



**Verified Carbon
Standard**

IMPROVED COOKSTOVE DISTRIBUTION IN GHANA BY EKI



EKI Energy Services Limited

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1 PROJECT DETAILS

1.1 Summary Description of the Project

The main purpose of project is distribution of fuel-efficient improved cook stoves (ICS) in Republic of Ghana (Ghana). The ICS disseminated through this project will replace the low efficient baseline cook stoves.

Through this project, the distribution and installation of high thermal efficient improved cook stoves (ICS) will be undertaken for households and communities/non-household. The ICS will burn charcoal more efficiently thereby improving thermal energy transfer to pots, hence saving charcoal and greenhouse gases. Not only will this halt the rapidly progressing deforestation but will also reduce health hazards from indoor air (smoke) pollution and time & money of the participating household will be saved in the procurement of charcoal.

As the target populations are unable to afford these stoves (ICS), project promoters have distributed ICS free of cost. The end user will be informed in advance that the use of ICS generates carbon finance which in turn is used to cover the price of ICS and for recovering project implementation costs.

The project locations for initial Project Activity Instances are in Republic of Ghana (Ghana) and it may expand further in other parts of Africa and details are provided in Section 1.12 of this document.

The ICS will substitute the currently common cooking on traditional cookstove. The baseline scenario is the continued use of non-renewable biomass (Charcoal) by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of project activity.

The first project activity instance is expected to implement on 17 Oct 2022 under this grouped project activity. PP has planned to distribute 200,000 project activity instances (ICS) under this grouped project activity.

The average annual GHG emission reduction from the project is expected to be 3.81 tCO₂e per Year for each project activity instance (i.e., ICS) and 5,0,58,788 tCO₂e for the group project activity over the entire crediting period.

1.2 Sectoral Scope and Project Type

The sectoral scope and type of project applicable are as below:

Sectoral scope: 03 - Energy demand

Type: II – Energy efficiency improvement projects

The project is a grouped project

1.3 Project Eligibility

The project involves energy efficient cookstove distribution which falls under the category of efficiency improvements in thermal application, therefore it is eligible under the scope of VCS Program. As per VCS Standard Version 4.2, section 2.1.1, efficiency improvements in thermal applications (e.g., cook stoves) are not excluded, hence project is eligible under VCS.

1.4 Project Design

The project is a grouped project

Eligibility Criteria

For the inclusion of new project activity instances i.e., ICS, the project proponent shall ensure that it meets the eligibility criteria below:

No.	Criterion	How the new project activity instances to comply
1	Meet the applicability conditions set out in the methodology applied to the project	New project activity instances (Energy Efficient Cook Stoves) will meet the applicability conditions set out in Section 3.2 where the target of the end-user is household and the ICS deployed is at least 25% of thermal efficiency.
2	Use the technologies or measures specified in the project description.	The technology used for project activity is energy efficient cook stoves. Only energy efficient cook stoves to be adopted in the project by replacing traditional cook stoves in household.
3	Apply the technologies or measures in the same manner as specified in the project description.	Only energy efficient cook stoves to be adopted in the project by replacing traditional cook stoves in household.
4	Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	The new project activity instances will be installed within Africa region subject to the same baseline scenario determined in Section 3.4.
5	Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.	All new project activity instances will use the activity method for demonstration of additionality. Step 1: Regulatory Surplus

		There is no mandated government programme or policy in host country of this project ensuring the distribution of new energy efficient cook stoves for each project activity instances. Step 2: Positive List The inclusion of new project activity instances will comply with positive list as it satisfies criterion 1 where it meets all the applicability conditions of the methodology.
6	Where a capacity limit applies to a project activity included in the project, no project activity instance shall exceed such limit. Further, no single cluster of project activity instances shall exceed the capacity limit, determined as follows: Each project activity instance that exceeds one percent of the capacity limit shall be identified. Such instances shall be divided into clusters, whereby each cluster is comprised of any system of instances such that each instance is within one kilometer of at least one other instance in the cluster. Instances that are not within one kilometer of any other instance shall not be assigned to clusters. None of the clusters shall exceed the capacity limit and no further project activity instances shall be added to the project that would cause any of the clusters to exceed the capacity limit.	No project activity instance shall exceed the applicable limit, which is 180 GWhth/y. Since the project activity instances have same model, hence expected annual energy saving for each instance is 0.01 GWh_{th}/y which is 0.0056% of the threshold limit. As the annual energy saving is below 1% of the limit, therefore no project activity instance is identified and divided into clusters.

1.5 Project Proponent

Organization name	EKI Energy Services Limited
Contact person	Manish Dabkara

Title	Managing Director & Chief Executive Officer
Address	Office No 201, Plot No 48, Scheme 78, Vijay Nagar Part- II, Indore 452010, India
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1.6 Other Entities Involved in the Project

Organization name	EKI Energy Services Limited
Role in the project	Project Consultant
Contact person	Monil Shrivastava
Title	Executive- Operations
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1.7 Ownership

The project ownership is with EKI Energy Services Limited.

The ICS are distributed to end users (Households) at free of cost. The end users are informed in advance that the use of ICS generates carbon finance which in turn is used to cover the price of ICS and for recovering project implementation costs. The participating household will sign a declaration to transfer the ownership rights of the carbon assets generated from this project to the EKI Energy Services Ltd, also undertaking is provided by EKI for projects ownership. The undertaking from manufacturer and distributor and end user agreement has been submitted to confirm that cook stove ownership is with EKI Energy Services Limited.

1.8 Project Start Date

17-October-2022 (The earliest date of commissioning of 1st ICS)

1.9 Project Crediting Period

First crediting period: 17- October-2022 to 16- October-2029, seven years renewable crediting period. Being renewable crediting period, total crediting period of grouped project activity is 21 years

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	
Large project	X

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 1	8,32,739
Year 2	8,20,583
Year 3	8,08,305
Year 4	7,95,903
Year 5	7,83,376
Year 6	7,70,722
Year 7	7,57,940
Total estimated ERs	55,69,568
Total number of crediting years	7
Average annual ERs	7,95,653

1.11 Description of the Project Activity

The project involves distribution of fuel-efficient improved cook stoves (ICS) to replace the baseline traditional cook stoves in households.

