



**Verified Carbon
Standard**

CLEAN COOKSTOVES FOR RURAL INDIA



STEERING THE PLANET TO NET ZERO

EKI Energy Services Limited

Project title	Clean Cookstoves for Rural India
Project ID	VCS 2944
Crediting period	11-May-2022 to 10-May-2029
Original date of issue	06-December-2023
Most recent date of issue	16-September-2026
Version	08
VCS Standard Version	4.7
Prepared by	EKI Energy Services Limited

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1 PROJECT DETAILS

1.1 Summary Description of the Project

The main purpose of the project is the distribution, and installation of high thermal efficient improved cook stoves (ICS) has been undertaken for households in the Indian states by replacing the low-efficient traditional cookstove.

The ICS burns firewood more efficiently thereby improving thermal energy transfer to pots, hence saving firewood and emission of greenhouse gases. Not only will this will halt the rapidly progressing deforestation but also cause a reduction of health hazards from indoor air (smoke) pollution, reduction in time spent in collecting firewood by women and children. Now women will also have to spend less time in cooking.

A pre-survey was conducted to identify the communities, and potential beneficiaries by recognizing the families that are using rudimentary mud or three-stone stoves. As the target populations are unable to afford these stoves (ICS), project promoters have distributed ICS free of cost.

The project locations for initial Project Activity Instances are in Assam & Madhya Pradesh states of India and may expand further to other parts of India. The first project activity instance was implemented on 11-May-2022 under this grouped project activity and EKI has distributed 24,996 ICS in Assam and 126,158 ICS in Madhya Pradesh till the submission of the revised PD.

The ICS substitutes the currently common cooking on the open fire with an improved cookstove. When all beneficiaries use ICS correctly and use less wood fuel, it will reduce the cooking time with thermal efficiency. The baseline scenario is the continued use of non-renewable biomass (firewood) by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of project activity.

The average annual GHG emission reductions for the group project activity are expected to be 54,681 tCO₂e, and hence, total GHG emission reductions over the entire crediting period are expected to be 348,252 tCO₂e.

1.2 Audit History

Audit type	Period	Program	Validation/verification body name	Number of years
Validation	11-May-2022 to 10-May-2029	VCS	LGAI Technological Center, S.A. (Applus+ Certification)	7 years (Crediting Period)

verification	11-May-2022 to 31-December 2022	VCS	LGAI Technological Center, S.A. (Applus+ Certification)	7 months 20 days
verification	01-January 2023 to 31-December-2023	VCS	VKU Certification	1 year
verification	01-January-2024 to 30-September 2025	VCS	RINA Services S.p.A (RINA)	1 year 9 months

1.3 Sectoral Scope and Project Type

Sectoral scope ¹	03 - Energy demand
Project activity type	Type: II – Energy efficiency improvement projects

1.4 Project Eligibility

1.4.1 General eligibility

The current project activity is a grouped project.

The project involves energy-efficient cookstove distribution which falls under the category of efficiency improvements in the thermal application; therefore, it is eligible under the scope of the VCS Program. As per VCS Standard Version 4.7, section 2.1.3, efficiency improvements in thermal applications (e.g., cook stoves) are not excluded, hence the project is eligible under VCS.

For the inclusion of new project activity instances i.e., ICS, the project proponent shall ensure that it meets the eligibility criteria below as per 3.6.16 and 3.6.9 section of VCS Standard Version 4.7:

No.	Criterion	How the new project activity instances comply
1	Meet the applicability conditions set out in the methodology applied to the project	The project uses VCS approved methodology VM0050, version 1.0. New project activity instances (Energy Efficient Cook Stoves) meet the applicability conditions set out in Section 3.2 below, 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 the project activity is energy-efficient cookstoves. Only energy efficient cook stoves are adopted in the project by replacing traditional cookstoves in households.

¹ Projects, activities, or methodologies may be developed under any of the 16 VCS sectoral scopes: <https://verra.org/programs/verified-carbon-standard/vcs-program-details/#sectoral-scopes>

3	Apply the technologies or measures in the same manner as specified in the project description.	Only energy efficient cook stoves are adopted in the project by replacing traditional cook stoves in households.
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 installed within India are subject to the same baseline scenario determined in Section 3.4 below.
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 use the activity method for demonstration of additionality. Step 1: Regulatory Surplus There is no mandated government programme or policy in the host country of this project ensuring the distribution of new energy efficient cook stoves for each project activity instance. Step 2: Positive List The inclusion of new project activity instances will comply with the 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. (Ref. section 3.6.8 of the VCS standard v4.7)	No project activity instance shall exceed the applicable limit, which is 180 GWh_{th}/y. Expected maximum annual energy saving for each instance comes out to be 0.0019 GWh_{th}/y which is less than 0.01% of the threshold limit. As the maximum annual energy saving is below 1% of the limit, therefore no project activity instance is identified and divided into clusters.

1.4.2 AFOLU project eligibility

Not applicable, as the project involves the distribution of energy efficient improved cookstoves.

1.4.3 Transfer project eligibility

Not Applicable. The project has not been listed under any other carbon registries.

1.5 Project Design

Indicate if the project has been designed as:

- ☐ Single location or installation
- ☐ Multiple locations or project activity instances (but not a grouped project)
- ☒ Grouped project

1.5.1 Grouped project design

Grouped projects provide for the inclusion of new project activity instances subsequent to the initial validation of the project as per section 3.6.17 of VCS Standard Version 4.7.

No.	Criterion	How the new project activity instances comply
1	Occur within one of the designated geographic areas specified in the project description	New project activity instances (Energy Efficient Cook Stoves) will occur in the designated geographic areas specified in the project description that is India.
2	Conform with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial conformance with multiple sets of eligibility criteria is insufficient.	New project activity instances will comply with a complete set of eligibility criteria as mentioned above for the inclusion of new project activity instances.
3	Be included in the monitoring report with sufficient technical, financial, geographic, and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body.	New project activity instances information to be included in the monitoring report with sufficient technical, financial, geographic, and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body
4	Have evidence of project ownership, in respect of each project activity instance, held by the project proponent from the respective start date of each project activity instance (i.e., the	New project activity instances ownership needs to be evidenced from the start date of the respective project activity instance.

No.	Criterion	How the new project activity instances comply
	date upon which the project activity instance began reducing or removing GHG emissions).	
5	Have a start date that is the same as or later than the grouped project start date.	New project activity instances' start date should be after the start date of grouped project activity.
6	Only eligible for crediting from the start of the verification period in which they were added to the grouped project.	New project activity instances will adhere to this criterion by being eligible for crediting only from the beginning of the verification period in which they are included in the grouped project
7	Not be or have been enrolled in another VCS project.	New project activity instances will not be previously registered or currently enrolled in any other VCS project.
8	Adhere to the clustering and capacity limit requirements for multiple project activity instances set out in 3.6.8 - 3.6.9.	In line with section 3.6.8 of the VCS standard v4.7 all singular project activity instances within ten kilometres of another instance of this project activity with EKI Energy Services Limited will be consider within this current project activity only (Project ID 2944). Applicability for Section 3.6.9, already provided in the above table.

1.6 Project Proponent

Organization name	EKI Energy Services Limited
Contact person	Manish Dabkara
Title	Managing Director & Chief Executive Officer
Address	Office No 201, Plot No 07, Scheme 78, Vijay Nagar Part- II, Indore 452010, India
Telephone	+91 9907534900
Email	manish@enkingint.org and registry@enkingint.org

1.7 Other Entities Involved in the Project

At present, EKI Energy Services Limited is the only sole entity of this project.

Organization name	Not Applicable
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Contact person	Not Applicable
Title	Not Applicable
Address	Not Applicable
Telephone	Not Applicable
Email	Not Applicable

1.8 Ownership

The project ownership is with EKI Energy Services Limited.

The ICS are distributed to end uses (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 has signed 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.

1.9 Project Start Date

Project start date	11-May-2022
Justification	The earliest date of commissioning of 1st ICS Under this grouped project activity, the first project activity instance was implemented on 11-May-2022 in Assam in the Udalguri district. In Madhya Pradesh, the First ICS was deployed on 16-July-2022 in the Dhar district. 24,996 & 126,158 project activity instances (ICS) have been implemented in Assam and Madhya Pradesh respectively, till submission of the revised PD.

1.10 Project Crediting Period

Crediting period	☒ Seven years, twice renewable ☐ Ten years, fixed ☐ Other (state the selected crediting period and justify how it conforms with the VCS Program requirements)
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Start and end date of first or fixed crediting period	11-May-2022 to 10-May-2029 (inclusive of both the dates)
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1.11 Project Scale and Estimated GHG Emission Reductions or Removals

☒ < 300,000 tCO₂e/year (project)

☐ ≥ 300,000 tCO₂e/year (large project)

Calendar year of crediting period	Estimated GHG emission reductions or removals (tCO ₂ e)
11-May-2022 to 31-December-2022	13,863
01-January-2023 to 31-December-2023	57,989
01-January-2024 to 31-December-2024	58,148
01-January-2025 to 31-December-2025	57,989
01-January-2026 to 31-December-2026	57,989
01-January-2027 to 31-December-2027	57,989
01-January-2028 to 31-December-2028	58,148
01-January-2029 to 10-May -2029	20,654
Total estimated ERRs during the first or fixed crediting period	348,252
Total number of years	7
Average annual ERRs	54,681

1.12 Description of the Project Activity

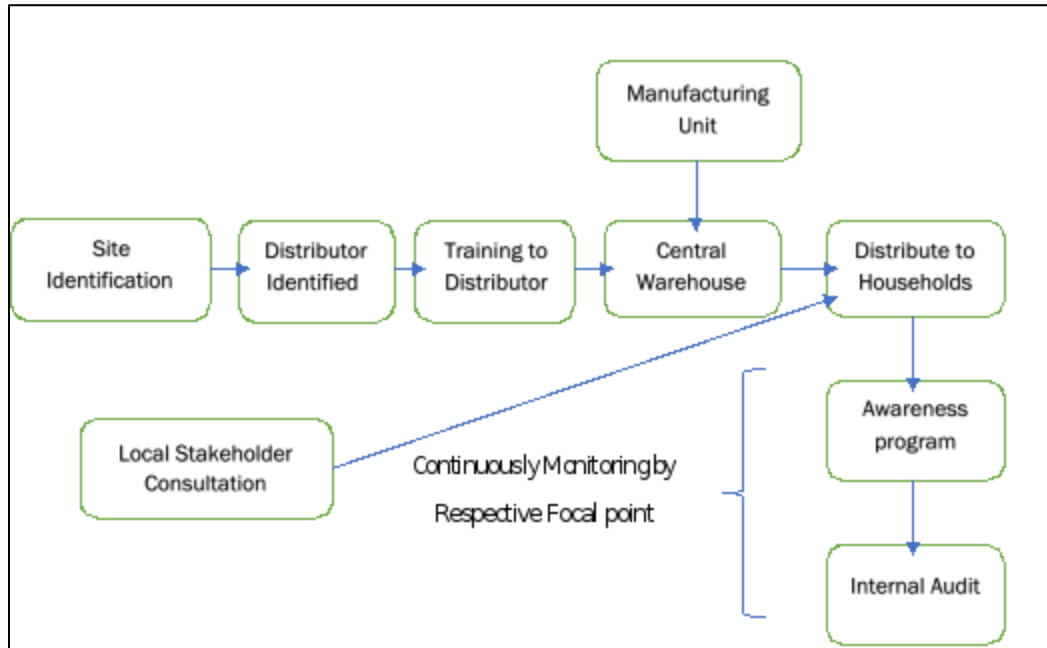
The project involves the distribution of fuel-efficient improved cookstoves (ICS) to replace the baseline traditional cookstoves in households.

In the baseline scenario, traditional cookstoves utilize open wood fires, and the widespread use of these inefficient biomass stoves is a major contributor to deforestation. Thus, households continue to use wood fuel in the project scenario.

The ICS deployed under this project is energy efficient which substantially reduces fuel consumption and emissions for conducting cooking tasks in homes. The ICS improve the efficiency of combustion and thermal transfer to the pot compared with a traditional pot support or three-stone fire by incorporating energy efficient technology which provides a conducive

environment for clean and efficient combustion of wood. It substantially reduces wood fuel consumption compared with a less efficient or three-stone fire or traditional pot support.

EKI has procured the ICS from the manufacturer and provide the same to the distribution agency at a central point near the distribution area. Distribution agency has trained their team for distribution and registration process. Further, distribution team have distributed the stoves to the end users. Distribution team have educated the end user on the proper use of the ICS, its benefits for the user and how it will improve the environment.



Cookstove Flow Chart



(One of the training plans conducted in Assam for the cookstove program)

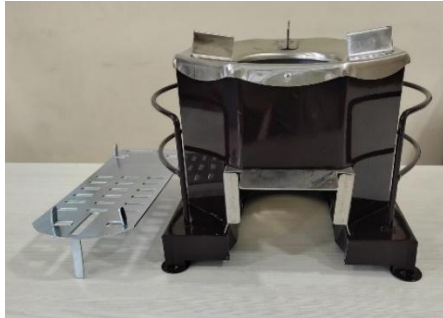
For the implementation of the improved stoves, EKI identifies the potential location where the majority of population is using the traditional mud and three stone stoves. Based on previous experience in other projects, or available information or baseline survey, ICS implementation have been planned. EKI prioritized the appointment of a local implementation partner for the delivery of ICS and local men's and women's teams will be contracted and trained for the implementation of ICS. This boosts local employment and the income of local people. Awareness about the implementation and use of the ICS have been provided to the local community through awareness programs. EKI is conducting the distribution of ICS door to door or by selecting a dedicated central point accessible to the intended user. EKI has deployed a dedicated team to train end users for the proper use of ICS, and to educate users about the benefits towards climate with the use of ICS. The team ensures the proper functioning of ICS and take feedback from users about ICS and address their concerns and may extend the distribution in future as part of this grouped project activity.

The initial project activity instance was installed on 11-May-2022 at Lilongwe, India under the umbrella of this grouped project activity. EKI has distributed 151,154 ICS and may add further in future.

The ICS deployed under the grouped project activity may be either the portable or fixed cookstove manufactured by the different manufacturers, having thermal efficiency of includes more than 25% (as per applied methodology VM0050).

Technical Specifications of cookstoves distributed under the project activity instance to date are as below:

GHG Reduction Technologies Pvt LTD. is ISO 9001:2015 Certified Organization. They have ample experience in metal fabrication along with in-house testing and assembly facility and have strategic tie-ups with tool room and powder coating setups.

TECHNICAL DETAILS			
A)	Cook Stove Type/Category	AGNEEKAA ECO MINI STOVE MODEL4 SE	
			
		Natural Draft	
B)	Secondary Air Supply	Through Natural Draft	
C)	Stove Material Used	Body	Galvanized Iron Sheet
		Body Material Thickness	0.6mm
		Combustion Chamber	Stainless Steel SS 202 grade
		Combustion Chamber Material Thickness	1 mm SS 202/201 2B grade
		Insulating Material	Ceramic Thermal Wool
		Insulating Material Thickness	6 to 8mm
		Top Plate	Stainless Steel SS 202/201 Mat/ Mirror grade
		Top Plate Material Thickness	1 mm
D)	Physical Structure	External Dimension	Length: - 260mm
			Width: - 260mm
			Height: - 248mm
		Combustion Chamber Dimension	Diameter: - 125mm
E)	Grate Thickness	2 mm Material HR sheet	
F)	Weight Of the Stove	3.8 Kg	
G)	Type of Firewood	Firewood 30 to 50 mm diameter	
H)	Feeding Process	Continuous Feeding Front Loading	
I)	Expected life of the stove	7 Years	

J)	Guarantee /Warranty Period	1 Year	
K)	Box Dimension	Outer Side Box Dimension	Length: - 300mm
			Width: - 300mm
			Height: - 270mm
L)	Thermal Efficiency	36.42% Thermal efficiency is determined by the Indian Institute of Technology Delhi ²	

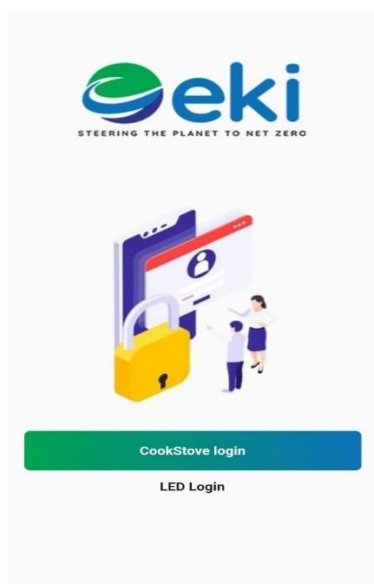
The PP may change for future models of ICS and the same will be transparently reflected during verification. The details and specifications of respective cook stoves will be considered for ER calculation of project activity instance.

