



**Monitoring report form for CDM programme of activities
(version 01.0)**

Complete this form in accordance with the Attachment "Instructions for filling out the monitoring report form for CDM programme of activities" at the end of this form.

MONITORING REPORT

Title of the programme of activities (PoA)	Paradigm Sub Saharan Africa Cook Stove Programme	
UNFCCC reference number of the PoA	9672	
Version number(s) of the PoA-DD(s) applicable to this monitoring report	10	
Coordinating/managing entity (CME)	The Paradigm Project	
Version number of this monitoring report	5.0	
Completion date of this monitoring report	08/05/2017	
Monitoring period number and dates covered by this monitoring report	1 st Monitoring Period 01/09/2013 – 31/12/2016 (first and last days are included)	
Monitoring report number for this monitoring period	1	
Host Party(ies)	Host Party(ies) of the PoA	Is this a host Party to a specific-case CPA covered in this monitoring report?(yes/no)
	Rwanda	No
	Ethiopia	Yes
Sectoral scope(s)	Sectoral Scope 3: Energy Demand	
Selected methodology(ies)	AMS.II.G: "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass" (Version 5.0)	
Selected standardized baseline(s)	N/A	
Total amount of GHG emission reductions or net GHG removals by sinks for all specific-case CPAs in the PoA covered in this monitoring report	GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012	GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards
	N/A	2,512

PART I - Programme of activities

SECTION A. Description of PoA

A.1. Brief description of the PoA

>> The PoA “Paradigm Sub Saharan Africa Cook Stove Programme” targets households that are primarily using inefficient biomass technologies for cooking and replaces these technologies with improved efficiency cookstoves. The project is currently distributing the EzyStove improved wood stove in Ethiopia, working through its local operating entity, EzyLife.

Policy/Measure or Stated Goal of the PoA

The PoA “Paradigm Sub Saharan Africa Cook Stove Programme” aims to abate greenhouse gas (GHG) emissions and reduce non-renewable biomass consumption used for thermal energy needs by introducing improved, higher efficiency cook stoves to replace traditional inefficient and low efficiency cook stoves.

The PoA intends to provide the following benefits:

Environmental benefits:

Through the introduction of improved efficiency cooking stoves, the project will reduce the demand for biomass in household cooking and thus reduce the rate of deforestation resulting from inefficient biomass cooking in the project area. In addition to reducing the amount of biomass consumed in household cooking, the improved stoves also reduce GHG emissions resulting from inefficient combustion in traditional technologies, thus improving air quality and reducing harmful gasses that contribute to climate change.

Social and economic benefits:

By reducing the amount of biomass needed for cooking, the project is contributing to productive time and income savings that were previously spent on gathering or purchasing cooking fuel. The project is also reducing exposure to indoor air pollution, which primarily affects women and children, by minimizing toxic emissions produced by inefficient cooking technologies. In addition to household benefits, the project is supporting local jobs related to production and distribution of ICS.

Framework for the Implementation of the PoA

The Coordinating/Managing Entity (CME) of the PoA is The Paradigm Project, a social enterprise with experience implementing cookstove projects in Sub Saharan Africa and Latin America. Working through its local operating entities and partners, Paradigm manufactures cookstoves, builds distribution channels to reach the end consumer, provides technical expertise on cookstove technologies and carbon asset management, and, in countries where appropriate, facilitates financing for products. All tools and data management practices for the CPAs are managed by the CME, who trains local enumerators to conduct surveys, manage data entry and storage and perform quality checks on data. Paradigm’s local entities operate under the brand names EzyLife and Paradigm East Africa Manufacturing.

The CME will communicate directly with the CDM Executive Board and relevant Designated Operational Entity (DOE) on all matters related to the PoA and its Component Project Activities (CPAs).

A.1.1. Generic CPA(s)

Title, identification/reference number and/or version number of the generic CPA(s) of the PoA	Sectoral scope(s)	Applied methodology(ies) or combination of methodologies and/or standardized baseline(s)
Generic component project activity (CPA) for Paradigm Sub Saharan Africa Cook Stove Programme, version: 10	Sectoral Scope 3: Energy Demand	AMS.II.G: "Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass" (Version 5.0)

A.1.2. Specific-case CPA(s) covered in this monitoring report

Reference number of the specific-case CPA included in the PoA as of the end of this monitoring period	Title, identification/reference number and version number of the generic CPA to which the specific-case CPA applies	Crediting period dates of the specific-case CPA	Is this specific-case CPA covered in this monitoring report? (yes/no)
9672-0001	Generic component project activity (CPA) for Paradigm Sub Saharan Africa Cook Stove Programme, version: 10	September 1, 2013 – August 31, 2020	Yes
9672-0002	Generic component project activity (CPA) for Paradigm Sub Saharan Africa Cook Stove Programme, version: 10	September 1, 2013 – August 31, 2020	No

A.2. Contact information of the coordinating/managing entity (CME) and/or responsible persons(s)/entity(ies)

>> The CME is The Paradigm Project

Contact information:

Mr Neil Bellefeuille

Email: neil@theparadigmproject.org

Detailed contact information is provided in Appendix 1 to this document.