The ICS to be deployed under this project is energy efficient which substantially reduces fuel consumption and emissions for conducting cooking and water heating tasks in homes. The ICS improve the efficiency of combustion and thermal transfer to the pot compared with a traditional pot support fire by incorporating energy efficient technology which provides a conducive environment for clean and efficient combustion of charcoal. It substantially reduces Charcoal fuel consumption compared with a less efficient traditional pot support.

The project activity cook stoves are with different manufacturers and specifications of cook stoves will be provided during validation/verification or during inclusion of project activity instances.

TECHNICAL DETAILS		
A)	Cook Stove Type/Category	I-22-C (Stove)
B)	Air Supply	Natural Draft
C)	Body	AluZinc Sheet
	Body Material Thickness	0.5mm
	External Dimension	Width :- 290mm
		Height :- 260mm
	Ceramic combustion insert thickness: min 25mm	25mm
D)	Wight Of the Stove	8 Kg
E)	Type of Fuel	Charcoal
F)	Expected life of stove	7 Years
G)	Guarantee /Warranty Period	1 Years
H)	Thermal Efficiency	34%



Figure 1.a I-22-C (Improved cookstove)

The PP may change for future model of ICS and same will be transparently reflect during verification. The details and specifications of respective cook stoves will be considered for ER calculation of project activity instance.

Data collection of ICS end-user

Project proponent must gather the necessary information to identify households using its ICS during the course of the project. To facilitate this process, each ICS will be assigned a unique

serial number. This number will be recorded during the registration process together with the following information (as appropriate and as available):

- Name of ICS user or head of the household
- Address/ Village name of ICS household
- Stove model Distributed
- Date of distribution/installation
- ICS serial number
- Retailer/distributor/Manufacturer information

The information collected will be stored in the hard copy and/or electronic database excel sheet which will serve as project database for project monitoring and sampling purposes.

1.12 Project Location

All the project activity instances in the proposed grouped project activity would be located within geographical boundaries of Africa.

For initial project activity instance, geographical area is in Republic of Ghana though it may expand in different countries of Africa.

The geographical boundary for projects located in Republic of Ghana is delineated in the form of extreme geographic coordinates of Ghana as follows¹:

Latitude: 8° 2' 5.5608" N

Longitude: -1° 18' 47.8512" W

¹<https://www.google.com/maps/place/Ghana/@0.5907892,11.6986528,3z/data=!4m5!3m4!1s0xfd75acda8dad6c7:0x54d7f230d093d236!8m2!3d7.946527!4d-1.023194>



1.13 Conditions Prior to Project Initiation

The conditions prior to project initiation are the continued use of non-renewable fuel (Charcoal) by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of project activity.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

There are no laws and regulations governing the use of improved cookstoves in Ghana for households. The project is a voluntary effort by the project proponent.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project has not been registered, nor is it seeking registration under any other GHG program

1.15.2 Projects Rejected by Other GHG Programs

The project has not been rejected by any other GHG program

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

The project is not included in an emissions trading program or any other mechanism that includes GHG allowance trading. The undertaking is submitted for same.

Does the project reduce GHG emissions from activities that are included in an emissions trading program or any other mechanism that includes GHG allowance trading?

☐ Yes

☒ No

1.16.2 Other Forms of Environmental Credit

The project has not sought or received another form of GHG-related environmental credit. The undertaking is submitted for same.

Has the project sought or received another form of GHG-related credit, including renewable energy certificates?

☐ Yes

☒ No

1.17 Sustainable Development Contributions

The project includes distribution of fuel efficient improved cookstoves thereby replacing use of inefficient cookstoves. The project contributes to social, environmental, economic and technological benefits which contribute to sustainable development of the local environment and the country as follows:

Social benefits

1. Reduces drudgery to women (due to reduced charcoal use) who spend long hours in kitchen for cooking.
2. Improves overall health of women and children by reducing smoke in the kitchen, thus reducing health hazards from indoor air pollution.
3. Better cooking time – the materials used in making the ICS transmit the heat effectively, cooking the food faster.
4. Better cooking environment due to less smoke and carbon residue in the kitchen.
5. Better quality of life – the rural communities get family time as the whole family can sit and eat together.

Environmental benefits

1. Improves the local environment by reducing rate of degradation of forests and deforestation in the project area.
2. Reduce indoor pollution – ICS emits less smoke and reduces morbidity from respiratory diseases and other health hazards, as well as the medical expenditure involved. A resource-poor household would need to spend limited available finances on medicines, further exacerbated by loss of wages from both not being able to work and having to look after the ill-person.
3. Reduce global and local environmental pollution and environmental degradation by reduction in use of non-renewable biomass thus leading to reduction in GHG emissions.
4. Less water and effort is needed for cleaning vessels as the cooking process is relatively smoke free.

Economic benefits

1. Employment opportunities for local communities through the CDM activity.
2. Reduces purchase of charcoal and/or wage equivalent from reduced charcoal collection time.

Technological benefits:

- Introduction of efficient technology to the rural communities

1.18 Additional Information Relevant to the Project

Leakage Management

Not applicable as the project adopts a net gross adjustment factor of 95% to account for leakage.

Commercially Sensitive Information

No commercially sensitive information has been excluded from the public version of the project description.

Further Information

Not applicable

2 SAFEGUARDS

2.1 No Net Harm

The project will only bring positive impacts on environmental and socio-economic aspects as elaborated in Section 1.17. No potential negative environmental or socio-economic impacts have been identified for the project; thus this section is not applicable.

2.2 Local Stakeholder Consultation

The Local stakeholder consultation details will be provided during verification of project activity.

2.3 Environmental Impact

No negative environmental impacts have been identified from the project and environmental impact assessment (EIA) is not required for the project. In fact project activity supports positive environmental impacts.

2.4 Public Comments

This section will be completed after 30 days public comment period. It will be checked if there are any comments received during 30 days public comment period.

