produced at the YWCA's workshop in Kampala. The woodstove, popularly known as the 'Y' stove, is based on the Lorena. It is intended for use in rural areas and is disseminated through the many YWCA branches in the country. It has a fire box for ensuring optimum combustion and an arrangement for pre-heating secondary air and a chimney made out of clay segments. This stove, when first introduced in 1987, had only one pot-hole but it has now been modified to a two-pot design.
The organisations mentioned above have had to use local capital and in some cases grants from donors in order to sustain production at very low levels. Fewer than 2,000 institutional stoves have been disseminated in the last 6 years, which is a drop in the ocean for a country with many boarding schools, hospitals and prisons, not to mention the numerous restaurants and eating houses, most of which depend solely on fuelwood for cooking.

Main institutions working on improved institutional stoves[15]

Production and dissemination of institutional stoves in Uganda started in the mid 1980s with two producers. The producers designed the stove models they were disseminating. With the beginning of this decade more producers have joined this trade bringing the total number to seven.
Most of the stove designs disseminated today are adapted from models produced in different parts of the region, particularly Kenya and Tanzania. Training of employees is done on the fob while some proprietors are former employees of the first producers.
The following establishments produce household stoves and other energy-saving devices and big-fuels. In most cases proprietors have invested their own capital or obtained financial assistance from donors which proves again the difficulty to succeed on the dissemination of this type of technologies in the country.

PREEEP program

Since 2008, DED – in cooperation with GTZ, KfW, InWEnt and CIM – supports the Ugandan energy sector through the Promotion of Renewable Energies and Energy Efficiency Programme (PREEEP). The aim of this programme[16] is to develop renewable energies on a sustainable basis, support actions designed to raise energy efficiency and to encourage the wider use of solar and hydropower plants and

[15] http://www.hedon.info/BP29_HouseholdEnergyActivitiesInUganda

[16] http://www.gtz.de/en/themen/16464.htm

energy-efficient stoves to improve people's living conditions. PREEEP is being implemented on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ) with co-financing from the Dutch Government and ACP–EU Energy Facility. Therefore, there is no reason to think that the project could be self-sustained after the funding from this donor ends.

A World Bank financed initiative started in 2010 called the Energy for Rural Transformation (ERT) Programme. This programme is coordinated by the Ministry of Energy and Mineral Development and involves 10 more implementing institutions, including a number of line ministries and government agencies. DED has committed itself to support the implementation of ERT with up to 10 Technical Advisors attached to the various implementing agencies. So far, agreement has been reached to support the Ministry of Energy and Mineral Development with one GIS expert, the Ministry of Water and Environment with a technical expert on water pumping systems, the Ministry of Local Government with two advisors to support districts in Northern Uganda in the integration of energy into their development plans, and the Ministry of Finance, Planning and Economic Development with one advisor in support of the impact M&E system for the entire ERT Programme.

Conclusion from sub-step 4.a: In the absence of the project activity, no credible self-sustainable alternatives exist for the large-scale distribution of improved stoves without the help of carbon finance.

Sub Step 4b: Discuss any similar options that are occurring

As described in Sub-step 4a, other stove initiatives exist but in limited capacity and require donor and subsidy funding, or alternatively carbon financing mechanisms.

Conclusion form sub-step 4b: *In the absence of the project activity, no credible self-sustainable alternatives are occurring for the large-scale distribution of improved stoves without the help of carbon finance.*

B.6. Emission reductions:

B.6.1. Explanation of methodological choices:

>> BASELINE STUDIES

A series of studies will be undertaken for the project. The methodological choices of the baseline studies are as follows:

Baseline Non-renewable Biomass Assessment

The project activity employs biomass therefore the fractional non-renewability of biomass is identified in this PDD.

Baseline survey (BS) of target population characteristics

The baseline survey provides critical information on target population characteristics, baseline technology use, fuel consumption, leakage, and sustainable development indicators. *Baseline Survey Representativeness:* The Baseline survey followed the sampling guidance of the GS methodology and is representative of end users targeted in the program activity.

Baseline Survey Sample Size: The survey was carried out for each baseline scenario using representative and random sampling, following the GS guidelines for minimum sample size. It is expected a group size bigger than 1000 for most cases along the crediting period which leads to minimum sample size of 100.

Data Collected is specific to the characteristics of each baseline scenario, and will be tailored to each scenario in this project. Data collected will be as required in the GS methodology.

Baseline performance field test (BFT) of fuel consumption

This test may be undertaken by testing a paired sample (baseline and project performance measured for same subjects) or by independent sampling (different subjects, and usually different sample sizes, for baseline and project scenarios). However, in some cases a single sample test may be conducted; this may occur for example when a baseline default factor is used during the crediting period, such that a PFT is required without any comparative BFT as allowed in the methodology.

The approach taken will accommodate the following requirements:

- It is transparent and can easily be replicated,
- It is evidently conservative,
- The sample is randomly selected so as to not introduce a material bias,
- And the impact of daily and seasonal variations on the expected average fuel consumption savings is accounted for.

BFT representativeness: through a sample of potential end users who are typical of end users in the project activity.

BFT sample size: The test data will be analysed in combination to estimate the average annual emission reductions or average fuel savings per unit.