SECTION B. Implementation of PoA**B.1. Implementation of the management system of the PoA**

>> The management system based on EB 65 Annex 3 (Version 2.1) "Standard for Demonstration of Additionality, Development of Eligibility Criteria and Application of Multiple Methodologies for Programme of Activities" has been followed according to the following criteria:

- a) A clear definition of roles and responsibilities of personnel involved in the process of inclusion of CPAs, including a review of their competencies

The Paradigm Project, as CME, was directly responsible for all activities regarding registration of the CPA and is the sole implementing party involved in the CPA, responsible for all operations under the CPA. The CME reviewed the included CPA for its compliance with the eligibility criteria outlined

in the PoA-DD and Generic CPA. CME staff responsible for review and inclusion of the CPA have relevant expertise in CDM carbon asset development and the specifics of the PoA.

b) Records of arrangements for trainings and capacity development for personnel

The CME has trained staff responsible for distribution, data management and monitoring within the CPA. The CME has records of training activities and has developed tools for standardizing data collection and quality control measures. Records of trainings and other methods of capacity development will be kept in electronic form for 2 years beyond the end of the relevant crediting period.

c) Procedures for technical review of inclusion of CPAs

The CPA included in this monitoring period is directly owned and operated by the CME. The CPA was checked by the CME for compliance with all eligibility criteria and evidence has been reviewed and documented.

d) Procedure to avoid double counting

The CME directly manages and operates the CPA and is the exclusive manufacturer and distributor of the improved cookstove technology (the EzyStove) in the project boundary. In addition to the proprietary nature of the technology distributed ensuring that the technology is not credited under any other project within the project boundary, the CME has implemented a redundant check via a serialization system for each cookstove credited under the CPA.

e) Records and documentation control process for each CPA under the PoA

Continuous records for improved cookstove sales and distribution to end users are maintained using a system developed by the CME and implemented by trained staff at the CPA level. Electronic records are kept for all ICS sales to distributors and, at the point of distribution to the end user, end user details, date of distribution and the serial number of the ICS is recorded. This information is stored by the CPA operator and entered into an electronic database that is kept by the CME. This database is checked for accuracy and used in sampling for monitoring and verification.

f) Measures for the continuous improvement of the PoA management system

The CME will continue to review and look for opportunities to improve its management system, especially through the use of improved, automated data collection techniques. Utilizing best practices developed in other cookstove projects, the CME is satisfied with its processes and tools for operations and data management used in this monitoring period.

B.2. Implementation of single sampling plan(s)

>> The monitoring report covers a single CPA implementing the EzyStove improved cookstove within the borders of Ethiopia. The following sampling plan has been applied to all cookstoves within the CPA:

a) List of CPAs to which the single sampling was applied

The monitoring report covers a single CPA, which was monitored according to the sampling plan outlined in the generic CPA.

b) Description of implemented single sampling design

The objective of the sampling plan is to determine the following parameters on an annual basis with a 95/10 confidence/precision:

n_y	Fraction of ICS still operational
SM_y	Fraction of meals cooked per week on the project stove
$\eta_{new,y}$	Efficiency of the ICS

Target population

The target population was all households who purchased the ICS and were recorded in the CME's monitoring database.

Sampling method

A stratified random sampling plan was used. The PoA-DD defines a strata for monitoring as the geographical boundaries of a country and unique stove type. The monitoring period covers a single CPA within the geographical boundaries of Ethiopia with a single technology implemented. Thus one strata is used to cover the CPA under this monitoring period. Within this strata, a simple random sample approach was used.