2.5 AFOLU-Specific Safeguards

This section is not applicable as the project is a non-AFOLU project

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

VCS Methodology: VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1 dated 22 July 2021, Sectoral scope 3

<https://verra.org/wp-content/uploads/2021/07/VMR0006-Methodology-for-Installation-of-High-Efficiency-Firewood-Cookstoves-v1.1.pdf>

This methodology also refers the latest version of AMS II.G version 13 - Energy efficiency measures in thermal applications of non-renewable biomass

<https://cdm.unfccc.int/methodologies/DB/GNFWB3Y6GM4WPXFRR2SXKS9XR908IO>

For calculation of fraction of non-renewable biomass, the below tool is used “TOOL30: Calculation of the fraction of non-renewable biomass”

<https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v4.0.pdf>

3.2 Applicability of Methodology

The applicability of methodology is justified as below

Applicability criterion	How the project complies
Project activities shall be implemented in domestic premises or in community-based kitchen	The proposed project involves deployment of ICS only in households For all project activity instances, project activity is implemented in households.
The project stove shall have specified high-power thermal efficiency of at least 25% per the manufacturer's specifications and shall exclusively use woody biomass and can be single pot or multi-pot;	Energy Efficient stoves planned to be installed under this project are single pot portable cook stoves that have efficiency more than 25%. For all project activity instances, ICS with efficiency of 34% is planned to be installed. For future project activity instances, Manufacturer may change and that cook stove efficiency that should be more than 25% as mentioned in methodology based on manufacturer specification. .
Both 'Projects' and 'Large Projects' can use the methodology	Estimated average annual emission reductions for the grouped project activity are more than 300,000 tonnes CO₂e per year. Therefore, proposed project qualifies the "Large Projects" criteria.
Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics;	Non-renewable biomass has been used since 31 December 1989 in Africa as demonstrated at below by referring to published literature, official reports or statistics;
For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that: - It is produced using exclusively renewable biomass (more than one type of biomass may be used) - The consumption of the fuel should be monitored during the crediting period	Not applicable, as project activity does not use processed biomass as a fuel. The ICS is introduced as energy efficiency measure to replace baseline stoves and reduce the use of non-renewable biomass for combustion.

c. Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting)	
The VCS PD shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions such as unique identifications of product and end-user locations (e.g. programme logo) The above criteria is as per below VCS meth requirement and para 7 of latest version of meth AMS II.G version 12 is followed. (Additionally, applicability criteria numbers 8 and 9 set out in Section 2.2 of AMS II.G, version 11.1 shall apply)	Each ICS in this project will be identified by a unique combination of customer name and geographical location, as well as a serial number. The serial number will be a unique number which will allow for a clear distinction between the stoves. No individual serial number can be repeated within the project, thus ensuring that each stove is counted only once in the proposed project. In addition, the project has been cross-checked against other CDM project activity operating in the country using the UNFCCC, the Gold Standard, and other relevant voluntary carbon schemes to ensure that the ICS is not included in any other CDM project activity or voluntary project activity.
The VCS PD shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices. The above criteria is as per below VCS meth requirement and para 8 of latest version of meth AMS II.G version 12 is followed. (Additionally, applicability criteria numbers 8 and 9 set out in Section 2.2 of AMS II.G, version 11.1 shall apply)	Manufacturers/ cook stove distributors undertaking is provided that EKI will be owner of that carbon credits and Manufacturers/ cook stove distributors will not claim any credits for such cook stoves.

Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods or referring to published literature, official reports or statistics.

Justification: Use of non-renewable biomass is established through demonstration of gap between the demand of fire wood and silviculturally permissible production of biomass from forest and tree outside forest. The fact is established using published literature referring to the following studies:

According to a Ghana's national report (2017), the rate of deforestation and forest degradation has been on the rise in recent decades. The annual deforestation rose to 794,214 ha per annum between 2013 and 2015.¹¹ Much has been written about deforestation's causes in Ghana, and it is reported (2019) that Non-renewable biomass such as firewood and charcoal is a key driver of deforestation and negatively impacts climate change, biodiversity, and livelihoods in Ghana². Thus, the above clearly shows that non-renewable biomass has been used in the Ghana since 31 December 1989.

Conclusion:

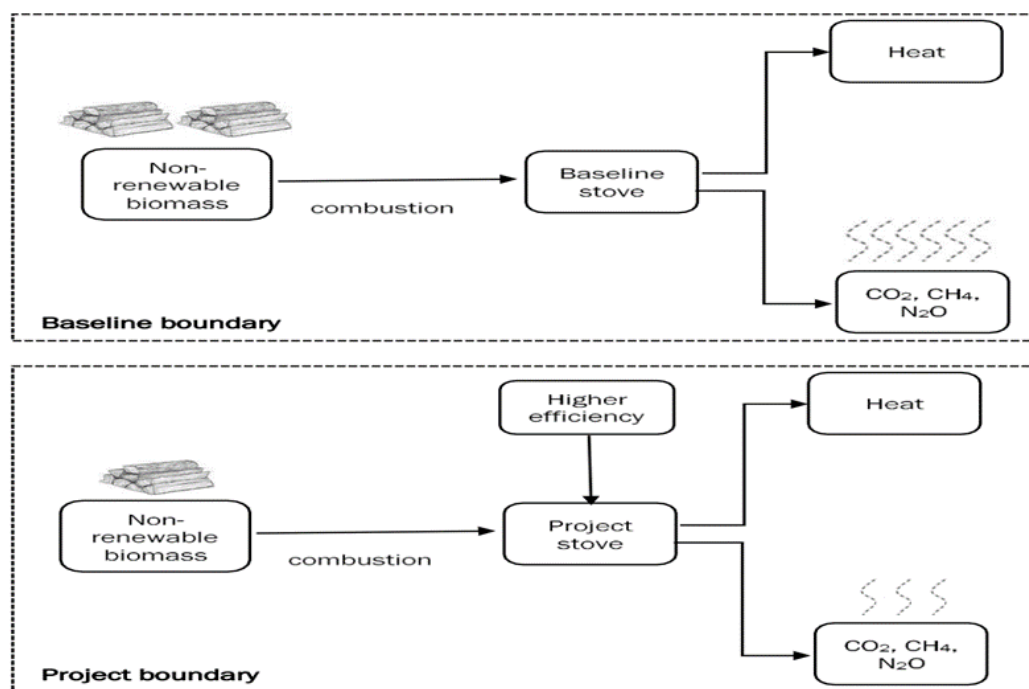
Therefore, it is established from the above studies that, a staggering gap exists between the demand and potential for sustainably extractable fuel wood from forest land. While the first three studies refer to the fuel wood supply scenario and the gap that were precedent before 1989; the study highlight the widening of gap between the demand and supply of biomass after 1989. The widening of the gap has been both due to the increased population pressure as well as the conversion of dense forest to medium dense, scrub and open type forest land due to unsustainable extraction even after the government's initiative towards promotion of afforestation. Thus, it can therefore be concluded that the gap exists from and before 1989 and continued thereafter, forcing the population in using biomass extracted in un- sustainable manner which is identified as non-renewable component