Any of the two valid options for the statistical analysis will be applied as appropriate, either the 90/30 rule using mean values or the 90 rule using the lower bound values. In all cases, sample sizes will be greater than 20, as requested by the methodology[17].

[17] See GS meth page 13.

PROJECT STUDIES

Likewise, the methodological choices of the project studies are as follows:
As described in this document, a project scenario is defined by end users within a target population that adopt project technologies that cause specific emission reductions in the project area. The project area for this project is defined as the country of Uganda.

The following project studies will be conducted for each project scenario:

- Project non-renewable biomass (NRB) assessment, as biomass is one of the project fuels
- Project survey (PS) of target population characteristics
- Project performance field test (PFT) of fuel consumption.

These three project studies will satisfy the same requirements as the baseline studies as required by the methodology, but the project survey and PFT are conducted with end users representative of the project scenario target population and currently using the project technology.

In situations where the baseline technology still operate as backups or complementary units in parallel with project technologies, the fuel consumption implications will be accounted for in the PFT. PFTs are always required in the project situation, so as to capture the potential use of the baseline technology as backup or auxiliary units.

Findings of the PFT will be submitted post-registration as allowed by the methodology, on time for the verification and prior to the request for issuance. In such case, the project documentation submitted for validation and registration review will however provide a Project Estimation of expected project emission, supported by appropriate and credible sources of information.

LEAKAGE STUDIES

The project documentation contains a projection of leakage based on available data and general observation. A leakage investigation will be conducted every two years using relevant survey methods that can be combined with monitoring surveys as is applicable.

The following potential sources of leakage are investigated:

a) The displaced baseline technologies are reused outside the project boundary in place of lower emitting technology or in a manner suggesting more usage than would have occurred in the absence of the project.

Justification: No leakage. There is no evidence that the project increases the use of higher emitting technologies outside the project boundary where lower emitting technologies as in place (i.e. 3 stones fires). Wood fuels remain a valuable and declining resource. This trend will not be reversed by the project activity.

Moreover many users collect locally available wood for free. The free supply of wood is external to economic markets for wood and thus, to a large extent, these communities are shielded from market forces on wood fuel prices.

Given that the leakage assessment does not expect an increase in fuel consumption by the non-project households/users attributable to the project activity, calculations do not need to be adjusted to account for this leakage

b) The non-renewable biomass or fossil fuels saved under the project activity are used by non-project users who previously used lower emitting energy sources.

Justification: No leakage. There is no evidence that the project increases the use of higher emission fuel outside the project boundary where lower emitting energy sources take in place. Wood fuels remain a valuable and declining resource. This trend will not be reversed by the project activity.

Moreover many users collect locally available wood for free. The free supply of wood is external to economic markets for wood and thus, to a large extent, these communities are shielded from market forces on wood fuel prices.

Given that the leakage assessment does not expect an increase in fuel consumption by the non-project households/users attributable to the project activity, calculations do not need to be adjusted to account for this leakage.

c) The project significantly impacts the NRB fraction within an area where other CDM or VER project activities account for NRB fraction in their baseline scenario.

The project boundary covered in this project overlies with other CDM and VER project activities. A mechanism will be put in place to distinguish the biomass saved for each individual stove to ensure none of the project stoves are not accounted within another CDM or VER project activities as described in the monitoring plan.

d) The project population compensates for loss of the space heating effect of inefficient technology by adopting some other form of heating or by retaining some use of inefficient technology[18].

Justification: No leakage. The climate throughout Uganda is temperate to hot. There is very little if any space heating by stoves throughout the country as observed in the surveys[19] performed across the country. No evidence exists that the project will result in increased fuel use for heating from inefficient stoves.

If this condition changes during the crediting period and homes start requiring heating for the main home, the project stoves are capable of providing heating that is released both from the combustion chamber, as well as from residual heat captured in the liner post-combustion. In this manner the stove may in fact act as a more efficient heat source than 3-stone fires. The scarcity and/or cost of fuel is an additional incentive to not use multiple stoves for heating and thus reducing the likelihood that space heating is compensated by inefficient stoves.

e) By virtue of promotion and marketing of a new technology with high efficiency, the project stimulates substitution within households who commonly used a technology with relatively lower emissions, in cases where such a trend is not eligible as an evolving baseline.

Justification: No leakage. Project stoves shift cooking fuels only from high emission to low emission cooking. The type of cooking typically done on traditional stoves is replaced with the improved stoves. Cooking tasks that were typically done on kerosene (fast boiling of water, cooking for guests) will continue because of their ease and speed of cooking, or will be reduced due to the additional appeal and fuel savings associated with the use of the efficient stoves distributed. The design of the kitchen test captures multiple stove and fuel use.

[18] Baseline and project performance field tests would subsume this potential for leakage, but the later would not be addressed in case of a single sample performance test and efficiency ratio multiplier.

[19] Evidence available in the baseline monitoring annex.

PROJECT SCENARIO CREDITING IN RELATION TO THE APPROPRIATE BASELINE SCENARIO

Emission reductions are verified and credited by comparing the emissions for a given project scenario to the emissions for the applicable baseline scenario. As explained in this document, multiple project scenarios may be credited in comparison to different baseline scenarios, and multiple project scenarios may be credited in comparison to the same baseline scenario, as is applicable along the crediting period.