The thermal efficiency of the implemented cookstove was tested at the manufacturer's end as per BIS protocols IS: 13152: 2013. Further, continuous research and development activities are being conducted by the manufacturer to improve the efficiency, quality, and design of the stove, by incorporating feedback from end users through routine follow-ups and site visits. EKI may adopt the modified stove with improved efficiency for future distribution under the current grouped project activity

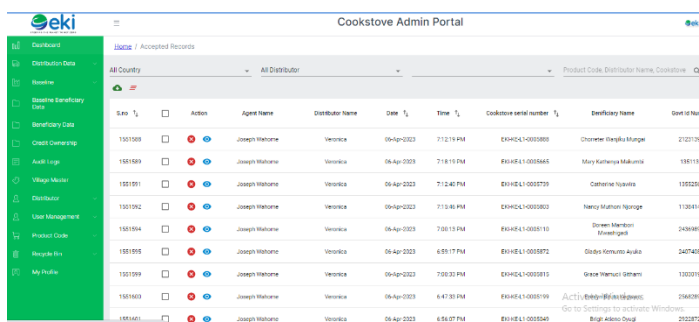
Data collection of ICS end-user

ICS distribution agency is responsible for stove distribution and data collection. The distribution agency will follow the SOP designed by EKI for stove distribution and registration. In starting phase, the ICS registration process was carried out by manual recording process and further upgraded to ICT (e.g., using a mobile app). The distribution team gets training that includes a brief introduction to the project activity, the objective of the distribution of ICS as well as ICS distribution and data collection process.

² refer to Appendix 4



Mobile Application



SNo	Action	Agent Name	Distributor Name	Date	Time	Cookstove serial number	Beneficiary Name	Gvt Id Number
1501509	☐	Joseph Mahanta	Veronica	06-Apr-2023	7:12:19 PM	EX-HSC4-1-0000889	Chomrai Rangshu Mungai	21221396
1501509	☐	Joseph Mahanta	Veronica	06-Apr-2023	7:18:15 PM	EX-HSC4-1-0000888	Miya Ramkumar Mahanta	1581158
1501501	☐	Joseph Mahanta	Veronica	06-Apr-2023	7:12:40 PM	EX-HSC4-1-0000739	Catherine Nualita	15922555
1501502	☐	Joseph Mahanta	Veronica	06-Apr-2023	7:13:06 PM	EX-HSC4-1-0000803	Nancy Mathan Nongmai	11304117
1501504	☐	Joseph Mahanta	Veronica	06-Apr-2023	7:00:13 PM	EX-HSC4-1-0000110	Shreen Mahanta Shreegoud	24369891
1501505	☐	Joseph Mahanta	Veronica	06-Apr-2023	6:59:17 PM	EX-HSC4-1-0000872	Oliver Komara Aulak	24074883
1501509	☐	Joseph Mahanta	Veronica	06-Apr-2023	7:00:20 PM	EX-HSC4-1-0000815	Grew Mahanta Satham	13020391
1501503	☐	Joseph Mahanta	Veronica	06-Apr-2023	6:47:30 PM	EX-HSC4-1-0000199	ACTU-Subin Mahanta	25602096
1501501	☐	Joseph Mahanta	Veronica	06-Apr-2023	6:56:07 PM	EX-HSC4-1-0000849	Go to Settings to activate Windows	25228721

Online Database Dashboard

The project proponent gathered the necessary information to identify households using its ICS during the course of the project. To facilitate this process, each ICS was assigned a unique serial number. This number was 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

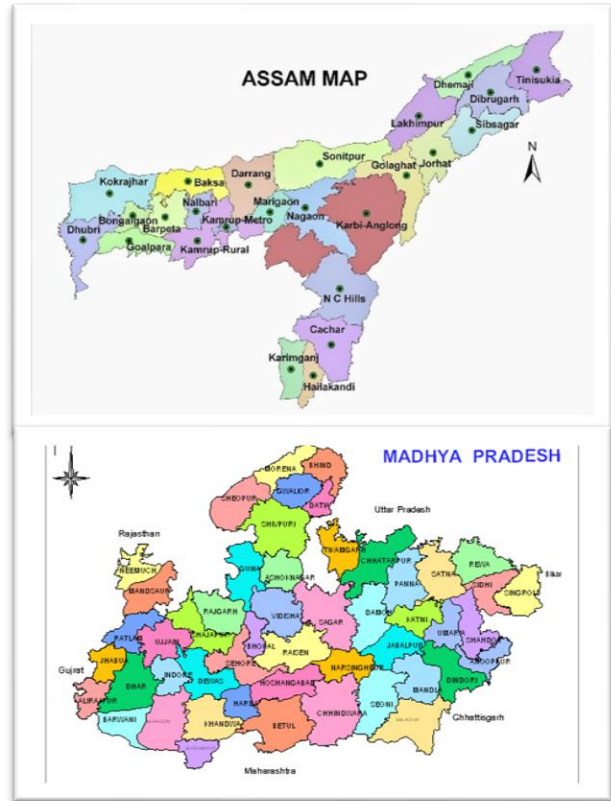
The information collected have been stored in hard copies and/or electronic database excel sheets which serves as a project database for project monitoring and sampling purposes.

1.13 Project Location

All the project activity instances installed during the current monitoring period are located within the geographical boundaries of Assam & Madhya Pradesh states of India.

The geographical boundary for the instances installed during the current monitoring period is delineated in the form of extreme geographic coordinates as follows:

Latitude - 26° 14' 38.9616" N
Longitude - 92° 32' 16.2312" E

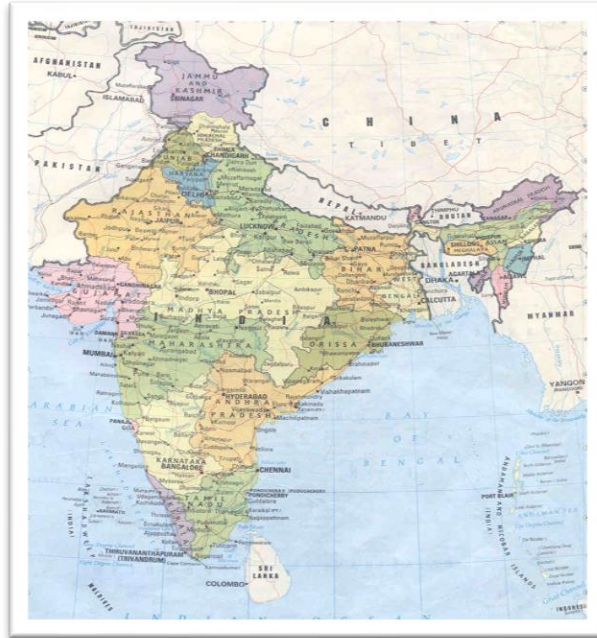


Madhya Pradesh⁴:
Latitude - 23° 28' 23.964" N
Longitude - 77° 56' 52.7928" E

The geographical boundary for projects located in India is delineated in the form of extreme geographic coordinates of India as follows:
Latitude - 8° 44' to 37° 6' N
Longitude - 68° 7' to 97° 25' E

³ <https://www.latlong.net/place/assam-india-6684.html>

⁴ <https://www.latlong.net/place/madhya-pradesh-india-21644.html>



1.14 Conditions Prior to Project Initiation

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

A large number of households in rural India rely on mud or three-stone stoves for their daily cooking needs. These mud or three-stone stoves not only have very low thermal efficiency (15% as per the methodology) but also contribute to health hazards from indoor air (smoke) pollution.

Through the current project activity, the distribution and installation of highly thermal efficient improved cook stoves (ICS) are undertaken to replace the inefficient traditional or three stone fire cookstoves. The ICS burns fuelwood more efficiently thereby improving thermal energy transfer to pots, hence saving firewood and greenhouse gases.



Baseline cooking techniques being used prior to project initiation

1.15 Compliance with Laws, Statutes and Other Regulatory Frameworks

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

1.16 Double Counting and Participation under Other GHG Programs

1.16.1 No Double Issuance

Is the project receiving or seeking credit for reductions and removals from a project activity under another GHG program?

☐ Yes ☒ No

1.16.2 Registration in Other GHG Programs

Has the project registered under any other GHG programs?

☐ Yes ☒ No

Is the project active under the other program?

☐ Yes ☒ No

1.16.3 Projects Rejected by Other GHG Programs

Has the project been rejected by any other GHG programs?

☐ Yes ☒ No

1.17 Double Claiming, Other Forms of Credit, and Scope 3 Emissions

1.17.1 No Double Claiming with Emissions Trading Programs or Binding Emission Limits

Are project reductions and removals or project activities also included in an emissions trading program or binding emission limit? See the VCS Program Definitions for definitions of emissions trading program and binding emission limit.

☐ Yes ☒ No

1.17.2 No Double Claiming with Other Forms of Environmental Credit

Has the project activity sought, received, or is planning to receive credit from another GHG-related environmental credit system? See the VCS Program Definitions for definition of GHG-related environmental credit system.

☐ Yes ☒ No

1.17.3 Supply Chain (Scope 3) Emissions

Do the project activities specified in Section 1.12 affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

If yes:

Is the project proponent(s) or authorized representative a buyer or seller of the product(s) (goods or services) that are part of a supply chain?

☐ Yes ☒ No

If yes:

Has the project proponent(s) or authorized representative posted a public statement on their website saying, "Carbon credits may be issued through Verified Carbon Standard project [project ID] for the greenhouse gas emission reductions or removals associated with [project proponent or authorized representative organization name(s)] [name of product(s) whose emissions footprint is changed by the project activities]."

☐ Yes ☒ No

1.18 Sustainable Development Contributions

The project includes the distribution of fuel-efficient improved cookstoves thereby replacing the use of inefficient cookstoves. The project contributes to social, environmental, economic, and

technological benefits which contribute to the sustainable development of the local environment and the country as follows:

Social benefits

1. Reduces drudgery of women (due to reduced firewood use) who spend long hours and travel long distances to collect firewood. Hence reducing the proportion of time spent on unpaid domestic and care work (SDG 5.4.1)
2. Improves the overall health of women and children by reducing smoke in the kitchen, thus reducing health hazards from indoor air pollution. Therefore, contribute to a decrease in the mortality rate attributed to household and ambient air pollution (SDG 3.9)
3. Better cooking time – the materials used in making the ICS transmit the heat effectively, cooking the food faster. Hence reducing the proportion of time spent on unpaid domestic and care work (SDG 5.4.1)
4. Better cooking environment due to less smoke and carbon residue in the kitchen. Therefore, contribute to an increase in the proportion of the population with primary reliance on clean fuels and technology (SDG 7.1.2)
5. Better quality of life – the rural communities get family time as the whole family can sit and eat together. As the cooking on ICS is faster due to its thermal energy-based mechanism.

Environmental benefits

1. Improves the local environment by reducing the rate of degradation of forests and deforestation in the project area. (SDG 15.2.1)
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 the loss of wages from both not being able to work and having to look after the ill person. Therefore, contribute to reducing the poverty of the participating households (SDG 1.1.1)
3. Reduce global and local environmental pollution and environmental degradation by reducing in use of non-renewable biomass thus leading to a reduction in GHG emissions (SDG 13.0).
4. Less water and effort are needed for cleaning vessels as the cooking process is relatively smoke-free.

Economic benefits

1. Creation of new employment opportunities for local communities through the VCS activity which will contribute towards the Economic growth of the country (SDG 8.3).
2. Reduces purchase of firewood and/or wage equivalent from reduced firewood collection time.

Technological benefits

1. Introduction of efficient technology to the rural communities

1.19 Additional Information Relevant to the Project

1.19.1 Leakage Management

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

No changes have been made in this section compared to the previously validated PD&MR, as the newly applied methodology contains the same provisions, as specified in Section 8.2.3 of VM0050: Energy Efficiency and Fuel-Switch Measures in Cookstoves, v1.0 contains the same provisions.

1.19.2 Commercially Sensitive Information

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

No change in this section as compared to previously validated PD&MR, as the nature of information remains same.

1.19.3 Further Information

Not Applicable. No change in this section as compared to previously validated PD&MR, as there is no further information.

2 SAFEGUARDS AND STAKEHOLDER ENGAGEMENT

2.1 Stakeholder Engagement and Consultation

2.1.1 Stakeholder Identification

Stakeholder Identification

Stakeholder identification is a continuous process to assess the need for engaging entities that are interested in or affected by the project activities. Stakeholders include directly impacted groups such as beneficiary households, as well as other interested parties due to their roles within the local community and at the country level.

Legal or customary tenure/access rights	The manufacturer of the ICSs holds factory ownership and land-use rights, granted through specific legal statutes, for their production facility. End-users possess rights only to the ICS and in the end-user, agreement states that carbon credit ownership lies with the PP, which are secured through an end-user agreement established between the Project Proponent and the end-users.
Stakeholder diversity and changes over time	Stakeholders identified for this project activity are diverse in nature – in terms of socio-economic status, age and gender wise and the diversity is unlikely to change over time.
Expected changes in well-being	Expected changes 1. Economic well-being – the project activity is likely to provide employments to the locality thus economic well beings are expected. 2. Environmental well-being – as this project activity reduces the rate of degradation of forests and deforestation it will bring environmental well-being in the locality.
Location of stakeholders	Sates of Assam and Madhya Pradesh of India
Location of resources	In terms of the location of territories and resources owned or accessed by stakeholders, it can be stated that the end user possesses ownership of their respective houses where Improved Cook Stoves (ICSs) have been installed. Additionally, the manufacturer of ICSs holds ownership of their factory.

2.1.2 Stakeholder Consultation and Ongoing Communication

Date of stakeholder consultation	11-May-2022
Stakeholder engagement process	Various awareness activities such as pamphlet distribution, door-to-door awareness, invitations, etc. were conducted to engage community members and invite participants in the local stakeholder meetings and the project. The villages were identified and village representatives like village heads and sarpanch were invited. For the proposed project activity, household owners (end users) distributors, and their

representatives are relevant main local stakeholders. The public notice was placed in common places of India and were invited telephonically and personally to consult their feedback. EKI distribute cookstoves in India so stakeholder meetings were conducted before the implementation of the project.

Further, PP has also planned to conduct an awareness program/meeting in the new location within the geographical area to the local community for proper use, benefits of the cookstove, and benefits towards the environment. EKI will conduct these meetings where the need for such an awareness program will be required. Such meetings were also named local stakeholder consultation meetings. Details of the same are also provided below:

The details of the Stakeholder Meetings are as follows:

Date of invitation – 01-May-2022

Date of Meeting – 10-May-2022

Location of Meeting – Open Gathering area, Sikaridanga, Udalguri, Assam

Date of invitation – 20-June-2022

Date of Meeting – 04-July-2022

Location of Meeting – Community Hall, Jetpura, Dhar, Madhya Pradesh

Date of invitation – 21-August-2022

Date of Meeting – 19-September-2022

Location of Meeting – Community Hall, Dhengda, Sohpur, Madhya Pradesh

Date of Invitation – 20-August-2022

Date of Meeting – 19-September-2022

Location of Meeting – Community Hall, Gondari, Shivpuri, Madhya Pradesh

Date of Invitation – 07-September-2022

Date of Meeting – 09-October-2022

Location of Meeting – Panchayat house kohla, Jabalpur, Madhya Pradesh

Following is a brief description of the meetings conducted to date:

In the introductory speech, the representative of EKI Energy Services Limited (Project Investor), welcomed the gathering and

	gave a brief about the climate mitigation project activity. After the introductory speech, stakeholders were explained about the distribution of highly efficient cook stoves which will burn firewood more efficiently thereby improving thermal transfer to pots, hence saving fuel and time. The project also reduces the rapidly progressing deforestation but will also reduce health hazards from indoor smoke pollution and women and children will have to spend less time collecting contributing to a reduction in GHG emissions. The Project will also assist the local population by providing employment opportunities to both skilled & unskilled labours. The Minutes of the meetings with stakeholders' queries, and invitation letters will be submitted to the VVB. The list of attendees of the meetings is attached in the Appendix section of this report. The meetings started with an opening speech by a representative of the project participant. He introduced all guests to the dias. The representative of the project participant explained the technical aspects of the project to the stakeholders. He also explained about social, environmental & economic benefits of the project. He also elaborated about the carbon mechanism & its requirement for the current project. After the detailed discussions, the session was open to questions from stakeholders. Most of the questions were related to employment opportunities, economic development, benefits from the project to villagers, and other development activities.
Consultation outcome	Following questions were asked (translated from local language to English) which were adequately explained and answered: The questions raised by the villagers in Assam are summarized below: 1. District – Udalguri: Name of Person: Bina Boro Q: Will the project provide improved health in our village? A: Yes, the project will result in improved health by reducing health hazards from indoor air pollution Name of Person: Ansuli Narzary Q: Will the project release any harmful pollutants or hazardous toxic or notorious substances into the air? A: No, not from what we know there are no project emissions associated with to project, and does not have any negative impacts.

Name of Person: Bholaram Boro

Q: Will the project provide health benefits in our village?

A: Yes, the project reduces health hazards from indoor smoke pollution, and women and children will have to spend less time collecting contributing to a reduction in GHG emissions.

Name of Person: Mayarani Bosumatary

Q: Will there be employment generation due to the project activity for youth from the adjoining areas?

