



CLEAN COOKSTOVES FOR RURAL INDIA



EKI Energy Services Limited

Project Title	Clean Cookstoves for Rural India
Version	04
Date of Issue	06-December-2023
Prepared By	EKI Energy Services Ltd.
Contact	Address: Office no. 201, Plot 48, Scheme 78 part 2 Vijay Nagar, Near Brilliant Convention Centre, Indore - 452010 (M.P, India) Email: ramkrishna.patil@enkingint.org & registry@enkingint.org Telephone: +91 99075 34900 Website: www.enkingint.org

CONTENTS

1	PROJECT DETAILS.....	4
1.1	Summary Description of the Project	4
1.2	Sectoral Scope and Project Type	5
1.3	Project Eligibility	5
1.4	Project Design	5
1.5	Project Proponent	8
1.6	Other Entities Involved in the Project	8
1.7	Ownership.....	10
1.8	Project Start Date	10
1.9	Project Crediting Period	11
1.10	Project Scale and Estimated GHG Emission Reductions or Removals	11
1.11	Description of the Project Activity.....	12
1.12	Project Location	17
1.13	Conditions Prior to Project Initiation	18
1.14	Compliance with Laws, Statutes and Other Regulatory Frameworks.....	19
1.15	Participation under Other GHG Programs	19
1.16	Other Forms of Credit.....	20
1.17	Sustainable Development Contributions	20
1.18	Additional Information Relevant to the Project	24
2	SAFEGUARDS	24
2.1	No Net Harm	24
2.2	Local Stakeholder Consultation	24
2.3	Environmental Impact	29
2.4	Public Comments	29
2.5	AFOLU-Specific Safeguards	29
3	APPLICATION OF METHODOLOGY.....	29
3.1	Title and Reference of Methodology	29
3.2	Applicability of Methodology	30
3.3	Project Boundary	33
3.4	Baseline Scenario	34

3.5	Additionality	35
3.6	Methodology Deviations	35
4	IMPLEMENTATION STATUS	36
4.1	Implementation Status of the Project Activity	36
5	ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS.....	36
5.1	Baseline Emissions	36
5.2	Project Emissions	36
5.3	Leakage.....	36
5.4	Estimated Net GHG Emission Reductions and Removals.....	36
6	MONITORING	45
6.1	Data and Parameters Available at Validation	45
6.2	Data and Parameters Monitored.....	49
6.3	Monitoring Plan.....	52
7	QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS	63
7.1	Data and Parameters Monitored.....	63
7.2	Baseline Emissions	65
7.3	Project Emissions	65
7.4	Leakage.....	65
7.5	Net GHG Emission Reductions and Removals.....	65
	APPENDIX 1: <LOCAL STAKEHOLDER MEETING EVIDENCE>.....	68
	APPENDIX 2: < OTHER SUPPORTING EVIDENCE >.....	88
	APPENDIX 3: < END USER AGREEMENT >	91
	APPENDIX 4: < STOVE EFFICIENCY CERTIFICATE >	93
	APPENDIX 5: < A COMPARATIVE ANALYSIS OF THE ESTIMATED FNRB WITH THE LITERATURE REFERRED BY TOOL 30 >.....	94
	BIBLIOGRAPHY	101

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 Joint PD & MR.

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 reduction from the project for Assam is expected to be 4.58 tCO₂e per Year for each project activity instance (i.e., ICS) and for Madhya Pradesh, it is expected to be 4.76 tCO₂e per Year for each project activity instance (i.e., ICS) respectively. The average annual GHG emission reductions for the group project activity are expected to be 714,973 tCO₂e, and hence, total GHG emission reductions over the entire crediting period are expected to be 5,004,811 tCO₂e.

The 1st monitoring survey for the grouped project activity was conducted from 03-January-2023 to 27-February-2023 for Madhya Pradesh and from 28-January-2023 to 16-February-2023 for Assam. PP have considered a 10% reduction in the fuelwood consumption for the project stove and additional 10% reduction in stove usage rate on the achieved survey results for the current monitoring period taking as a conservative approach. The project results in a total emission reduction of 164,300 tCO₂e over the monitoring period of 11-May-2022 to 31-December-2022.