The initial emissions profile of each baseline scenario and project scenario is determined by the results of the respective baseline studies and project studies. Over the project period the results are updated and adjusted depending on results of the ongoing monitoring studies. This document also describes the requirements for the baseline studies and project studies required respectively for baseline, project scenarios and ongoing monitoring studies.

When the baseline fuel and the project fuel are the same and the baseline emission factor and project emission are considered the same, the overall GHG reductions achieved by the project activity in year y are calculated as follows:

$$ERy = \Sigma_{b,p} (N_{p,y} * U_{p,y} * P_{p,b,i,y} * NCV_{b,fuel} * (f_{NRB,b,y} * EF_{fuel,CO2+EFfuel,nonCO2})) - \Sigma LE_{p,y} \quad \textbf{(1)}$$

Where:

$\Sigma b,p$	Sum over all relevant (baseline b/project p) couples
$N_{p,y}$	Cumulative number of project technology-days included in the project database for project scenario p against baseline scenario b in year y
$U_{p,y}$	Cumulative usage rate for technologies in project scenario p in year y, based on cumulative adoption rate and drop off rate revealed by usage surveys (fraction)
$P_{p,b,y}$	Specific fuel savings for an individual technology of project p against an individual technology of baseline b in year y, in tons/day, as derived from the statistical analysis of the data collected from the field tests
$f_{NRB,b,y}$	Fraction of biomass used in year y for baseline scenario b that can be established as non---renewable biomass (drop this term from the equation when using a fossil fuel baseline scenario)
$NCV_{b,fuel}$	Net calorific value of the fuel that is substituted or reduced (IPCC default for wood fuel, 0.015 TJ/ton)
$EF_{b,fuel,CO2}$	CO2 emission factor of the fuel that is substituted or reduced. 112 tCO2/TJ for Wood/Wood Waste, or the IPCC default value of other relevant fuel
$EF_{b,fuel,nonCO2}$	Non---CO2 emission factor of the fuel that is reduced
$LE_{p,y}$	Leakage for project scenario p in year y (tCO2e/yr)

EF may include a combination of emission factors from fuel production, transport, and use. CO2 and non-CO2 emissions factors for charcoal may be estimated from project specific monitoring or alternatively by researching a conservative wood to charcoal production ratio (from IPCC, credible published literature, project-relevant measurement reports, or project-specific monitoring) and multiplying this value by the pertinent EF for wood.

When the baseline fuel and the project fuel are different and/or the emission factors are different, the overall GHG reductions achieved by the project activity in year y are calculated as follows:

$$ERy = \Sigma_{b,p} N_{p,y} * U_{p,y} * (f_{NRB,b,y} * ER_{b,p,y,\,CO2} + ER_{b,p,y,\,non\text{-}CO2}) - \Sigma\, LE_{p,y} \qquad \textbf{(2)}$$

Where:

$\Sigma b,p$	Sum over all relevant (baseline b/project p) couples
$N_{p,y}$	Cumulative number of project technology-days included in the project database for project scenario p against baseline scenario b in year y
$U_{p,y}$	Cumulative usage rate for technologies in project scenario p in year y, based on cumulative adoption rate and drop off rate (fraction)
$ER_{b,p,y,\,CO2}$	Specific CO2 emission savings for an individual technology of project p against an individual technology of baseline b in year y, in tCO2/day, and as derived from the statistical analysis of the data collected from the field tests
$ER_{b,p,y\,,\,non\text{-}CO2}$	Specific non-CO2 emission savings for an individual technology of project j against an individual technology of baseline b in year y, converted in tCO2/year, and as derived from the statistical analysis of the data collected from the field tests
$f_{NRB,b,y}$	Fraction of biomass used in year y for baseline scenario b that can be established as non-renewable biomass (drop this term from the equation when using a fossil fuel baseline scenario)
$LE_{p,y}$	Leakage for project scenario p in year y (tCO2e/yr)

PROJECT ESTIMATION – EMISSION REDUCTIONS ESTIMATED FOR THE PDD

The summary of the options chosen for the baseline and project studies at the validation stage, after those other methods are approached as described in the monitoring plan:

Qualitative analysis

- Baseline studies
    - Baseline scenario (non-institutional): field survey performed during June 2011. See Annex “Baseline Monitoring” of the PDD, section “non-institutional baseline studies”.

- Project studies

    - Project scenario (non-institutional): literature. See Annex "Baseline Monitoring" of the PDD, section "non-institutional project studies".

Quantitative analysis

- Baseline tests

    - Baseline scenario (non-institutional): literature, the requested KPTs will be performed before verification of the project. See Annex "Baseline Monitoring" of the PDD, section "non-institutional baseline studies".

- Project tests

    - Project scenario (non-institutional): literature, the requested KPTs will be performed before verification of the project. See Annex "Baseline Monitoring" of the PDD, section "non-institutional project studies".

B.6.2. Data and parameters that are available at validation:

>> The following parameters are available at the validation stage and do not need to be monitored over the crediting period.

Data / Parameter:	$EF_{b,CO2}$
Data unit:	kg CO2/TJ
Description:	CO2 emission factor arising from use of fuels in baseline scenario
Source of data used:	IPCC defaults
Value applied:	112,000
Justification of the choice of data or description of measurement methods and procedures actually applied :	Deemed valid by GS VER Methodology 2006 IPCC Guidelines for National Greenhouse Gas Inventories
Any comment:	*When EF is in units of tCO2/t_fuel, NCV term will be removed from emission calculations. Term can include a combination of emission factors from fuel production, transport, and use.*

	Measuring emission factors from stove technologies is costly and difficult to do accurately. Lacking measurable emission factors from the project technologies, PP applies default IPCC emission values.