3.3 Project Boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Emission from use of non-renewable biomass/Fossil fuel	CO ₂	Yes	Major source
		CH ₄	Yes	Major source
		N ₂ O	Yes	Major source
		Other	No	No other source identified
Project	Emission from use of non-renewable biomass	CO ₂	Yes	Major source
		CH ₄	Yes	Major source
		N ₂ O	Yes	Major source
		Other	No	No other source identified

A representation of the baseline boundary and project boundary are given as below

² D.Nje et al., Greening The Wood Fuel Sector Of Ghana, (2019)



3.4 Baseline Scenario

As per methodology “The baseline scenario is the continued use of non-renewable wood fuel (firewood/charcoal) or fossil fuel (coal/kerosene) by the target population to meet similar thermal energy needs as provided by project cook stoves in absence of project activity.”

The project activity instances to be included in this grouped project activity should meet the baseline scenario as mentioned above.

For all project activity instances, the baseline scenario is the continued use of non-renewable wood fuel (Charcoal) by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of project activity

3.5 Additionality

The methodology uses activity method for the demonstration of additionality.

Activity Method

Step 1: Regulatory Surplus

There is no mandated government programme or policy in host country of this project ensuring the distribution of domestic fuel-efficient cookstoves. The project is not mandated by any law, statute or other regulatory framework, or for UNFCCC non-Annex I countries, any systematically enforced law, statute or other regulatory framework.

Households may only participate voluntarily in this project. It is hereby confirmed that the proposed project is a voluntary coordinated action by EKI.

Step 2: Positive List

As per Section 3.2, the project meets the applicability conditions of the methodology which represent the positive list.

The project installs the ICS at zero cost to the household and has no other source of revenue other than the sale of GHG credits.

The project is not implemented as part of government schemes or supported by multilateral funds.

Conclusion: As the project fulfils the conditions above, it is deemed additional.

If any project activity instance does not follow the positive list as stipulated by methodology, then additionality need to demonstrate as per tool requirement.

3.6 Methodology Deviations

The project did not apply any methodology deviations

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

The methodology does not account for baseline emissions separately, but instead quantifies net emission reductions achieved by the project. Please refer to Section 4.4.

4.2 Project Emissions

The methodology does not account for baseline emissions separately, but instead quantifies net emission reductions achieved by the project. Please refer to Section 4.4

4.3 Leakage

Leakage shall be considered as default 0.95 in accordance with methodology

4.4 Net GHG Emission Reductions and Removals

The improved cookstove is introduced as energy efficiency measure in the project, therefore equations 1 and 2 of the methodology will be applied to calculate the net GHG emission reductions

$$ER_y = \sum_i \sum_j ER_{y,i,j}$$

Where:

- i = Indices for the situation where more than one type/model of improved cookstove is introduced to replace three-stone fire
- J = Indices for the situation where there is more than one batch of improved cookstove of type i
- ER_y = Emission reductions during year y in t CO₂e
- $ER_{y,i,j}$ = Emission reductions by improved cookstove of type i and batch j during year y in t CO₂e

$$ER_{y,i,j} = B_{y,savings,i,j} \times NCV_{wood\ fuel} \times f_{NRB,y} \times (EF_{wf,CO_2} + EF_{wf,non\ CO_2}) \times N_{y,i,j} \times 0.95 \quad \text{Equation (2)}$$

Where:

- $B_{y,savings,i,j}$ = Quantity of woody biomass that is saved in tonnes per improved cookstove of type i and batch j during year y
- $f_{NRB,y}$ = Fraction of woody biomass that can be established as non-renewable biomass (f_{NRB})³
- $NCV_{charcoal}$ = Net calorific value of the charcoal that is substituted or reduced (IPCC default for charcoal, 0.0295 TJ/tonne)⁴
- EF_{wf,CO_2} = CO₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 112 tCO₂/TJ)⁵
- $EF_{wf,non\ CO_2}$ = Non-CO₂ emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 26.23 tCO₂/TJ)⁶

³ Default values endorsed by designated national authorities and approved by the Board are available at <https://cdm.unfccc.int/DNA/fNRB/index.html>

⁴<https://unstats.un.org/unsd/energy/yearbook/2014/08i.pdf>

⁵2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion

⁶2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion

$N_{y,i,j}$	=	Number of improved cookstoves of type i and batch j operating during year y
0.95	=	Discount factor to account for leakage

The quantify of woody biomass saved due to implementation of improved cookstoves to be estimated using equation below:

$$B_{y,savings,i,j} = B_{old,i,j} \times \left(1 - \frac{\eta_{old,i,j}}{\eta_{new,i,j}}\right) \quad \text{Equation (3)}$$

where

η_{old}	=	Efficiency of baseline cookstove
$\eta_{new,y,i,j}$	=	Efficiency of the improved cookstove type i and batch j determined through water boiling test (WBT) during year y Alternatively, efficiency may be determined using Equation 4.
$B_{old,i,j}$	=	Annual quantity of woody biomass that would have been used in the absence of the project activity (in tonnes per device) to generate useful thermal energy equivalent to that provided by the improved cook stove.

$$\eta_{new,y,i,j} = \eta_p \times (DF_n)^{y-1} \times 0.94 \quad \text{Equation (5)}$$

where

η_p	=	Efficiency of project stove (fraction) at the start of project activity.
$(DF_n)^{y-1}$	=	Discount factor to account for efficiency loss of project cookstove per year of operation (fraction). This value may be based on actual monitoring or based on manufacturer's declaration on expected loss in efficiency or through publicly available literature on relevant industry standards. Alternatively default value of 0.99 efficiency loss per year can be considered.
0.94	=	Adjustment factor to account for uncertainty related to project cookstove efficiency test.

