



**Monitoring report form
(Version 03.2)**

CONSOLIDATED MONITORING REPORT

Title of the Programme of Activities	Improved Cook Stoves for East Africa (ICSEA)
Reference number of the Programme of Activities	7014
Version number of the consolidated monitoring report	1.0
Completion date of the consolidated monitoring report	12 Dec 2013
Registration date of the Programme of Activities	17 Aug 2012
Monitoring period number and duration of this monitoring period	1 st Monitoring Period. 15 Sep 2012 – 14 March 2013
Coordinating/Managing Entities Project participant(s)	Improved Cook Stoves for East Africa (ICSEA) Limited
Host Party(ies)	Burundi, Kenya, Lesotho, Rwanda, South Africa Uganda
PoA boundary	Burundi, Kenya, Lesotho, Rwanda, South Africa Uganda
Sectoral scope(s) and applied methodology(ies)	3: Energy demand AMS II.G., version 3 , “Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass”
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the included CPA DD(s)	23,244 tonnes of CO ₂ e (for 12 months)
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	4,051 tonnes of CO ₂ e (for 6 months)
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	2,188 tonnes of CO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	1,863 tonnes of CO ₂ e
Number of CPA(s) included as on the last date of this monitoring period	1

Details of CPAs included as on last date of this monitoring period (14/03/2013):

Sr. no.	UNFCCC REF No	CPA Title	Name of the CPA operator	Date of Inclusion	Start Date of Crediting Period
1	CPA 7014-0001	International Lifeline Fund Uganda CPA 1 (ILFUg1)	International Lifeline Fund (ILF)	17 Aug 2012	15 Sep 2012

Emission reduction details of the CPAs in the monitoring period:

Sr. no.	UNFCCC REF No	Estimated GHG emission reductions (tCO ₂ e) per year as per included CPA DD	Achieved GHG emission reductions (tCO ₂ e) in the monitoring period	Achieved GHG emission reductions (tCO ₂ e) during the period up to 31 Dec 2012	Achieved GHG emission reductions (tCO ₂ e) during the period from 1 Jan 2013
1	CPA 7014-0001	40,577 on average 23,244 in the first year	4,051	2,188	1,863

List of Monitoring reports for CPAs being proposed for verification for this monitoring period:

Sr. no.	Appendix No.	UNFCCC REF. No	CPA Title	Monitoring Report version/date	Start date of emission Crediting Period in this monitoring period
1	Appendix -1	CPA 7014-0001	International Lifeline Fund Uganda CPA 1 (ILFUg1)	1.0/ 12 Dec 2013	15 Sep 2012

APPENDIX-1: MONITORING REPORT ILFUG1

Title of the project activity	International Lifeline Fund Uganda CPA 1 (ILFUG1)
Reference number of the project activity	CPA 7014-0001
Version number of the monitoring report	1.0
Completion date of the monitoring report	12 Dec 2013
Registration date of the project activity	17 Aug 2012
Monitoring period number and duration of this monitoring period	1 st Monitoring Period 15 Sep 2012 – 14 March 2013
Project participant(s)	Improved Cook Stoves for East Africa Limited
Host Party(ies)	Uganda
Sectoral scope(s) and applied methodology(ies)	3: Energy demand AMS II.G., version 3 , “Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass”
Estimated amount of GHG emission reductions or net anthropogenic GHG removals by sinks for this monitoring period in the registered PDD	23,244 tonnes of CO ₂ e (for 12 months)
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	4,051 tonnes of CO ₂ e (for 6 months)
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	2,188 tonnes of CO ₂ e
Actual GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	1,863 tonnes of CO ₂ e

SECTION A. Description of project activity**A.1. Purpose and general description of project activity****(a) Purpose of the project activity and the measures taken for GHG emission reductions or net anthropogenic GHG removals by sinks**

The purpose of this small-scale Programme of Activities (PoA) is to stimulate the dissemination of improved cook stoves (ICS) by the provision of access to carbon finance from the creation and sale of Certified Emission Reductions (CERs). The International Lifeline Fund Uganda CPA 1 (ILFUG1) has been active in the production, marketing, distribution, sales and after-sales of the “Okelo Kuc” brand of portable domestic charcoal improved cook stoves (ICS).

(b) Brief description of the installed technology and equipment

The “Okelo Kuc” ICS are more efficient in transferring heat to the cooking pots than traditional stoves, thus the Okelo Kuc require less fuel to prepare the same meal. This efficiency is translated into fuel savings when compared to the traditional stoves used in Uganda. By reducing fuel consumption, the CPA reduces greenhouse gas emissions from the use of fuel. This reduction in fuel consumption is measured, and corresponding CO₂ emission reductions are calculated from these savings.

(c) Relevant dates for the project activity (e.g. construction, commissioning, continued operation periods, etc.);

Starting date of the project activity: 01 April 2011
 Inclusion date: 17 August 2012 (submitted at the time of requesting registration of the PoA)
 Start date of the crediting period: 15 September 2012
 Start date of the monitoring period: 15 September 2012
 End date of the monitoring period: 14 March 2013

(d) Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period

Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved in this monitoring period	4,051 tonnes of CO ₂ e (for 6 months)
Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period up to 31 December 2012(if applicable)	2,188 tonnes of CO ₂ e
Total GHG emission reductions or net anthropogenic GHG removals by sinks achieved during the period from 1 January 2013 onwards (if applicable).	1,863 tonnes of CO ₂ e

A.2. Location of project activity

(a) Host Party :Uganda

(b) Region/State/Province, etc.

This CPA disseminates Okelo Kuc ICS over the entire territory of Uganda. Uganda is one of the host countries that form the geographical region of the PoA.

(c) City/Town/Community, etc.

The mission of the PoA is to make ICS affordable and available to all households across Africa, especially for low and medium income households where implementation of ICS is more difficult. The stated goal is to enable the transformation of traditional kitchens across Africa to ICS.