Data / Parameter:	$EF_{b,nonCO2}$
Data unit:	kg CO2/TJ
Description:	Non-CO2 emission factor arising from use of fuels in baseline scenario
Source of data used:	- IPCC defaults in Second Assessment Report, 1996. - IPCC 2006 Guidelines for National Greenhouse gas Inventories
Value applied:	7540 kg CO_2/TJ
Justification of the choice of data or description of measurement methods and procedures actually applied :	Deemed valid by GS VER Methodology
Any comment:	*Term can include a combination of emission factors from fuel production, transport, and use.* Measuring emission factors from stove technologies is costly and difficult to do accurately. Lacking measurable emission factors from the project technologies, PP applies default IPCC emission values.

Data / Parameter:	$EF_{p,CO2}$
Data unit:	kg CO2/TJ
Description:	CO2 emission factor arising from use of fuels in project scenario
Source of data used:	IPCC 2006 Guidelines for National Greenhouse gas Inventories
Value applied:	112,000
Justification of the choice of data or description of measurement methods and procedures actually applied :	Deemed valid by GS VER Methodology
Any comment:	When EF is in units of tCO2/t_fuel, NCV term will be removed from emission calculations. Term can include a combination of emission factors from fuel production, transport, and use. Measuring emission factors from stove technologies is costly and difficult to do

	accurately. Lacking measurable emission factors from the project technologies, PP applies default IPCC emission values.

Data / Parameter:	$EF_{b,nonCO2}$
Data unit:	kg CO2/TJ
Description:	Non-CO2 emission factor arising from use of fuels in project scenario
Source of data used:	Options: IPCC defaults, credible published literature, project-relevant measurement reports, or project-specific field tests prior to first verification. Chosen: - IPCC defaults in Second Assessment Report, 1996. - IPCC 2006 Guidelines for National Greenhouse gas Inventories
Value applied:	7540 kg CO_2/TJ
Justification of the choice of data or description of measurement methods and procedures actually applied :	Deemed valid by GS VER Methodology
Any comment:	*Term can include a combination of emission factors from fuel production, transport, and use.* Measuring emission factors from stove technologies is costly and difficult to do accurately. Lacking measurable emission factors from the project technologies, PP applies default IPCC emission values.

Data / Parameter:	NCV_b
Data unit:	TJ/ton
Description:	Net calorific value of the fuel used in the baseline
Source of data used:	IPCC default value. Reference: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2: http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html
Value applied:	Wood: 15.6TJ/Gg = TJ/ton
Justification of the choice of data or description of measurement methods and procedures actually applied:	Adopt IPCC default values. Net Calorific Values were not measured in actual baseline, thus the project uses IPCC default values.

Any comment:	When EF is in units of tCO2/t_fuel, the NCV term will be removed from emission calculations.

Data / Parameter:	NCV_p
Data unit:	TJ/ton
Description:	Net calorific value of the fuel used in the project
Source of data used:	IPCC default value for wood. Reference: 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 2: http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html
Value applied:	0.0156TJ/ton
Justification of the choice of data or description of measurement methods and procedures actually applied:	Adopt IPCC default values. Net Calorific Values were not measured in the project, thus the project uses IPCC default values.
Any comment:	When EF is in units of tCO2/t_fuel, the NCV term will be removed from emission calculations. This has same value as NCVbaseline as the project reduces use of the same fuel.

Data and parameters available at validation stage that will be monitored over the crediting period

Data / Parameter:	$f_{nrb,i,y}$
Data unit:	Fractional non-renewability
Description:	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data used:	Applicable NRB assessment (study)
Value applied:	0.975
Justification of the choice of data or description of measurement methods and procedures actually applied:	Option (b) chosen is deemed valid by the methodology: Adoption of the approach similar to CDM-approved methodology AMS II.G v02.
Any comment:	NRB assessment may be used for multiple scenarios along the crediting period.

Data / Parameter:	$LE_{p,y}$
Data unit:	t_CO2e per year

Description:	Leakage in project scenario p during year y
Source of data used:	Study
Value applied:	0
Justification of the choice of data or description of measurement methods and procedures actually applied:	Transparent data analysis and reporting. See PDD section B.6.1.
Any comment:	Aggregate leakage can be assessed for multiple project scenarios, if appropriate

B.6.3. Ex-ante calculation of emission reductions:

>> Emission reductions per appliance at the validation stage will be calculated contemplating the following assumptions (see pertinent annex to this PDD for further details):

The number of appliances sold will be according to the implementation schedule of the project activity.

The usage rate for each technology type will be according to the implementation schedule of the project activity values are assumed at the validation stage.

The same NRB study is applicable to all technologies.

.

Adjustment factors are deemed not necessary for the ex-ante calculations at the validation stage. Quantitative assessment and analysis of baseline and project monitoring studies before each verification will determine if adjustment factors need to be applied.

