



# Sustainable Development Verified Impact Standard

## TIME SAVINGS FROM IMPROVED COOKSTOVES (ICS)



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<b>Title</b>	Time Savings from Improved Cookstoves (ICS)
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<b>Type</b>	Methodology
<b>Associated Sustainable Development Goal</b>	SDG 3, Good Health and Well-Being; SDG 5, Gender Equality and SDG 7, Affordable and Clean Energy
<b>Asset</b>	Time Savings Unit (TSU). One TSU is one year of time saved.
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# Relationship to Approved or Pending Methodologies

Approved and pending methodologies under the SD VISta Program and other programs, that prescribe similar project activities or aim to achieve similar sustainable development benefits were reviewed to determine whether an existing methodology could be reasonably revised to meet the objective of this proposed methodology. No methodologies were identified.

**Table 1: Similar Methodologies**

Methodology	Title	Program	Comments
W+ Time 001	Time Savings Domestic Energy	W+ Standard	This methodology is specific to women and does not use an ex-ante crediting mechanism.

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# 1 SOURCES

No relevant modules and tools have been used by the methodology.

## 2 SUMMARY DESCRIPTION OF THE METHODOLOGY

### 2.1 Methodology Description

The methodology will provide guidelines on the quantification of time savings achieved through the introduction of improved cookstoves (ICS), replacing inefficient baseline cooking practices in the household, or retrofitting existing installations. Time savings are categorized into two parts: (i) reducing time spent collecting cooking fuel, and (ii) less time spent cooking time over smoky fires.

Various types of fuels are used in inefficient baseline cooking practices, including firewood, dung, agricultural residues, and charcoal.<sup>1</sup> When collecting the cooking fuel, a household needs to make a trip either weekly or daily. The number of trips required for collecting cooking fuel varies according to the types of fuel used. Depending on the types of fuel, it could be either collected or purchased. The time required to gather the cooking fuel may be documented as per non-binding survey questionnaires (see Appendix 1).

ICS can save about 60% of the time and human energy expenditure<sup>2</sup> on fuel collection and cooking activities. The time savings arise from household drudgery reduction, specifically for women and girls, by reducing or eliminating the need to cut, collect and carry heavy firewood loads over long distances and time spent tending to inefficient, traditional open fire. Although not quantified as part of this methodology, positive health outcomes are an additional benefit derived from projects applying this methodology. The mitigating intervention is the provision, or retrofitting, of improved cookstoves (ICS) that replace inefficient baseline cooking technology. Examples of improved cookstoves include all types of fixed, portable "rocket" stoves or homemade stoves with a thermal efficiency at or above 25 percent, requiring only small diameter wood that can take the form of small branches, twigs, dung, and crop residues.

This methodology permits two steps of crediting approaches with the issuance of project assets.

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<sup>1</sup> Sunil Malla and Govinda R Timilsina, 2014, *Household Cooking Fuel Choice and Adoption of Improved Cookstoves in Developing Countries: A Review.*, pg 12. Working Paper. The World Bank: Development Research Group Environment and Energy Team

<sup>2</sup> <https://www.sciencedirect.com/science/article/pii/S0360544219312058>

1. Step 1 (Forward Crediting): This approach allows forward crediting with a one-time verification after the installation of a minimum of one batch of ICS, estimating the time savings for the entire project crediting period.
2. (Optional) Step 2 (Ex-post true-up): This approach adopts ex-post crediting and monitoring with periodic verifications conducted after monitoring and valid for a defined monitoring period. The ex-post option measures the actual decline in the participation rate, compared to the conservative estimate applied in Step 1 by continuously monitoring installed ICS. Step 2 may be implemented upon completion of verification under Step 1.

## 2.2 Asset Description

**Table 1: Asset(s) That Would Be Created By Projects Using the Proposed Methodology**

<i>Time Savings Unit (TSU)</i>	
<b>Asset Description</b>	Reduction in time spent (in hours) on cooking fuel collection and cooking tasks in a household
<b>Unit</b>	Years
<b>Sustainable Development Goal(s)</b>	SDG 3, SDG 7
<b>Additionality</b>	Not applicable
<b>Crediting Baseline</b>	Not applicable
<b>Offset optionality</b>	No
<b>Comments</b>	Projects applying the proposed methodology will reduce the household's time spent cutting, collecting, carrying, and preparing firewood.

## 2.3 Asset Crediting Period

The crediting period for the project shall be either seven years, twice renewable for a total of 21 years, or ten years fixed. However, projects that opt to use the default factor of  $HDR_{y,fc}$  will be limited to a five-year forward crediting period, after which projects can choose to adopt the optional ex-post true up to continue crediting to a maximum of 21 or ten years. The crediting period of the project activity shall not exceed the total crediting period of the underlying carbon cookstove project, if applicable.