A: Responding about the increased possibilities for employment of local youth due to the project activity, it was pointed out that the preference would be given to the locals in employment at the project site.

Name of Person: Radha Rani Singha

Q: Will project support for reduction in forest cutting

A: Yes, the project requires less biomass, and thus project reduces the rate of deforestation.

Name of Person: Anari Brahma

Q: Will the project leads to water pollution

A: No, the project does not lead to any kind of water pollution.

The question raised by the villagers in the **Madhya Pradesh** site are also summarised below:

1. District - Dhar

Q: Why cook stove is good?

A: The work is done in small woods, due to less smoke the problem of eyes has also ended, even trees do not have to be cut. Food is also prepared quickly

Q: How much firewood is used?

A: The firewood required is less as compared to traditional cook stove

Q: What kind of tree had to be cut for the cookstove?

A: Same type of practices you can follow for tree cutting in the Improved cookstove.

Q: Has the problem of smoke gone down?

A: Yes, smoke comes out to be less than traditional chulah, so it is also good for our health.

2. District – sohpur

Q: Shall we get it for free?

A: Yes

Q: Do we have to go anywhere for receiving it or we can get it to our home directly?

A: You can surely receive it from your home

Q: Why are you taking an I.D. from us?

A: We are taking it for the record purposes. So that we can identify the user and the address during further regular maintenance and monitoring.

Q: What happens if it will get damaged?

A: In any case, if it is damaged, so finally you can get the second (new one).

3. District – Shivpuri

Q: How this cook stove can burn?

A: It required small pieces of wood, and that should not be big in a size.

Q: How we can produce burning energy in it?

A: It required small pieces of wood.

Q: Does any money required for buying it?

A: No! Don't pay for it.

Q: How we can clean it?

A: Please, clean it by utilizing a dry and clean cloth.

Q: What if it goes damaged?

A: Inform about the serial number of the cook stove to customer care number

Q: Can we clean it by using a wet cloth?

A: No! Only dry and clean cloth is required.

4. District – Jabalpur

Q: How is your cook stove different from traditional stoves?

A: It will require less fuel and release less smoke.

Q: Can we use thick firewood pieces in it?

A: No! Only thin and small pieces of firewood are enough.

	Q: What are the profits of this cook stove after utilization? A: Required less fuel, releases minute smoke, and finally no disease will be found after utilizing this cook stove. Q: How much weight is required for cooking food a on cookstove? A: We can use 40- 50 kg of weight to feed a cook stove in India. Q: Is any money required for buying this cook stove? A: No! It is absolutely free. Q: How we can clean it? A: Clean and dry cloth is required for cleaning this cook stove. The stakeholders are satisfied due to the health and environmental benefits and there are no negative comments from stakeholders.
Ongoing communication	As a part of ongoing communication with local stakeholders, end users are informed about the grievance register. PP has provided a customer care number (Included in the ICS Card) for beneficiaries to register their complaints. When a complaint is lodged via this customer care number, it is received and managed at the Head Office (HO) of PP. Subsequently, the complaint is forwarded to our dedicated local representatives for resolution. In addition, field officers have been employed to visit beneficiaries, solicit any grievances, relay them to HO, and take appropriate actions as necessary. End users also have the option of directly contacting a well-trained representative from a distribution channel partner who typically resides in proximity to the beneficiary communities and visits the beneficiaries periodically, for the purpose of recording their complaints. Presently, our organization adheres to a centralized grievance management mechanism, wherein all complaints are consolidated at the HO level and addressed with the collaboration of local representatives. Upon addressing the complaint/Grievance, PP closes it in the register. Thus, ongoing communication of stakeholders is followed through a grievance mechanism. If any concerns are received during the operation of the project activity, the same will be addressed if relevant to the project activity. For the current monitoring period no grievances have been received. EKI will also plan to contact the end users on regular basis to ensure the proper functioning of cookstoves, take feedback to address grievances, and add more users by spreading awareness.

Stakeholder input

There has been not any feedback received during the stakeholder consultation/communication meeting which may require any action.

2.1.3 Free Prior and Informed Consent

Obtaining consent

Following clause 3.18.8 of VCS standard v.4.7, the project proponent has disclosed:

1. The minimum information, including the nature, size, pace, reversibility, and scope of the cook stove project activity;
2. The reason/purpose of the project, which is to efficiently use non-renewable biomass fuel and reduce other environmental and health hazards for the community;
3. The duration of the project activity, set at 7 years;
4. The locations that will be affected, primarily some regions in India; and
5. A preliminary assessment of the likely economic, social, cultural, and environmental impact, including potential risks and fair and equitable benefit sharing in a context that respects the precautionary principle. The stake holders were invited with prior intimation to them and gathered at the stake holder consultation venue on the stipulated date. Stakeholders were briefed verbally that the project would bring solely positive effects on economic, social, cultural, or environmental aspects, including savings in non-renewable biomass fuel and increased employment opportunities.
6. Moreover, information regarding personnel likely to be involved in the execution of the project, including Indigenous Peoples, private sector staff, research institutions, government employees, and others, was shared with stakeholders, clarifying that they would be the end-users/beneficiaries of the project activity.

Hence, it is evident that the affected community was informed prior to the operational date of the project activity.

Outcome of FPIC

The potential of carbon credit that could be generated due to the project was informed and discussed with local stakeholder during stake holder consultation meeting. "As the project device is installed in the household of the beneficiaries on their own will and PP is having transparent agreement with these concerned. Thus, it can be

said that the project has not encroached on land, relocated people without consent, and forced physical or economic displacement.”

2.1.4 Grievance Redress Procedure

Development process	The grievance register is being maintained by the distributors for submission of input/ grievance (if any) related to the project activity. The queries by stakeholders (during question-and-answer session) are noted and documented in the grievance register. In addition, the contact details of the project proponent and local representative/ partner of the project proponent are also provided to the stakeholder's attending the consultation meeting for sharing suggestions/ queries either through call/messaging/ e-mailing post meeting.
Grievance redress procedure	The agreed grievance redress procedure, developed with stakeholders, is as follows: 1. When end users call the customer care number, PP at HO receives the complaint. 2. PP then shares the complaint with their local representative. 3. The local representative works to resolve the grievance. 4. Also, field officers are hired to visit beneficiaries, collect any complaints, and share them with HO. 5. PP also periodically shares SMS with information and the customer care number for end users to reach out. 6. All collected complaints are centralized at the HO level for resolution with the assistance of local representatives. 7. Upon addressing the complaint/Grievance, PP closes it in the register.

2.1.5 Public Comments

Between 13-May-2022 to 12-June-2022, the public comment period, no comments were received for the project activity.

Comments received	Actions taken
No comments were received for the project activity	Not applicable.

2.2 Risks to Stakeholders and the Environment

2.2.1 Management Experience

The project proponent (EKI Energy Services Limited) has substantial experience in implementing the project activity, having executed similar projects in VCS and other GHG mechanisms. Also, PP ensures that the involved community in these projects is properly informed about the project's implementation and their opinions/suggestions are duly considered.

2.2.2 Risk Assessment

	Risks identified	Mitigation or preventative measure(s) taken
Natural and human-induced risks to stakeholders' wellbeing	Risk of smoke inhalation, fire hazards from malfunction, and continued reliance on wood leading to deforestation.	Mitigation or preventative measure(s) taken: The cook stove has been engineered to emit minimal to no smoke, avoiding fire hazards from malfunctions and significantly reducing wood consumption to indirectly combat deforestation. Additionally, the project proponent ensures that the end users receive adequate training in handling the cook stove, mitigating both natural and human-induced risks to stakeholders' wellbeing
Risks to stakeholder participation	Risk of exclusion due to poor communication or lack of awareness	Stakeholder engagement ensured through inclusive communication channels, awareness programs, and community involvement to prevent barriers to participation.
Working conditions	Risk of unsafe cooking environments and accidents with traditional stoves	Using ICS is a safer way for cooking as compare to the traditional cookstove thus it will be rather reducing the safety risk.
Safety of women and girls	Risk of exposure to physical harm during frequent wood collection trips.	ICS reduces wood consumption, lowering the number of trips required. This decreases exposure to potential incidents and enhances safety for women and girls.
Safety of minority and marginalized groups, including children	Risk of burns, accidents, or unsafe cooking practices with traditional stoves.	ICS offers safer cooking methods. Training ensures proper use, reducing risks for marginalized groups and children.

Pollutants (air, noise, discharges to water, generation of waste, and release of hazardous materials and chemical pesticides and fertilizers)	No risk identified, the project does not involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous materials.	Not applicable, as no risk has been identified.
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2.3 Respect for Human Rights and Equity

2.3.1 Labor and Work

	Risks identified ⁵	Mitigation or preventative measure(s) taken
Discrimination	Risk of discrimination based on gender, race, religion, sexual orientation or other habits	PP has provided declaration that no discrimination has occurred. PP follows national labor laws ⁶ prohibiting discrimination and ensures equal opportunity in employment. No cases were reported during the monitoring period.
Sexual harassment	Risk of sexual harassment at the workplace	The PP complies with national laws ⁷ prohibiting sexual harassment and maintains a safe working environment. Employees are informed about workplace conduct policies, and no incidents were reported during the monitoring period.
Equal pay for equal work	Risk of Equal pay for equal work	The project owner follows a standardized salary structure and applicable labor laws ⁸ to ensure equal pay for equal work. Payroll

⁵ The identified risks and commensurate mitigation or preventative measure(s) for forced labor, child labor, and human trafficking, must be inclusive of staff and contracted workers employed by third parties.

⁶ <https://www.labour.gov.in/documents/acts-and-policies?page=1>

⁷ https://doe.gov.in/files/inline-documents/DoE_Prevention_sexual_harassment.pdf

⁸ <https://www.labour.gov.in/documents/acts-and-policies?page=1>

		records are maintained and periodically reviewed to prevent wage discrimination.
Gender equity in labor and work	Risk of gender inequality in labor and work	The PP strictly follows the gender equality in labor and work. Till date PP has provided employment to women in this project activity with an average salary range which is similar to the one which is being paid to other male employees for the same job role. Women employees were recruited as a part of this project for the distribution process, training program and monitoring activities.
Forced labor	Risk of illegal act of recruiting, transporting, harboring, or receiving people through force, fraud.	The PP complies with national labor regulations ⁹ prohibiting forced labor. Employment is voluntary, workers are engaged through formal agreements, and wages are paid in accordance with applicable laws. The PP has also provided a declaration confirming that no cases of forced labor occurred during the monitoring period.
Child labor	Risk of child labor	The PP complies with national laws ¹⁰ prohibiting child labor and maintains employee records to verify the legal working age. The PP has also provided a declaration that confirming that no cases of child labor occurred during the monitoring period.
Human trafficking	Risk of human trafficking	The PP strictly follows the national laws ¹¹ prohibiting human trafficking, and has provided a

⁹ Article 23: Prohibition of traffic in human beings and forced labour - Constitution of India

¹⁰ India's Constitutional Provisions Against Child Labour: A Closer Look • Law Notes by TheLaw.Institute

¹¹ Article 23: Prohibition of traffic in human beings and forced labour - Constitution of India

		declaration that no human trafficking has occurred during the monitoring period
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2.3.2 Human Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified, the project activity safeguards the rights of Indigenous Peoples (IPs), Local Communities (LCs), and customary right holders in accordance with applicable national laws and relevant international human rights law ¹² frameworks, including the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP ¹³) and ILO Convention 169. Free, Prior, and Informed Consent (FPIC) has been obtained from local stakeholders, ensuring voluntary participation and informed decision-making. The project ensures non-discriminatory participation in cookstove distribution and provides employment opportunities to local community members with fair treatment and wages. The project is not implemented on any tangible cultural heritage site and does not affect intangible cultural heritage, while promoting cultural harmony through engagement with IPs, LCs, and customary right holders.	Not applicable, as no risk has been identified.

2.3.3 Indigenous Peoples and Cultural Heritage

¹² <https://www.ohchr.org/sites/default/files/Documents/Publications/fs9Rev.2.pdf>

¹³ https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2018/11/UNDRIP_E_web.pdf

Risks identified	Mitigation(s) or preventative measure taken
No risk identified, the project activity involves the distribution of cookstoves manufactured outside the beneficiaries' land; therefore, no tangible cultural heritage sites are affected. The project does not interfere with the customs, traditions, or beliefs of stakeholders and has no negative impact on intangible cultural heritage. It promotes cultural harmony by engaging diverse community groups and respecting local cultural practices.	Not applicable, as no risk has been identified.

2.3.4 Property Rights

Risks identified	Mitigation or preventative measure(s) taken
No risk identified, PP involves distribution of improved cookstove to households and communities in India and it does not require acquisition of property, hence no impact on any property rights.	Not applicable, as no risk has been identified.

2.3.5 Benefit Sharing

As the project doesn't impact property rights as described in Section 2.3.4 above, the table below is not applicable.

Process used to design the benefit sharing plan	Not Applicable.
Summary of the benefit sharing plan	Not Applicable.

Approval and dissemination of benefit sharing plan	Not Applicable.
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2.4 Ecosystem Health

	Risks identified	Mitigation or preventative measure(s) taken
Impacts on biodiversity and ecosystems	No risk identified, As the ICS consumes less firewood than baseline cooking technologies, it helps to reduce forest degradation. This reduction in demand for fuelwood allows forests to regenerate, protecting wildlife habitats and biodiversity.	Not applicable, as no risk has been identified.
Soil degradation and soil erosion	No risk identified, Improved cookstoves (ICS) reduce the need for woody biomass for cooking. This lowers fuelwood consumption, helps reduce forest degradation, and increases above-ground biomass in nearby forests. Reduced unsustainable wood harvesting also decreases soil erosion and supports improved biodiversity and species richness in the project area.	Not applicable, as no risk has been identified.
Water consumption and stress	No risk identified, the project activity involves implementation and construction of ICS and	Not applicable, as no risk has been identified.

	does not have any negative impacts on water consumption and does not lead to water stress in any way.	
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2.4.1 Rare, Threatened, and Endangered Species

Is the project located in or adjacent to habitats for rare, threatened, or endangered species?

☐ Yes

☒ No

Species and habitat	Since the project activity involves the distribution of ICS, which is not located in or adjacent to habitats for rare, threatened, or endangered species; hence this cell is not applicable.
Areas needed for habitat connectivity	As mentioned above paragraph Execution of project it does not include any activity that can have risk to Areas needed for habitat connectivity. Since the project activity involves the distribution of ICS, which is not located in or adjacent to habitats for rare, threatened, or endangered species; hence this cell is not applicable.

	Risks identified	Mitigation or preventative measure(s) taken
Habitats for rare, threatened, and endangered species	No risk identified, the project activity involves the distribution of improved cookstoves (ICS) at the household level and is not located in or near habitats of rare, threatened, or endangered species. Therefore, no risks are associated with such habitats.	Not applicable, as no risk has been identified.
Areas for habitat connectivity	No risk identified, the project activity only involves the distribution and use of improved cookstoves and does not	Not applicable, as no risk has been identified.

	involve land use change or infrastructure development. Therefore, it does not affect areas required for habitat connectivity.	
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2.4.2 Introduction of Species

Species introduced	Classification	Justification for use	Adverse effects and mitigation
Not applicable, as no live species are introduced under the project activity.	Not applicable, as no species are introduced under the project activity.	No live species are introduced; therefore, this section is not applicable.	As no species are introduced, no adverse effects are anticipated and no mitigation measures are required.

Existing invasive species	Mitigation measures to prevent the spread or continued existence of invasive species
Not applicable, as no invasive species have been identified within the project boundary	No invasive species have been identified within the project boundary. Additionally, as no species are introduced, there is no risk of spread; therefore, no mitigation measures are required.

	Risks identified	Mitigation or preventative measure(s) taken
Invasive species	No risk identified, no invasive species exist in the project area; therefore, there are no risks identified with the project activity.	Not applicable, as no risk has been identified.

2.4.3 Ecosystem Conversion

	Risks identified	Mitigation or preventative measure(s) taken
Ecosystem conversion	No risk identified, the project activity is neither ARR, ALM, WRC nor ACoGS; therefore, no risks associated with ecosystem	Not applicable, as no risk has been identified.

conversion are identified with the project activity.

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

Type (methodology, tool or module).	Reference ID, if applicable	Title	Version
Methodology	VM0050	VM0050 Energy Efficiency and Fuel Switch Measures in Cookstoves	1.0 ¹⁴
Corrections & Clarifications	-	CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES	1.0 ¹⁵
Tool	33	Default values for common parameters	3.0 ¹⁶

3.2 Applicability of Methodology

Methodology ID	Applicability condition	Justification of compliance
VM0050	1) The project activity corresponds to: a) Replacement of non-renewable biomass (e.g., firewood, charcoal)-fired cookstoves with any of the following: i) More efficient project devices that use the same fuel as in the baseline; ii) Efficient project devices fired by renewable biomass or bioethanol; iii) Efficient project devices fired by liquefied petroleum gas (LPG); or iv) Electric-powered project devices.	The project activity replaces non-renewable biomass with more efficient devices that continue to use the same baseline fuel (Wood). Hence, this criterion is fulfilled.