Therefore, total ex-ante calculations of emission reductions are calculated based on the following parameters:

Natural year	$P_{b,y}$ (ton wood-equiv/HH-y)	$P_{p,y}$ (ton wood-equiv/HH-y)	Usage units ($U_{p1,2,y}$)
2011	5.75	2.87	95%
2012	5.75	2.87	90%
2013	5.75	2.87	80%
2014	5.75	2.87	70%
2015	5.75	2.87	60%
2016	5.75	2.87	50%
2017	5.75	2.87	50%
2017	5.75	2.87	50%

Taking into account the above assumptions at the validation stage, the overall GHG reductions achieved by the project activity in year y are calculated as follows:

$ERy = \Sigma b,p\ (Np,y^*\ Up,y^*\ Pp,b,y^*\ NCVb,fuel^*\ (fNRB,b,y^*\ EFfuel,CO2+EFfuel,nonCO2)) - \Sigma\ LEp,y$ **(1)**

See pertinent annex to this PDD for full details of calculations.

B.6.4 Summary of the ex-ante estimation of emission reductions:

>> After replacing the formulas for the values in the table above the following are the expected ER:

Year	**Estimation of project activity emissions (tonnes of CO_2 e)**	**Estimation of leakage (tonnes of CO_2 e)**	**Estimation of overall emission reductions (tonnes of CO_2 e)**
2011	3,000	0	3,000
2012	12,000	0	12,000
2013	23,000	0	23,000
2014	30,000	0	30,000
2015	32,000	0	32,000
2016	32,000	0	32,000
2017	32,000	0	32,000
Total	164,000	0	164,000

(tonnes of CO_2 e)			

B.7. Application of the monitoring methodology and description of the monitoring plan:

B.7.1 Data and parameters monitored:

>> Data and parameters monitored over the crediting period

Data / Parameter:	$f_{nrb,i,y}$
Data unit:	Fractional non-renewability
Description:	Non-renewability status of woody biomass fuel in scenario i during year y
Source of data:	Applicable NRB assessment (study)
Monitoring frequency:	Only if leakage assessment and/or baseline/project studies results along the crediting period suggest NRB may be changing.
QA/QC procedures to be applied:	Transparent data analysis and reporting. Publicly available and verifiable data will be used to determine NRB.
Any comment:	NRB assessment may be used for multiple scenarios.

Data / Parameter:	$P_{b,y}$
Data unit:	ton/HH-y
Description:	Quantity of fuel that is consumed in baseline scenario b during year y
Source of data:	Baseline FT, baseline FT updates, and any applicable adjustment factors
Monitoring frequency:	Updated every two years, or more frequently
QA/QC procedures to be applied:	Transparent data analysis and reporting.
Any comment:	A single baseline fuel consumption parameter is weighted to be representative of baseline technologies being compared for project crediting.

Data / Parameter:	$P_{p,y}$
Data unit:	ton/HH-y
Description:	Quantity of fuel that is consumed in project scenario b during year y
Source of data:	Total sales record, Project FT, project FT updates, and any applicable adjustment factors
Monitoring frequency:	Updated every two years, or more frequently
QA/QC procedures to be applied:	Transparent data analysis and reporting.

Any comment:	A single project fuel consumption parameter is weighted to be representative of the quantity of project technologies of each age being credited in a given project scenario

Data / Parameter:	$U_{p,y}$
Data unit:	Percentage
Description:	Usage rate in project scenario p during year y
Source of data:	Annual usage survey
Monitoring frequency:	Annual or more frequently, in all cases on time for any request for issuance
QA/QC procedures to be applied:	Transparent data analysis and reporting.
Any comment:	A single usage parameter is weighted to be representative of the quantity of project technologies of each age being credited in a given project scenario.

Data / Parameter:	$N_{p,y}$
Data unit:	Project technologies credited (units)
Description:	Technologies in the project database for project scenario p through year y
Source of data:	Total sales report
Monitoring frequency:	Continuous
QA/QC procedures to be applied:	Transparent data analysis and reporting.
Any comment:	The total sales record is divided based on project scenario to create the project database

Data / Parameter:	$LE_{p,y}$
Data unit:	t_CO2e per year
Description:	Leakage in project scenario p during year y
Source of data:	Baseline and monitoring surveys
Monitoring frequency:	Every two years
QA/QC procedures to be applied:	Transparent data analysis and reporting.
Any comment:	Aggregate leakage can be assessed for multiple project scenarios, if appropriate

B.7.2. Description of the monitoring plan:

>> The activity provides a schedule for the project preparation and monitoring process as in the table below. This schedule takes into account the key parameters that are needed prior to validation and verification of the project. The options chosen as allowed by the methodology are as follows:

Name (Parameter)	Prior validation	Prior to first verification	After first verification	
			Description	Frequency
Baseline survey (not associated to specific parameter)	From the field	From the field (no need to re-assess)	As for prior to first verification.	Every year. Additionally, done after each crediting period.
Baseline FT ($P_{b,y}$)	From literature	From the field	Named "Baseline FT Update". As for prior to first verification.	For fixed baseline: re-assessed after renewal of each crediting period.
Project survey (not associated to specific parameter)	From literature	From the field	As for prior to first verification.	Every year.
Project usage survey ($U_{p,y}$)	From literature	From the field	As for prior to first verification.	Every year.
Project FT ($P_{p,y}$)	From literature	From the field	Named "Project FT Update". As for prior to first verification.	For fixed baseline: no need to re-assess
Project Leakage ($LE_{p,y}$)	From literature	From literature and/or project field surveys	As for prior to first verification.	Reassessment every 2 years
Total sales record ($N_{p,y}$)	Electronic or paper record	continuous	Tracks purchaser/user information from sales	
Project database (not associated to specific parameter)	Electronic or paper record	continuous	The project will have a specific project database that records each stove credited.	
NRB assessment for each baseline & project scenarios ($f_{nrb,i,y}$)	From literature/field as necessary	Fixed as prior to validation.	As for prior to first verification.	Re-assessed voluntarily at any time and compulsory on each renewal

				of crediting period.