Where the project households continue to use baseline cookstoves along with improved cookstoves, B_{old} shall be adjusted ex-post based on the percentage of project households found to continue such practice according to Equation 6 of the methodology. For such cases, the quantity of woody biomass saved $B_{y,savings,i,j}$ due to implementation of improved cook stoves shall be calculated using an adjusted value to account for ex-post use of baseline stoves in addition to improved cookstove.

$$B_{old,adjusted} = B_{old} \times (1 - \mu_y) \quad \text{Equation (6)}$$

where

$$B_{old,adjusted} = \text{Adjusted } B_{old} \text{ to account the ex-post usage of firewood in baseline cookstove(s) by project households in addition to improved cookstove (in tonnes per device)}$$

$$\mu_y = \text{Baseline stove usage factor to account for use of baseline cookstoves along with improved cookstoves.}$$

For ex-ante calculation purpose, the assumption below is applied:

For ex-ante calculation purpose, the assumption below is applied.

- 1) The project will install up to ICS 200,000 ICS.
- 2) The life span of ICS is 7 years; thus the operational lifetime of each project activity instance is taken as 7 years.
- 3) Annual stove loss rate is estimated at 0%. This is assumed for estimation. During actual ER calculation, this value may change. This value will be determined during actual verification based on survey results.
- 4) B_{old} is taken as 3.285 tonnes / device / year. Through baseline survey, it was observed that 1.5 Kg of charcoal is required per device and 365 days of operations. A default wood to charcoal conversion factor of 6 kg of firewood per kg of charcoal is used in line with paragraph 35 of AMS II.G version 11,
- 5) μ_y is taken as 0, i.e., it is assumed that baseline are decommissioned after distribution of ICS.

Determination of efficiency of ICS during year y

$$\eta_{new,y,i,j} = \eta_p \times (DF_n)^{y-1} \times 0.94$$

Where

$$\eta_p = 36\%$$

$$DF_n = 0.99$$

Example of calculation:

If $y = 1$

$$\eta_{new,y,i,j} = 36\% \times (0.99)^{1-1} \times 0.94$$

$$= 33.84\%$$

Hence the efficiency of ICS during year y is as below:

Year (y)	$\eta_{new,y,i,j}$
----------	--------------------

1	33.84%
2	33.50%
3	33.17%
4	32.83%
5	32.51%
6	32.18%
7	31.86%

Determination of quantity of woody biomass that is saved in tonnes per ICS during year y

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

Example of calculation:

If y= 1,

$$B_{y,savings,i,j} = 3.285 \times [1 - (0.2/0.3384)]$$

= 1.34 tonnes

Year (y)	$B_{old,i,j}$	$\eta_{new,y,i,j}$	η_{old}	$B_{y,savings,i,j}$
1	3.285	31.96%	0.2	1.34
2	3.285	31.64%	0.2	1.32
3	3.285	31.32%	0.2	1.30
4	3.285	31.01%	0.2	1.28
5	3.285	30.70%	0.2	1.26
6	3.285	30.39%	0.2	1.24
7	3.285	30.09%	0.2	1.22

Determination of emission reductions by ICS of year1 during year y

$$ER_{y,i,j} = B_{y,savings,i,j} \times NCV_{charcoal} \times f_{NRB,y} \times (EF_{wf,CO2} + EF_{wf,non\ CO2}) \times N_{y,i,j} \times 0.95$$

Where

$$NCV_{charcoal} = 0.0295 \text{ TJ/tonne}$$

$$f_{NRB,y} = 0.80$$

$$EF_{wf,CO_2} + EF_{wf,non\ CO_2} = 112 + 26.23 = 138.23 \text{ tCO}_2/\text{TJ}$$

Example of calculation:

If $y=1$,

$$\begin{aligned} ER_{y,i,j} &= 1.34 \times 0.0295 \times 0.80 \times 138.23 \times 200,000 \times 0.95 \\ &= 832,739 \text{ tCO}_2 \end{aligned}$$

Thus 7 years estimation for Project Activity Instances is as below

Year	$B_{y,savings,i,j}$	$NCV_{wood\ fuel}$	$f_{NRB,y}$	$EF_{wf,CO_2} + EF_{wf,non\ CO_2}$	$N_{y,i,j}$	$ER_{y,i,j}$
1	1.34	0.0295	0.80	138.23	200,000	8,32,739
2	1.32	0.0295	0.80	138.23	200,000	8,20,583
3	1.30	0.0295	0.80	138.23	200,000	8,08,305
4	1.28	0.0295	0.80	138.23	200,000	7,95,903
5	1.26	0.0295	0.80	138.23	200,000	7,83,376
6	1.24	0.0295	0.80	138.23	200,000	7,70,722
7	1.22	0.0295	0.80	138.23	200,000	7,57,940
Total						55,69,568
Number of crediting period						7
Average annual ERs						7,95,653

The above ER estimation for project activity instances is with consideration of 200,000 ICS quantity and this quantity may vary during actual implementation stage.

The total ER estimation combined for all Project activity Instances are as below

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
------	---	--	--	--

1	8,32,739	0	0	8,32,739
2	8,20,583	0	0	8,20,583
3	8,08,305	0	0	8,08,305
4	7,95,903	0	0	7,95,903
5	7,83,376	0	0	7,83,376
6	7,70,722	0	0	7,70,722
7	7,57,940	0	0	7,57,940
Total	55,69,568	0	0	55,69,568

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	$f_{NRB,Y}$
Data unit	Fraction
Description	Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass
Source of data	Calculated f_{NRB} by determining the share of renewable and non-renewable woody biomass in the total quantity of woody biomass consumption for the country/region following tool 30
Value applied	0.80 (calculated as per Meth tool)
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined ex-ante. Default value as per Methodological tool: Calculation of the fraction of non-renewable biomass. As per of methodological tool, value is calculated as per following Equation (1), $f_{NRB,y} = NRB / (NRB + DRB)$
Purpose of Data	Calculation of baseline emission
Comments	If the future project activity instances are expanded in other parts of Africa (other than Ghana), then this parameter value will be calculated during future project activity instances inclusion.