## 3 DEFINITIONS

### **Batch**

A population of project devices commissioned during a given period, which may not exceed one year. Multiple batches may be commissioned within a single calendar year, and the date of commissioning of the last project device of the batch will be used as the commissioning date for the entire batch.

### **Cooking Activity**

The actions taken to thermally cook food while on a heat source. Does not include the preparation of ingredients (e.g., chopping, peeling, etc.) or food preparation activities that do not require a heat source (e.g., combining ingredients into a final dish)

### **Improved Cookstove (ICS)**

Biomass fuel stoves designed to improve energy efficiency, remove smoke from the indoor living space, or lessen the drudgery of cooking duties. For the purposes of this methodology an improved cookstove must have a thermal efficiency at or above 25 percent.

### **Inefficient baseline stove**

Traditional solid-fuel cooking solutions such as open fire, three-stone fires, unvented mud/clay "U" shaped stoves, basic charcoal cookstoves

### **Retrofit**

Modification of a baseline stove where essential parts of the stove are replaced/modified to meet the definition of improved cookstove and the below applicability conditions

## 4 APPLICABILITY CONDITIONS

This methodology applies to project activities that save time by introducing improved cookstoves (ICS), thereby replacing inefficient baseline cooking practices.

This methodology is applicable under the following conditions:

- 1) The target populations are rural and peri-urban dwellers using inefficient baseline stoves with firewood and other woody biomass fuels for their primary cooking needs.
- 2) Only ICS with a rated thermal efficiency of at least 25 percent per Water Boiling Test (WBT)<sup>3</sup> are to be considered for implementation in the project activity.
- 3) Retrofitting of existing baseline cookstoves is permitted when the action will extend the lifetime of the baseline cookstove and/or improve the baseline cookstove's efficiency.

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<sup>3</sup> Water Boiling Test Protocol Version 4.2.3, <https://www.cleancookingalliance.org/technology-and-fuels/testing/protocols.html>

- 4) This methodology shall only be used in conjunction with an approved GHG emission reduction program and methodology.

## 5 PROJECT BOUNDARY

The project boundary is the physical, geographical site of the improved cookstoves that utilize firewood and other biomass.

The subjects of impact included in the project boundary are shown in Table 2 below.

**Table 2: Impacts and subjects included in the Project Boundary**

Impact	Subject	Primary or Secondary impact	Intended or Unintended	Required or Optional	Justification
Time Savings Units (TSUs)	Family members	Primary	Intended	Required	The primary impact related to quantification of the asset.
Good Health and Well-Being	Family members	Secondary	Unintended	Optional	The impact is not directly contributing to the quantification of the asset.
Gender Equality	Woman and girls	Secondary	Unintended	Optional	The impact is not directly contributing to the quantification of the asset
Affordable, Sustainable and Clean Energy	Village community	Secondary	Unintended	Optional	The impact is not directly contributing to the quantification of the asset

## 6 BASELINE SCENARIO

The baseline scenario is the household's continued use of inefficient baseline cooking practices to prepare cooking fuel and conduct cooking activities.

## 7 ADDITIONALITY

The asset does not allow for offsetting claims. Due to this, additionality is not applicable.

## 8 QUANTIFICATION OF SUSTAINABLE DEVELOPMENT IMPACTS

### 8.1 Baseline Impacts

The quantification of time spent by the household on cooking fuel collection and cooking activity before the start of project activity.

$$T_{BL} = t_{fuel,BL} + t_{cooking,BL} \quad \text{Equation (1)}$$

Where:

$T_{BL}$	Average annual hours spent due to the use of baseline device per household before the start of project activity, hours/household/year
$t_{fuel,BL}$	Average annual hours spent on cooking fuel collection before the start of project activity, hours/household/year
$t_{cooking,BL}$	Average annual hours spent on cooking activity (does not include food preparation) before the start of project activity, hours/household/year

### 8.2 Project Impacts

The quantification of time spent by the household on cooking fuel collection and cooking activity in project activity.

$$T_{PJ} = t_{fuel,PJ} + t_{cooking,PJ} \quad \text{Equation (2)}$$

Where:

$T_{PJ}$	Average annual hours spent due to the use of project device per household in the project activity, hours/household/year
$t_{fuel,PJ}$	Average annual hours spent on cooking fuel collection during the project activity, hours/household/year

$t_{cooking,PJ}$  Average annual hours spent on cooking activity (does not include food preparation) during the project activity, hours/household/year

### 8.3 Net Sustainable Development Impacts

The quantification of benefits from the project activity is time saved in hours over the lifespan of the eligible ICS technology in the population of households with installed and/or distributed ICS.