Description of Project Monitoring
All required monitoring and documentation will be implemented, reported, consolidated and managed by a qualified partner in collaboration with expert local partners to meet the verification requirements.

Monitoring procedure:

For each project scenario identified:

1. a monitoring survey and usage survey is conducted annually
2. a leakage assessment is conducted every two years
3. project KPT (PFT) is updated every two years

For each baseline scenario:

4. the baseline KPT (BFT) does not need to be updated for fixed baselines
5. additionally, baseline reassessment on each renewal of crediting period

For each project scenario identified the following are continuously maintained:

6. Total Sales Record
7. Project Database

Additionally:

8. the NRB assessment may be retaken voluntarily at any time and compulsory on each renewal of crediting period.

Detailed description of monitoring:

The following ongoing monitoring is conducted for each project scenario. This monitoring defines parameters that could not be determined at the time of the initial project studies or that must be updated according to the methodology.

1) Monitoring survey: It involves a survey for each project scenario done after the first verification.
   a) Frequency: annually, beginning 1 year after project registration.
   b) Representativeness: End users from a given project scenario are selected using representative sampling techniques to ensure adequate representation of users with

technologies of different ages. Common sampling approaches such as clustered random sampling may be used and geographic distribution will be factored into selection criteria[20].

c) Sample sizing and data collection: The monitoring survey has the same sample sizing and data collection guidelines as the baseline survey. Project monitoring survey is only conducted with end users representative of the project scenario and currently using the project technology. Instead, baseline monitoring survey is can be conducted with end users by asking to return to the traditional cooking method or with non users representative of the project scenario and currently using the project technology.

2) Leakage Assessment: Completed every other year, starting on time for the first verification. See leakage section on this PDD.

3) Usage survey: The usage survey provides a single usage parameter that is weighted based on drop off rates that are representative of the age distribution for project technologies in the total sales record.
   a) Frequency: annually, or more frequently, and in all cases on time for any request of issuance.
   b) Representativeness: To ensure conservativeness, participants in a usage survey with technologies in the first year of use (age 0-1) will have technologies that have been in use on average longer than 0.5 years. For technologies in the second year of use (age1-2), the usage survey will be conducted with technologies that have been in use on average at least 1.5 years, and so on.
   c) The minimum total sample size will be 100, with at least 30 samples for project technologies of each age being credited. The majority of interviews in a usage survey will be conducted in person and include expert observation by the interviewer within the kitchen in question.

4) Project FT Update: The PFT update is an extension of the project PFT and provides a fuel consumption assessment representative of project technologies currently in use.
   a) Frequency: every two years. The possibility to apply an Age Test instead of a PFT update to project technologies which remain materially the same year after year will be assessed along the crediting period.

5) Baseline FT Update: The BFT update requirements are the same as for the PFT update.

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20 Applicable common sampling approaches are outlined in Section III, Sampling Application Guidance, of
the General Guidelines for Sampling and Surveys for Small-Scale CDM Project Activities (EB 50 Report,
Annex 30)

a) Frequency: Completed every other year, or more frequently, except in cases where a fixed baseline is adopted.

6) Baseline reassessment on each renewal of crediting period.

7) Total sales record: The total sales record records the information listed below for all technologies implemented. It will be kept electronically and/or in paper records and provided at verification. The data contained are:
From product seller:
   a. Date of sale
   b. Geographic area of sale
   c. Model/type of project technology sold
   d. Quantity of project technology sold

From user (if available/provided):
   e. Name
   f. Address and telephone:
      a. Required for all bulk purchasers, i.e., retailers
      b. All end users except in cases where this is justified as not feasible[21].
   g. Mode of use: domestic, commercial, other: As many as commensurate with representative sampling.

8) Project database: The project database will be derived from the total sales record with project technologies differentiated by different project scenarios. The differentiation of the project database into sections is based on the results of the applicable monitoring studies for each project scenario, in order that ER calculations can be conducted appropriately section by section.

9) Non-Renewable Biomass Assessment Update: The non-renewable biomass fraction is fixed based on the results of the NRB assessment. Over the course of a project activity it may at any time choose to re-examine renewability by conducting a new NRB assessment. In case of a renewal of the crediting period the NRB fraction will be reassessed as any other baseline parameters and updated in line with most recent data available.

Mechanism for avoiding double counting of ER:

Double counting of stoves at any level will be avoided by ensuring they are registered only once in the sales records. The sales records will be updated as per the progress of the project and will include :

[21] For example, it may not be feasible in the case of distributed sales of portable cook stoves sold in market stalls or shops where the retailer cannot reasonably be expected to collect customer names and addresses during busy times.