The first CPA is implemented in cities/town/communities across Uganda, and is responsible for the sale and after-sales service of the Okelo Kuc ICS. The operation of the Okelo Kuc is carried out by the user/household. The CPA provides training and instructions on how to operate and care for the 'Okelo Kuc' ICS to all vendors and buyers.

This monitoring report covers the sale of 'Okelo Kuc' ICS in Lira District only.

(d) Physical/Geographical location

Uganda's geographical coordinates are:

Latitude: 4°12' N - 1°29' S

Longitude: 29°34' E - 35°0' E

Lira District headquarters' geographical coordinates are 2°20' N, 33°66' E

A.3. Parties and project participant(s)

Party involved (host) indicates a host Party)	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Uganda (host)	Improved Cook Stoves for East Africa (ICSEA) Limited (private)	No

A.4. Reference of applied methodology

AMS II.G. version 3, "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass

A.5. Crediting period of project activity

Renewable. The first crediting period is 7 years.

Start of crediting period: 15/09/2012

End of crediting period: 14/09/2019

SECTION B. Implementation of project activity**B.1. Description of implemented registered project activity**

(a) Information on the implementation status of the project activity during this monitoring period in accordance with the applicable provision for description of implemented registered CDM project activity in the Project standard.

Only one monitoring report will be prepared and submitted for the Improved Cook Stoves for East Africa (ICSEA) Programme of Activities for this monitoring period. Only one CPA (International Lifeline Fund Uganda CPA 1 (ILFUg1)) was included in this PoA during this monitoring period. The monitoring report for the International Lifeline Fund Uganda CPA 1 (ILFUg1) CPA is attached to this monitoring report in Appendix – 1.

Only one request for issuance will be submitted for this monitoring period.

During the first year, the CPA is expected to generate 23,244 tonnes of CO₂e reductions. Once the CPA has achieved its small-scale limit, a maximum of 48,647 tonnes of CO₂e will be reduced every year.

The CPA implementer and its supply chain are responsible for the sale and after-sales service of the 'Okelo Kuc' ICS and any arrangements for the distribution of carbon revenues. The operation of the ICS is carried out by the ICS user, while training or instructions on how to operate and care for the ICS are provided by the CPA.

The CPA follows the CME's monitoring plan and procedures for identifying ICS sold during the course of the project and those that are still in use, so the appropriate number of emission reductions can be claimed. To facilitate this process, the CPA keeps traceable information used by the CME to monitor back to each individual ICS manufactured and sold.

The CPA follows the CME's Free, Prior and Informed Consent (FPIC) and Fair Trade ethos which stipulates that by signing the Sales Agreement/Logbook, the ICS buyer agrees to transfer all ownership of their stream of CERs to ILF, in exchange for a selection of benefits that include, but are not limited to:

1. an initial reduced price,
2. free yearly ICS maintenance, and

3. a community benefit (e.g. fixing the community borehole/water point)

At the point of sale of each ICS, and to ensure transparency in every transaction, the transfer of carbon credit ownership is clearly described by the CPA and its distributors, with the reciprocal benefits provided by the CPA to the stove users in return for their carbon credits. Proof that end users are aware of and are willing to give up their rights to the emission reductions is also provided with the clear language in the Sales Agreement/Logbooks.

To correctly assess the number of CERs corresponding to the CPA, the commissioning date and stove model and size allows the CERs to be calculated in the current monitoring period.

The following table lists the number of 'Okelo Kuc' ICSs sold in Lira District since the starting date of the project activity and as recorded in the ILF sales records Excel database at the end of the monitoring period.

MONTH	ICS SOLD	MONTH	ICS SOLD
March 2011 ¹	3	April 2012	113
April 2011	67	May 2012	75
May 2011	54	June 2012	104
June 2011	79	July 2012	130
July 2011	98	August 2012	136
August 2011	107	September 2012	114
September 2011	150	October 2012	91
October 2011	110	November 2012	146
November 2011	132	December 2012	262
December 2011	144	January 2013	154
January 2012	141	February 2013	168
February 2012	199	March 2013	164
March 2012	106	ICS TOTAL	3047

(b) Description of the installed technology, technical processes and equipment

The ILF 'Okelo Kuc' brand of portable domestic charcoal ICS is 100% locally manufactured in Uganda in various sizes (small, medium, large and extra large). ILF is also responsible for the marketing, distribution, sales and after sales services provided to the households.

Compared to the traditional stove, the efficiency improvement by the ICS comes from the better insulation and increase in heat intensity. The ICS was tested and initially rated at an ICSEA-accredited laboratory using the ICSEA Water Boiling Test protocol, and proved to have an efficiency above 20% for the small, medium and large size ICS, as required by the CDM methodology.

(c) Description of:

(i) The events or situations that occurred during the monitoring period that may impact the applicability of the applied methodology;

No special events which may impact the applicability of the methodology occurred.

(ii) How the issues resulting from these events or situations have been addressed.

Not applicable.

B.2. Post registration changes

B.2.1. Temporary deviations from registered monitoring plan or applied methodology

No temporary deviations from the registered monitoring plan or the applied methodology have been applied during this monitoring period.

¹ Sold in the last week of March 2011 and commissioned in April 2011

B.2.2. Corrections

There are no corrections to project information or parameters fixed at validation that have been approved during this monitoring period or submitted with this monitoring report.

B.2.3. Permanent changes from registered monitoring plan or applied methodology

No permanent changes from the registered monitoring plan or applied methodologies have been approved during this monitoring period or submitted with this monitoring report.

B.2.4. Changes to project design of registered project activity

No changes to the project design of the project activity have been approved during this monitoring period or submitted with this monitoring report.

B.2.5. Changes to start date of crediting period

No changes to the start date of the crediting period have been approved during this monitoring period or submitted with this monitoring report.

B.2.6. Types of changes specific to afforestation or reforestation project activity

Not applicable.

SECTION C. Description of monitoring system

Simple random sampling was used. A number of 'Okelo Kuc' ICS were sampled using simple random sampling with the aid of a computerised randomiser. The ILF CPA sales records Excel database of ICS and user information established from the Warranty & Sales Agreement or Sales Agreement/Logbooks (and subsequently updated on a continuous basis) were used as the sampling frame.