#### Calculating the estimated total time saved per project activity in year y (hours)

$$T_{y,fc} = \sum N_y \times T_{savings} \times \frac{1}{(12 \times 365)} \quad \text{(Equation 3)}$$

Where:

$T_{y,fc}$  Total estimated time saved by the project activity in year y, years

$N_y$  Number of households with functional project device during year y

$T_{savings}$  Average annual hours saved due to the use of project device per household, hours/household/year

$\frac{1}{(12 \times 365)}$  Conversion factor for hour to year<sup>4</sup>

#### Calculating the estimated annual time saved per household (hours)

$$T_{savings} = T_{BL} - T_{PJ} \quad \text{(Equation 4)}$$

Where:

$T_{savings}$  Average annual hours saved due to the use of project device per household, hours/household/year

$T_{BL}$  Average annual hours spent due to the use of baseline device per household before the start of project activity, hours/household/year

$T_{PJ}$  Average annual hours spent due to the use of project device per household in the project activity, hours/household/year

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<sup>4</sup> A day would be defined as 12 hours as fuel collection and cooking activity are assumed to take place in daylight hours, for example 7 am to 7pm.

**Calculating the number of households with operational project devices in year y**

$$N_y = N_{new} \times [1 - (y - 1) \times HDR_{y,fc}] \quad \text{(Equation 5)}$$

Where:

$N_y$	Number of households with functional project device during year y
$N_{new}$	Number of participating households registered under the project activity
$y$	Project year
$HDR_{y,fc}$	Estimated annual decline rate of participating households under the project activity in year y

**(Optional) Step 2 (Ex-post true up)**
**Calculating the actual time saved per project in year y (hours)**

$$T_{y,ex-post} = N_y \times T_{savings} \times \frac{1}{(12 \times 365)} \quad \text{(Equation 6)}$$

Where:

$T_{y, ex-post}$	Total time saved by the project activity in year y, years
$N_y$	Number of households with functional project device during year y
$T_{savings}$	Average annual hours saved due to the use of project device per household, hours/household/year
$\frac{1}{(12 \times 365)}$	Conversion factor for hour to year

**Calculating the number of households with functional project devices in year y**

$$N_y = N_{new} \times (1 - HDR_{y,ex-post}) \quad \text{(Equation 7)}$$

Where:

$N_y$	Number of households with functional project device during year y
$N_{new}$	Number of participating households registered under the project activity
$HDR_{y,ex-post}$	Annual decline rate of participating households monitored under the project activity in year y

**Calculating the additional time savings achieved by the project activity**

$$T_y = T_{y,ex-post} - T_{y,fc} \quad \text{(Equation 8)}$$

Where:

$T_y$  Additional time saved by the project activity via ex-post true up step in year y, years

$T_{y, ex-post}$  Total time saved by the project activity in year y, years

$T_{y,fc}$  Total estimated time saved by the project activity in year y, years

## 9 MONITORING

### 9.1 Data and Parameters Available at Validation

Data / Parameter	$t_{fuel,BL}$
Data unit	Hours/ household
Description	Average annual hours spent on cooking fuel collection before the start of project activity.
Equations	1
Source of data	Sample survey of end-user
Value applied	
Justification of choice of data or description of measurement methods and procedures applied	Based on historical data or determined through sample survey at representative households. Sample survey to be carried out based on questionnaires or interviews. Sample survey should meet 90/10 confidence precision.
Purpose of Data	Calculation of baseline impacts
Comments	<ol style="list-style-type: none"> <li>1. Not applicable if the default value of <math>T_{savings}</math> is chosen.</li> <li>2. The value <math>t_{fuel,BL}</math> may be derived from historical data. Paragraph 23 of "General guidelines for SSC CDM methodologies (version 23)" provides guidance on using data, including historical data, to derive parameter values. Values used in other benefit crediting programs (e.g., registered projects in a different program with the same type of project device) from the same region are acceptable when it is demonstrated to be suitable for</li> </ol>