¹⁴ <https://verra.org/wp-content/uploads/2024/10/VM0050-EE-and-Fuel-Switch-Measures-in-Cookstoves-v1.0.pdf>

¹⁵ https://verra.org/wp-content/uploads/2025/02/CC_VM0050_v1.0_Feb2025.pdf

¹⁶ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-33-v3.pdf>

	b) Replacement of solid or liquid fossil fuel (e.g., coal, kerosene)-fired cookstoves with any of the following: i) Efficient project devices fired by renewable biomass or bioethanol; ii) Efficient project devices fired by LPG; - or iii) Electric-powered project devices.	
VM0050	2) Project devices are used in households, communities, institutions, or small or medium enterprises (SMEs), collectively referred to in this methodology as the “target population.”	The project activity is implemented in end-user households; therefore, this criterion is satisfied.
Use of renewable biomass		
VM0050	3) Where renewable biomass is used, it is exclusively renewable and qualifies as one of the following: a) A by-product, residue, or waste stream from agriculture, forestry, and related industries; or b) Originating from dedicated plantations that comply with all relevant applicability conditions in the most recent version of CDM TOOL16.	The project activity does not use renewable biomass therefore this criterion does not apply.
VM0050	4) Where biomass residues are used, they would have been left to decay or burned without energy recovery before implementation of the project activity, and their use does not involve a decrease in carbon pools – in particular of dead wood, litter, or soil organic carbon – on the land areas from which the biomass residues originate.	The project activity does not use biomass residues therefore this criterion does not apply.
VM0050	5) Where biomass residues from a production process are used, project implementation does not result in an increase in the processing capacity of	The project activity does not use biomass residues from a production process therefore this criterion does not apply.

	raw input or any other substantial changes (e.g., product change) in this process.	
VM0050	6) Where more than one type of renewable biomass is used, each of the biomass types used complies with the applicability conditions.	The project activity does not use renewable biomass therefore this criterion does not apply.
VM0050	7) Where project activities introduce renewable biomass as charcoal, it is renewable charcoal produced by efficient charcoal production processes (e.g., retort sedentary kilns, improved sedentary kilns, Casamance kilns). Methane produced during the charcoaling process is captured and destroyed or combusted for energy purposes.	The project activity does not introduce renewable biomass as charcoal into the project boundary therefore this criterion does not apply.
Cookstove characteristics and use		
VM0050	8) Project devices using renewable biomass (fuel-switch) or non-renewable biomass (improved efficiency) are single-pot, multi-pot portable, or in-situ cookstoves with an initial thermal efficiency of at least 25%.	Energy Efficient stoves that are installed or planned to install under this project are single-pot portable wood fired cook stoves that have an efficiency of more than 25%. For all project activity instances, ICS with efficiency of 36.42% has been 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.
VM0050	9) Project devices using LPG or bioethanol are single-pot, multi-pot portable, or in-situ cookstoves with an initial thermal efficiency of at least 30%.	The project activity uses ICSs that utilize wood as a fuel and does not involve LPG or

		bioethanol therefore this criterion does not apply.
VM0050	10) Electric project devices meet the maximum risk factor score of 15 on the Cookstove Durability Protocol and have the following minimum thermal efficiency: a) Hot plates and electric hobs: 40% b) Induction stoves and other electric stoves: 70%	The project activity uses ICSs that utilize wood as a fuel and does not involve Electric devices therefore this criterion does not apply.
VM0050	11) Project devices using LPG comply with all of the following conditions: a) The baseline fuel either includes non-renewable biomass or is a more carbon-intensive fossil fuel; b) The project has a provision for metering LPG supplied to each consumer at the LPG filling station, in order to determine household LPG consumption; and c) The project does not seek to issue any carbon credits for periods after 31 December 2045.	The project activity uses ICSs that utilize wood as a fuel and does not involve LPG therefore this criterion does not apply.
VM0050	12) Electric project devices use the following electricity sources: a) Decentralized renewable energy systems: Decentralized energy systems using fossil fuels are not eligible, except for backup generators that supply less than 1% of the annual electricity of the decentralized renewable energy system. b) Self-generated renewable electricity (with a maximum of 20% electricity from non-renewable sources for backup); or c) National or regional electricity grid.	The project activity uses ICSs that utilize wood as a fuel and does not involve Electric devices therefore this criterion does not apply.

VM0050	13) The project proponent designs incentive mechanisms to reduce the use of inefficient baseline devices and practices that can be replaced by the project devices and describes these mechanisms in the project description	Since the target population cannot afford Improved Cookstoves (ICS), the project proponent has designed an incentive mechanism by providing the ICS free of cost. Hence, this criterion is met.
VM0050	14) Where a project device has ended its technical life, the project proponent either replaces it with a comparable or better project device or retrofits its essential components to continue meeting the minimum service level requirements (i.e., thermal energy generation), otherwise no further emission reductions may be claimed for the project device.	After project device technical life ended, the project proponent either replaces it with a comparable or better project device or retrofits its essential components to continue meeting the minimum service level requirements (i.e., thermal energy generation), otherwise no further emission reductions will be claimed for the project device, therefore this criterion is met.
Avoiding harm and double counting		
VM0050	15) Project proponents implement a method for the distribution and identification of project devices that avoids double counting of emission reductions by other mitigation actions and includes unique product identification on the stove itself at the time of distribution/sale (e.g., program logo, alpha/numeric ID, and end-user location, such as geographic coordinates, complete address information).	Each ICS in this project can be identified by a unique combination of customer name and geographical location, as well as a serial number. The serial number is a unique number which allows 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.
VM0050	16) The project complies with any national, sub-national, or local regulations or guidance for the installation, commercialization, distribution, and use of improved cookstoves and/or fuel supply and use for the target population. National, regional, and local regulatory frameworks for the provision of the type of thermal energy services provided by the project activity must be documented.	The project activity adheres to all applicable national, sub-national, and local regulations or guidelines concerning the installation, distribution, commercialization, and use of improved cookstoves and associated fuel supply for the target population. The project proponent has engaged with the relevant authorities at each stage of project inception and obtained the necessary approvals; therefore, this criterion is satisfied.
VM0050	17) Where project activities reduce emissions from non-renewable biomass, including firewood and charcoal, the risk of double counting is assessed on a national basis by evaluating at validation and crediting period renewal whether there are REDD+ projects or jurisdictional REDD+ programs whose project boundary overlaps with the expected fuel source area of the project. The project proponent must report on the findings of this assessment for informational purposes in the project description.	There are no REDD+ projects or jurisdictional REDD+ programs, therefore this criterion is applicable.

CORRECTION AND CLARIFICATIONS TO VM0050 ENERGY EFFICIENCY AND FUELSWITCH MEASURES IN COOKSTOVES published on 03 February 2025:

Clarification/ correct ions	Applicability condition	Justification of compliance
Clarification 1	As a cross-check, baseline fuel consumption results must be compared with data from reputable sources, including government publications, peer-reviewed literature, third-party studies, or official data and statistics. The sources must be relevant to the context of the project activity, reflecting baseline cookstove types, types of users, and cooking practices. Where used for cross-checks, these sources must reflect data collected no more than five years ago.	The PP have compared the baseline fuel consumption results with data from the “NATIONAL FAMILY HEALTH SURVEY (NFHS-5) MADHYA PRADESH” and “NATIONAL FAMILY HEALTH SURVEY (NFHS-5) Assam”, published by the Ministry of Health and Family Welfare, Government of India. Relevant data can be found in Section 3.4 of this PD.
Clarification 2	For projects using direct measurement techniques (such as stove use monitors or electricity meters), usage rates are not capped. For projects employing surveys, the usage rate is capped at 90% where all of the following customer support actions are undertaken across the entire target population and demonstrated at verification: 1) Selection of technologies and fuels that fully meet the cooking needs of the target population, demonstrated by citing robust research or conducting an investigation of cooking practices and attitudes 2) Implementation of support activities to assist the target population in effectively operating and maintaining their cookstoves. These may include providing materials (print, in-person, or video) on how to operate the cookstove to prepare common local foods, how to troubleshoot common operational issues, and how to make minor repairs (including obtaining necessary replacement parts). All such	The grouped project shall claim up to 90% usage rate (in case of surveys) provided the required customer support actions are substantiated in the monitoring report at the time of verification.

	communications and materials must be provided in local language(s) commonly used in the project area. 3) Provision of a commonly used, toll- free communications channel through which the target population can contact the project proponent to access support (e.g., maintenance and repair services). For projects employing surveys and that do not implement all of these customer support actions across the entire target population, the usage rate is capped at 75%.	
Clarification 3	For usage rate monitoring, the project proponent must collect photographic evidence in the following manner: Take photographs of the stove(s), its components, and the cooking areas. The physical condition of the stove(s) and the cooking areas will help determine stove functionality and use.	The PP shall collect photographic evidence to support usage rate monitoring in accordance with the clarification. Photographs shall be taken of the stove(s), including all key components, as well as the associated cooking areas.
Clarification 4	The project stove efficiency ($\eta_{\text{new,avg,y}}$) must be determined using one of the following methods (options 1–3 prescribed in the methodology) and the corresponding documentation must be provided: 1) Water Boiling Test campaigns achieving 90/10 confidence and precision levels as per the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities 2) Manufacturer-certified value that is determined via the Water Boiling Test, with the test results made available for validation by a VVB 3) Certification from the host country's national standards body or certifying agency based on the Water Boiling Test For all three options, cookstove efficiency must be determined based on the Water Boiling Test following the most recent version of the Water Boiling Test Protocol¹ or equivalent	The Project Proponent will determine the project stove efficiency ($\eta_{\text{new,avg,y}}$) using one of the three options available: 1) The Project Proponent shall conduct WBT campaigns that achieve 90/10 confidence and precision levels, as per the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. 2) The Project Proponent may use manufacturer-certified efficiency values determined via the WBT. 3) The Project Proponent may submit certification issued by the host country's national standards body or another authorized certifying agency, based on the WBT.

	national standard/protocol. While carrying out the tests, the low and high power (not simmer) efficiencies must be used to calculate the average thermal efficiency.																					
Clarification 5	The following requirements must be applied in addition to the Controlled Cooking Test Protocol when conducting Controlled Cooking Tests (CCTs): 1) A minimum of 15 CCTs by five different cooks (three repeats per cook) must be conducted per cookstove model. 2) The CCTs must be alternated between the baseline and project cookstoves to limit potential bias caused by increased cook efficiency over repeats. For artisanal cookstoves, at least three randomly selected samples of each cookstove model must be tested.	Not applicable																				
Clarification 6	The following values of equivalent standard male adults must be applied when determining the parameters Hh_i and $Hh_{j,k}$ (instead of the references provided in Section 9.1 of VM0050, v1.0, parameter table for Hh_i and $Hh_{j,k}$): <table><tr><th>Gender and age</th><th>Fraction of standard adult</th></tr><tr><td>Child 0–14 years</td><td>0.5</td></tr><tr><td>Female</td><td>over</td></tr><tr><td>Male 15–59 years</td><td>1.0</td></tr><tr><td>Male over 59 years</td><td>0.8</td></tr></table>	Gender and age	Fraction of standard adult	Child 0–14 years	0.5	Female	over	Male 15–59 years	1.0	Male over 59 years	0.8	The PP have applied the following values of equivalent standard male adults when determining the parameters Hh_i and $Hh_{j,k}$, Refer Hh_i parameter of section 5.1 for more details. <table><tr><th>Gender and age</th><th>Fraction of standard adult</th></tr><tr><td>Child 0–14 years</td><td>0.5</td></tr><tr><td>Female</td><td>over</td></tr><tr><td>Male 15–59 years</td><td>1.0</td></tr><tr><td>Male over 59 years</td><td>0.8</td></tr></table>	Gender and age	Fraction of standard adult	Child 0–14 years	0.5	Female	over	Male 15–59 years	1.0	Male over 59 years	0.8
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Clarification 7	For the wood-to-charcoal conversion factor (CF), in addition to government-approved/endorsed national or regional values, the following source of data is accepted for claiming values of up to six tonnes of dry wood input per tonne of charcoal output:	Not applicable.																				

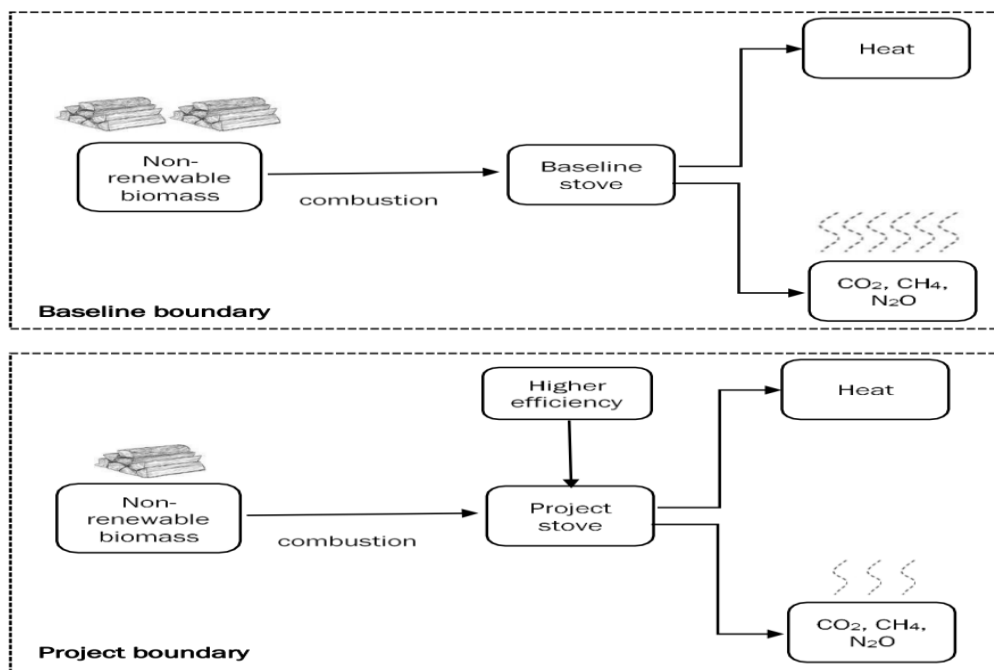
	Published, peer-reviewed literature specific to the project region and context.	
Clarification 8	Footnote 35 must be read as follows: The project proponent may rephrase the question keeping in mind the objective (i.e., whether or not the project cookstove is in usable good condition). Where the project cookstove is not in usable good condition, the project proponent must exclude such stoves from the project database for the whole crediting year and subsequent years. The project proponent may include such stoves again on replacing them with new cookstoves of similar efficiency.	The project proponent shall exclude cookstoves from the project database for the entire crediting year and subsequent years if survey results show that the stoves are not in good condition. These stoves will be removed from the calculations until they are replaced with new cookstoves that have similar efficiency characteristics. Once the replacement stoves are installed, they can be included again in the project database.
Correction 1	The third paragraph on page 14 should be read as follows: The initial baseline survey must be performed prior to validation. The project proponent may employ local third-party agencies to carry out the baseline survey. Follow-up baseline surveys must be conducted at most every two five years from the date of the last survey in control households that do not participate in the project. The project proponent may conduct additional surveys at any time, including at crediting period renewal.	PP shall conduct Follow-up baseline surveys at most every five years from the date of the last survey. The project proponent may conduct additional surveys at any time, including at crediting period renewal. Additionally, the project proponent may employ local third-party agencies to carry out the baseline survey.

3.3 Project Boundary

Source		Gas	Included?	Justification/Explanation
Baseline	Thermal energy generation	CO ₂	Yes	Major source
		CH ₄	Yes	May be significant for some fuels
		N ₂ O	Yes	May be significant for some fuels
		Other	No	No other source identified
Project	Thermal energy generation	CO ₂	Yes	Major source
		CH ₄	Yes	May be significant for some fuels
		N ₂ O	Yes	May be significant for some fuels

Source	Gas	Included?	Justification/Explanation
	Other	No	No other source identified

A representation of the baseline boundary and project boundary is given below:



3.4 Baseline Scenario

Re-establishing the Baseline (for already distributed ICS)

As per VM0050 requirements, for projects where ICS have already been distributed, the baseline has been re-established through control households. Control households (A total of 128 and 105 households have been identified as controlled households in Madhya Pradesh and Assam, respectively, for the purpose of baseline re-establishment) were selected from the vicinity of the project area among households that had not received improved cookstoves and continued to use baseline cooking technologies. These households were established prior to validation, and a pre-implementation baseline survey confirmed their statistical equivalence to project households in terms of baseline fuel types and usage shares, fuel sourcing, and cooking technologies. These control households will be monitored every 5 years, as required under VM0050.

The baseline scenario for this grouped project in Assam and Madhya Pradesh, India is defined according to the technologies, practices, fuel types, and fuel consumption patterns that will be replaced by the project devices in the target population, following the three-step procedure outlined in Section 6.1 of VM0050 v1.0.