The monitoring consisted of four stages:

1. (Continuous) Sales, data collection and tracking by the CPA
2. (Continuous) Data monitoring by the CME
3. Sample surveys after the end of the monitoring period and prior to verification
4. Data compilation and analysis, quality control and writing of the Monitoring Report

1. Sales, data collection and tracking by the CPA

The CPA is responsible for the marketing, sales and distribution of the 'Okelo Kuc' ICS through its network of vendors. These vendors have periodically been trained on how to follow the CME's rules on Free, Prior and Informed Consent and its Fair Trade ethos, and how to effectively collect the ICS information and buyers contact details into the physical Warranty & Sales Agreement and/or Sales Agreement/Logbooks. Duplicate copies of these documents were submitted to the CPA by the vendors. These were then sent to the CME at regular intervals for the purpose of updating the data and monitoring.

Every ICS buyer acknowledges receipt of the 'Okelo Kuc' on the user's copy of the Warranty & Sales Agreement and/or Sales Agreement/Logbook. The following information was collected by the CPA:

- I. Customer name
- II. Unique stove serial number (and GPS coordinates if appropriate)
- III. Commissioning date (collected afterwards via phone call)
- IV. Location - District and sub-county
- V. Telephone contacts
- VI. Stove model and size
- VII. Sales receipt number
- VIII. Signature of buyer
- IX. Vendor name
- X. Vendor Location
- XI. Sales date

The CPA entered the above collected information into an electronic sales records Excel database. The information has been regularly updated as random phone calls and visits were made to cross check the validity of the data as part of the CPA's tracking responsibilities.

The CPA initially used Warranty & Sales Agreements for ICS recording purposes and sent duplicate copies to the CME, while retaining a photocopy for itself. It subsequently introduced a Sales Agreement/Logbook record and collected duplicate and triplicate copies of all Sales Agreement/Logbooks, and sent the duplicate copies to the CME while keeping the triplicate copies for its own use. This is depicted in Diagram 1 below. The CPA randomly screened these records through phone calls and spot-visits as part of its tracking obligations.

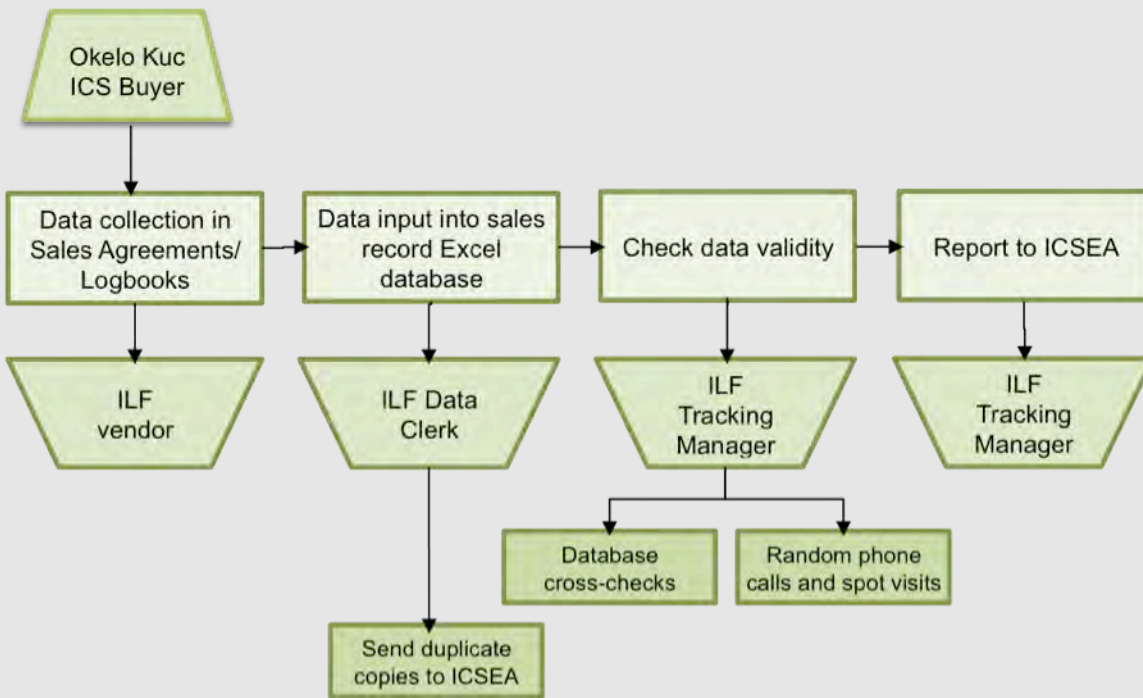


Diagram 1: CPA Data Tracking flow chart

2. Data monitoring by the CME

Monitoring activities were performed by the CME and have served to determine the adjusted total number of 'Okelo Kuc' ICS deployed until period y ($N_{(i,j)}$). The number of appliances ($N_{(i,j)}$) was determined as the fraction of days in a year in use for each ICS of the same model and cohort ($t_{fraction,y,(i,j)}$), by the fraction of these ICS still in use per cohort and model of ICS.