	use as per the procedures indicated in the above general guidelines.
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Data / Parameter	$t_{cooking,BL}$
Data unit	Hours/ household
Description	Average annual hours spent on a cooking activity before the start of project activity
Equations	1
Source of data	Sample survey of end-user
Value applied	
Justification of choice of data or description of measurement methods and procedures applied	Based on historical data or determined through sample survey at representative households. Sample survey to be carried out based on questionnaires or interviews. Sample survey should meet 90/10 confidence precision.  <i>To be measured before the commencement of project activity</i>
Purpose of Data	Calculation of baseline impacts
Comments	<ol style="list-style-type: none"> <li>1. Not applicable if the default value of <math>T_{savings}</math> is chosen.</li> <li>2. The value <math>t_{cooking,BL}</math> may be derived from historical data. Paragraph 23 of "General guidelines for SSC CDM methodologies (version 23)" provides guidance on using data, including historical data, to derive parameter values. Values used in other schemes (e.g., registered projects in another scheme with the same type of project device) from the same region are acceptable when it is demonstrated to be suitable for use as per the procedures indicated in the above general guidelines.</li> </ol>

Data / Parameter	$T_{savings}$
Data unit	Hours/ household
Description	Average annual hours saved due to the use of project device per household
Equations	4

<b>Source of data</b>	default value
<b>Value applied</b>	<ol style="list-style-type: none"> <li>1. 182.5 hours (for urban and peri-urban areas with open-fire baseline or equivalent efficiency globally)<sup>5</sup></li> <li>2. 365 hours (for a rural area with open-fire baseline or cookstoves with equivalent efficiency in Sub-Saharan Africa countries)<sup>6</sup></li> <li>3. 182.5 hours (rural areas with open-fire baseline or equivalent efficiency outside Sub-Saharan Africa)<sup>7</sup></li> </ol>
<b>Justification of choice of data or description of measurement methods and procedures applied</b>	<p>Determine the annual hours saved per household using one of the following options:</p> <ol style="list-style-type: none"> <li>a) Option 1: Apply the methodological default value for <math>T_{savings}</math></li> <li>b) Option 2: Instead of using the default value as proposed in Option 1, a measured value of <math>T_{savings}</math> can be determined using the sample surveys for <math>t_{fuel,BL}</math>, <math>t_{cooking,BL}</math>, <math>t_{fuel,PJ}</math> and <math>t_{cooking,PJ}</math>.</li> </ol> <p>The choice of which option to use shall be made ex ante.</p>
<b>Purpose of Data</b>	Calculation of project impacts
<b>Comments</b>	
<b>Data / Parameter</b>	$HDR_{y,fc}$

<sup>5</sup> P.P. Krishnapriyal et al. (2021) *Do improved cookstoves save time and improve gender outcomes? Evidence from six developing countries*. Manuscript submitted for publication. Sanford School of Public Policy, Duke University. A half an hour of saving per day default factor is judged to be conservative where ½ hours x 365 days = 182.5 hours per year. In addition, a discount factor of 50% against time savings recorded in rural areas from use of ICS is appropriate on the basis that some wood is purchased and overall fuelwood consumption is less in urban and peri-urban households (see reference materials for the default factor for rural stoves). See CQC’s consumer assessment research in References)

<sup>6</sup> The value is established from the following recent rigorous assessments indicating savings of 2 hours or more with use of ICS hence the proposed conservative default factor of one hour of saving per day for ICS use in rural area, where 1.0 x 365 days = 365 hours per year. Referenced studies are cited under References.

<sup>7</sup> P.P. Krishnapriyal et al. (2021) *Do improved cookstoves save time and improve gender outcomes? Evidence from six developing countries*. Manuscript submitted for publication. Sanford School of Public Policy, Duke University

<b>Data unit</b>	Fraction
<b>Description</b>	Estimated annual decline rate of participating households under the project activity in year y
<b>Equations</b>	5
<b>Source of data</b>	default value
<b>Value applied</b>	0.20
<b>Justification of choice of data or description of measurement methods and procedures applied</b>	<p>Use one of the following options:</p> <ul style="list-style-type: none"> <li>a) Step 1: Apply the methodological default value of 0.20</li> <li>b) (Optional) Step 2: Based on the historical data or a sample survey conducted as per the latest version of "sampling and surveys for CDM project activities and programme of activities."</li> </ul> <p>This parameter shall be determined ex-ante.</p>
<b>Purpose of Data</b>	Calculation of project impacts
<b>Comments</b>	<p>For Step 1: Berkeley Air Monitoring Group. Zambia Stove Survey and Water Boiling Test, For C-Quest Capital, April 2017. The 14.9% stove loss rate was determined from a clustered random sampling survey across several vintages designed and conducted by Berkeley Air in Zambia (2017). The population sampled was designed to achieve a 90/10 precision level and ended up resulting in an 8% level of precision (lower and more accurate than the 10%). 0.20 default value is a conservative adjustment. In addition, 0.20 default value will limit stoves with a lifespan greater than five years to a five-year crediting period.</p> <p>For (optional) Step 2: Paragraph 23 of "General guidelines for SSC CDM methodologies (version 23)" provides guidance on the use of data, including historical data, to derive parameter values. Values used in other schemes (e.g., registered projects in other scheme with the same type of project device) from the same region are acceptable when it is demonstrated to be suitable for use as per the procedures indicated in the above general guidelines.</p>