Sample size

A sample size calculation was undertaken using the calculations outlined in the generic CPA-DD and in accordance with the *Standard for sampling and surveys for CDM project activities and programme of activities*. A sample size was calculated to meet the required 95/10 confidence/precision using parameters conservatively estimated from data from an analogous program in another country and using the researcher's best guess based on experience, as compliant with EB67 Annex 6 Version 4.0, Appendix 1 paragraph 5. Calculations were performed for all three parameters; the larger of the two calculations was used for surveys assessing parameters n_y and SM_y , while a separate sample size was calculated for parameter $\eta_{new,y}$. Additional households were selected to account for potential non-response and outliers. For parameter n_y , a minimum sample of 19 households was calculated (increased to 30 to meet minimum sampling requirements). For parameter SM_y , a minimum sample of 61 households was calculated. For parameter $\eta_{new,y}$, a minimum sample of 19 households was calculated. To ensure that the project could reach the minimum required households and achieve precision requirements, a sample of 112 households was set for parameters n_y and SM_y and a sample of 41 households was set for parameter $\eta_{new,y}$.

Sample frame

Samples were selected using a random number generator in Excel. Following the sampling calculations, the first 112 households selected were surveyed to determine parameters n_y and SM_y . The first 41 households randomly selected were also chosen for WBTs to determine parameter $\eta_{new,y}$.

c) Collected data (electronic spreadsheets are included for reference)

All surveyed parameters were collected by a trained enumerator using the Open Data Kit (ODK) application over an Android phone. The enumerator visited households to conduct surveys and inspect the physical condition of the project stoves. If a household was too far to visit or was unavailable during the time of monitoring, the enumerator had the option to conduct a survey by phone. Of the 112 households sampled, 86 were monitored, of which 3 were removed as outliers. All other households were not able to be reached. All stoves in use were monitored for the parameter SM_y , totalling 65 households. Data collected from surveys is compiled into an excel database and has been shared with the DoE. Copies of all electronic surveys will remain available through the ODK online platform.

Water Boiling Tests were conducted at a designated laboratory using a trained tester. Stoves randomly selected for WBTs were collected during household survey visits and sent to the laboratory for testing. Of the 41 households sampled, 11 could not be reached or were too far for

monitoring, 2 refused to be monitored and 5 were not tested because the stove was not in use (usage surveys were conducted in these households), for a total sample of 24 households with completed WBTs. Data was recorded in excel during testing.

Quality control procedures were conducted using best practices. Households surveyed were randomly selected for a phone check on the accuracy of data. WBTs were randomly selected for a review by a third party, Mekele University in Addis Ababa, to ensure accuracy of data.

1. Analysis of the collected data

The data is first cleaned, checked for quality and accuracy, and any outliers are removed. Outliers are determined both by numerical analysis and user response. Specifically, respondents reporting use of the ICS for commercial cooking in such a mode that cannot be separated cleanly from household meal data are removed so as not to improperly skew the data. Additionally, the Median Absolute Deviation for the total number of meals cooked per week is calculated and any survey results exceeding more than 3x the MAD away from the median are removed. 3 outliers were identified and removed in preparing the monitoring report. Data is analysed in Excel to determine proportions and mean values. These calculations are then factored into the emissions reduction calculations.

2. Demonstration of whether the required confidence/precision has been met

The final data set is analysed for precision for all three parameters. The following precision/confidence results were achieved:

<i>Parameter</i>	<i>Sample Achieved</i>	<i>Value</i>	<i>Confidence</i>	<i>Precision</i>
n_y	83	78%	95%	8.92%
SM_y	65	51%	95%	6.61%
$\eta_{new,y}$	24	30.79%	95%	2.06%

d) Demonstration of whether the samples were randomly selected and are representative of the population

Samples were randomly selected using a random number generator on data organized by date of distribution. The sample frame was then compared to the overall target population to ensure representativeness.

SECTION C. Post-registration changes to the PoA (including the generic CPA(s))

C.1. Corrections

>> Post Registration Change to the PoA was approved on April 11, 2016 under reference number PRC-9672-002.

C.2. Inclusion of a monitoring plan to the registered PoA-DD (including its generic CPA-DD(s)), if a monitoring plan was not included at the time of registration

>> N/A

C.3. Permanent changes to the monitoring plan as described in the registered PoA-DD, applied methodology, or applied standardized baseline

>> Post Registration Change to the PoA was approved on April 11, 2016 under reference number PRC-9672-002. These changes allow for the use of controlled cooking tests (Option 3 equation 5 under AMS.II.G) in calculating fuel savings in the project activity.

C.4. Changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA

>> N/A

C.5. Types of changes specific to afforestation and reforestation activities

>> N/A

PART II - Specific-case component project activity(ies)

SECTION D. Description of specific-case CPA(s)

>> CPAs within the Paradigm Sub Saharan Africa Cook Stove Programme distribute the EzyStove improved cookstove to households using traditional biomass technologies.