Step 1: The project proponent has identified the alternatives as per the paragraph 1, step 1 of the applied methodology based on the outcome of the baseline survey conducted for the

target/controlled baseline households. As per the methodology, the results are supposed to be cross-checked with the relevant and current information from credible literature from the specific project region, official publications (e.g., surveys, studies), or official statistics from government entities or other credible agencies. A report titled, “Roadmap for Access to Clean Cooking Energy in India” dated October 2019 published by NITI Ayog¹⁷ has been referred to identify the alternatives in combined with the baseline report. The major alternative selected are enlisted as below.

- Existing three stone conventional cookstoves with fire wood as fuel.
- Electric cookstoves
- LPG cookstoves
- Kerosine stove
- Improved efficient cookstoves (project activity without registration under a carbon programme)

The project proponent (PP) has conducted the baseline survey of the defined targeted baseline households and adhered to the questionnaire provided in Appendix 1 of the applied methodology, VM0050, version 1.0. The details of the baseline survey have been provided in the below section.

Step 2: An assessment of India’s regulatory framework reveals:

National Policy Context:

- **India’s Updated NDC (2022)**¹⁸: Promotes clean cooking as part of national mitigation actions, with targets for scaling biomass-efficient stoves and transitioning to LPG/electricity where viable.
- **National Programme on Improved Chulhas**¹⁹ and successor initiatives encourage dissemination of energy-efficient biomass cookstoves.
- **NITI Aayog & CCA India – India Clean Cooking Study (2022)**²⁰ identifies traditional biomass cooking as dominant in rural areas of Madhya Pradesh and Assam.

None of the identified alternative in the step 1 is inconsistent with any of the existing policy/regulation in the host country, India. Hence, none of the alternative identified in step 1 is eliminated.

Step 3: The barriers faced by each of the alternatives identified are provided in the below table.

<u>S.I No.</u>	<u>Alternative</u>	<u>Barrier faced</u>
Alternative –1	Existing three stone conventional	There is no barrier faced for this alternative. This is most prevailing practice identified

¹⁷ https://www.niti.gov.in/sites/default/files/2023-02/CEEW-Roadmap_for_Access_to_Clean_Cooking_Energy_in_India-Report.pdf

¹⁸ <https://unfccc.int/sites/default/files/NDC/202208/India%20Updated%20First%20Nationally%20Determined%20Contrib.pdf>

¹⁹ https://www.niti.gov.in/sites/default/files/2023-02/CEEW-Roadmap_for_Access_to_Clean_Cooking_Energy_in_India-Report.pdf

²⁰ <https://www.niti.gov.in/sites/default/files/2022-12/clean-cooking-report.pdf>

	cookstoves with fire wood as fuel.	from the baseline survey and the literature ²¹ referred.
Alternative -2	Electric cookstoves	Financial Barriers²²: - High upfront cost of improved cookstoves relative to rural household income levels - High recurring cost of LPG refills, kerosine and electricity - Affordability constraints for LPG/kerosine and electricity Institutional Barriers²³: - Limited local production and distribution networks for efficient stoves - Weak institutional coordination and enforcement of efficiency/quality standards - Lack of long-term support for stove maintenance and after-sales services Information Barriers²⁴: - Low awareness among households regarding health and efficiency benefits of improved stoves - Deep-rooted cultural cooking practices that favor traditional open fires - Limited dissemination of information on stove durability and fuel savings
Alternative -3	LPG cookstove	
Alternative -4	Kerosine stove	
Alternative -5	Improved efficient cookstoves (project activity without registration under a carbon programme)	
		Despite favorable policies, enforcement and actual adoption of clean cooking fuels remain limited, particularly in rural tribal belts of Madhya Pradesh. Firewood remains the most accessible and culturally preferred cooking fuel, making traditional mud/three-stone stoves the representative baseline under VM0050.

²¹[https://www.niti.gov.in/sites/default/files/2023-02/CEEW-Roadmap for Access to Clean Cooking Energy in India-Report.pdf](https://www.niti.gov.in/sites/default/files/2023-02/CEEW-Roadmap%20for%20Access%20to%20Clean%20Cooking%20Energy%20in%20India-Report.pdf)

²²[https://cag.gov.in/uploads/download_audit_report/2019/Chapter 6 Transition of BPL households to LPG of Report No 14 of 2019 Perf](https://cag.gov.in/uploads/download_audit_report/2019/Chapter_6_Transition_of_BPL_households_to_LPG_of_Report_No_14_of_2019_Perf), <https://www.ceew.in/publications/state-of-clean-cooking-energy-access-in-india-ires-2020-report>

²³ <https://www.ceew.in/publications/how-can-india-improve-clean-cooking-fuel-supply-and-lpg-accessibility>

²⁴ <https://docs.iza.org/dp13967.pdf>, <https://india.mongabay.com/2019/07/despite-health-and-environmental-benefits-why-do-people-hesitate-to-use-improved-cookstoves/>

Remaining Baseline Scenario: The baseline is thus characterized by the continued use of inefficient traditional three-stone or mud cookstoves fuelled by non-renewable firewood to meet thermal energy requirements for household cooking and water heating.

This excludes households already using LPG, electricity, or other non-biomass fuels, in line with VM0050 requirements that baseline technologies must rely primarily on non-renewable biomass.

Baseline Scenario Survey Requirements:

The baseline survey has been designed and conducted in accordance with VM0050 Section 6.2 and the CDM Standard for Sampling and Surveys. The survey objectives include collecting critical information on existing baseline technologies, fuel types, and consumption patterns.

Survey and data collection methods:

The baseline survey has been designed and conducted in accordance with VM0050 Section 6.2 and the CDM Standard for Sampling and Surveys. The survey was implemented as physical on-site visits (face-to-face) prior to validation, engaging households in the control households²⁵ across the project regions in Assam and Madhya Pradesh respectively. For this survey, baseline survey was conducted in nearby to adoption survey samples with comparable household characteristics. The survey instrument was developed to capture critical information on existing baseline technologies, fuel types, consumption patterns, and household characteristics that form the foundation for baseline scenario establishment.

The **Baseline Kitchen Performance Test (KPT)** was performed according to the standards outlined in the "**Kitchen Performance Test (KPT) Version 4.0²⁶**" protocol. The samples for the Baseline KPT were selected from areas nearby the selected Project KPT samples as shown below.

Timing: The Project Proponent (PP) conducted the baseline survey and Kitchen Performance Tests (KPTs) from 08-September-2025 to 15-September-2025 in Madhya Pradesh, and from 08-September-2025 to 22-September-2025 in Assam. This activity was conducted strictly in accordance with VM0050 ver 1.0 and the KPT protocol to accurately assess the pre-project scenario, specifically regarding the type and quantity of fuels consumed and the cooking technologies currently in use. The survey was strategically scheduled to ensure representative and conservative data collection by avoiding major festivals, holidays, and seasonal events that could significantly impact cooking practices and fuel consumption patterns in the control households.

Follow-up baseline surveys must be conducted every five years in control households that do not participate in the project.

Sample size calculations:

²⁵ Control households have been established prior to validation, statistically equivalent to project households.

²⁶ <https://cleancooking.org/binary-data/DOCUMENT/file/000/000/604-1.pdf>

A simplified approach is being used for determining the minimum sample size for parameters listed under APPENDIX 5: SAMPLING GUIDANCE of the methodology.

Simple random sampling is suited to populations that are homogeneous. This method is often used because it is straightforward and ensures that each member of the population has an equal chance of being included in the sample. The sample-based estimate (mean or proportion) is an unbiased estimate of the population parameter.

For baseline survey:

Sample size determination for proportion parameter:

The equation for 90/10 confidence / precision to give the required sample size is:

$$n \geq \frac{1.645^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.645^2 \times p(1-p)}$$

Where:

- n : Sample size of households
- N : Total number of households
- p : Expected proportion of parameter of interest
- 1.645 : Represents the 90% confidence required
- 0.1 : Represents the 10% relative precision

Parameter	Assam	Madhya Pradesh
N (Total number of households)	24,996	1,26,158
p (Expected proportion of parameter of interest)	0.75	0.75
1.645 (Represents the 90% confidence required)	1.645	1.645
0.1 (Represents the 10% relative precision)	0.1	0.1
n (Min Sample Size)	90	91

For BC_{b,i,k,y} – Project KPT samples:

Sample size determination for mean parameter:

$$n \geq \frac{1.645^2 N \times V}{(N-1) \times 0.1^2 + 1.645^2 \times V}$$

$$V = (SD / \text{mean})^2$$

Where:

- n : Required sample size (households to be surveyed)
- N : Total number of households
- SD : Expected standard deviation
- Mean : Expected mean value, depends on similar studies or location
- 1.645 : Represent the 90% confidence required
- 0.1 : Represent the 10% confidence required

Parameter	Assam	Madhya Pradesh
N (Total number of households)	24,996	126,158
SD (Expected standard deviation)	0.3	0.3
mean (Expected mean) kg/per capita/day	0.91	0.91
1.645 (Represents the 90% confidence required)	1.645	1.645
0.1 (Represents the 10% relative precision)	0.1	0.1
V (Variance)	0.109	0.109
n (Min Sample Size)	30	30

Calibration procedures for equipment:

To measure the weight of wood consumed by the project stove during baseline KPT, weighing scales were used. The weighing scales used for baseline purposes were calibrated before starting the survey, as per the national/international standard, or as specified in the user manual of the respective weighing scale.

Details of weighing scales is given below:

- Serial No.: EKI-01716, EKI-01715, EKI-01714, EKI-01713, EKI-01712, EKI-01711, EKI-01686, EKI-01682
- Accuray Class: 5g (0-10kg) & 10g (10-20kg)
- Date of calibration: 04-August-2025

Details of moisture meter is given below:

- Serial No.: EKI-01690, EKI- 01695, EKI- 01693, EKI-01696, EKI-01698, EKI-01689, EKI-01708, EKI-01709
- Precision: $\pm 2\%$ gear 1
- The digital moisture meter used for monitoring is auto-calibrated.

Survey Results and Validation

Baseline Survey:

The details of baseline survey conducted on the ground is as follows:

State	Min sample	Sample conducted
Madhya Pradesh	91	128
Assam	90	105

Hence, minimum sample size criteria have been fulfilled. These 233 identified controlled households are defined subsequent baseline and KPT surveys.

Baseline Fuel Types and Usage:

- Primary fuel: Non-renewable firewood (100% of target households)
- Usage patterns: 3 meals prepared daily.

Fuel Sources:

- Collected firewood: 100% of households (from surrounding forests)

Baseline Technologies:

- Three-stone fires/ Traditional stoves: 100% of target households

Average Household Size:

- MP - 3.82 persons,
- Assam – 4.01 persons.

90/10 assessment:

90/10 assessment	Madhya Pradesh	Assam
Parameter	Value	Value
Sample Mean	3.82	4.01
Sample Size (valid count)	118	100
Standard Deviation	0.43	0.47
Standard error	0.04	0.05
What is the precision attained?	1%	1%
Does the result satisfy the 90/10 rule?	YES	YES

BCb,j,k,y : The details of KPT conducted on the ground is as follows:

State	Min. sample	Sample conducted	Valid sample
Madhya Pradesh	30	38	35
Assam	30	38	36

Outlier identification calculation is given below:

Outlier identification		
Parameter	Madhya Pradesh	Assam
Mean	2.35	2.45
Standard Deviation	0.31	0.35
COV	0.13	0.14
Upper Quartile	2.49	2.66
Lower Quartile	2.14	2.21
Interquartile Range	0.35	0.45
Outlier Threshold (Upper)	3.02	3.33
Outlier Threshold (Lower)	1.61	1.54

After removing outlier, the total valid sample count for Madhya Pradesh and Assam comes out to be 35 and 36 respectively, which is above minimum sample requirements. The final value arrived for Madhya Pradesh and Assam from the baseline KPT sample is 2.290 kg wood/capita/day and 2.402 kg wood/capita/day respectively.

The campaign achieved a confidence and precision of at least 90/10 and its assessment is given below:

90/10 assessment		
Parameter	Madhya Pradesh	Assam
Sample Mean	2.29	2.40
Sample Size (valid count)	35	36
Standard Deviation	0.22	0.29
Standard error	0.04	0.05
What is the precision attained?	2%	3%
Does the result satisfy the 90/10 rule?	YES	YES

Calculation for $BC_{b,i,y}$:

$BC_{b,i,y}$: Mean value X Hhi

Parameter	Discription	Results	Methods to be applied
Mean value	Mean value obtained after 90/10 assessment from baseline KPT	MP: 2.290 kg/per capita/day Assam: 2.402 kg/per capita/day	KPT Protocol
Hhi	Family size obtained after 90/10 assessment from baseline survey	MP: 3.82 (Family Size) Assam:4.01 (Family Size)	
$BC_{b,i,y}$	Fuel used per baseline device type i during year y (tonnes)	MP:3.193 tonnes/HH/year Assam:3.515 tonnes/HH/year	

Survey Validation and Cross-Verification

The survey results have been validated against:

- At all India level, firewood and chips were used by more than two-third (67.35) of rural households, followed by LPG, which was used by 15 per cent households," said a National Sample Survey Organisation study based on NSS 68th round of survey carried out during July, 2011 to June, 2012 ²⁷

²⁷ https://www.business-standard.com/article/pti-stories/two-thirds-of-rural-families-used-firewood-for-cooking-report-115073001772_1.html

- NFHS-5 (2019–21)²⁸ and NFHS-5 (2019–21)²⁹ – Further validation has been carried out using data from National Family Health Survey (2019–21), which provides state-level insights for Madhya Pradesh and Assam, including cooking fuel distribution (LPG/natural gas and wood) and an average rural household size of 4.6 and 4.4 respectively.

Where minor deviations occurred (e.g., higher firewood dependency), these were consistent with the **rural, tribal, and low-income focus** of the project areas compared to national averages that include urban LPG users.

Key Baseline Parameters

Baseline Device Efficiency:

Weighted average efficiency of traditional firewood stoves (three-stone): 15% (VM0050 default).

Follow-up Surveys:

Follow-up surveys must be conducted every 5-years in controlled households and do not participate in the project which will monitor any significant changes in baseline conditions, with measurement campaigns updated if statistically significant variations are detected.

This baseline scenario reflects the reality of cooking practices in India where traditional biomass-fired cookstoves remain dominant despite policy efforts to promote clean cooking alternatives, creating substantial opportunities for emission reductions through improved cookstove deployment.

3.5 Additionality

3.5.1 Regulatory Surplus

Is the project located in an UNFCCC Annex 1 or Non-Annex 1 country?

☐ Annex 1 country ☒ Non-Annex 1 country

Are the project activities mandated by any law, statute, or other regulatory framework?

☐ Yes ☒ No

If the project is located inside a Non-Annex 1 country and the project activities are mandated by a law, statute, or other regulatory framework, are such laws, statutes, or regulatory frameworks systematically enforced?

☐ Yes ☐ No

3.5.2 Additionality Methods

²⁸ [FR374_MadhyaPradesh.pdf](#)

²⁹ [FR374_Assam.pdf](#)

Methodology VM0050 version 01.0 uses activity method for the demonstration of additionality.

Step 1: Regulatory Surplus

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

1. Type of device distributed:

The grouped project distributed ICSs with efficient biomass-fired to replace traditional cookstove with inefficient traditional biomass-fired. This aligns with criterion a) of the methodology “Efficient biomass-fired cookstoves that replace inefficient biomass-fired cookstoves”

2. Distribution mechanism and revenue source:

The proposed project will distribute ICSs free of cost to users which means no money shall be charged to users for the distribution of ICSs; hence there is no financial return from the project other than revenue from the sale of GHG credits. As each ICS has costs associated with the purchase and operation of the equipment, this project will not occur in the absence of GHG credits revenue. The action is not financially viable without the support of revenues from the sale of GHG credits. The significant costs for this project activity, including ICS purchase cost, have been demonstrated to VVB.

Step 3: Project Method

The grouped project will distribute ICSs free cost to end users which means no money shall be charged to users for the distribution of ICSs; hence there is no financial return from the project other than revenue from the sale of GHG credits. So, this step is not applicable.

Conclusion: As the project fulfils the conditions above, it is deemed additional. New project activity instances will meet the additionality criteria of the grouped project. If any project activity instance does not follow the positive list as stipulated by methodology, then additionality needs to demonstrate as per tool requirement.

3.6 Methodology Deviations

No methodology deviations from the applied methodology, VM0050 version 1.0, have been applied during this monitoring period. The project was originally developed under methodology VMR0006 version 1.1 but has now transitioned to methodology VM0050 version 1.0.