1.2 Sectoral Scope and Project Type

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

Sectoral scope: 03 - Energy demand

Type: II – Energy efficiency improvement projects

The project is a grouped project

1.3 Project Eligibility

The project involves energy-efficient cookstove distribution which falls under the category of efficiency improvements in the thermal application, therefore it is eligible under the scope of the VCS Program. As per VCS Standard Version 4.4, section 2.1.3, efficiency improvements in thermal applications (e.g., cook stoves) are not excluded, hence the project is eligible under VCS.

1.4 Project Design

The project is a grouped project

Eligibility Criteria

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

No.	Criterion	How the new project activity instances comply
1	Meet the applicability conditions set out in the methodology applied to the project	New project activity instances (Energy Efficient Cook Stoves) will meet the applicability conditions set out in Section 3.2 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 to be adopted in the project by replacing traditional cookstoves in households.
3	Apply the technologies or measures in the same manner as specified in the project description.	Only energy efficient cook stoves are to be 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 will be installed within India 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	All new project activity instances will use the activity method for demonstration of additionality. Step 1: Regulatory Surplus

	specified project activity and geographic area.	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. (Section 3.6.9 of the VCS standard v4.4)	No project activity instance shall exceed the applicable limit of 180 GWh_{th}/y. Since the project activity instances installed to date and proposed to be installed have/will have the same model, hence expected annual energy saving for each instance is less than 0.018 GWh_{th}/y which is less than 0.01% of the threshold limit. As the annual energy saving is below 1% of the limit, therefore no project activity instance is identified and divided into clusters.

Along with the above points, the Inclusion of New Project Activity Instances follows the below criteria

Grouped projects provide for the inclusion of new project activity instances subsequent to the initial validation of the project.

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.
2	Conform with at least one complete set of eligibility criteria for the inclusion of new project activity	New project activity instances will comply with a complete set of eligibility criteria as mentioned

No.	Criterion	How the new project activity instances comply
	instances. Partial conformance with multiple sets of eligibility criteria is insufficient.	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	Be included in an updated project description, with updated project location information (as set out in Section 3.11), which shall be validated at the time of verification against the applicable set of eligibility criteria.	New project activity instances should be included by validating eligibility criteria as mentioned in this document
5	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 date upon which the project activity instance began reducing or removing GHG emissions).	New project activity instances ownership needs to be evidenced from the start date of the respective project activity instance.
6	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.
7	Be eligible for crediting from the start date of the project activity instance through to the end of the project crediting period (only).	New project activity instances are eligible to claim credits from the start date of the project activity instance through to the end of the project crediting period.
8	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 criteria by being eligible for crediting only from the beginning of the verification period in which they are included in the grouped project

No.	Criterion	How the new project activity instances comply
9	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.
10	Adhere to the clustering and capacity limit requirements for multiple project activity instances set out in 3.6.8 - 3.6.9.	Section 3.6.8 of the VCS standard v4.4 is not applicable for the project those have been listed on or before 21 December 2022 and validation is completed by 30 June 2023. The current project was listed on 13 May 2022 and validation was completed on 19 May 2023. Therefore, the revised condition mentioned in section 3.6.8 of VCS standard v4.4 is not applicable to the current project ¹ . Applicability for Section 3.6.9, already provided in the above table.

1.5 Project Proponent

Organization name	EKI Energy Services Limited
Contact person	Manish Dabkara
Title	Managing Director & Chief Executive Officer
Address	Office No 201, Plot No 48, Scheme 78, Vijay Nagar Part- II, Indore 452010, India
Telephone	+91 99075 34900
Email	manish@enkingint.org and registry@enkingint.org

1.6 Other Entities Involved in the Project

Bishikha LLP, Envro Queen Pvt Ltd, JPS Enterprise, and Aransh Agro are associated with EKI energy for ICS distribution in Assam and MP and GHG Reduction Technologies Pvt LTD is the manufacturer of the ICS deployed under the project activity to date.