## 9.2 Data and Parameters Monitored

<b>Data / Parameter:</b>	$t_{fuel,PJ}$
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<b>Data unit:</b>	Hours/ household
<b>Description:</b>	Average annual hours spent on cooking fuel collection during the project activity
<b>Equations</b>	2
<b>Source of data:</b>	Sample survey of end user
<b>Description of measurement methods and procedures to be applied:</b>	Determined in the first year of the introduction of the devices (e.g., during the first year of the crediting period, $y=1$ ) through sample survey at representative households. Sample survey to be carried out based on questionnaires or interviews. Sample survey should meet 90/10 confidence precision.
<b>Frequency of monitoring/recording:</b>	First-year of crediting period
<b>QA/QC procedures to be applied:</b>	The reliability calculation to be conducted to ensure that the result obtained from the survey meets the precision required.
<b>Purpose of data:</b>	Calculation of project impacts
<b>Calculation method:</b>	
<b>Comments:</b>	Not applicable if default value of $T_{savings}$ is chosen. The sample household chosen under the baseline survey may be selected again in the sample survey for this parameter.

<b>Data / Parameter:</b>	$t_{cooking,PJ}$
<b>Data unit:</b>	Hours/ household
<b>Description:</b>	Average annual hours spent on cooking activity during the project activity
<b>Equations</b>	2
<b>Source of data:</b>	Sample survey of end user
<b>Description of measurement methods and procedures to be applied:</b>	Determined in the first year of the introduction of the devices (e.g., during the first year of the crediting period, $y=1$ ) through sample survey at representative households. Sample survey to be carried out based on questionnaires or interviews. Sample survey should meet 90/10 confidence precision.
<b>Frequency of monitoring/recording:</b>	

<b>QA/QC procedures to be applied:</b>	The reliability calculation to be conducted to ensure that the survey results meet the precision required.
<b>Purpose of data:</b>	Calculation of project impacts
<b>Calculation method:</b>	
<b>Comments:</b>	Not applicable if default value of $T_{savings}$ is chosen. The sample household chosen under the baseline survey may be selected again in the sample survey for this parameter.

<b>Data / Parameter:</b>	$N_{new}$
<b>Data unit:</b>	Quantity
<b>Description:</b>	Number of participating households registered under the project activity
<b>Equations</b>	5
<b>Source of data:</b>	Project database
<b>Description of measurement methods and procedures to be applied:</b>	
<b>Frequency of monitoring/recording:</b>	Fixed and recorded at the time of commissioning/distribution
<b>QA/QC procedures to be applied:</b>	
<b>Purpose of data:</b>	Calculation of project impacts
<b>Calculation method:</b>	
<b>Comments:</b>	

<b>Data / Parameter:</b>	Number of project devices installed/distributed
<b>Data unit:</b>	Quantity

<b>Description:</b>	Number of project devices installed/distributed under the project.
<b>Equations</b>	-
<b>Source of data:</b>	Project database
<b>Description of measurement methods and procedures to be applied:</b>	
<b>Frequency of monitoring/recording:</b>	Fixed and recorded at the time of commissioning/distribution
<b>QA/QC procedures to be applied:</b>	
<b>Purpose of data:</b>	
<b>Calculation method:</b>	
<b>Comments:</b>	

<b>Data / Parameter:</b>	Thermal efficiency of project device
<b>Data unit:</b>	Fraction
<b>Description:</b>	Efficiency of the project device implemented as part of the project activity
<b>Equations</b>	-
<b>Source of data:</b>	Manufacturer specification
<b>Description of measurement methods and procedures to be applied:</b>	
<b>Frequency of monitoring/recording:</b>	Fixed and recorded at the commissioning of the project
<b>QA/QC procedures to be applied:</b>	

<b>Purpose of data:</b>	To determine the applicability of the project
<b>Calculation method:</b>	
<b>Comments:</b>	A minimum high-power thermal efficiency of 25% per WBT 4.2.3 Protocol is needed to meet the applicability of the methodology.