4 QUANTIFICATION OF ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

Baseline emissions are calculated as follows:

$$BE_y = \sum_{i,j,k} EC_{i,y} \times N_{j,k,y} \times n_{j,k,y} \times (EF_{b,i,CO_2} \times f_{NRB,y} + EF_{b,i,nonCO_2}) \quad (1)$$

Where:

BE_y	=	Baseline emissions during year y (t CO ₂ e)
$EC_{i,y}$	=	Average energy consumption of baseline device type i in year y (TJ)
$N_{j,k,y}$	=	Number of commissioned project devices of type j from batch k in year y
$n_{j,k,y}$	=	Emission reductions by improved cookstove of type i and batch j during year y in tCO ₂ e
EF_{b,i,CO_2}	=	CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario (t CO ₂ /TJ)
$f_{NRB,y}$	=	Fraction of woody biomass that is established to be non-renewable used by baseline device in year y; this variable is not considered for fossil fuels (fraction)
$EF_{b,i,nonCO_2}$	=	Non-CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario (t CO ₂ e/TJ)
i	=	Baseline device type and its respective fuel type
j	=	Project device type and its respective fuel type

Average Energy Consumption of Baseline Device ($EC_{i,y}$)

As per Section 8.1.1, The average energy consumption of baseline device type i is calculated as follows:

$$EC_{i,y} = BC_{b,i,y} \times NCV_{b,i} \quad (2)$$

Where:

- $BC_{b,i,y}$ = Fuel used per baseline device type i during year y (tonnes)
 $NCV_{b,i}$ = Net calorific value of baseline fuel for baseline device type i (TJ/tonne)

The baseline fuel consumption was determined using “**Option 1: Measurement Campaign**” conducted by the survey team. The sampling approach is consistent with the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities, Version 9.0. The campaign ensures a minimum confidence and precision level of 90/10 for the target parameter—average daily fuel consumption per adult equivalent. The results are then scaled using the average household size (H_{hi}) to derive the value of $BC_{b,i,y}$.

average household size (H_{hi}): MP- 3.82 and Assam- 4.01

Cross-check of $EC_{i,y}$ to address stove stacking:

Project proponents must address stove stacking (continued use of pre-project devices in project households) by comparing the quantity of baseline energy consumption determined by Option 1 above ($EC_{i,y}$) to energy used in the project scenario ($EC_{p,y}$) using back-calculation. Where the results indicate that baseline consumption ($EC_{i,y}$) is higher than that indicated by back calculation from the project scenario ($EC_{est,y}$) then stove stacking is occurring (as $EC_{p,y}$ is unable to completely capture household energy consumption from cooking due to the presence/use of pre-project devices). The back-calculation results ($EC_{est,y}$) must be applied in Equation (1) as a conservative cap.

$$EC_{est,y} = EC_{p,y} \times \frac{\eta_{new,avg,y}}{\eta_{old,avg}} \quad (3)$$

Where:

- $EC_{est,y}$ = Back-calculated energy consumption of the potential mix of devices and fuels in the baseline in year y (TJ)
 $EC_{p,y}$ = Energy used in project scenario by project devices during year y (TJ)
 $\eta_{new,avg,y}$ = Weighted average efficiency of project devices in year y (fraction)
 $\eta_{old,avg}$ = Weighted average efficiency of baseline devices that are replaced by project devices (fraction)

$EC_{p,y}$ must be determined as follows:

$$EC_{p,y} = \sum_{j,k} BC_{p,j,k,y} \times NCV_{p,j} \quad (4)$$

Where:

- $BC_{p,j,k,y}$ = Average quantity of fuel used by project device type j from batch k during year y (tonnes or m^3)
 $NCV_{p,j}$ = Net calorific value of project fuel used in project device type j (TJ/tonne or TJ/ m^3)

For ex-ante Baseline Emission calculation purpose, the project information given below is applied:

- 1) 151,154 project activity instances (ICS) were deployed under this grouped project.
- 2) The life span of each ICS is 7 years; thus, the operational lifetime of each project activity instance is taken as 7 years.
- 3) Annual stove loss rate³⁰ is estimated at 0%. This is assumed for estimation. During actual ER calculation, this value may change. This value is determined during actual verification based on survey results.
- 4) $BC_{ex-ante,b,i}$ Value has been calculated from the Kitchen Performance Test
- 5) $f_{NRB,b,y}$ is 0.07 as per the tool 33 version 3.0

Determining Average Energy Consumption of Baseline Device ($EC_{i,y}$):

The average energy consumption of baseline devices is calculated using Equation 02, Section 8.1.1 of VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves (v1.0).

State	$BC_{ex-ante,b,i}$ (tonnes)	$NCV_{b,i}$ (TJ/tonne)
Assam	3.515	0.0156
Madhya Pradesh	3.193	0.0156

For Assam:

Operating Year of ICS	:	$BC_{b,i,y} \times NCV_{b,i}$	=	$EC_{i,y}$
Year 01	:	3.515×0.0156	=	0.055
Year 02	:	3.515×0.0156	=	0.055
Year 03	:	3.515×0.0156	=	0.055
Year 04	:	3.515×0.0156	=	0.055
Year 05	:	3.515×0.0156	=	0.055
Year 06	:	3.515×0.0156	=	0.055
Year 07	:	3.515×0.0156	=	0.055

For Madhya Pradesh:

Operating Year of ICS	:	$BC_{b,i,y} \times NCV_{b,i}$	=	$EC_{i,y}$
Year 01	:	3.193×0.0156	=	0.050
Year 02	:	3.193×0.0156	=	0.050
Year 03	:	3.193×0.0156	=	0.050
Year 04	:	3.193×0.0156	=	0.050
Year 05	:	3.193×0.0156	=	0.050
Year 06	:	3.193×0.0156	=	0.050
Year 07	:	3.193×0.0156	=	0.050

³⁰ The "Annual stove loss rate" in the context of Improved Cook Stoves (ICS) refers to the annual rate at which ICS units are lost or removed from service, typically due to wear and tear, damage, or other reasons. It represents the number of ICS units that become non-operational or are taken out of use in a given year.

Cross-check of $EC_{i,y}$ to address stove stacking:

A default schedule of linear decrease in efficiency up to the terminal efficiency assumed as 25 per cent³¹ shall be applied through the life span of the project device:

Note: For emission reduction estimation Project proponent has considered Baseline KPT results for baseline energy consumption. However, $EC_{est,y}$ will be calculated during verification for cross-check purposes and minimum value will be considered.

The baselines emissions will be calculated for 1 instance as follows:

Parameter	Description	Value	Source
$EC_{i,y}$	Average energy consumption of baseline device type i in year y (TJ)	For MP: 0.050 For Assam: 0.055	Calculated as per equation 02 Section 8.1.1 of approved methodology VM0050 V1.0.
$N_{j,k,y}$	Number of commissioned project devices of type j from batch k in year y	1	Considered 01 for calculation
$n_{j,k,y}$	Proportion of commissioned project devices of type j from batch k that remain operating in year y (fraction)	0.9	As per adoption survey the usage rate has been found 100% i.e. 1. But the usage rate is capped at 0.9, as per Clarification 2 – Corrections and Clarifications to VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves, v1.0 (03 February 2025), which sets a 90% cap for survey-based usage rates.
$EF_{b,i,CO2}$	CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario (t CO ₂ /TJ)	112	The CO ₂ emission factor for wood (112 tCO ₂ /TJ) is taken from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, and is applied as per Section 9.1, Option 3 of VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves (v1.0).
$f_{NRB,y}$	Fraction of woody biomass that is established to be non-renewable used by baseline device in year y (fraction)	0.07	As per VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves (Data/Parameter: fNRB,y), using the default value from the version 3 of CDM Tool 33.
$EF_{b,i,nonCO2}$	Non-CO ₂ emission factor for fuel used by baseline device type i in the	9.46	As per VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves (Option 3 of the methodology guidelines), using the default value for wood fuel from the 2019 Refinement to the 2006 Intergovernmental

³¹ As per approved Meth Page no 37 option B Data/Parameter $\eta_{new,avg,y}$

baseline scenario (t CO ₂ e/TJ)	Panel on Climate Change Guidelines for National Greenhouse Gas Inventories.
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Assam							
$\sum_{i,j,k} EC_{i,y} \times N_{j,k,y} \times n_{j,k,y} \times (EF_{b,i,CO2} \times f_{NRB,y} + EF_{b,i,nonCO2})$							
Operational Year	EC _{i,y}	N _{j,k,y}	n _{j,k,y}	EF _{b,i,CO2}	f _{NRB}	EF _{b,i,nonCO2}	BE _y
Year 1	0.055	1	0.9	112	07%	9.46	0.854
Year 2	0.055	1	0.9	112	07%	9.46	0.854
Year 3	0.055	1	0.9	112	07%	9.46	0.854
Year 4	0.055	1	0.9	112	07%	9.46	0.854
Year 5	0.055	1	0.9	112	07%	9.46	0.854
Year 6	0.055	1	0.9	112	07%	9.46	0.854
Year 7	0.055	1	0.9	112	07%	9.46	0.854

Madhya Pradesh							
$\sum_{i,j,k} EC_{i,y} \times N_{j,k,y} \times n_{j,k,y} \times (EF_{b,i,CO2} \times f_{NRB,y} + EF_{b,i,nonCO2})$							
Operational Year	EC _{i,y}	N _{j,k,y}	n _{j,k,y}	EF _{b,i,CO2}	f _{NRB}	EF _{b,i,nonCO2}	BE _y
Year 1	0.050	1	0.9	112	07%	9.46	0.776
Year 2	0.050	1	0.9	112	07%	9.46	0.776
Year 3	0.050	1	0.9	112	07%	9.46	0.776
Year 4	0.050	1	0.9	112	07%	9.46	0.776
Year 5	0.050	1	0.9	112	07%	9.46	0.776
Year 6	0.050	1	0.9	112	07%	9.46	0.776
Year 7	0.050	1	0.9	112	07%	9.46	0.776

Similarly, for all ICS, the baseline emissions are calculated, and the summarized results are presented below:

Year	BE _y - Total
11-May-2022 to 31-December-2022	28,464
01-January-2023 to 31- December -2023	119,183
01-January-2024 to 31- December -2024	119,510
01-January-2025 to 31- December -2025	119,183
01-January-2026 to 31- December -2026	119,183
01-January-2027 to 31- December -2027	119,183
01-January-2028 to 31- December 2028	119,510
01-January-2029 to 10-May-2029	42,449

4.2 Project Emissions

Project emissions are calculated as follows:

$$PE_y = PE_{energy,y} + PE_{others,y}$$

Where:

PE_y	=	Project emissions during year y (t CO ₂ e)
$PE_{energy,y}$	=	Project emissions from energy consumption of project devices in year y (t CO ₂ e)
$PE_{others,y}$	=	Project emissions from other sources in year y (t CO ₂ e) There is no other sources of project emission involved apart from burning of firewood in the project cookstoves

$PE_{energy,y}$ from Biomass is calculated as follows:

Project emissions from energy consumption of project devices using biomass, fossil fuels, or bioethanol in year y are calculated as follows ($PE_{energy,y}$):

$$PE_{energy,y} = \sum_j \sum_k BC_{p,j,k,y} \times N_{j,k,y} \times NCV_{p,j} \times n_{j,k,y} \times (EF_{p,j,CO_2} \times f_{NRB,y} + EF_{p,j,nonCO_2})$$

Where:

$BC_{p,j,k,y}$	=	Average quantity of fuel used by project device type j from batch k during year y (tonnes)
$N_{j,k,y}$	=	Number of commissioned project devices of type j from batch k in year y
$n_{j,k,y}$	=	Proportion of commissioned project devices of type j from batch k that remain operating in year y (fraction)
$NCV_{p,j}$	=	Net calorific value of project fuel used in project device type j (TJ/tonne)
EF_{p,j,CO_2}	=	CO ₂ emission factor for fuel used by project device type j in the project scenario (tCO ₂ /TJ)
$f_{NRB,y}$	=	Fraction of woody biomass that is established to be non-renewable used by baseline device in year y; this variable is not considered for fossil fuels (fraction)
$EF_{p,j,nonCO_2}$	=	Non-CO ₂ emission factor for fuel used by project device type j (t CO ₂ e/TJ)

Parameter	Description	Value	Source
$BC_{p,j,k,y}$	Average quantity of fuel used by project device type j from batch k during year y (tonnes)	For MP: 1.559 For Assam: 1.708	Project KPT Result
$N_{j,k,y}$	Number of commissioned project devices of type j from batch k in year y	1	Considered 01 for calculation

$n_{j,k,y}$	Proportion of commissioned project devices of type j from batch k that remain operating in year y (fraction)	0.9	As per adoption survey the usage rate has been found 100% i.e. 1. But the usage rate is capped at 0.9, as per Clarification 2 – Corrections and Clarifications to VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves, v1.0 (03 February 2025), which sets a 90% cap for survey-based usage rates.
$NCV_{p,j}$	Net calorific value of project fuel used in project device type j (TJ/tonne)	0.0156	Option 3 as specified in the methodology guidelines applies the default value for wood fuel provided in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories under the VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves methodology.
EF_{p,j,CO_2}	CO ₂ emission factor for fuel used by project device type j in the project scenario (tCO ₂ /TJ)	112	The CO ₂ emission factor for wood (112 tCO ₂ /TJ) is taken from the 2006 IPCC Guidelines for National Greenhouse Gas Inventories and the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories, and is applied as per Section 9.1, Option 3 of VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves (v1.0).
$f_{NRB,y}$	Fraction of woody biomass that is established to be non-renewable used by baseline device in year y; this variable is not considered for fossil fuels (fraction)	0.07	As per VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves (Data/Parameter: fNRB,y), using the default value from the version 3 of CDM Tool 33.

$EF_{p,j,nonCO2}$	Non-CO ₂ emission factor for fuel used by project device type j (t CO ₂ e/TJ)	9.46	As per VM0050 Energy Efficiency and Fuel-Switch Measures in Cookstoves (Option 3 of the methodology guidelines), using the default value for wood fuel from the 2019 Refinement to the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories.
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BC_{p,j,k,y} for Project devices:

The project fuel consumption was determined using “**Option 1: Measurement Campaign**” conducted by the survey team. The sampling approach is consistent with the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities, Version 9.0. The campaign ensures a minimum confidence and precision level of 90/10 for the target parameter—average daily fuel consumption per adult equivalent. The results are then scaled using the average household size (Hhi) to derive the value of **BC_{p,j,k,y}**.

For ex-ante Project Emission calculation purpose, the project information given below is applied:

- 1) 151,154 project activity instances (ICS) were deployed under this grouped project.
- 2) The life span of each ICS is 7 years; thus, the operational lifetime of each project activity instance is taken as 7 years.
- 3) Annual stove loss rate³² is estimated at 0%. This is assumed for estimation. During actual ER calculation, this value may change. This value is determined during actual verification based on survey results.
- 4) $BC_{p,j,k,y}$ has been calculated from the value for Kitchen Performance Test
- 5) $f_{NRB,b,y}$ is 0.07 as per the tool 33 version 3.0

The project emissions will be calculated for 1 instance as follows:

Assam								
$\sum_k BC_{p,j,k,y} \times N_{j,k,y} \times NCV_{p,j} \times n_{j,k,y} \times (EF_{p,j,CO2} \times f_{NRB,y} + EF_{p,j,nonCO2})$								
Operational Year	BC _{p,j,k,y}	NCV _{p,j}	N _{j,k,y}	n _{j,k,y}	EF _{p,i,CO2}	f _{NRB}	EF _{p,i,nonCO2}	PE _{energy,y}
Year 1	1.708	0.0156	1	0.9	112	07%	9.46	0.415

³² The "Annual stove loss rate" in the context of Improved Cook Stoves (ICS) refers to the annual rate at which ICS units are lost or removed from service, typically due to wear and tear, damage, or other reasons. It represents the number of ICS units that become non-operational or are taken out of use in a given year.

Year 2	1.708	0.0156	1	0.9	112	07%	9.46	0.415
Year 3	1.708	0.0156	1	0.9	112	07%	9.46	0.415
Year 4	1.708	0.0156	1	0.9	112	07%	9.46	0.415
Year 5	1.708	0.0156	1	0.9	112	07%	9.46	0.415
Year 6	1.708	0.0156	1	0.9	112	07%	9.46	0.415
Year 7	1.708	0.0156	1	0.9	112	07%	9.46	0.415

Madhya Pradesh								
$\sum_k BC_{p,j,k,y} \times N_{j,k,y} \times NCV_{p,j} \times n_{j,k,y} \times (EF_{p,j,CO2} \times f_{NRB,y} + EF_{p,j,nonCO2})$								
Operational Year	BC _{p,j,k,y}	NCV _{p,j}	N _{j,k,y}	n _{j,k,y}	EF _{p,j,CO2}	f _{NRB}	EF _{p,j,nonCO2}	PE _{energy,y}
Year 1	1.559	0.0156	1	0.9	112	07%	9.46	0.379
Year 2	1.559	0.0156	1	0.9	112	07%	9.46	0.379
Year 3	1.559	0.0156	1	0.9	112	07%	9.46	0.379
Year 4	1.559	0.0156	1	0.9	112	07%	9.46	0.379
Year 5	1.559	0.0156	1	0.9	112	07%	9.46	0.379
Year 6	1.559	0.0156	1	0.9	112	07%	9.46	0.379
Year 7	1.559	0.0156	1	0.9	112	07%	9.46	0.379

Similarly, for all ICS, the project emissions are calculated, and the summarized results are presented below:

Year	PE _{energy,y} - Total
11-May-2022 to 31-December-2022	13,871
01-January-2023 to 31- December -2023	58,142
01-January-2024 to 31- December -2024	58,301
01-January-2025 to 31- December -2025	58,142
01-January-2026 to 31- December -2026	58,142
01-January-2027 to 31- December -2027	58,142
01-January-2028 to 31- December 2028	58,301
01-January-2029 to 10-May-2029	20,708

4.3 Leakage Emissions

Leakage emissions under the grouped project arise from the reduced or avoided use of non-renewable biomass. Accordingly, as specified in Section 8.3 of VCS Methodology VM0050, Version 1.0, an adjustment factor of 0.95 is applied to the GHG emission reductions. This factor is incorporated in the emission reduction equation presented in Section 4.4 below, consistent with Equation (11) in Section 8.3 (Point 1) of the methodology, that is, $0.95 \times (BE_y - PE_y)$.