D.1. Brief description of implemented specific-case CPA(s)

>> The CPA described in this monitoring report, TPP-CPA-ETH-01, distributes the EzyStove improved cook stove in Ethiopia. The CPA is implemented by EzyLife Ethiopia, a subsidiary company directly managed by The Paradigm Project, the CME. The CME works in close partnership with regional Ethiopian governments to identify Waredas through which the technology can be implemented. Sales demonstrations, including a demonstration of the benefits and use of the stove, are conducted to large groups of individuals, who may then opt to purchase a stove through their local Tabiya group.

- a) Purpose of the specific-case CPA(s) and the measures taken for GHG emission reductions or net GHG removals by sinks

Ethiopia has a population of nearly 81 million people with average household income levels below the poverty line and a low penetration of improved stoves. The Paradigm Project saw a large demand and need for a technology that could effectively reduce GHG emissions as well as the financial and time burdens imposed by the use of inefficient stoves. The EzyStove technology implemented can cook most local dishes and, by improving the efficiency of wood combustion and thermal energy transfer to pots, decreases the amount of wood fuel needed for household cooking tasks.

- b) Description of the technology employed and installed equipment and/or infrastructure, including information requested by the eligibility criteria

The EzyStove reduces the amount of wood needed by 37.8% and the emissions of CO₂ by 69.1%, compared with a traditional three-stone fire. The outer exoskeleton creates a strong, long lasting support structure for the fire chamber, while enabling any type of pot or pan to be used. Ezy Stove significantly reduces harmful smoke and wood consumption and generally cooks faster than traditional technologies.



Figure 1: EzyStove Improved Wood Cookstove

The EzyStove is designed to be manufactured locally, reducing the cost to end users by as much as 40% from comparable imported model. The stove is steel and uses a simple, robust technology requiring no moving parts. Operation is easy and the desired fuel savings is achieved through enhancing airflow, improving insulation and focusing the heat generated by biomass onto the desired cooking surface.

- c) Relevant dates for the specific-case CPA(s) (e.g. construction, commissioning, continued operation periods, etc.)

<i>Project Activity</i>	<i>Date</i>
Registration of the PoA	22/07/2014
Start date of crediting under CPA 9672-0001	01/09/2013
First date of ICS installation	25/03/2015
Operating period under this MR	01/09/2013 – 31/12/16

EzyLife began initial product sales in March of 2015 seeking to provide affordable efficient stoves for the majority of Ethiopians who cook meals using biomass. Prior to 2015, the CME developed a partnership to work with a 3rd party partner contacted to be a distributor of stoves in Ethiopia. However, after more than a year of intermittently selling efficient stoves and conducting activities to develop distribution, the CME and the 3rd party partner mutually elected to part ways. As such, the CME re-launched a directly-managed entity in 2014 to pursue the same goals. Since records of sales pre-dating the CME-managed entity being developed were incomplete, the CME elected to include only those units which it sold directly and could account for completely. Thus, no records except those originated by the CME in its work on the ground are included in this monitoring report. The time lag between the start date of crediting and the first recorded dates of ICS installation are representative of the time between starting work with the 3rd party partner and successfully launching a directly-operated business in Ethiopia. As a result of this delayed implementation and associated monitoring, the current crediting period covered under this monitoring report is from January 1, 2016 through December 31, 2016. This is the first year of annual monitoring and credits generated under this CPA for the first monitoring report are generated from January 1 to December 31, 2016. No emission reductions are claimed under this monitoring period from September 1, 2013 to December 31, 2015.

d) Total GHG emission reductions or net GHG removals by sinks achieved in this monitoring period for the specific-case CPA(s), including information on how double counting is avoided

The total GHG emissions for the monitoring period is 2,512. Annual energy savings per household calculated during the monitoring period is 0.00957 GWh per device, with total energy savings in the CPA during the monitoring period totalling 24.5 GWh. This is within the overall cap per CPA of 180 GWh.