<b>Data / Parameter:</b>	Lifespan
<b>Data unit:</b>	Number of years
<b>Description:</b>	The operating lifetime of project device
<b>Equations</b>	-
<b>Source of data:</b>	Manufacturer specification
<b>Description of measurement methods and procedures to be applied:</b>	
<b>Frequency of monitoring/recording:</b>	Fixed and recorded at the commissioning of the project
<b>QA/QC procedures to be applied:</b>	
<b>Purpose of data:</b>	
<b>Calculation method:</b>	
<b>Comments:</b>	

<b>Data / Parameter:</b>	Date of commissioning of project device
<b>Data unit:</b>	Date
<b>Description:</b>	Actual date of distribution/ installation of project device
<b>Equations</b>	-
<b>Source of data:</b>	Internal record

<b>Description of measurement methods and procedures to be applied:</b>	
<b>Frequency of monitoring/recording:</b>	Fixed and recorded at the commissioning of the project
<b>QA/QC procedures to be applied:</b>	
<b>Purpose of data:</b>	Calculation of project impacts
<b>Calculation method:</b>	
<b>Comments:</b>	

<b>Data / Parameter:</b>	Date of commissioning of batch
<b>Data unit:</b>	Date
<b>Description:</b>	The latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch.
<b>Equations</b>	
<b>Source of data:</b>	Internal record
<b>Description of measurement methods and procedures to be applied:</b>	
<b>Frequency of monitoring/recording:</b>	Fixed and recorded at the commissioning of the last project device in the batch
<b>QA/QC procedures to be applied:</b>	
<b>Purpose of data:</b>	Calculation of project impacts
<b>Calculation method:</b>	

<b>Comments:</b>	The first and last date of commissioning of each project device within the batch should be less than or equal to a full year.
<b>Data / Parameter:</b>	$HDR_{y,ex-post}$
<b>Data unit:</b>	Fraction
<b>Description:</b>	Annual decline rate of participating households monitored under the project activity in year y
<b>Equations</b>	7
<b>Source of data:</b>	Sample survey of end-user
<b>Description of measurement methods and procedures to be applied:</b>	Determined through sample survey at representative households. Sample survey to be carried out based on questionnaires or interviews. Sample survey should meet 90/10 confidence precision. Alternatively, the data of the monitoring surveys from the underlying carbon projects and its monitoring report may be used to derive the value of $HDR_{y,ex-post}$ .
<b>Frequency of monitoring/recording:</b>	At least once every two years (biennial)
<b>QA/QC procedures to be applied:</b>	The reliability calculation to be conducted to ensure that the result obtained from the survey meets the precision required.
<b>Purpose of data:</b>	Calculation of additional time saved by project activity in ex-post option
<b>Calculation method:</b>	
<b>Comments:</b>	For application in Step 2 (ex-post true up)

### 9.3 Description of the Monitoring Plan

#### **Purpose of monitoring**

Upon completion of the distribution/installation of improved cookstoves and household trainings in the use of the improved cookstove, a monitoring survey is to be conducted of stoves in use. The survey's objective is to obtain an unbiased and reliable estimate of parameters monitored, which will be used to quantify time savings due to the use of the project device.

The following data shall be monitored and recorded via a monitoring survey.

- a) Step 1 (forward crediting) - the monitoring will be conducted on a one-time basis upon the commissioning of the project devices.
  - i) Number of households with functional project devices,  $N_y$   
(To meet the requirement of project resilience measure as per Section 9.5)
  - ii) The time savings on firewood gathering and cooking activity due to the use of project device if methodological default value not been applied,  $T_{savings}$
- b) (Optional) Step 2 (Ex-post true-up) – the monitoring will be conducted on an ongoing basis for the purpose of continuous monitoring of the project devices.
  - i) Annual decline rate of participating households monitored under the project activity in year  $y$ ,  $HDR_{y,ex-post}$

### **Monitoring procedures, including estimation, modeling, measurement, or calculation approaches**

A sample survey may be used to monitor the parameters as per the relevant requirements for sampling in the "Standard for sampling and surveys for CDM project activities and programmes of activities".<sup>8</sup>

The sample size estimations should follow the "Guideline for Sampling and surveys for CDM project activities and programmes of activities".<sup>9</sup>

The parameters may be monitored in a common survey. A random sub-sample within the common survey is allowed if the reliability specification (e.g., 90/10 confidence/precision) is achieved for each parameter.

### **Procedures for managing data quality**

The reliability check will be performed to ensure the required confidence/precision is met for each sampled parameter. If the reliability required is not met, the sampling may be repeated with an increased sample size. Alternatively, the upper or lower bound of 90% confidence interval may be chosen.