4.4 Estimated GHG Emission Reductions and Carbon Dioxide Removals

Net GHG emission reductions are calculated as follows:

$$ER_y = (BE_y - PE_y) * 0.95 - LE_{RB,y} \quad (11)$$

Where:

ER_y : Emission reductions during year y in t CO₂e

BE_y : Baseline emissions during year y in t CO₂e

PE_y : Project emissions during year y in t CO₂e

$LE_{RB,y}$: Leakage emissions associated with use of renewable biomass during year y (t CO₂e)

$LE_{RB,y}$ is considered zero, as the project activity does not involve the use of renewable biomass; therefore, no leakage emissions associated with renewable biomass occur, as per approved methodology VM0050, Section 8.3 – Leakage Emissions.

Hence Net GHG emission reductions are calculated as follows:

For Madhya Pradesh:

$$ER_y = (BE_y - PE_y) * 0.95 - LE_{RB,y}$$

$$ER_y = (0.776 - 0.379) * 0.95 - 0$$

$$ER_y = 0.377 \text{ tCO}_2\text{e}$$

For Assam:

$$ER_y = (BE_y - PE_y) * 0.95 - LE_{RB,y}$$

$$ER_y = (0.854 - 0.415) * 0.95 - 0$$

$$ER_y = 0.417 \text{ tCO}_2\text{e}$$

Operating Year of ICS	Assam			Madhya Pradesh		
	Baseline Emission	Project Emission	Emission reduction	Baseline Emission	Project Emission	Emission reduction
1	0.85	0.41	0.42	0.78	0.38	0.38
2	0.85	0.41	0.42	0.78	0.38	0.38
3	0.85	0.41	0.42	0.78	0.38	0.38
4	0.85	0.41	0.42	0.78	0.38	0.38
5	0.85	0.41	0.42	0.78	0.38	0.38
6	0.85	0.41	0.42	0.78	0.38	0.38
7	0.85	0.41	0.42	0.78	0.38	0.38

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

Vintage period	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated reduction VCU (tCO ₂ e)	Estimated removal VCU (tCO ₂ e)	Estimated total VCUs (tCO ₂ e)
11-May-2022 to 31-December-2022	28,464	13,871	0	13,863	0	13,863

01-January-2023 to 31-December - 2023	119,183	58,142	0	57,989	0	57,989
01-January-2024 to 31-December - 2024	119,510	58,301	0	58,148	0	58,148
01-January-2025 to 31-December - 2025	119,183	58,142	0	57,989	0	57,989
01-January-2026 to 31-December - 2026	119,183	58,142	0	57,989	0	57,989
01-January-2027 to 31-December - 2027	119,183	58,142	0	57,989	0	57,989
01-January-2028 to 31-December - 2028	119,510	58,301	0	58,148	0	58,148
01-January-2029 to 10-May-2029	42,449	20,708	0	20,654	0	20,654
Total	786,664	383,749	0	348,252	0	348,252

The estimated annual average GHG emissions reductions over the first crediting period is calculated to be 54,681 tCO₂e.

5 MONITORING

5.1 Data and Parameters Available at Validation

Data / Parameter	EF _{b,i,CO2} EF _{p,j,CO2}
Data unit	tCO ₂ /TJ

Description	CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario CO ₂ emission factor for fuel used by project device type j in the project scenario
Source of data	Option 3 as specified by the methodology guidelines: default value for wood fuel from the 2019 refinement of the 2006 IPCC Guidelines for National Greenhouse Gas ³³
Value applied	112
Justification of choice of data or description of measurement methods and procedures applied	The data is selected in accordance with the applied methodology and relevant guidelines. Since wood is the fuel used in the baseline scenario, the IPCC default value provided in the methodology has been applied.
Purpose of data	Calculation of baseline and project emissions
Comments	NA

Data / Parameter	EF _{b,i,nonCO2} EF _{p,j,nonCO2}
Data unit	tCO ₂ /TJ
Description	Non-CO ₂ emission factor for fuel used by baseline device type i in the baseline scenario Non-CO ₂ emission factor for fuel used by project device type j in the project scenario
Source of data	Option 3 as specified by the methodology guidelines: default value for wood fuel from the 2019 refinement of the 2006 IPCC Guidelines for National Greenhouse Gas ³⁴
Value applied	9.46
Justification of choice of data or description of measurement methods and procedures applied	The data is selected in accordance with the applied methodology and relevant guidelines. Since wood is the fuel used in the baseline scenario, the IPCC default value provided in the methodology has been applied.
Purpose of data	Calculation of baseline and project emissions
Comments	NA

³³ [19R_V2_2_Ch02_Stationary_Combustion.pdf](#)

³⁴ [19R_V2_2_Ch02_Stationary_Combustion.pdf](#)

Data / Parameter	NCV _{b,i} NCV _{p,j}
Data unit	TJ/tonne
Description	Net calorific value of baseline fuel used by baseline device type i Net calorific value of project fuel used by project device type j
Source of data	Option 3 as specified in the methodology guidelines applies the default value for wood fuel provided in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories ³⁵ .
Value applied	0.0156
Justification of choice of data or description of measurement methods and procedures applied	The data is selected in accordance with the applied methodology and relevant guidelines. Since wood is the fuel used in the baseline scenario, the IPCC default value provided in the methodology has been applied.
Purpose of data	Calculation of baseline and project emissions
Comments	NA

Data / Parameter	BC _{ex-ante,b,i}
Data unit	tonnes
Description	Ex-ante annual average quantity of fuel used per baseline device type i
Source of data	Option 1 as specified in the VM0050 v1.0 methodology guidelines: Kitchen Performance Test
Value applied	For Assam: 3.515 For Madhya Pradesh: 3.193
Justification of choice of data or description of measurement methods and procedures applied	The baseline fuel consumption will be determined using “Option 1: Measurement Campaign” to be conducted by the survey team. The sampling approach will be consistent with the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities, Version 9.0. The campaign ensures a minimum confidence and precision level of 90/10 for the target parameter—average daily fuel consumption per adult equivalent. The results will then be scaled using the average household size (H_{hi}) to derive the value of BC_{b,i,y}. For more detail, please refer section 3.4. <u>Cross-check of EC_{i,y} to address stove stacking:</u> Project proponents address stove stacking (continued use of pre-project devices in project households) by comparing the quantity of baseline

³⁵ https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/2_Volume2/19R_V2_2_Ch02_Stationary_Combustion.pdf

	energy consumption determined by Option 1 above ($EC_{i,y}$) to energy used in the project scenario ($EC_{p,y}$) using back-calculation. Where the results indicate that baseline consumption ($EC_{i,y}$) is higher than that indicated by back calculation from the project scenario ($EC_{est,y}$) then stove stacking is occurring (as $EC_{p,y}$ is unable to completely capture household energy consumption from cooking due to the presence/use of pre-project devices). The back-calculation results ($EC_{est,y}$) must be applied in Equation (1) as a conservative cap.
Purpose of data	Calculation of baseline emissions
Comments	NA

Data / Parameter	$\eta_{old,avg}$
Data unit	Fraction
Description	Weighted average efficiency of baseline devices that are replaced by project devices
Source of data	Option 1 as specified in the VM0050 v1.0 methodology
Value applied	15% (wood)
Justification of choice of data or description of measurement methods and procedures applied	For three stone fire using firewood or a cookstove with no improved combustion air supply or flue gas ventilation, default value of 15% as per applied methodology VM0050, v1.0
Purpose of data	Calculation of baseline emissions
Comments	NA

Data / Parameter	Hhi
Data unit	Equivalent standard male adults
Description	Average household size of the target population using device type i
Source of data	Baseline survey The campaign has achieved a confidence and precision of at least 90/10 for the target parameter of average household size.
Value applied	MP: 3.82 Assam: 4.01
Justification of choice of data or description of	The data is obtained through a baseline survey conducted in accordance with the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities (Version 9.0). The survey

measurement methods and procedures applied	achieves a minimum confidence and precision level of 90/10 for the target parameter (average household size), ensuring statistically reliable and representative data for the project activity. For more detail, please refer section 3.4. The data will be updated every five years during follow-up baseline surveys.
Purpose of data	Estimation of average energy consumption when applying Option 1: Measurement campaign Cross-checking energy and fuel consumption values
Comments	This parameter must be determined ex ante via the baseline survey as described in Section 6.2 of applied methodology VM0050, v1.0.

5.2 Data and Parameters Monitored

Data / Parameter	$N_{j,k,y}$
Data unit	Number
Description	Number of commissioned project devices of type j from batch k in year y
Source of data	Monitoring
Description of measurement methods and procedures to be applied	The following data will be recorded during project activity implementation: 1) Number of new devices distributed under the project activity, identified by the type of device and date of commissioning; and 2) Identification information of the recipient of the device distributed under the project activity (e.g., name, address, phone number). Data management and reporting of this information must adhere to both data privacy requirements and good practice.
Frequency of monitoring/recording	Not Applicable, no equipment is used to monitor this parameter
Value applied	Assam: 24,996 Madhya Pradesh: 126,158 Total: 151,154 PP may distribute up to 1,000,000 ICSs
Monitoring equipment	Sample Survey
QA/QC procedures to be applied	Not Applicable.
Purpose of data	Calculation of baseline and project emissions
Calculation method	Not Applicable

Comments	PP has distributed one ICS per household and the same is followed for each project activity instance. PP may add further in future.
Data / Parameter	$\eta_{j,k,y}$
Data unit	Fraction
Description	Proportion of commissioned project devices of type j from batch k that are still being used regularly in year y
Source of data	Monitoring (Project Usage Surveys)
Description of measurement methods and procedures to be applied	Option 2 (surveys): Based on an adoption rate determined by a survey according to the most recent version of the CDM Standard for Sampling and Surveys for Project Activities and Programmes of Activities and achieving 90/10 confidence precision for the proportion of devices in operation. The lower end of the 90% confidence interval will be used to ensure conservativeness. The adoption survey will include: a) Kitchen observation (which includes visual and physical checks of the stove and its components), including photographic evidence; and b) Interview with the primary cook. The project proponent will provide proof of training and supervision to ensure field teams have the capacity required to complete adoption surveys successfully. The average of the sum of "yes" (1) responses to the adoption survey question "If yes, have you used the stove regularly since you installed it?" (where this response is cross-checked and confirmed with the physical check of the stove and the coherency with the responses to the following questions of the survey), and "no" (0) responses to the questions "do you use the project cookstove?" and "If yes, have you used the stove regularly since you installed it?". Where the project does not achieve the target precision in a monitoring period, the project proponent will apply an appropriate conservativeness deduction as per Section 4 of the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. As per Correction and Clarifications to VM0050: Energy Efficiency and Fuel Switch Measures in Cookstoves v1.0, Clarification 2, the project will apply survey-based methods and fully comply with all required customer-support criteria. Cookstove technologies have been selected based on local cooking needs and practices. Comprehensive user training, locally translated materials, and ongoing support for operation and maintenance are being provided across the entire target population. A toll-free support system is also available for user assistance. Therefore, the project qualifies for the 90% usage-rate cap, and a value of 0.9 is applied for the ex-ante calculation. Evidence demonstrating compliance with all the above criteria will be provided to the VVB during each verification throughout the crediting period to maintain eligibility for the 90% usage-rate cap

Frequency of monitoring/recording	Option 2 (surveys): annually
Value applied	0.9
Monitoring equipment	Not applicable
QA/QC procedures to be applied	The date on which a sample project device stopped being used should be taken as follows: Option 2 (surveys): Where the project device is not working or not being used at the time of conducting the survey, it should be conservatively assumed that the project device has not been active since the date on which the last adoption survey was conducted.
Purpose of data	Calculation of baseline and project emissions
Calculation method	The 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 the same is followed for each project activity instance

Data / Parameter	$BC_{b,i,y}$
Data unit	Tonnes/HH/Year
Description	Fuel used per baseline device type i during year y
Source of data	Option 1 as specified in the VM0050 v1.0 methodology : A measurement campaign following the Kitchen Performance Test Protocol in control households that do not participate in the project, established prior to validation as statistically equivalent to the pre-project conditions of project households regarding baseline fuel consumption.
Description of measurement methods and procedures to be applied	Option 1: Follow-up baseline surveys will be conducted every five years in control households that do not participate in the project, established prior to validation as statistically equivalent to the pre-project conditions of project households regarding baseline fuel consumption. Measurement campaign will be updated where follow-up baseline surveys show that the fuels, fuel sources, or technologies used by the control group are no longer statistically equivalent to the pre-project conditions of project households. During the follow-up survey, if the cooking practices of any household are found to differ from the pre-project conditions, such households will be replaced with new control households for continued monitoring. The measurement campaign will be designed, carried out, and analyzed in compliance with the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. The result will be scaled appropriately using the average household size (H_{hi}) to obtain the value of $BC_{b,i,y}$.

	<u>Justification of Data Choice and Description of Measurement Methods:</u> The parameter value is derived from in situ Kitchen Performance Tests (KPTs) conducted for 38 households (Each state) sampled from project activity. The baseline KPT campaign was undertaken between 08-September-2025 to 15-September-2025 in Madhya Pradesh, and from 08-September-2025 to 22-September-2025 in Assam by locally engaged field staff who received specialized training aligned with the Kitchen Performance Protocol v4.0 (March-2018). All measurements followed the procedures, quality control requirements, and data handling provisions of the protocol. In accordance with VM0050, baseline households were identified prior to validation through a structured baseline survey implemented by trained local surveyors. Households were selected to represent the target population's pre project cooking conditions, including baseline fuel types and percentage of use, fuel sourcing patterns, and baseline cooking technologies. Control households were also established prior to validation, following the methodology requirement that they must be statistically equivalent to project households with respect to baseline fuel mix, usage shares, sourcing practices, and cooking technologies. Equivalence was confirmed through comparison of key baseline indicators collected during the initial survey. These control households do not participate in the project and will be revisited every five years from the date of the last survey for follow up baseline surveys, ensuring continuity and methodological compliance for future monitoring periods. <u>Sampling and Statistical Justification:</u> As per the sampling approach outlined in Appendix 5 of the methodology, a minimum sample size of 30 households was required to achieve 90/10 confidence and precision (see Section 5.3.2 for detailed calculations). A total of 38 households (from each state) were surveyed, resulting in an oversampling factor of 1.2, thereby increasing the statistical robustness of the parameter estimate. Comprehensive analysis of the monitored data is provided in the accompanying Excel file and in Section 5.3.2 of this document. The observed standard deviation for MP and Assam was 0.14 and 0.22, with a resulting precision of 1% and 2% respectively. These results demonstrate compliance with the methodology's 90/10 confidence precision requirement and justify the use of the measured parameter value for baseline estimation.
Frequency of monitoring/recording	Every Five years
Value applied	For Assam: 3.515 For Madhya Pradesh: 3.193
Monitoring equipment	KPT measurements Weighing scales & Digital Moisture Meter
QA/QC procedures to be applied	Sample households assessed during the baseline survey/KPT have been designated as the control group for follow-up surveys. The sample was selected randomly in line with the CDM Sampling and Survey Guidelines and the approach described in Section 3.4 of the PD. These households

	were non-participants at the time of the survey and had not received project ICS. The dataset includes all required information and unique household identification details to ensure traceability during baseline reassessment after five years, and the records have been submitted to the VERRA Secretariat. To minimize risk, these households will be excluded from stove distribution campaigns. Any independent adoption of improved stoves will be captured during reassessment, ensuring a conservative baseline. If some households are not traceable, new households may be added or reassessment will be conducted with the available control households
Purpose of data	Calculation of baseline emissions
Calculation method	Not Applicable
Comments	Not Applicable

Data / Parameter	$f_{NRB,y}$
Data unit	Fraction or %
Description	Fraction of woody biomass that is established to be non-renewable used by device in year y
Source of data	Option (3) Default value of the most recent version of CDM TOOL33
Description of measurement methods and procedures to be applied	The fraction of non-renewable biomass is determined using the default value from Version 3 of CDM Tool 33 ³⁶ , Table 03, as permitted under VM0050 – Energy Efficiency and Fuel-Switch Measures in Cookstoves.
Frequency of monitoring/recording	Ex ante for each crediting period
Value applied	0.7 or 7%
Monitoring equipment	Not applicable
QA/QC procedures to be applied	Not applicable
Purpose of data	Calculation of baseline and project emissions
Calculation method	Not Applicable, the $f_{NRB,y}$ value is directly sourced as a default value from CDM Tool 33, Version 3, Table 03 as permitted under VM0050, requiring no independent field measurement or calculation. This default value is directly applied in the baseline emission reduction formula to quantify project GHG reductions.