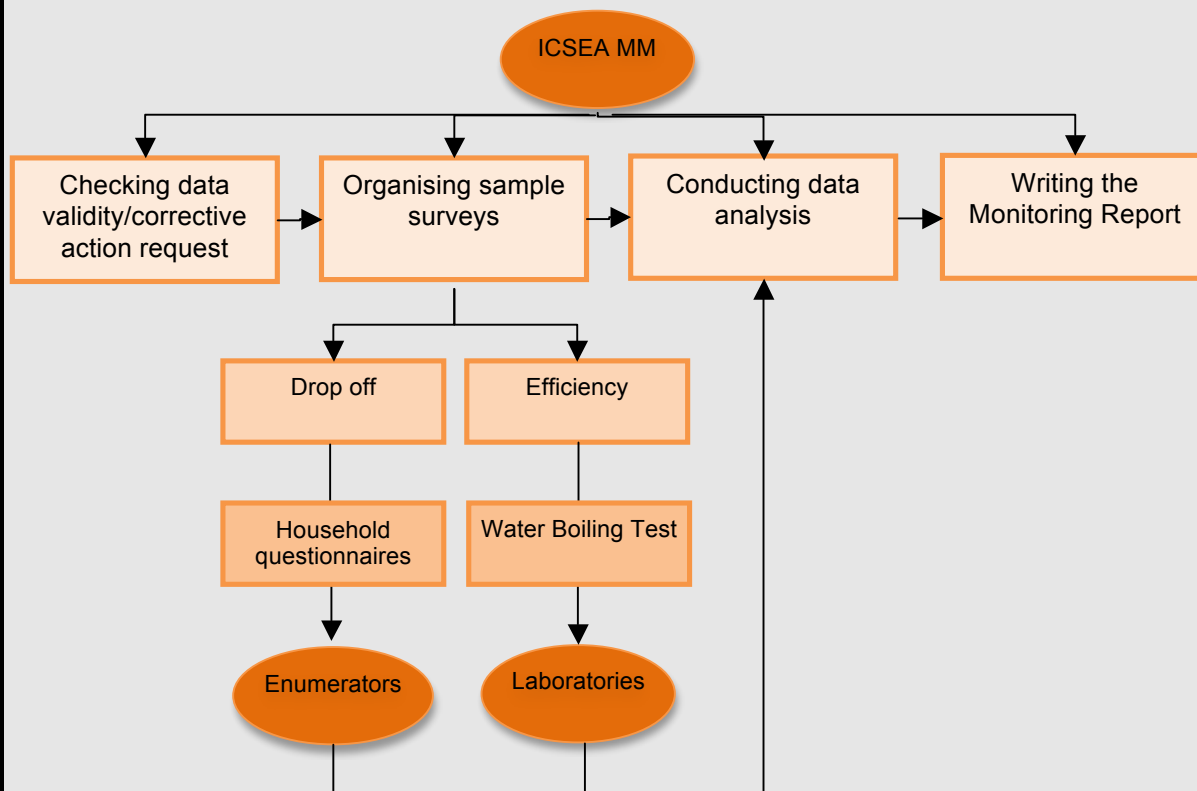


Diagram 2: CME Data Monitoring flow chart

ICSEA received all duplicate copies of the Warranty & Sales Agreement and/or Sales Agreement/Logbooks and randomly screened these records through spot-visits, together with crosschecks on ILF reports and logistics records to confirm that the sales records were authentic and that no double counting occurred. ICSEA also regularly conducted QA/QC checks for inconsistencies, and instructed ILF to make corrections on several occasions. CME audit corrections as necessary were visibly made to the records in green ink.

3. Sample surveys

After the end of the monitoring period, and prior to verification, sample surveys were conducted by the CME in order to determine the:

- statistically adjusted drop off of ICS in use from the total population of 'Okelo Kuc' in period y ($U_{(i,j)}$)
- adjustment factor for the continued use of baseline appliances by 'Okelo Kuc' users in period y
- average efficiency of the 'Okelo Kuc' being deployed ($\eta_{new,(i,j)}$)

Data generation:

The ILF CPA delivered the updated sales records Excel database. ICSEA's Monitoring Manager drew a random sample from this with the aid of a computerised randomiser and submitted the electronic sample (including household details) to the ICSEA team of enumerators. This team, together with the ICSEA Monitoring Manager, conducted the household survey at the household locations. The purpose of the survey was to support the monitoring of the parameters as per the registered PDD. The selection of questions for the questionnaire was chosen bearing in mind the purpose of the survey and included questions regarding drop off check, the continued use of baseline appliances, perceived changes in air quality etc.

To obtain stoves for efficiency testing, ICSEA's Monitoring Manager drew a random sample with the aid of a computerised randomiser from the sales records Excel database of 'Okelo Kuc' ICS from the 1-year old and 2-year old cohorts. This list was submitted to the team of enumerators responsible for collecting the ICS from each household. In exchange for their stove, each household was provided with a brand new 'Okelo Kuc' ICS. All the collected 'Okelo Kuc' ICS were delivered to ICSEA's office in Kampala, and were later taken to ICSEA-authorized laboratories for efficiency testing.

Data recording:

The ICSEA Monitoring Manager and the team of enumerators recorded the information from the household surveys on pre-printed questionnaires.

The ICSEA Project Manager collected all testing results from the authorised laboratories, and analysed and cross checked all the data, and recorded the information in the ICSEA efficiency testing calculations Excel spreadsheet.

Data aggregation and reporting:

In the field the ICSEA Monitoring Manager checked all the collected information from the household questionnaires for inconsistencies and instructed the team of enumerators to take corrective action where necessary. The ICSEA Monitoring Manager aggregated the results of the survey, conducted the analyses and reported on drop off and other parameters. For the detailed information on the sampling plan used, please refer to Section D.3 of the CPA-DD.

4. Data compilation

ICSEA's Monitoring Manager finally transferred the parameter values from the sales records Excel database, the values of drop off and other parameter analysis as well as the ICSEA efficiency testing calculation spreadsheet to the CPA CER Excel spreadsheet that contains the equations to calculate the emission reductions for the monitoring period. The achieved values are reported in the monitoring report.

Roles and responsibilities of personnel:

Person	Role
ILF Data Clerk	Responsible for entering, updating and maintaining all data from Warranty & Sales Agreement and Sales Agreement/Logbooks into the Excel Database
ILF Tracking Manager	Responsible for supervising all work done by the ILF Data Clerk and delivering the updated database/reports to ICSEA
ICSEA Monitoring Manager	Responsible for training and organising enumerators' activities, supervising ILF, updating the drop off analysis and values of other parameters, and generating the CPA CER Excel spreadsheet.
ICSEA Enumerators	Conducting household interviews for drop off check and other parameters during periodic sampling, collecting ICS for efficiency check and reporting results to the ICSEA Monitoring Manager
ICSEA Project Manager	Responsible for organising testing activities for efficiency checks, supervising authorised laboratories and coordinating the reports of the ICSEA's Monitoring Manager

Security procedures for the monitoring system:

ICSEA and the CPA implemented a system of crosschecks to ensure data quality. There was a separation of roles for every step of the data generation, aggregation and recording, calculation and reporting between those who were responsible and those who were controlling the respective step, at both the CPA and at the CME level.