Data / Parameter	NCV _{charcoal}
Data unit	TJ/tonne
Description	Net calorific value of the charcoal that is substituted or reduced
Source of data	United Nations Energy Statistics Yearbook ⁷
Value applied	0.0295
Justification of choice of data or description of measurement methods and procedures applied	default value
Purpose of Data	Calculation of baseline emission
Comments	-

Data / Parameter	EF _{wf,CO2}
Data unit	tCO2/TJ
Description	CO2 emission factor for the use of wood fuel in baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion
Value applied	112
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	EF _{wf,nonCO2}
Data unit	tCO2/TJ

⁷ <https://unstats.un.org/unsd/energy/yearbook/2014/08i.pdf>

Description	Non-CO2 emission factor for the use of wood fuel in baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion
Value applied	26.23
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	η_{old}
Data unit	Fraction
Description	Efficiency of baseline cookstove
Source of data	Methodological default value
Value applied	0.2
Justification of choice of data or description of measurement methods and procedures applied	(c) A default value of 0.1 shall be used if baseline device is a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney. (d) A default value of 0.2 shall be used for other types of devices. During baseline survey, it was observed that baseline device is conventional stove using charcoal. Therefore, default value of 0.2 is considered for the project activity.
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	η_p
Data unit	Percentage

Description	Efficiency of project stove at the start of project activity.
Source of data	Manufacturer's specification
Value applied	36%
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined ex-ante
Purpose of Data	Calculation of $\eta_{new,y,i,j}$
Comments	This efficiency is for the cook stove model considered for initial project activity instances. If manufacturer or cook stove model changes, the respective model efficiency will be considered for ER calculations

Data / Parameter	$(DF_n)^{y-1}$
Data unit	Fraction
Description	Discount factor to account for efficiency loss of project cookstove per year of operation (fraction).
Source of data	As per methodology, default value of 0.99 efficiency loss per year
Value applied	0.99
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined ex-ante
Purpose of Data	Calculation of $\eta_{new,y,i,j}$
Comments	-

Data / Parameter	Life Span
Data unit	Years
Description	Operating lifetime of project device for projects opting Equation 5 for determining project stove efficiency

Source of data	Manufacturer's specification
Value applied	7
Justification of choice of data or description of measurement methods and procedures applied	This parameter will be monitored Once at the time of Project stove installation
Purpose of Data	Calculation of $\eta_{\text{new},y,i,j}$
Comments	-

Data / Parameter	B_{old}
Data unit	Tonnes
Description	Annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices.
Source of data	Baseline survey
Value applied	3.285
Justification of choice of data or description of measurement methods and procedures applied	During baseline survey average charcoal consumed per household per day was calculated as 1.5 kg. As per applied methodology <i>"Where charcoal is used by baseline devices, a default wood to charcoal conversion factor of 6 kg of firewood per kg of charcoal may be used in line with paragraph 35 of AMS II.G, version 11"</i> Therefore, annual quantity of woody biomass = $1.5 \times 6 \times 365/1000 = 3.285$ Tonnes
Purpose of data	Calculation of emission reductions
Comments	--

5.2 Data and Parameters Monitored

Data / Parameter	$N_{y,i,j}$
Data unit	Number
Description	Number of project devices of type I and batch j operating during year y
Source of data	Monitoring

Description of measurement methods and procedures to be applied	Measured directly or based on a representative sample. As per methodology, minimum sample size will be determined in which case compliance with 90/10 confidence precision is not obligatory.
Frequency of monitoring/recording	At least once every two years
Value applied	200,000
Monitoring equipment	Sample survey
QA/QC procedures to be applied	-
Purpose of data	Calculation of emission reductions
Calculation method	Proportion of operational stoves obtained from the survey is multiplied by the total commissioned stoves to arrive at this value
Comments	PP has distributed one ICS per household and same is followed for each project activity instances.

Data / Parameter	$\eta_{new,y,i,j}$																
Data unit	Fraction																
Description	Efficiency of the improved cook stove type i and batch j determined as per equation 5 of methodology during year y																
Source of data	Calculation																
Value applied	For ex-ante calculation, the value below is applied <table border="1"> <thead> <tr> <th>Year(y)</th><th>$\eta_{new,y,i,j}$</th></tr> </thead> <tbody> <tr><td>1</td><td>31.96%</td></tr> <tr><td>2</td><td>31.64%</td></tr> <tr><td>3</td><td>31.32%</td></tr> <tr><td>4</td><td>31.01%</td></tr> <tr><td>5</td><td>30.70%</td></tr> <tr><td>6</td><td>30.39%</td></tr> <tr><td>7</td><td>30.09%</td></tr> </tbody> </table>	Year(y)	$\eta_{new,y,i,j}$	1	31.96%	2	31.64%	3	31.32%	4	31.01%	5	30.70%	6	30.39%	7	30.09%
Year(y)	$\eta_{new,y,i,j}$																
1	31.96%																
2	31.64%																
3	31.32%																
4	31.01%																
5	30.70%																
6	30.39%																
7	30.09%																
Justification of choice of data or description of	This parameter shall be determined ex-ante. The average lifetime of cook stove is 7 years.																

measurement methods and procedures applied	
Purpose of Data	Calculation of emission reductions
Comments	Calculation to be performed using equation below: $\eta_{new,y,i,j} = \eta_p \times (DF_n)^{y-1} \times 0.94$ (The project opts to determine the efficiency using the equation 5 given by methodology; Therefore, it is not required to monitor this parameter via Sampling survey.) However, the grouped project activity provides the option to use of different model of cook stove for new future project activity instances to be included, hence this parameter value may vary based on different model of future instances. Default value of 0.99 efficiency loss per year can be considered In case of ICS model changes for new project activity instances, the efficiency of new ICS model should be determined during verification and same will be considered for that project activity instance.

Data / Parameter	μ_y
Data unit	Fraction
Description	Adjustment to account for any continued use of pre-project devices during the year y
Source of data	Sample survey
Description of measurement methods and procedures to be applied	Minimum sample size of each type i and batch j will be in line with the guidelines provide in section 8.4 option (b) of the methodology. This parameter will be monitored using one of the following methods: (a) If the baseline cookstoves are decommissioned and no longer used, as determined by the monitoring survey its value is 0 and B_{old}, adjusted is equal to B_{old}. (b) If both the improved cookstove and baseline cookstoves are used together then surveys shall be conducted to record the average continued operation of baseline cookstoves in a sample of households. The surveys should be designed to capture the cooking habits and stove usage of households in the region, including quantification of use of baseline cookstoves, by formulating questions and/or collecting evidences to determine the frequency of usage of both the improved cookstoves and baseline cookstoves.