D.2. Geographical references or other means of identification of the location of the specific-case CPA(s)

>> The boundary of the CPA is the geographical boundary of Ethiopia. During the monitoring period, stoves were distributed in the regions of Tigray, Afar and Oromia. The following map shows the concentrated areas where the majority of ICS were distributed:

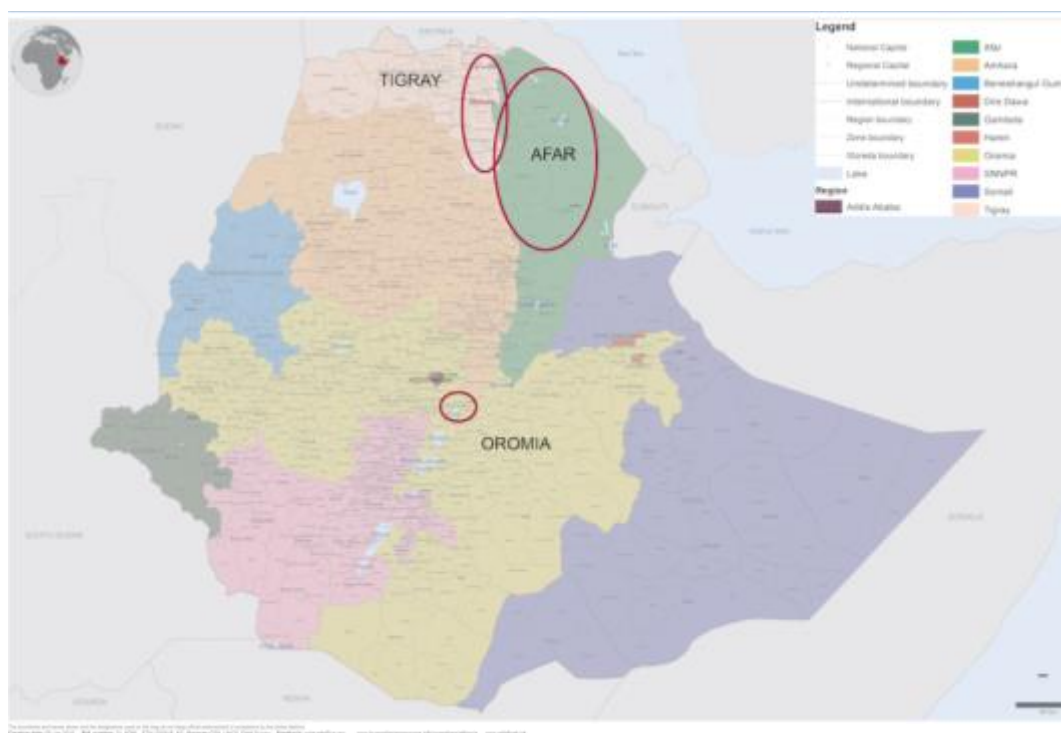


Figure 2: Administrative map of Ethiopia, highlighting area of ICS sales

SECTION E. Post-registration changes to specific-case CPA(s)**E.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline**

>> A temporary deviation was made to the registered monitoring plan to delay annual monitoring until the first full year of crediting in 2016. Due to a delay in implementation, no project activities took place from September 1, 2013 to March 24, 2015. Stove sales began on March 25, 2015 and the CME chose to delay annual monitoring for the first 8 months of the project activity due to very low sales volumes. For conservativeness, the CME is not claiming any credits from March 25, 2015 to December 31, 2015. Annual monitoring began in 2016 and credits under the CPA are being claimed for the period from January 1, 2016 to December 31, 2016.

E.2. Corrections

>> N/A

E.3. Changes to the start date of the crediting period of the specific-case CPA(s)

>> N/A

E.4. Inclusion of a monitoring plan into the specific-case CPA(s) that was not included at registration

>> N/A

E.5. Permanent changes to the monitoring plan as described in the registered specific-case CPA-DD(s), applied methodology or standardized baseline

>> N/A

E.6. Changes to project design of the specific-case CPA(s)

>> N/A

E.7. Types of changes specific to afforestation and reforestation specific-case CPA(s)

>> N/A

SECTION F. Description of the monitoring system of specific-case CPA(s)

>> The monitoring plan for all CPAs within the PoA are standardized following the relevant methodology and project standards and in accordance with the PoA-DD.

Sales data collection and recording

Each CPA operator shall keep a database that includes the following parameters which shall be designed according to the forms prescribed below:

1) CPA Database (Total Sales Record)

Parameter	Description
Unique ID of the CPA	Each CPA in this PoA shall have an attached unique serial number identifying it under the PoA.
Start date of the CPA	The CPA operator shall indicate the start date of the CPA in this database and provide documentary evidence of start date such as a purchase order for stoves or similar proof of start of CPA activities.
Name and Contact details of the CPA operator	The name, email address, telephone number of the CPA operator shall be provided in this database
Sales information and contact details for each sale to resellers within the CPA	The date of sale and quantity of units sold, name, contact phone and detailed location information will be recorded for each bulk sale within the CPA. These sales will consist of bulk sales to CPA level intermediaries or distributors..
Total number of ICSs deployed	Cumulative ICS distribution data
Type(s) of ICS technologies included in the CPA	A description of the ICS technologies to be distributed in the CPA. Multiple ICS can be deployed