The ILF team was trained and supervised by ICSEA's Monitoring Manager on how to effectively handle all data entry and subsequent updates, both in the field and in the ILF offices. The ILF Data Clerk was

responsible for sorting out Warranty & Sales Agreement and Sales Agreement/Logbooks, filtering those with incomplete or incorrect data, entering the data of those correctly completed into the sales record Excel database, flagging any duplicates, following up on those with inconsistencies, and updating the sales record Excel database as households were contacted/phoned/visited throughout the year.

The ILF Tracking Manager checked the correctness and consistency between the information on the Warranty & Sales Agreement and the Sales Agreement/Logbooks and the corresponding sales records Excel database. In case inconsistencies were detected, ICSEA's Monitoring Manager instructed the CPA team to search for the error source. If the error source was found, the information was corrected accordingly; if the error source could not be found, the database record was quarantined in the sales records Excel database. In addition to checking done by the ILF Tracking Manager, the ICSEA's Monitoring Manager checked the correctness and consistency of all sampling data collected and processed in the Monitoring Period.

SECTION D. Data and parameters

D.1. Data and parameters fixed ex ante or at renewal of crediting period

(Copy this table for each piece of data and parameter.)

Data / Parameter:	NCV_{biomass}
Unit:	TJ/tonne
Description:	Net calorific value of the non-renewable woody biomass that is substituted
Source of data:	IPCC default for wood fuel
Value(s) applied:	0.015
Purpose of data:	Baseline emission calculation
Additional comment:	

Data / Parameter:	EF_{projected-fossilfuel}
Unit:	tCO ₂ /TJ
Description:	Emission factor for the substitution of non-renewable woody biomass by similar consumers.
Source of data:	IPCC
Value(s) applied:	81.6
Purpose of data:	Baseline emission calculation
Additional comment:	

Data / Parameter:	C_{y,fueltype,region,old}
Unit:	tonnes/year
Description:	Quantity of woody biomass used in the absence of the project activity in tonnes per type of ICS
Source of data:	Survey of local usage on regional level which could comprise a country
Value(s) applied:	Charcoal equivalent to 4.56 tonnes of wood/stove/year
Purpose of data:	Baseline emission calculation
Additional comment:	

Data / Parameter:	$\eta_{old,i}$
Unit:	Fraction
Description:	Efficiency of the baseline appliance being replaced
Source of data:	Default value according to AMS II.G./Version 03
Value(s) applied:	0.1
Purpose of data:	Baseline emission calculation
Additional comment:	Option 2 from the PoA-DD has been taken to calculate $B_{y,savings}$

Data / Parameter:	$L_{(i,j)}$
Unit:	Fraction
Description:	The fraction by which emission reductions are multiplied to obtain an assessment adjusted for leakage risks
Source of data:	Default value as per methodology
Value(s) applied:	0.95
Purpose of data:	Baseline emission calculation
Additional comment:	

D.2. Data and parameters monitored

(Copy this table for each piece of data and parameter.)

Data / Parameter:	$\eta_{new,(i,j)}$
Unit:	%
Description:	Adjusted average efficiency of the ICS 'Okelo Kuc' being deployed as part of the project activity.
Measured/ Calculated Default:	Calculated from sampled ICS
Source of data:	WBT for Sampled ICS survey
Value(s) of monitored parameter:	41 for 1-year old ICS 37 for 2-year old ICS
Monitoring equipment:	Bomb Calorimeter, Weighing balance, Digital thermometer
Measuring/ Reading/ Recording frequency:	Every two years

Calculation method (if applicable):	<p>ICS were tested by three authorised laboratories in Uganda in accordance with the ICSEA WBT (<i>ex ante</i> as a rating check, and <i>ex post</i> as part of the monitoring exercise). The ICS tested according to the monitoring plan had been randomly selected with the aid of a computerised randomiser from the CPA's sales record Excel database. Monitoring of the statistically adjusted average efficiency involved two steps:</p> <p>Step 1: A survey had been carried out in accordance with the sampling plan generated by the computerised random number generator. The survey included phone calls, collection and replacement of selected ICS from households, completion of the stove collection data form, delivery of ICS to laboratories and efficiency testing of the ICS closely supervised by ICSEA's Project Manager.</p> <p>Step 2: Calculation of the adjusted average efficiency at 90% confidence level and 10% precision (annual inspections) following the statistical standard approach for a heterograde test of independent units that have a standard normal distribution. η_{new} was determined following the ICSEA Water Boiling Test (WBT) protocol. Tests results were reported in the ICSEA efficiency testing Excel spreadsheet.</p> <p>The Bomb Calorimeter was used to measure the calorific value of the charcoal samples obtained from each testing laboratory, instead of using default values.</p>
QA/QC procedures:	<p>Tests during monitoring were performed by ICSEA's three authorised laboratories: Chemiphar, the Uganda National Bureau of Standards and The Centre for Renewable Energy & Energy Conservation (CREEC) (Makerere University). In addition 10 Okelo Kuc ICSs were randomly sampled and tested by all laboratories. Comparisons were made on the thermal efficiency results to check on laboratories' staff performance and consistency throughout. The results were all duly certified by the testing laboratories.</p>
Purpose of data:	Emission Reduction calculation
Additional comment:	
Data / Parameter:	$f_{NRB,y}$
Unit:	Fraction
Description:	Fraction of woody biomass saved by the project activity in the year y that can be established as non-renewable biomass
Measured/ Calculated Default:	Calculated
Source of data:	Derived from literature and extrapolation
Value of monitored parameter	0.915
Monitoring equipment:	N/A
Measuring/ Reading/ Recording frequency:	Yearly
Calculation method (if applicable):	