Organization name	Bibisikha LLP
Role in the project	Distributor

¹ Please refer the "DECEMBER 2022 VCS PROGRAM UPDATE: OVERVIEW OF SUBSTANTIVE UPDATES TO PROGRAM RULES AND REQUIREMENTS AND EFFECTIVE DATES, Release Date: 21 December 2022

Contact person	Bibek Bora
Title	Director – Owner
Address	Khongia Goon near Borkhongia High School Dist- Jorhat – 785616 Assam
Telephone	+91 7002513935
Email	Bibek@bibsikha.in

Organization name	Envro Queen PVT LTD
Role in the project	Distributor
Contact person	Sameer Bagchi
Title	Owner/ Partner
Address	130 MG Road Dhar MP – 454001
Telephone	8871965144
Email	Sg65410@gmail.com

Organization name	JPS Enterprise
Role in the project	Distributor
Contact person	Yogesh Sharma
Title	Owner/ Partner
Address	S-2, G8 Prem Nagar, Jaipur – 302019
Telephone	9057244624
Email	jpsenterprises111@gmail.com

Organization name	Aransh Agro
Role in the project	Distributor
Contact person	Pavan Patel

Title	Owner/ Partner
Address	Plot No. 392, Tripuri Ward garh, Jabalpur, MP
Telephone	8821930305
Email	aranshgroup@gmail.com

Organization name	GHG Reduction Technologies Pvt LTD
Role in the project	Manufacturing
Contact person	Mr. Soumitra Kulkarni
Title	Director
Address	A-11/2/3, Nagargoje Industries PVT LTD, SUMmet Compound Ambad, Nashik Maharashtra – 422010
Telephone	+91 982287213
Email	Soumitra.kulkarni@enkingint.org

1.7 Ownership

The project ownership is with EKI Energy Services Limited.

A pre-survey was conducted to identify the communities, using families who only used traditional stoves rather than LPG or any other type of ICS. The ICS is distributed to end users (Households) free of cost. The end users are informed in advance that the use of ICS generates carbon finance which in turn will be used to cover the price of ICS and for recovering project implementation costs. The participating household joined the initiative voluntarily and willingly sign a declaration (End user agreement)² to transfer the ownership rights of the carbon assets generated from this project to EKI Energy Services Ltd. The detail regarding end user agreement is explained clearly to the household community. As the ICS is distributed free of cost and therefore all the households are happy with the distribution. End users are informed that their participation in this project is voluntary and the same will be mentioned in the End User Agreement also, signed by the end user. The undertaking from the manufacturer and distributor and end-user agreement will be submitted to VVB to confirm that cook stove ownership is with EKI Energy Services Limited.

1.8 Project Start Date

² refer to Appendix 3

11-May-2022 (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 by Bibsikha LLP (Distributor) in the Udalhuri district. In Madhya Pradesh, the First ICS was deployed on 16-July-2022 by the Enviro Queen PVT LTD 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 Joint PD & MR.

1.9 Project Crediting Period

First crediting period: 11-May-2022 to 10-May-2029, seven years renewable crediting period. Being a renewable crediting period, the total crediting period of grouped project activity is 21 years.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

Project Scale	
Project	
Large project	X

Year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 2022-23	562,767
Year 2023-24	838,394
Year 2024-25	786,069
Year 2025-26	730,592
Year 2026-27	678,671
Year 2027-28	628,045
Year 2028-29	580,366

Total estimated ERs	5,004,811
Total number of crediting years	7
Average annual ERs	714,973