The CPA operator shall collect information on sales to end users of cookstove products. The CPA operator trains bulk purchasers of stoves on data collection best practices and provides the reseller with a registration format to collect customer contact details, stove serial numbers and communicate the transfer of carbon rights at the point of purchase. This information is stored by the CME in a customer database according to the format below:

2) Detailed Customer Database

Parameter
Name of and phone number (if available) of ICS recipient
Name of and phone number distributor/sales agent (last point of contact with the consumer)
Date of Sale of ICS
Date of Delivery of ICS
Geographical Location of the final recipient (point of use of the ICS)
Unique Serial or Batch Number of ICS
Name of ICS
New or Repeat purchase of cookstove by end user

The CPA operator is responsible for the primary data collection for both databases. Information for the first database is matched to an accounting system where bulk sales information is recorded. A data manager, who the CME has trained and provided with a data-entry template, will enter end-user data into the Detailed Customer Database as stoves are sold to end users.

Data for this monitoring period falls under a single CPA and hence there is no ambiguity as to the attribution of data to the specific CPA.

Survey monitoring of stove use and replacement of traditional technologies

Monitoring surveys are conducted using the Open Data Kit application. The survey is designed by the CME, who trains local enumerators in survey implementation. The CME conducts quality control checks on this data and analyses results to determine the proportion of stoves in use in the project, as well as the displacement of traditional technologies within the home.

SECTION G. Data and parameters

G.1. Data and parameters fixed ex ante, at registration, inclusion or renewal of crediting period

Data/parameter	η_{old}
Unit	%
Description	Efficiency of the system being replaced
Source of data	AMS-II.G default value
Value(s) applied	0.1032
Choice of data or measurement methods and procedures	A weighted average has been used to incorporate improved cook stoves and traditional three stone fires in Ethiopia. The weighted average efficiency of the baseline stoves was derived from national data the proportion of households in the baseline scenario using traditional stoves with a default efficiency of 0.10 (established at 96.8% of the total population) and the proportion using improved stoves with a default efficiency of 0.20 (established at 3.2% of the total population), The thermal efficiency of either stove type was based of the default values in the baseline and monitoring methodology AMS-II.G
Purpose of data	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comments	

Data/parameter	NTG
Unit	Fraction
Description	Net to gross adjustment factor of to account for leakage
Source of data	AMS-II.G default value
Value(s) applied	0.95
Choice of data or measurement methods and procedures	AMS-II.G provides that the use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities can also be a potential source of leakage and that as an alternative to leakage assessments can be multiplied by a net to gross adjustment factor of 0.95 to account for leakages, in which case surveys are not required
Purpose of data	Calculation of leakage
Additional comments	

Data/parameter	f_{NRB}
Unit	Fraction
Description	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass
Source of data	Default values from the CDM SSC_WG Information note on default fNRBs calculated using the methodology prescribed in the baseline and methodology AMS-II.G
Value(s) applied	0.88
Choice of data or measurement methods and procedures	The baseline and methodology AMS-II.G describes the methodological procedure to be followed in determination of the Non-Renewable biomass fraction which was strictly adhered to in the default values provided by the SSC-WG
Purpose of data	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comments	

Data/parameter	NCV _{biomass}
Unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted
Source of data	Baseline and methodology AMS-II.G
Value(s) applied	0.015
Choice of data or measurement methods and procedures	The baseline and methodology AMS-II.G provides for the NCV of biomass as per the IPCC default value provided in paragraph 11
Purpose of data	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comments	

Data/parameter	EF _{projected_fossilfuel}
Unit	tCO ₂ /TJ
Description	Emission factor for the substitution of non-renewable biomass by similar consumers
Source of data	Baseline and methodology AMS-II.G
Value(s) applied	81.6
Choice of data or measurement methods and procedures	The baseline and methodology AMS-II.G provides an emissions factor which is conservative and accounts for projected fossil fuel consumption as follows: This value represents the emission factor of the substitution fuels likely to be used by similar users, on a weighted average basis. It is assumed that the mix of present and future fuels used would consist of a solid fossil fuel (lowest in the ladder of fuel choices), a liquid fossil fuel (represents a progression over solid fuel in the ladder of fuel use choices) and a gaseous fuel (represents a progression over liquid fuel in the ladder of fuel use choices). Thus a 50% weight is assigned to coal as the alternative solid fossil fuel (96 tCO ₂ /TJ) and a 25% weight is assigned to both liquid and gaseous fuels (71.5 tCO ₂ /TJ for Kerosene and 63.0 tCO ₂ /TJ for Liquefied Petroleum Gas (LPG))
Purpose of data	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comments	