QA/QC procedures:	The $f_{NRB,y}$ was determined for ILF's CPA on the basis of the most recent national approved studies. In accordance with the monitoring plan, this parameter is to be monitored at least once a year and corrections are to be made if necessary. By updating the value at least once a year, leakage b) is taken into consideration. A cross check comparison is to be made against UNFCCC published default values, and any significant differences have to be justified. In this case, the option of a project specific value has been adopted for $f_{NRB,y}$. Survey has shown the existence of NRB in Uganda because the conditions listed in Appendix 1 of EB 67 Annex 22 were found to exist. Recent data from FAO (through linear regression and extrapolation) were used to determine the demand for biomass i.e. all wood harvested (Db). The growth of biomass was taken on a conservative value by considering all the growing stock in Uganda and its growth rate. This gives a value of 91.5%.
Purpose of data:	Baseline emission calculation
Additional comment:	
Data / Parameter:	$t_{fraction,(i,j)}$
Unit:	Fraction of 365
Description:	Fraction of the days in use in year y of a single ICS deployed
Measured/ Calculated Default:	Calculated /
Source of data:	Derived from sales figures
Value(s) of monitored parameter:	Variable, dependent on day ICS was first put into use (commissioning date) with respect to the monitoring period.
Monitoring equipment:	Sales Record Excel Database and household survey
Measuring/ Reading/ Recording frequency:	Continuous monitoring and recording of each ICS sold. Sample surveys.
Calculation method (if applicable):	The CPA keeps a paper and electronic record of the sales data, and the ICS is considered to be in use from the commissioning date, which is the date on which the stove is put into use for the first time. The fraction of the number of days in use is calculated daily through the electronic database.

QA/QC procedures:	<p>Sales records were scrutinised by the CPA to avoid double counting and the CME also conducted spot-checks to verify the legitimacy of such records. On a monthly basis, the CPA verified the ICSs that had been put into use based on the ICS sales during the month through telephone surveys and/or physical inspection and CME monitoring events.</p> <p>Sales records and survey results provided the commissioning date, which is the date on which the stove is put into use for the first time. That date is used as the start date for the computation of certified emission reductions for single ICS. Based on the analysis of the sales records and survey results a commissioning date 9 days after the sales date has been conservatively calculated and used for emission reduction calculation purposes.</p> <p>On a monthly basis, the ILF (CPA implementer) has been sending duplicate copies of Sales Agreement/Logbooks to the ICSEA (CME) for verification of the data entered into the ILF sales record Excel database.</p> <p>Telephone checks and spot checks were used by the CME to review and authenticate the data in the sales database. An ICS not found to be in use was suspended from the sales record Excel database until it was verified to be in use. ICS that were found not to be in use before the annual verification were quarantined in the sales database. These data were also used to determine the number of ICS installed in the CPA.</p>
Purpose of data:	Emission reduction calculation
Additional comment:	

Data / Parameter:	U_(i,j)
Unit:	Fraction
Description:	The fraction by which emission reductions are multiplied to obtain an adjustment for drop off of ICS in use in the total population of ICS.
Measured/ Calculated Default:	Calculated /
Source of data:	Survey of ICS users for the total population using random sampling method.
Value(s) of monitored parameter:	0.95
Monitoring equipment:	Questionnaire
Measuring/ Reading/ Recording frequency:	The survey was done once in the first monitoring period (6 months).

Calculation method (if applicable):	<p>The CPA keeps a paper and electronic record. The household usage survey was carried out to assess the number of ICS in operation.</p> <p>Monitoring of the statistically adjusted drop off involves two steps:</p> <p>Step 1: Sample survey amongst 'Okelo Kuc' ICSs deployed</p> <p>Step 2: Calculation of the adjusted drop off rate at 90% confidence level and 10% precision (annual inspections) following the statistical standard approach for a homograde test of independent units that have a standard normal distribution.</p> <p>The drop off fraction was determined through interviews during the usage survey performed by the dedicated monitoring team and enumerators. Checks were conducted until the required precision (10%) for this parameter was achieved. All questionnaires and information gathered during the sampling were analysed and entered into the electronic drop off analysis database by the CME monitoring team.</p>
QA/QC procedures:	Usage monitoring was performed by the CME following the sampling plan (see Section D.3.).
Purpose of data:	Emission reduction calculation
Additional comment:	

D.3. Implementation of sampling plan

(a) Description of implemented sampling design

The ILF CPA had chosen in advance a sampling approach for its drop off check and efficiency check, based on the estimated monitoring costs and the CPA's existing monitoring/tracking system in Lira District.

The overall objective was to estimate the emission reductions during a 6-month period in tCO₂ during the crediting period, and with 90/10 confidence/precision, and to estimate the mean thermal efficiency of the 'Okelo Kuc' ICS with 90/10 confidence/precision.

Simple random sampling was used. The target population was the 3047 'Okelo Kuc' ICS sold by the CPA in Lira District, from 1st March 2011 until 15th of March 2013 (both days inclusive).

A total of 300 households were generated for the usage survey (including the drop off check) using simple random sampling with the aid of a computerised randomiser. An over-sampling approach was used to help maximise the response rate for any possible outliers. The sample size was determined using a sample size model and data from the survey. A required minimum sample size of 43 households was calculated. The monitoring team sampled a total of 96 households due to non-responses. A questionnaire with 22 questions was administered to 55 households where the 'Okelo Kuc' ICS were located. The purpose of the survey was to support the monitoring of the parameters in accordance with the registered PDD. The selection of questions for the questionnaire was undertaken having in mind the purpose of the survey.

A total of 108 households using an 'Okelo Kuc' ICS belonging to the 2-year old cohort were contacted from a randomly generated list produced with the aid of a computerised randomiser. 30 ICS were needed for the efficiency check (in accordance with EB 76-A06 version 4). 32 ICS were collected by the ICSEA team of enumerators from individual households (and replaced with new ones).