Frequency of monitoring/recording	At least once every two years
Value applied	0
Monitoring equipment	-
QA/QC procedures to be applied	-
Purpose of data	Calculation of emission reduction
Calculation method	-
Comments	-

5.3 Monitoring Plan

Measurement/monitoring of two parameters based on a representative sample. Simplified approach proposed in option (b) under Section 8.4 of methodology will be used for determining the minimum sample size in which case compliance with 90/10 confidence precision is not obligatory.

Monitored Parameters

The project involves Introduction of improved cook stove as energy efficiency measures:

No.	Monitoring Parameters	Sampling parameters	Parameter type	Monitoring frequency
1	$N_{y,i,j}$ Number of project devices of type i and batch j operating during year y	Proportion of ICS still in operation.	Proportion	Biennially (at least once in two year)
2	μ_y Adjustment to account for any continued use of pre-project devices during the year y	Proportion of baseline stove still in operation	Proportion	Biennially (at least once in two year)

Target Population

The target population will be the complete set of appliances (ICS) deployed under the project.

Sampling Method

The project involves distribution of ICS throughout the project area thereby replacing traditional cooking devices. The population is homogeneous in nature i.e. common technology with similar

operating characteristics and dispersed in the country. Since the characteristics of population (for example quantity of biomass consumed) are more similar. Therefore, simple random sampling technique will be used calculate the samples. Samples will be drawn by using the random number generator.

To determine the parameters, sampling will involve the following approaches (outcome in brackets):

$N_{y,i,j}$	Visual inspection of the premises to see if ICS is operational and in use. Interview with end user if required to verify that ICS is still in use (Yes/No)
μ_y	Visual inspection of the premises to see if ICS is operational and in use. Interview with end user if required to verify that ICS is still in use (Yes/No)

Sample Size:

Simplified approach will be used for determining minimum sample size for parameters listed under Sections 9.2 of the methodology in which case it is not requisite for the sample size to meet confidence/precision requirements.

The project proponent will choose to use the same sample to monitor both the parameters. According to the Standard for sampling and surveys for VCS project activities and programme of activities, if there is more than one parameter to be estimated, then a sample size calculation should be done for each of them. Then either the largest number for the sample size is chosen as sampling effort with one common survey, or separate sampling efforts and surveys are undertaken for each parameter. Therefore the project proponent will sample combination of two parameters i.e. $N_{y,i,j}$ and μ_y in the same sample. Sampling more than one parameter within the same sample (household) helps reduce travel needs for monitoring and the associated costs.

Oversampling is strongly encouraged, not only to compensate for any attrition, outliers or non-response associated with the sample, but also to prevent a situation at the analysis stage where the required reliability is not achieved and additional sampling efforts would be required. The sample size shown above will be adjusted upwards to account for non-responses, Project proponent shall determine the appropriate non-responses rate based on previous experience.

Sampling Frame

The sampling frames shall be defined as per below. In overall, ICS will have same group of end users which is household users, thus it is expected that the geographical locations do not have influence on the parameter of interest. Therefore, all monitoring parameters can be assumed to be highly homogeneous for each ICS model regardless of how the end user group and distribution/installation location is defined.

Data to be collected:

Field Measurement:

The table below summarizes field measurement data requirements:

Parameter	Timing (indicative)	Frequency as required by methodology	Methods to be applied
$N_{y,i,j}$	Monitoring will likely occur every 12 to 24 months	Biennially	Visits to the premises, visual inspection and interview with ICS end-user.
μ_y	Monitoring will likely occur every 12 to 24 months	Biennially	Visits to the premises, visual inspection and interview with ICS end-user.

Soft copies of the surveys will be kept and the database will have back up. Original stove purchase contracts, information collected from the registration or other means of acceptance by the users will be stored in the project office. A back-up of the project database will also be stored on an electric medium. All data monitored and required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of credits for the project activity, whichever is later.

(i) Quality Assurance/Quality Control

The project proponent will consider the non-response and the possible removal of outliers from the sample, as part of a Quality Control/Quality Assurance system. The choice of measure applied to each parameter will depend on the cost of each data collection approach and logistics required. The project proponent will determine the most effective measure for each parameter from the following list:

- Oversampling: Randomly draw a sample more than the calculated number (say 20%) and collect data for each parameter
- Buffer Group: Randomly draw additional samples (say 20%) and collect data from only for minimum numbers of ICS as per sample size calculation. If this would not result in the required sample size data would be collected from the additional ICS that were selected in the sample.

The sampling plan has the following procedures in place to ensure good quality data. The project proponent will ensure that field personnel have reviewed, understand and have agreed to follow the monitoring plan procedures, including provisions for maximizing response rates, documenting out-of-population cases, refusals and other sources of non-response. A quality control and assurance strategy will be documented. Quality control and assurance strategies include addressing non-sampling errors, such as non-response or bias from interviewer. The project proponent or a competent third party designated by the project proponent with the proper skills will train the monitoring personnel on how to properly survey households to prevent bias from interviewer. In the case a household refuses to participate, another household will be

chosen at random. To reduce interviewer bias, good questionnaire design and well-tested questionnaires will be used.

The sample data for mean value parameter is continuous and therefore the presence of outliers is possible. To identify and address outliers for the parameter, outliers will be defined as those data points with values greater than three standard deviations from the mean of the sample. Data points identified as outliers will be examined further to correct for possible transcription and data entry errors but will be omitted from the analysis if no such administrative errors exist.

Analysis

The project proponent will manage a project database that includes the following data that can be directly attributable within the project, thereby allowing unambiguous determination of the emission reductions attributable to each project:

- A list of households participating in the project, including name, community/location, distribution/installation date and unique serial number;
- Where replacements are made, assurance that the efficiency of the new ICS is similar to the specified.

Data obtained from the samples will be used to estimate proportions and mean values for the parameters described above. The values will then be factored into the emissions reduction calculations and result in the request for issuance of VERs. The parameters are applied for emission reduction calculations. The stoves that are not in use will be excluded from emissions reductions calculations and will not be counted towards the total number of ICS in operation during the monitoring period.