### **Monitoring frequency**

#### **Step 1 (Forward crediting)**

The project shall perform a monitoring survey within one year of the commissioning date of a given batch of project devices. The latest commissioning of a project device within the project

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<sup>8</sup> [https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20191129115244256/Meth\\_stan05.pdf](https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20191129115244256/Meth_stan05.pdf)

<sup>9</sup> [https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20151023152925068/Meth\\_GC48\\_%28ver04.0%29.pdf](https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20151023152925068/Meth_GC48_%28ver04.0%29.pdf)

shall be used as the date of commissioning for the batch. Projects may not add additional devices to a batch one year after the first device of the batch's commissioning date.

**(Optional) Step 2 (Ex-post true up)**

A monitoring survey shall be performed on ongoing monitoring periods for the respective batch of project devices. The monitoring frequency for parameter  $HDR_{y,ex-post}$  is at least once every two years.

## 9.4 Project Resilience Measures Required for Forward Crediting

The project proponent must demonstrate that sufficient measures are in place to ensure the project's continued implementation. The project proponent shall explain in the project description the proposed measures to ensure the continued implementation of the project for the duration of the crediting period. At a minimum, these resiliency measures must include activities that:

- Ensure project devices installed are operational and verify the number of participating households with functional project devices via a sample survey upon the commissioning of the last project device in the batch
- Ensure sufficient training is provided to ICS beneficiaries, demonstrating:
  - how to properly use the project-specific stove
  - best practices for maintaining the operability of the project stove throughout the crediting period and beyond
  - how to access any service and support activities which will be undertaken
- Ensure the establishment of a local team to service and provide maintenance support
- Ensure sufficient provision is made for parts and servicing of project stoves for the duration of the crediting period by demonstrating either:
  - Project proponent provides replacement parts and/or maintenance **OR**
  - Project participants have access to replacements parts and/or maintenance through local businesses
- Define actions to be taken to encourage users to continue to use ICS beyond the crediting period<sup>10</sup>

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<sup>10</sup> Actions may include the following:

- 1) Raising awareness among women on the use of clean cookstoves for health and well-being of family via community talk by local women leaders.
- 2) Distribution of brochures and flyers to users to educate and emphasizes the benefits of clean cookstoves for post installation period.
- 3) Getting feedback from user on their willingness to continue use the ICS for a longer period.

## 10 REFERENCES

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Sustainable Rural Enterprise and Livelihoods Project Impact Assessment Study, SURELIVES Results Highlights, 2001-2012. August 2013. Malawi.

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# APPENDIX 1 - NON-BINDING SURVEY QUESTIONNAIRES

## a) Baseline survey

### 1.1. General information

Title of project activity	
Name of Surveyor	
Date of survey	dd/mm/yyyy

### 1.2. Household profile

Username (Household representative)	
Household size (total number of people)	
- Adult	
- Children	
Address/GPS	
Phone number (if available)	

### 1.3. Baseline stove description prior to project implementation

Mark x for the type of stove used

A three-stone fire, or a conventional system with no improved combustion air supply or flue gas ventilation system	
Any other type of stove	

### 1.4. Cooking fuel collection

Prior to the project implementation	
What type of fuel that you use in the stove?	<input type="checkbox"/> Firewood <input type="checkbox"/> Charcoal

(✓ the fuel used and fill in the relevant input below)	<input type="checkbox"/> Agricultural residues <input type="checkbox"/> Dung
<b>a) firewood</b>	
The method to acquire the fuel	<input type="checkbox"/> Collected <input type="checkbox"/> Purchased
How frequent do you gather the fuel	<input type="checkbox"/> Daily basic <input type="checkbox"/> Weekly basic <input type="checkbox"/> Other (please specify) _____
Based on frequency above, how many hours do you spend on cooking fuel gathering?	_____(Hour and minute) per ( day / week ) (choose one)
Which family member responsible for the above task?	
<b>b) Charcoal</b>	
The method to acquire the fuel	<input type="checkbox"/> Collected <input type="checkbox"/> Purchased
How frequent do you gather the fuel	<input type="checkbox"/> Daily basic <input type="checkbox"/> Weekly basic <input type="checkbox"/> Other (please specify) _____
Based on frequency above, how many hours do you spend on cooking fuel gathering?	_____(Hour and minute) per ( day / week ) (choose one)
Which family member responsible for the above task?	
<b>c) Agricultural residues</b>	
The method to acquire the fuel	<input type="checkbox"/> Collected <input type="checkbox"/> Purchased
How frequent do you gather the fuel	<input type="checkbox"/> Daily basic <input type="checkbox"/> Weekly basic <input type="checkbox"/> Other (please specify)