Also, a total of 72 households using an 'Okelo Kuc' ICS belonging to the 1-year old cohort were sampled from the sampling plan, for efficiency check, using simple random sampling with the aid of a computerised randomiser as well. A minimum of 30 stoves were needed (EB 76-A06 version 4). 32 ICS were collected by the ICSEA team of enumerators from each individual household and replaced them with a new one from the same model as the one previously owned.

All the 'Okelo Kuc' ICS that were collected were transported to the CME's office in Kampala and later

delivered for testing at the accredited laboratories.

(b) Collected data (electronic spreadsheets may be attached and referenced)

The primary means of monitoring the CPA's activities is by means of buyer information collected through Warranty & Sales Agreement and Sales Agreement/Logbooks and the unique numbering of each 'Okelo Kuc' ICS. The sales data was stored in the CPA's sales record Excel database and transferred into the PoA's master sales record Excel database.

(c) Analysis of the collected data

Parameter	n*	Value	Standard deviation	Confidence	Precision	Lower bound applicable?
η_{new} (1 yr cohort)	32	41%	284.27	90%	10%	No
η_{new} (2 yr cohort)	32	37%	373.80	90%	10%	No
U	55	95%	N/A	90%	1 %	No

* valid responses

(d) Demonstration on whether the required confidence/precision has been met

The required confidence/precision for both the drop off and efficiency checks have been met. Statistical models were used.

SECTION E. Calculation of emission reductions or GHG removals by sinks

Please note that the methodology ASM II.G, ver. 3 does not provide specific equations for the calculation of baseline emissions, project emissions or leakage, only for emission reductions.

E.1. Calculation of baseline emissions or baseline net GHG removals by sinks

As leakage was considered ex-ante, B_{old} was adjusted to account for the quantified leakage.

E.2. Calculation of project emissions or actual net GHG removals by sinks

Not applicable, as methodology ASM II.G., v3 does not consider project emissions or actual net GHG removals by sinks.

E.3. Calculation of leakage

Leakage Adjustment Factor $L_{(i,j)}$ as per the methodology is applied to the project activity to calculate the Emission Reductions of this Monitoring Period.

In accordance with AMS II.G./Version 03 clause 23 a default value of 95% has been used. See the Values table in Section E.4.

E.4. Summary of calculation of emission reductions or net anthropogenic GHG removals by sinks

Calculation of emission reductions:

Total number of emission reductions achieved by all ICS included in the ILFUG1 CPA is a sum of emission reductions generated by each ICS multiplied by the applied weighted factor for continued use of baseline (0.99) derived from the usage survey.

Basically, there were two groups of ICS within the ILFUG1 CPA:

- one year old ICS (1-year cohort)
- two year old ICS (2-year cohort).

The ICS in these two groups have different thermal efficiency factors (41% for 1-year old and 37% for 2-year old ICS), which is reflected in the calculation of emission reductions generated by each ICS.

Equation used for the calculation of emission reductions, in line with AMS II. G., ver. 3:

$$ER_y = B_{y,savings} \cdot f_{NRB,y} \cdot NCV_{biomass} \cdot EF_{projected-fossilfuel}$$

Please refer to the table below for the values used in this calculation.

e.g. ER_y (emission reductions) for a 2-year old ICS (2-year cohort):

$$ER_y = 1.50 \cdot 0.92 \cdot 0.015 \cdot 81.6$$

$$ER_y = 1.68912 \text{ t CO}_2\text{e}$$

Emission reductions achieved per 2-year old ICS during the monitoring period of 6 months (182 days). All ICS from the 2-year cohort were in operation for the whole monitoring period of 182 days ($t_{fraction} = 182/365=0.5$ for all 2-year cohort), and each ICS has generated emission reductions of **1.68912 t CO₂e** during this monitoring period.

Total number of emission reductions generated by 2-year cohort is:

$$ER_{2-y \text{ cohort}} = 1305 \cdot 1.68912 = 2,204 \text{ t CO}_2\text{e}$$

e. g. ER_y (emission reductions) for a 1-year old ICS (1-year cohort):

$$ER_y = 1.55 \cdot 0.92 \cdot 0.015 \cdot 81.6$$

$$ER_y = 1.7454 \text{ t CO}_2\text{e}$$

This is the emission reduction achieved per 1-year old ICS during the monitoring period of 182 days for an ICS that was in operation for the full monitoring period of six months. Not all 1-year cohort ICS were in operation for the whole monitoring period of 182 days. The value of ER_y (emission reductions achieved per ICS in the monitoring period) for 1-year old ICS that have been in use for less than 182 days is lower (ER_y decreases proportionally to the decrease of the $t_{fraction}$).

Total number of emission reductions generated by the 1-year cohort is:

$$ER_{1-y \text{ cohort}} = 1,887 \text{ t CO}_2\text{e}$$

The total number of emission reductions achieved by all the ICS included in the ILFUG1 CPA is the sum of the emission reductions achieved by both cohorts multiplied by the applied weighted factor for continued use of the baseline (0.99):

$$ER_{total} = (ER_{1-y \text{ cohort}} + ER_{2-y \text{ cohort}}) \cdot 0.99 = (1,887 + 2,204) \cdot 0.99 = 4,051 \text{ t CO}_2\text{e}$$

Total number of GHG emission reductions achieved in this monitoring period:

Item	Baseline emissions or baseline net GHG removals by sinks (t CO ₂ e)	Project emissions or actual net GHG removals by sinks (t CO ₂ e)	Leakage (t CO ₂ e)	Emission reductions or net anthropogenic GHG removals by sinks (t CO ₂ e)
Total	4,051	Not applicable	Not applicable	4,051

Values used in the calculation of emission reductions were:

Formulae Based on ICSEA PoA-DD Monitoring Plan				
ER_y	=	$B_{y,savings} * fNRB_y * NCV_{biomass} * EF_{projected-fossilfuel}$		
$B_{y,savings}$	=	$B_{old} * (1 - \eta_{old} / \eta_{new})$		
B_{old}	=	$N * C_{y,fueltype,region,old} * L$		
N	=	$U * t_{fraction}$		
Values Applied				
Parameter	Fuel	Value	unit	Source
NCV		0.015	TJ/tonne	AMS-II.G./Version 03 clause 5
EF	mix	81.6	tCO ₂ e/TJ	AMS-II.G./Version 03 clause 5
fNRB		92%		UCB research: FAO
η_{old}	charcoal	10%	%	AMS-II.G./ version 03 clause 6
$\eta_{new_1\ year_old}$	charcoal	41%	%	Efficiency Test - Water Boiling Test (WBT) protocol.
$\eta_{new_2\ year_old}$	charcoal	37%	%	Efficiency Test - Water Boiling Test (WBT) protocol.
$(1 - \eta_{old} / \eta_{new_1\ year_old})$		76%	%	
$(1 - \eta_{old} / \eta_{new_2\ year_old})$		73%	%	
$C_{y,fueltype,region,old}$	charcoal	4.568	tonnes wood/stove/	AMS-II.G./ version 03 clause 6
U		95%	%	Usage Survey
L		95%	%	AMS II.G./Version 03 clause 23
Applied Weighted Factor for Continued Use of Baseline		99.0%	%	Usage Survey
$t_{fraction}$			Fraction of 365 days	Derived from sales figures (day of purchase as of each individual sales agreement)

Equations used for the calculation of emission reductions, in line with AMS II. G., ver. 3:

$$ER_y = B_{y,savings} \cdot f_{NRB,y} \cdot NCV_{biomass} \cdot EF_{projected-fossilfuel}$$

Parameter	Unit	Description
ER_y	tCO ₂ e	Emission reductions during the year y
$B_{y,savings}$	Tonnes	Quantity of woody biomass that is saved
$f_{NRB,y}$	%	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass
$NCV_{biomass}$	TJ/t	Net calorific value of the non-renewable woody biomass that is substituted
$EF_{projected-fossilfuel}$	tCO ₂ /TJ	Emission factor for the substitution of non-renewable woody biomass by similar consumers

The Option 2 in Section E.6.2. of the PoA-DD was chosen to calculate the $B_{y,savings,(i,i)}$ of the ICS. This option compares the efficiency of the baseline stove against the efficiency of the ICS deployed.

$$B_{y,savings,(i,i)} = B_{old,(i,i)} \cdot (1 - \eta_{old,i} / \eta_{new,(i,i)})$$

Parameter	Unit	Description
$B_{y,savings}$	Tonnes	Quantity of woody biomass that is saved in period y
$B_{old,(i,i)}$	Tonne	Quantity of woody biomass used in the absence of the project activity in tonnes per model and cohort of ICS
$\eta_{old,i}$	%	Efficiency of the baseline system/s being replaced
$\eta_{new,(i,i)}$	%	Efficiency of the system being deployed as part of the project activity (fraction)

$B_{old,(i,i)}$ is calculated using the following formula:

$$B_{old,(i,i)} = N_{(i,j)} \cdot C_{y, fueltype, region} \cdot L_{(i,j)}$$

Parameter	Unit	Description
$B_{old,(i,i)}$	Tonnes	Quantity of woody biomass used in the absence of the project activity
$N_{(i,j)}$	-	Number of appliances per cohort and model
$C_{y, fueltype, region, old}$	Tonnes/year	Estimate of average annual consumption of woody biomass per appliance
$L_{(i,j)}$	Fraction	Leakage, the fraction by which emission reductions are multiplied to obtain an assessment adjusted for leakage risks

The number of appliances ($N_{(i,j)}$) is determined as the fraction of days in a year in use for each ICS of the same model and cohort ($t_{fraction,y,(i,j)}$), by the fraction of these ICS to be still in use per cohort and model of ICS.

$$N_{(i,j)} = U_{(i,j)} \cdot \sum_{(i,j)=1}^n t_{fraction,y,(i,j)}$$

Where:

$U_{(i,j)}$

Usage, the fraction to adjust for drop off of ICS per cohort and model

$t_{fraction,y,(i,i)}$

Fraction of the days in use in year y of a single ICS deployed per cohort and model

E.5. Comparison of actual emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Item	Values estimated in ex-ante calculation of registered PDD	Actual values achieved during this monitoring period
Emission reductions or GHG removals by sinks (t CO₂e)	23,244 (12 months)	4,051 (6 months)

E.6. Remarks on difference from estimated value in registered PDD

In the registered CPA-PDD, the expected annual emission reductions are 23,244 tonnes of CO₂e for the period 15/09/2012 – 14/09/2013 (365 days) (see Section A.4.4 of the CPA-PDD).

This monitoring period covers 182 days (15/09/2012 – 14/03/2013, both days included). The expected emission reductions as applied in the ex-ante calculation of the registered PDD are 23,244 tonnes of CO₂e / 365 days * 182 days = 11,527 tonnes of CO₂e.

The actual values achieved during this monitoring period are lower than estimated in the CPA-PDD. The main reason is that this was the first monitoring period in the implementation of the CPA and the number of 'Okelo Kuc' ICS disseminated was lower than estimated.

E.7. Actual emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Item	Actual values achieved up to 31 December 2012	Actual values achieved from 1 January 2013 onwards
Emission reductions or GHG removals by sinks (t CO₂e)	2,188	1,863

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.2	5 November 2013	Editorial revision to correct table in page 1.
03.1	2 January 2013	Editorial revision to correct table in section E.5.
03.0	3 December 2012	Revision required to introduce a provision on reporting actual emission reductions or net anthropogenic GHG removals by sinks for the period up to 31 December 2012 and the period from 1 January 2013 onwards (EB70, Annex 11).
02.0	13 March 2012	Revision required to ensure consistency with the "Guidelines for completing the monitoring report form" (EB 66, Annex 20).
01	28 May 2010	EB 54, Annex 34. Initial adoption.

Decision Class: Regulatory
Document Type: Form
Business Function: issuance
Keywords: monitoring report, performance monitoring