Name of the project and means of identification
Type of appliance deployed
Name and contact details of the primary parties involved in the sales
Distinguishing mechanism applied to each appliance specific to each technology
Start of project crediting period
VERs issued per verification period

Publicly available information on GS VER and CDM stove projects can confirm that technologies installed by the project are not used by other groups and that double counting has been avoided.

B.8. Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies):

>> A full description and results of baseline monitoring is in PDD Annex 3.

Date of completion of baseline study: 15 June 2011

Responsible entity for baseline study:

CIRCODU
Mr. Arineitwe Ndemere Joseph
P. O. Box 16340 Kampala Uganda
+256 772 858394,+256414530671

The key implementing party of the baseline study is not a project participant.

SECTION C. Duration of the project activity / crediting period

C.1. Duration of the project activity:

C.1.1. Starting date of the project activity:

>>15 June 2011 (day after the first submission of the LSC report).

C.1.2. Expected operational lifetime of the project activity:

>> Renewable crediting period (7 years, renewable 2 times).

C.2. Choice of the crediting period and related information:

C.2.1. Renewable crediting period:

C.2.1.1. Starting date of the first crediting period:

>>15 August 2011 (when a significant amount of stove have been sold).

C.2.1.2. Length of the first crediting period:

>>7 years

C.2.2. Fixed crediting period:

C.2.2.1. Starting date:

>>N/A

C.2.2.2. Length:

>>N/A

SECTION D. Environmental impacts

D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts:

>> A generic analysis based on the existing precedents of similar activities[22] and the context of the present activity. It has been concluded that no adverse environmental impacts will take place as a result of the activity.

Questions in this regard were answered to the satisfaction of authorities and stakeholders attending the stakeholder consultations in May 2011. There are precedents of project approval granted to similar previous activities[23] by the Designated National Authority, for which a full Environmental Impact Assessment was deemed unnecessary by the National Environmental Management Authority (NEMA) of Uganda.

[22] See project registry sites of CDM and GS websites.

[23] https://gs1.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?id1=447

Transboundary impacts are not considered as the activity is based around the commercialisation and operation of the improved technologies and the boundary is the physical, geographical site of the efficient systems using biomass as per the methodology.

An environmental impact assessment is not required for this project. See proof letter appended to this PDD.

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party:

>> N/A

SECTION E. Stakeholders' comments

>>

E.1. Brief description how comments by local stakeholders have been invited and compiled:

>> A public consultation process was undertaken to take comments from stakeholders, including individuals, groups or communities affected, or likely to be affected, by the proposed clean development mechanism project activity.

Invitations were issued to all organizations or individuals that could be identified with experience working in improved cookstoves in Uganda. This included stove manufacturers, and large and small vendors who sell stoves to end users. In addition, because of concerns that individual stove users would be underrepresented, the project recruited community members from the rural areas for an independent live consultation meeting. It was ensured that these community members represented both genders and diverse ethnic groups.

In order to make the stakeholders consultation process more meaningful and accessible a first live meeting was hold in Kampala on the 17 May 2011 for groups C, D, E and F who represent the higher-level bodies. Due to political unrest local disturbances were experienced, there was a delay in confirmations of those attending the event. This was compensated by active follow-up calls over the phone when possible. Likewise, to ensure open communication channels with the attendees & non-attendees we facilitated the minutes after the meeting to all invites regardless if they attended the meeting or not. They were encouraged to send their written feedback during the feedback round.

Separately, a second live meeting was held in a rural typical context to the project implementation on the 31 May for groups A and B who represent the local stakeholders and end-users. In this case the minutes

were available locally in the sub-county hall and the feedback was gathered from the same relevant places and people.

Additionally, a series of focus groups and pilot tests were performed to gather further input in this case around the stove usability and affordability. In this case the invitees were selected by a point person in the community that was known to our local partners. The test subjects represented a cross-section of the local test area in socio-economic status.

As a summary, the process included:

- Interviews with NGOs, public authorities and private relevant parties.
- Pilot cookstoves delivered to gather feedback through focal groups and field surveys.
- Performance tests among selected improved cookstoves.
- Two public meetings, one in the urban context with high-level parties relevant to the activity, the other one in the rural context with local representatives and potential project beneficiaries.
- Feedback round for both consultation meetings to allow later comments from attendees and non-attendees. For each meeting, a summary of the meeting was disseminated among invitees and delivered to the relevant public places where the locals could revise it.

E.2. Summary of the comments received:

>> At the stakeholder consultation, participants were informed about the project and given an opportunity to discuss the impact the project would have on individuals, the target community, and local environment. As discussed in the GS Passport, stakeholder comments and feedback was largely positive and in support of the project.

No indicators were scored as negative in the stakeholder consultations. Most had positive scores, provided that local technologies would be included in the project. Locally produced technologies are part of the initial project design, therefore indicating a positive score. However, these indicators were logged as neutral on the blind matrix presented in this report based on the consensus suggestion at the stakeholder consultation.

The main differences observed about comments between both meetings were that for the “big parties” the interest remained on the politics and logistics of the initiatives while the “local parties” where more interested about the price of the stoves, where to buy them from and other related matters.

As described above, the project is committed to including local products and will provide support to local manufacturers to improve the performance and durability of their technologies. Accordingly, stakeholders are assured that locally made products will be included in the project when the conditions allow for it.