Implementation

The project participant will follow the simple random sampling approach and the minimum sample size will be determined as per the following guidelines:

- Project target population < 300: Minimum sample size 30
- Project target population 300 – 1000: Minimum sample size 10% of group size
- Project target population > 1000: Minimum sample size 100

The simplified approach will be used for determining minimum sample size for parameters to be monitored in which case it is not requisite for the sample compliance with 90/10 confidence precision is not obligatory.

Sampling for the purpose of emission reduction calculation and elaboration of the monitoring report will occur at the end of each monitoring period. This sampling will be conducted by trained personal from project proponent or an experienced third-party entity. The credentials and/or training materials for the sampling personal will be provided to the VVB at verification. The maximum length of one monitoring period will be two years (duration, not calendar years), with option for annual or bi-annual monitoring. The project proponent will be responsible for managing household data collection and entry into the project database. Field personnel will receive training on how to properly deal with surveying techniques and reduce errors and sign a

document certifying that there is no conflict of interest of those involved in data collection and analysis. If there is conflict of interest, the personnel will not be allowed to participate in data collection and analysis. The project database will record the start and end dates of each monitoring period and record the emission reductions attributable to each monitoring period. Appropriate record keeping procedures will be implemented to ensure that each monitoring period data set can be transparently attributed to its corresponding project, preventing any occurrences of double counting. An internal review of the project database will be able to determine the current status of each device – the duration of previous monitoring periods, the households delivering monitoring data, and current verification activities.

(i) Assessment for Leakage

The methodology provides a net to gross adjustment factor of 0.95 to account for leakages, hence the surveys are not required to determine leakage.

The other source of leakage occurs if equipment currently being utilized is transferred from outside the boundary to the project activity. All ICS in the project are newly manufactured/assembled or newly installed, thus no leakage is applicable.

(ii) Monitoring Reporting

The project proponent will assess all monitoring data and produce a monitoring report for the VVB to verify corresponding to the preceding monitoring period. This report will present the data relating to the emission reductions generated by those project activity instances during the monitoring period.

The purpose of the monitoring plan is to ensure successful monitoring of the emission reductions of the proposed project during its crediting period. The overall monitoring will be managed by the project implementer EKI Energy Services Ltd. (EKIESL)

Activities and performance related to emissions reduction are monitored by EKIESL. The PP proposed the following roles and responsibilities for data monitoring, collection, data archiving and calibration of equipment for these project activity instances. The team comprise will follow the below participants.

The monitoring activities will involve data collection during distribution as well as usage information post distribution. The data collected during distribution also involves information about the stove, the end user and location to enable one to uniquely identify each ICS unit and avoid double counting.

Repair and Maintenance - EKIESL/it's representative will establish service center at project location where end users can repair the cook stoves and can use further. The repair and maintenance will be followed as per manufacturer recommendation. This will ensure that cook stove will operate for longer period. After 7 years of lifetime, a report from Maintenance Company will be provided to confirm the extended life of cook stove. The project will claim credits beyond 7 years only for balanced year till cook stove is replaced by new cook stoves.

EKIESL/it's representative will distribute the stoves, as well as carry out the monitoring activities that occur during the distribution of stoves. EKIESL or through their associates will ensure that

the distributor is trained on how to capture the end user data. The project activity implementer is fully responsible to ensure the correct distribution process and data gathering is followed.

The following information will be recorded at the time of distribution of ICS to the user:

- Name of the User
- Total Family Members
- Location/Address
- Installation Date
- Unique ID

Once ICS are distributed, monitoring activities will involve selecting a sample of stove from the distribution record and visiting the premises where these stoves are located to monitor key parameters pertinent in ER Calculation. The individuals carrying out the monitoring activities will follow instructions provided during training, to check and record the following key parameters:

- Check if project stoves are operational and in use
- Check if there is any on-going use of replaced stoves.

Check biomass consumption of new cookstove Data collecting & handling is conducted in a transparent way to secure high quality of recording and storing of data. Data collected and monitored are stored electronically in a secure and retrievable manner for at least two years after the end of the project crediting period. Uncertainty related to data handling (if any) would be rectified, if necessary, by revising monitoring procedures. The changes would be approved by a verifier (e.g., Designated Operational Entity)

Roles and responsibilities of different participators are proposed to be as follows:

Entity/Person	Roles & Responsibilities
EKIESL	✓ VCS documentation development ✓ Communicate with VERRA for all VCS related matters ✓ Communicate with DOEs for validation & verification ✓ Identify local partners for local representation and support ✓ Identity suitable ICS manufacturers ✓ Design the distribution plan for on ground implementation of ICS ✓ Design the monitoring system (including data collection in an electronic database) ✓ Training and development of local resources (as may be required) ✓ Regular Monitoring and quality assurance of data ✓ Monitor & Supervise on-ground distribution, etc. ✓ Annual Review meeting with Local Teams and other associated entity in order to ensure continuous improvements of the project activity
Distributor / Operational Team (Local Representative)	✓ To support & assist EKIESL in achieving the stated goal of the project activity ✓ Assist and facilitate EKIESL in baseline data collection, efficiency testing, data of biomass consumption for new ICS through sampling survey etc. ✓ To be the local representative and communicate, act and

	engage in implementation activities of project activity ✓ To identify and deploy suitable local team and resources for ICS distribution, data collection, regular spot-check at households etc. ✓ Assist and facilitate EKIESL during training of the Operational Team and capacity building across the end users. ✓ To bridge any gap in between end users of ICS and EKIESL in order to ensure smooth operation of the program to achieve overall objective of the project activity ICS Distributor(s)–who will be responsible for deploying the ICS at household and register the end user in the digital tool. They will also be responsible for giving demonstration of ICS use, discussing with the end users on its benefits and educate them on continued use of ICS and discontinuation of the use of conventional/traditional open firing practice. They will also conduct periodic check at households to gather feedback, address to any technical concerns, collect necessary data and transmit the information.
ICS Manufacturer or Supplier	✓ To design and develop ICS as per required standard ✓ To provide technical parameters and manufacturer's efficiency etc. at the time of supply ✓ To educate and train EKIESL team on the installation (delivery), uses, handling etc. of the ICS at households.

APPENDIX

This section will complete during validation of project activity