	_____
Based on frequency above, how many hours do you spend on cooking fuel gathering?	_____(Hour and minute) per ( day / week ) (choose one)
Which family member responsible for the above task?	
<b>d) Dung</b>	
The method to acquire the fuel	<input type="checkbox"/> Collected <input type="checkbox"/> Purchased
How frequent do you gather the fuel	<input type="checkbox"/> Daily basic <input type="checkbox"/> Weekly basic <input type="checkbox"/> Other (please specify) _____
Based on frequency above, how many hours do you spend on cooking fuel gathering?	_____(Hour and minute) per ( day / week ) (choose one)
Which family member responsible for the above task?	
<b>Total time spent on cooking fuel collection</b> <b>(Sum of a, b, c and d)</b>	_____(Hour and minute) per ( day / week ) (choose one)

**1.5 Cooking activity**

Prior to the project implementation	
How many hours a day do you spend cooking on your existing stove?	(Hour and minute)
Which family member responsible for the above task?	

**b) Project survey**
**1.1. General information**

Title of project activity	
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Name of Surveyor	
Date of survey	dd/mm/yyyy

**1.2. Household profile**

Username (Household representative)	
Household size (total number of people)	
- Adult	
- Children	
Address/GPS	
Phone number (if available)	

**1.3. Identification of project cookstove and its status**

Cooking device	Improved cookstove
Number of project cookstove installed	
<b>Project cookstove 1</b>	
Model name	
Unique ID	
Date of installation	dd/mm/yyyy
<b>Project cookstove 2</b>	
Model name	
Unique ID	
Date of installation	dd/mm/yyyy
<b>Project cookstove 3</b>	
Model name	
Unique ID	
Date of installation	dd/mm/yyyy
Is the project cookstove in good condition and operational? (Physically check the stove).	Yes/No

**The surveyor to stop the interview with household if the project cookstove is not operational.**

**1.4 Cooking fuel collection**

Post the project implementation	
What type of fuel that you use in the stove? ( <i>√ the fuel used and fill in the relevant input below</i> )	<input type="checkbox"/> Firewood <input type="checkbox"/> Charcoal <input type="checkbox"/> Agricultural residues <input type="checkbox"/> Dung
<b>a) firewood</b>	
The method to acquire the fuel	<input type="checkbox"/> Collected <input type="checkbox"/> Purchased
How frequent do you gather the fuel	<input type="checkbox"/> Daily basic <input type="checkbox"/> Weekly basic <input type="checkbox"/> Other (please specify) _____
Based on frequency above, how many hours do you spend on cooking fuel gathering?	_____(Hour and minute) per ( day / week ) (choose one)
Which family member responsible for the above task?	
<b>b) Charcoal</b>	
The method to acquire the fuel	<input type="checkbox"/> Collected <input type="checkbox"/> Purchased
How frequent do you gather the fuel	<input type="checkbox"/> Daily basic <input type="checkbox"/> Weekly basic <input type="checkbox"/> Other (please specify) _____
Based on frequency above, how many hours do you spend on cooking fuel gathering?	_____(Hour and minute) per ( day / week ) (choose one)
Which family member responsible for the above task?	
<b>c) Agricultural residues</b>	

The method to acquire the fuel	<input type="checkbox"/> Collected <input type="checkbox"/> Purchased
How frequent do you gather the fuel	<input type="checkbox"/> Daily basic <input type="checkbox"/> Weekly basic <input type="checkbox"/> Other (please specify) _____
Based on frequency above, how many hours do you spend on cooking fuel gathering?	_____(Hour and minute) per ( day / week ) (choose one)
Which family member responsible for the above task?	
<b>d) Dung</b>	
The method to acquire the fuel	<input type="checkbox"/> Collected <input type="checkbox"/> Purchased
How frequent do you gather the fuel	<input type="checkbox"/> Daily basic <input type="checkbox"/> Weekly basic <input type="checkbox"/> Other (please specify) _____
Based on frequency above, how many hours do you spend on cooking fuel gathering?	_____(Hour and minute) per ( day / week ) (choose one)
Which family member responsible for the above task?	
<b>Total time spent on cooking fuel collection</b> <b>(Sum of a, b, c and d)</b>	_____(Hour and minute) per ( day / week ) (choose one)

**1.5 Cooking activity**

Post the project implementation	
How many hours a day do you spend cooking after the installation of project cookstove?	(Hour and minute)
Which family member responsible for the above task?	