³⁶ <https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-33-v3.pdf>

Comments	This parameter has been fixed ex ante for the crediting period.																
Data / Parameter	$\eta_{new,avg,y}$																
Data unit	Fraction/Percentage																
Description	Weighted average efficiency of project devices in year y																
Source of data	As per section 9.2 of approved methodology VM0050 V1.0, A linear decrease in efficiency is applied over the lifespan of the project device until it reaches the terminal efficiency of 25%.																
Description of measurement methods and procedures to be applied	The efficiency will be established using following method, and the corresponding documentation will be presented: - Certification from the host country's national standards body or certifying agency. Certification is provided by the Indian Institute of Technology Delhi (Centre for Energy Studies), which conducted testing in accordance with BIS standards (IS:13152:2013). The decrease in thermal efficiency of project device j from batch k due to aging will be accounted for during the monitoring period, as presented below. - A linear decrease approach, applying a default schedule of linearly decreasing efficiency up to the terminal efficiency (assumed to be 25%) through the lifespan of the project device³⁷. The weighted average efficiency is calculated by multiplying the energy consumption $EC_{p,j,k,y}$ of the project device j of batch k by its thermal efficiency $\eta_{new,j,k,y}$ and then summing these values for all project devices. The resulting sum is divided by the total energy consumption of all project devices to determine the weighted average efficiency.																
Frequency of monitoring/recording	Annually																
Value applied	<table><tr><td>Year</td><td>$\eta_{new,avg,y}$</td></tr><tr><td>Year 1</td><td>35.60%</td></tr><tr><td>Year 2</td><td>33.97%</td></tr><tr><td>Year 3</td><td>32.34%</td></tr><tr><td>Year 4</td><td>30.71%</td></tr><tr><td>Year 5</td><td>29.08%</td></tr><tr><td>Year 6</td><td>27.45%</td></tr></table>			Year	$\eta_{new,avg,y}$	Year 1	35.60%	Year 2	33.97%	Year 3	32.34%	Year 4	30.71%	Year 5	29.08%	Year 6	27.45%
Year	$\eta_{new,avg,y}$																
Year 1	35.60%																
Year 2	33.97%																
Year 3	32.34%																
Year 4	30.71%																
Year 5	29.08%																
Year 6	27.45%																

³⁷ Consider non-binding best practice example 6 in AMS-II.G

		Year 7	25.82%
Monitoring equipment	Not Applicable		
QA/QC procedures to be applied	Not Applicable		
Purpose of data	Calculation of baseline and project emissions		
Calculation method	Not Applicable		
Comments	Not Applicable		

Data / Parameter	$BC_{p,j,k,y}$
Data unit	tonnes
Description	Average quantity of fuel used by project device type j from batch k during year y
Source of data	Option 1 as specified in the VM0050 v1.0 methodology
Description of measurement methods and procedures to be applied	PP has chosen Option 1: Kitchen performance test (KPT) as per the applied methodology (VM0050, v1.0). A measurement campaign following the Kitchen Performance Test protocol will be designed, carried out, and analyzed in compliance with the most recent version of the CDM Standard for Sampling and Surveys for CDM Project Activities and Programmes of Activities. The campaign will achieve confidence and precision of at least 90/10 for the target parameter of average daily fuel consumption per adult equivalent. The result must be scaled appropriately using the average household size to obtain the value of $BC_{p,j,k,y}$. Project activities applying KPTs will also measure the quantity of fuel used by pre-project devices that are still operational and provide it in the calculation sheet and monitoring reports (this is a reporting-only requirement).
Frequency of monitoring/recording	Biennial
Value applied	For Assam: 1.708 For Madhya Pradesh: 1.559
Monitoring equipment	Weighing scales and moisture meters
QA/QC procedures to be applied	The digital moisture meter used for monitoring is auto-calibrated. However, the weighing scales require manual calibration and are calibrated prior to the survey in accordance with national or international standards, or as specified in the respective user manuals.

	All weighing scales used for monitoring are calibrated before the start of the survey in accordance with applicable national/international standards or manufacturer specifications. As in the baseline KPTs, field staff conducting the tests receive specific training to ensure reliable data collection. The test results from each batch must meet the 90/10 confidence and precision requirement specified in the methodology; otherwise, additional sample tests will be conducted until the requirement is achieved.
Purpose of data	Calculation of baseline and project emissions
Calculation method	Not Applicable
Comments	Not Applicable

5.3 Monitoring Plan

For measurement/monitoring of two parameters based on a representative sample. The Simple random sampling approach proposed in APPENDIX 5: SAMPLING GUIDANCE of the methodology have been used for determining the minimum sample size in which case compliance with 90/10 confidence precision is not obligatory.

According to the Guidelines on Sampling and Surveys for CDM Project Activities and Programmes of Activities, it is important to distinguish between two categories of data when determining sample size: those related to mean and those related to proportions.

Sample size refers to the number of observations or individuals included in a statistical study or experiment. Determining the appropriate sample size is critical to ensuring that the results of the study are accurate and representative of the population being studied.

- Mean values: Corresponding to average values inferred from data that are often referred to as continuous variables
- Proportion (or percentage) values: Values that are derived from data that are described as attributes, yes/no data, or binary data

The following table specifies the parameters described in the methodology to be considered in relation to the CDM sampling guidelines, together with a description of the type of data to which they correspond (mean or proportion).

Monitored Parameters:

The project involves the monitoring parameter set out in Section 5.2 (Data and Parameters Monitored) above are describe below:

No.	Monitoring Parameters	Unit	Parameter type	Monitoring frequency
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1	$N_{y,j,k}$ Number of project devices of type i and batch j operating during year y	Number	Mean value	Every time that new project devices are distributed
2	$n_{j,k,y}$ Proportion of commissioned project devices of type j from batch k that are still being used regularly in year y	Fraction	Proportion	Option 2 (surveys): annually
3	$BC_{b,i,y}$ Fuel used per baseline device type i during year y	tonnes	Mean value	Every Five years
4	$\eta_{new,avg,y}$ Weighted average efficiency of project devices in year y	Percentage	Calculated	Annually
5	$BC_{p,j,k,y}$ Average quantity of fuel used by project device type j from batch k during year y	tonnes	Mean value	Biennial
Hh_i	Average household size of the target population using device type i	-	Mean value	Every five years during follow-up baseline surveys

Target Population

The "population" in this applied methodology refers to the total number of project devices commissioned, whereas the sample target represents a specific subset of these devices. The target population for $n_{j,k,y}$ and $BC_{p,j,k,y}$ is the complete set of appliances (ICS) deployed under the project.

The target population for fuel used per baseline device ($BC_{b,i,y}$) is set in control households that do not participate in the project, established prior to validation as statistically equivalent to the pre project conditions of project households regarding baseline fuel consumption.

Sampling Method

The project involves the 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 project boundary. Since the characteristics of the population (for example quantity of biomass consumed per household) are more similar. Therefore, a simple random sampling technique is being used to calculate the samples. Samples will be drawn by using the random number generator.

Sample Size

A simplified approach is being used for determining the minimum sample size for parameters listed under APPENDIX 5: SAMPLING GUIDANCE of the methodology.

The project proponent has chosen to use the same sample to monitor both 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 a sampling effort with one common survey, or separate sampling efforts and surveys are undertaken for each parameter. Therefore, the project proponent has sample a combination of parameters i.e. $n_{j,k,y}$ - Via Usage survey and $BC_{b,i,y}$, $BC_{p,j,k,y}$ - Via KPT 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 below in this section have been adjusted upwards to account for non-responses, Project proponent will determine the appropriate non-responses rate based on previous experience.

Simple random sampling is suited to populations that are homogeneous. This method is often used because it is straightforward and ensures that each member of the population has an equal chance of being included in the sample. The sample-based estimate (mean or proportion) is an unbiased estimate of the population parameter.

Sample size determination for mean parameter

$$n \geq \frac{1.645^2 N \times V}{(N - 1) \times 0.1^2 + 1.645^2 \times V}$$

$$V = \left(\frac{SD}{mean} \right)^2$$

Where:

n	=	Sample size for households
N	=	Total number of households
SD	=	Expected standard deviation
$mean$	=	Expected mean, depends on similar studies or location
1.645	=	Represents the 90% confidence required
0.1	=	Represents the 10% relative precision

Sample size determination for proportion parameter

The equation for a 90/10 confidence/precision to give the required sample size is:

$$n \geq \frac{1.645^2 N \times p(1-p)}{(N-1) \times 0.1^2 \times p^2 + 1.645^2 \times p(1-p)}$$

Where:

n	=	Sample size for households
N	=	Total number of households
p	=	Expected proportion of parameter of interest
1.645	=	Represents the 90% confidence required
0.1	=	Represents the 10% relative precision

Sampling Frame

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

Data to be collected

Field Measurement:

$n_{y,j,j}$: The survey involves a visual inspection of the premises to see if ICS is operational and in use. An interview with the end user also been conducted *as per the binding survey questionnaire* given in Appendix 3 of applied methodology. Based on the response received from the end user, the value of the parameter has been calculated.

$BC_{b,i,y}$ and $BC_{p,j,k,y}$: These parameters will be calculated via KPT as the KPT protocol³⁸.

The interviewer can fill out the monitoring questionnaire and KPT form data manually or using an app-based electronic device (e.g., mobile phone) at each sample household. Data recorded through a manual process will be recorded and transferred into the electronic database.

Stoves Users are requested to provide the required information to the interviewer. Users can share their background information in several ways, including by speaking directly with designated focal points who may reside in their communities. Soft copies of the surveys and KPT form have been kept in a database with a backup. The original survey questionnaires and KPT forms filled by the survey team and signed by the users are stored in the project office. A backup of the survey and KPT results 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.

³⁸ Kitchen Performance Test (KPT) Version 4.0. <https://cleancooking.org/binary-data/DOCUMENT/file/000/000/604-1.pdf>

Quality Assurance/Quality Control

The project proponent considers 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 depends on the cost of each data collection approach and the logistics required. The project proponent determines the most effective measure for each parameter from the following list:

A sample 20% larger than the minimum required will be drawn to create a buffer. If respondents from the primary sample do not respond, additional data will be collected from the reserve sample to meet the minimum size requirement.

The sampling plan has the following procedures in place to ensure good-quality data. The project proponent ensures that field personnel have reviewed, understand, and agreed to follow the monitoring plan procedures, including provisions for maximizing response rates and documenting out-of-population cases, refusals, and other sources of non-response. A quality control and assurance strategy has been documented. Quality control and assurance strategies include addressing non-sampling errors, such as non-response or bias from the interviewer. The project proponent or a competent third party designated by the project proponent with the proper skills have trained the monitoring personnel on how to properly survey households to prevent bias from the interviewer. In the case a household refuses to participate, another household will be chosen at random. To reduce interviewer bias, a good questionnaire design and well-tested questionnaires are being used. The surveyor at the site gets training from EKI for the monitoring survey and KPT. Additionally, gives weighing machine calibration instructions.

The sample data for the mean value parameter is continuous and therefore the presence of outliers is possible. Data points identified as outliers are examined further to correct for possible transcription and data entry errors but are omitted from the analysis if no such administrative errors exist.

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.

In case, the end user experiences any issues with the ICS, he or she can call the service center with the help of customer service number available on the box of ICS, to report the issues. After receiving a complaint, the maintenance team will take the necessary action immediately to resolve the issue. 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.

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 if the end users receive a replacement or retrofit of comparable or higher quality. This will be achieved by:

- Replacing the stove with a comparable or better model, or
- Retrofitting essential components with a performance guarantee.

Projects shall complete these replacements or retrofits within the crediting period. If devices are retrofitted or repaired before or at the end of their technical life, emission reductions will continue to be claimed only if:

1. Detailed documentation is maintained for each device (parts replaced, specifications, personnel involved, and retrofit date), and

A manufacturer warranty or a guarantee from an experienced repair company confirms that the stove's performance (efficiency, safety, indoor emissions) remains comparable to the original.

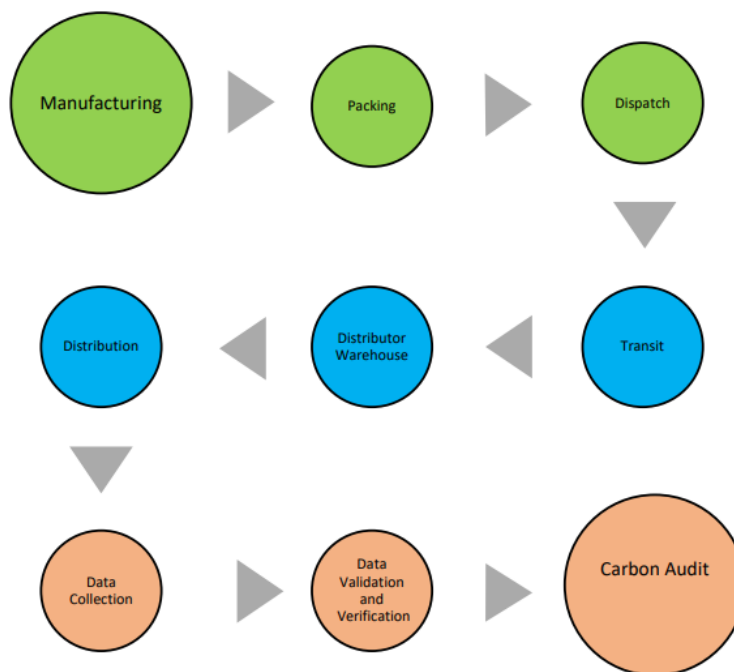
Data collection and management methods:

The methods for Distribution, Monitoring, and reporting data and parameters are described below.

Each distributed ICS is equipped with a label stating the unique serial number which is used for references and monitoring. The unique serial numbers provide the basis for monitoring activities and prevent instances of double counting.

The ICS is transported by the distributing entity to the Project site. Users receive the ICS through distributing entities only. The ICS data collection and management system uses a safe data storage system using the mobile app. ICS distribution data are also being collected using an offline mechanism i.e., manual entry. Developing an app allowed much larger-scale data collection & management. Additionally, the app offers details on the activities of distribution partners and accumulated data sets.

The ICS flow is described in the following figure:



Calibration procedures for monitoring equipment:

To measure the weight of wood consumed by the project stove during KPT, weighing scales are being used. The weighing scales used for monitoring purposes are being calibrated before starting the survey, as per the national/international standard, or as specified in the user manual of the respective weighing scale.

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 are then being factored into the emissions reduction calculations and result in the request for the issuance of VCUs. The parameters are applied for emission reduction calculations. The stoves that are not in use will be excluded from emissions reduction calculations and will not be counted towards the total number of ICS in operation during the monitoring period.

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 participators. 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.

Roles and responsibilities:

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

Monitoring Responsibility:

Data/Parameters	Monitoring Responsibility
Date of commissioning of batch j	1. Distributor / Operational Team (Local Representative) member is responsible for signing of end user agreement with beneficiary being handed over with the improved cookstoves. The beneficiary information in the end user agreement will be transferred by Distributor / Operational Team (Local Representative) member in excel database/spreadsheet including the information relating to the commissioning. 2. The beneficiary as well as the commissioning data/information in the beneficiary database/excel spreadsheet will be cross verified by EKIESL team member with the hard copy of the end user agreement to ensure correctness of data transfer.
n _{j,k,y} Proportion of commissioned project devices of type j from batch k that are still being used regularly in year y	1. EKIESL team member has followed the adoption survey template given in applied methodology for developing of the structured interview schedule/questionnaire, training of surveyors and cross verify the tabulated data with the original information schedule. 2. The information will be collected by the team members of the Distributor / Operational Team (Local Representative) through sampling survey. The team members will also be responsible for data triangulation and data tabulation in excel spreadsheet.

	3. The survey data/information in the excel/spreadsheet will be cross verified by EKIESL team member to ensure correctness of data transfer.
BC_{b,i,y} Fuel used per baseline device type i during year y BC_{p,j,k,y} Average quantity of fuel used by project device type j from batch k during year y	1. EKIESL team member will be responsible for developing of the structured KPT schedule/Form, training of surveyors and cross verify the tabulated data with the original information schedule. 2. The information will be collected by the team members of the Distributor / Operational Team(Local Representative) through sampling survey. The team members will also be responsible for data triangulation and data tabulation in excel spreadsheet. 3. The survey data/information in the excel/spreadsheet will be cross verified by EKIESL teammember with the hard copy survey schedule to ensure correctness of data transfer.

APPENDIX 1: COMMERCIALLY SENSITIVE INFORMATION

Use the table below to describe the commercially sensitive information included in the project description to be excluded in the public version.

Section	Information	Justification
NA	NA	NA