The project is designed to incorporate feedback continuously in order to maximize the positive impact on communities in Uganda. Feedback from this consultation round will not be the only opportunity for interested parties to provide feedback as an email account has been provided to the stakeholders as well as regular communication is maintained with the key relevant local stakeholders.
As a summary from both meetings:

1. Stakeholders felt that intellectual property should be an indicator as product copying is so common in Uganda.
2. Stakeholders also felt it was prudent to discuss public health. They felt there should have been an indicator determining the impact of the stoves on public health since women have died using cookstoves in unventilated rooms.
3. There was also some concerns about the stoves all being imported as that could hurt local manufacturing that currently exists, is expensive, adds to carbon emissions through transportation, and doesn't employ the local people significantly.
4. There was also some concern about a lack of stoves in the future due to some unforeseen disturbance to the project. Local stakeholders felt it was important to not only bring the stoves into the community, but that they will continuously be able to obtain them in the future.

All these comments have been taken in consideration and will be addressed along the project as necessary. None of them entails alterations on the project design.

E.3. Report on how due account was taken of any comments received:

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From the meeting on the 17 May

Stakeholder comment	Was comment taken into account (Yes/ No)?	Explanation (Why? How?)
What are the criteria for selecting local manufacturers? Where is UpEnergy in the process and what is the strategy?	Yes	First, UpEnergy takes the stoves in the field to see what customers think of them for user testing. Then UpEnergy tests the efficiency of the stove. The thermal efficiency should be at least 20% more efficient, last at least 3 years, and have an observed reduction in air pollution.
Is there a certification or standardization for the stoves?	Yes	If a certification or standard is developed that meets the objectives of the project, Up Energy will review it for adoption.

From the meeting on the 31 May

Stakeholder comment	Was comment taken into account (Yes/ No)?	Explanation (Why? How?)
At times, people have big pots because of the large families. Can this stove cook for more people like the attendants (40people)?	Yes	The stoves under consideration at the moment can cook for up to 15 people. They are currently working on distributing household stoves, but are planning to distribute institutional stoves as well.
What is price of the stove? Is there a chance that they can get these stoves at a reduced price?	Yes	The stove prices considered are already subsidized and Jikopoa is likely to cost 40,000/= and Envirofit 55,000/= (Ugandan shilling).
Why are the prices for the stove different?	Yes	The stoves are manufactured using different processes and different quality materials. For this reason, and because they are manufactured in different places and must be shipped different distances, they cost different amounts.
Is the price of the stove inclusive of the booking fee (commitment fee)?	Yes	Yes it is inclusive of the commitment fee.
Will you always import stoves from Kenya, or you will set up a local factory?	Yes	We seek to provide the best stoves possible to Ugandans and will work with local manufacturers to meet the needs of Ugandans.
What will happen if the demand for the stove is high? Will they keep on importing the stove from Kenya and China?	Yes	We seek to meet demand with stoves of several different types and will focus on developing a Uganda made stove in qualifying for the project.
What is the durability of the stove?	Yes	We seek to use stoves that we expect to last at least 3 years.
Have you considered training interested persons to	Yes	UpEnergy has talked to Kateta Aids Foundation to work with local

manufacture the stoves locally, instead of meeting high costs on importation?		people and will seek new locally manufactured stoves.
Do you intend to identify one person in an area to distribute stoves, or many people?	Yes	The project will get many people to work as contact persons to distribute these stoves.
My grandmother would not be able to afford the stove, or even the 10000 commitment fee. How would you sell this stove to her?	Yes	She could pay in instalments or have a relative buy it for her as a gift.
Sometimes these projects come when they are good, but after some time the quality of products goes down because of the uptake. What can be done?	Yes	Up Energy will monitor the quality of stoves in order to prevent a decrease in quality.
Can you confirm that this project will last and will not go away in the long-term?	Yes	As long as the business is sustainable and there is a need for these stoves, there should be no reason to discontinue the project.

Stakeholder comments have informed the design of the project. Many of the comments emphasized the importance of elements that were included in the original project design such as the development of local manufacturing capacity. These comments are noted in the Stakeholder Consultation Report. Some comments led to changes in project design. These changes are summarized here:

- Air quality: Measurement of user perceptions between old stove and new stove. Perceived smoke levels, Incidence of coughing, Incidence of respiratory illness, Incidence of itchy eyes.
- Time and money savings due to reduced fuel consumption

Many stakeholders present at the meeting will play an active role in project monitoring. Stakeholders suggested the following elements which are included in the project:

The project will actively seek Ugandan manufacturers to produce stoves of the quality standards needed.

PDD REFERENCES[24]

1. PDD Annex 1 – project participants details
2. PDD Annex 2 – ODA letter no public funding
3. PDD Annex 3 – Baseline Monitoring Report
    a. NRB study
    b. Baseline scenario: Non-institutional stoves
        Baseline Monitoring report
        Baseline raw data with statistical analysis
        Baseline survey report
4. PDD Annes 4 – Monitoring Information
5. PDD Annex 5 – ER Ex-ante calculations
6. PDD Annex 6 – Justification of the methodology
7. PDD Annex 7 – EIA

[24] Corresponds to references cited in, or in support of, the PDD. Note that references with direct internet links are not provided here. Numbering in Table of Contents may differ from PDD footnote numbering.