Data/parameter	B _{old}
Unit	Tonnes
Description	Quantity of woody biomass used in the absence of the project activity in tonnes per device per year
Source of data	Literature Review
Value(s) applied	3.4545 tonnes
Choice of data or measurement methods and procedures	Option (a) of Paragraph 13 of the baseline and monitoring methodology AMS-II.G has been selected for calculation of the parameter B _{old} . A comprehensive baseline report has been availed supporting this value
Purpose of data	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comments	

G.2. Data and parameters monitored

Data/parameter	S_y
Unit	Number
Description	Number of distributed ICS in year y
Measured/calculated/ default	Measured
Source of data	Detailed Customer Databases consisting of detailed sales records for all sales to end consumers directly, or through intermediaries or distributors
Value(s) of monitored parameter	5,187
Monitoring equipment	Sales and registration records
Measuring/reading/ recording frequency	Continuously
Calculation method (if applicable)	Calculated directly from the customer database
QA/QC procedures	The CME inspects data records for consistency and a 5% sample is selected for quality control checks by phone to confirm accuracy
Purpose of data	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comments	Data is compiled annually and calculated for each annual crediting period

Data/parameter	n_y
Unit	Fraction
Description	Fraction of distributed ICS operational in year y
Measured/calculated/ default	Measured
Source of data	Survey
Value(s) of monitored parameter	0.78
Monitoring equipment	Monitoring survey done using the ODK application on an Android phone. Survey will include an interview with the user and, for in-person surveys, a physical inspection of the ICS
Measuring/reading/ recording frequency	Annually
Calculation method (if applicable)	Calculated fraction determined by reported survey results. Stoves reported as not in use, in disrepair, or not in the project home were counted as not in use
QA/QC procedures	Reference section B.2 for detailed sampling plan and QAQC procedures
Purpose of data	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comments	The parameter is monitored annually and calculated for each annual crediting period

Data/parameter	D_y
Unit	Number
Description	Cumulative number of days which ICSs have been operational in year y
Measured/calculated/ default	Calculated
Source of data	Detailed Customer Database
Value(s) of monitored parameter	937,039
Monitoring equipment	N/A
Measuring/reading/ recording frequency	Annually
Calculation method (if applicable)	Days between the date of delivery and the end of the crediting period are counted for each ICS distributed

QA/QC procedures	Delivery dates are compared to original bulk sales dates to ensure date of delivery is not earlier than date of sale. QAQC procedures used for parameter S_y also apply to this parameter
Purpose of data	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comments	The parameter is monitored annually and calculated for each annual crediting period

Data/parameter	SM_y
Unit	Fraction
Description	Fraction of meals in a week cooked on the project stove in year y
Measured/calculated/ default	Measured
Source of data	Survey
Value(s) of monitored parameter	0.51
Monitoring equipment	Monitoring survey done using the ODK application on an Android phone
Measuring/reading/ recording frequency	Annually
Calculation method (if applicable)	The survey asks for total meals cooked during the week and asks which stove(s) are used for cooking at each meal time in order to calculate the fraction of meals cooked on the ICS vs baseline stoves (if any). Each full traditional meal cooked (breakfast, lunch, dinner) is counted as one meal for 7 days of the week. Tea or coffee is counted as half a meal. Additional questions are asked to determine the number of meals not cooked every day, but regularly in the week, such as injera, which is common in Ethiopia. As all meals are factored into the monitoring, SM_y subsumes all possible uses of biomass in the project scenario and calculates the percentage of ICS meals accordingly
QA/QC procedures	Reference section B.2 for detailed sampling plan and QAQC procedures
Purpose of data	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comments	The parameter is monitored annually and calculated for each annual crediting period

Data/parameter	$\eta_{new,y}$
Unit	Fraction
Description	Efficiency of the device being deployed as part of the project activity in year y
Measured/calculated/ default	Calculated
Source of data	Water Boiling Tests
Value(s) of monitored parameter	0.3079
Monitoring equipment	Extech MO210 moisture meter and GoerTek digital thermometer with K-type thermocouple were purchased new prior to testing. A digital hanging scale and thermometers were calibrated prior to testing
Measuring/reading/ recording frequency	Annually
Calculation method (if applicable)	Efficiency was determined for three test phases (cold start, hot start and simmer) and then averaged for each stove
QA/QC procedures	Reference section B.2 for detailed sampling plan and QAQC procedures
Purpose of data	Calculation of baseline emissions or baseline net GHG removals by sinks
Additional comments	Households selected for WBTs relinquish their aging stove and receive a new replacement stove. These new stoves are recorded as new replacement stoves in the Detailed Customer Database and are accounted for accordingly. The parameter is monitored annually and calculated for each annual crediting period

G.3. Implementation of specific-case CPA level sampling plan

>> A single sampling plan, as described in section B.2 part 1, was applied to the specific-case CPA.

SECTION H. Calculation of GHG emission reductions or net GHG removals by sinks

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

>> Emission reductions are calculated as follows, according to the AMS.II.G, version 5 methodology and the calculations outlined in the SSC-PoA-DD and the generic CPA-DD:

$$ER_y = B_{y,savings} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel} \times N_{y,i}$$

Where:

ER_y	Emission reductions during the year y in tCO ₂ e
$B_{y,savings}$	Quantity of woody biomass that is saved in tonnes
$f_{NRB,y}$	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass
$NCV_{biomass}$	Net calorific value of the non-renewable woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)
$EF_{projected_fossilfuel}$	Emission factor for the substitution of non-renewable woody biomass by similar consumers. Use a value of 81.6 tCO ₂ /TJ
$N_{y,i}$	Number of project devices of type i operating in year y ,

The project uses Option 2 Equation 3 of the baseline and monitoring methodology AMS-II.G to calculate the parameter $B_{y,savings}$ as shown below:

$$B_{y,savings} = B_{old} \cdot \left(1 - \frac{\eta_{old}}{\eta_{new}}\right)$$

Where:

B_{old}	Quantity of woody biomass used in the absence of the project activity in tonnes
η_{old}	A weighted average 0.1032 has been used as a weighted average of the traditional three stone fires and the improved cook stoves in Ethiopia. .
η_{new}	Efficiency of the system being deployed as part of the project activity (fraction), as determined using the Water Boiling Test (WBT) protocol. Use weighted average values if more than one type of system is being introduced by the project activity.

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

>> Not applicable, as the relevant methodology, AMS.II.G version 5, provides for the calculation of emission reductions and does not require the calculation of project emissions separately from baseline emissions. Emission reduction calculations are described in section H.1 above.

H.3. Calculation of leakage

>> Per the monitoring plan outlined in the generic CPA-DD, the project has adopted a net gross adjustment factor of 95% to account for leakage within the project.

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

Specific-case CPA reference number	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e) achieved in the monitoring period		
				Up to 31/12/2012	From 01/01/2013	Total amount
9672-001		2,512	N/A (included in net removals via .95 NTG calculation)	0	2,512	2,512
Total		2,512		0	2,512	2,512

H.5. Comparison of GHG emission reductions or net GHG removals by sinks with estimates in the included CPA-DD(s)

Specific-case CPA reference number	Value estimated in ex ante calculation in the included CPA-DD(s)	Actual values achieved by the specific-case CPA(s) during this monitoring period
9672-0001	122,585 (Years 1 - 4)	2,512
Total		

H.6. Remarks on difference from the estimated value in the included CPA-DD(s)

>> Because the project was delayed in its early work, stove sales did not really begin in earnest until early 2015, and did not begin to increase in volume significantly until mid-to-late 2016. Therefore the reduced actual values achieved are a result of slower sales of ICS than expected. The CME anticipates that sales will continue to increase and actual values will begin to track more closely to estimated values in the future.

Appendix 1. Contact information of coordinating/managing entity and/or responsible persons/entities

Coordinating/managing entity and/or responsible person/entity	<input checked="" type="checkbox"/> Coordinating/managing entity <input checked="" type="checkbox"/> Person/entity responsible for completing the CDM-MR-FORM
Organization name	The Paradigm Project
Street/P.O. Box	1935 East Vine Street
Building	Suite 300
City	Murray
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Postcode	84121
Country	USA
Telephone	+1-970-889-4700
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Personal e-mail	neil@theparadigmproject.org

Appendix 1. Contact information of coordinating/managing entity and/or responsible persons/entities

1. In accordance with section A.2 of Part I above, complete the table in Appendix I, with the following mandatory fields: Coordinating/managing entity and/or responsible person/ entity, Organization, Street/P.O. Box, City, Postcode, Country, Telephone, Fax, E-mail and Name of contact person. Copy and paste the table as needed.

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