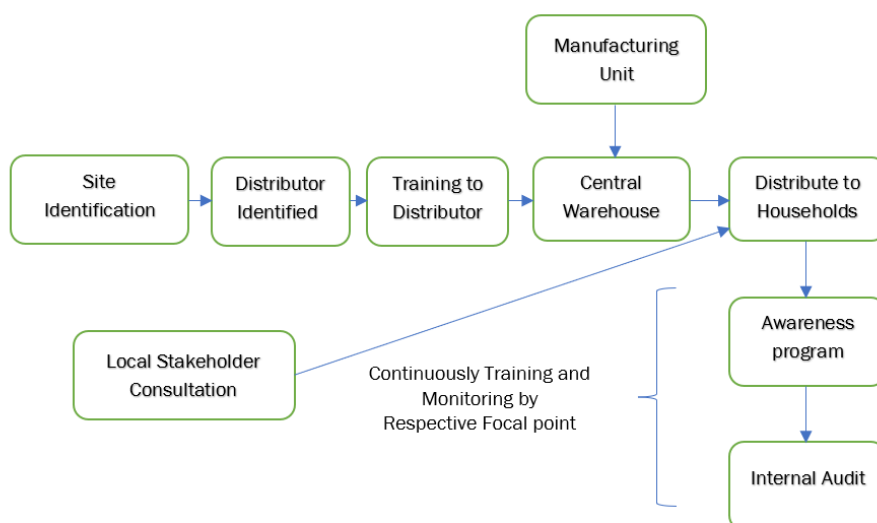
1.11 Description of the Project Activity

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 wood fuel consumption and emissions for conducting cooking and water heating tasks in homes. The ICS improves the efficiency of combustion and thermal transfer to the pot compared with traditional pot support or three-stone fire by incorporating energy-efficient technology which provides a conducive environment for clean and efficient combustion of firewood. It substantially reduces wood fuel consumption compared with a less efficient three-stone fire or traditional pot support.

EKI will procure the ICS from the manufacturer and will be responsible to provide the same to the distribution agency at a central point near the distribution area. The distribution agency will train its team for the distribution and registration process. Further, the distribution team will distribute the stoves to the end users. The distribution team will educate the end-user on the proper use of the ICS, its benefits for the user, and how it will improve the environment. Additionally, EKI will plan to conduct regular training programs and field visits for ensuring continual communication with the local stakeholders. In case of any support for repair/maintenance of the stove, the end-user can contact the support team using the customer support number available on the box of ICS.



Cookstove Flow Chart



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

For the implementation of the improved stoves, EKI will identify the potential location where the majority of the population is using the traditional mud and/or three-stone fuelwood fire stoves. Based on previous experience in other projects, available information, or baseline survey, ICS implementation will be planned.

Baseline Survey of Local Usage. Project proponent carried out a survey of usage prior to implementation of the project activity. The project participant follows the simple random sampling approach and the minimum sample size should be determined as per the following guidelines:

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

EKI will prioritize 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 will boost local employment and the income of local people. Awareness about the implementation and use of the ICS will be provided to the local community through awareness programs. EKI will conduct the distribution of ICS door-to-door or by selecting a dedicated central point accessible to the intended user. EKI will plan to deploy 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 will ensure the proper functioning of ICS and take feedback from users about ICS and address their concerns.

The ICS deployed under the grouped project activity may be the portable or fixed cookstove manufactured by the different manufacturers, having thermal efficiency of includes more than 25% (as per applied methodology VMR 0006).

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

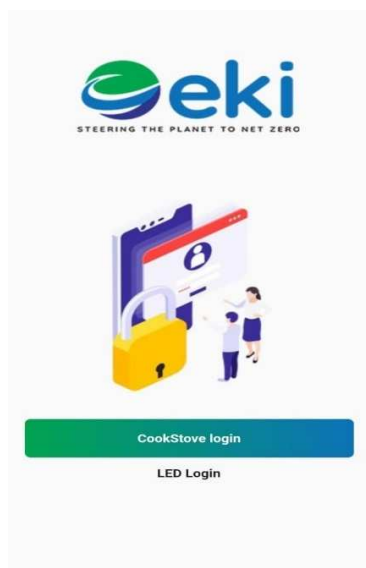
L)	Thermal Efficiency	36.42% Thermal efficiency is determined by the Indian Institute of Technology Delhi ³
----	--------------------	--

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.

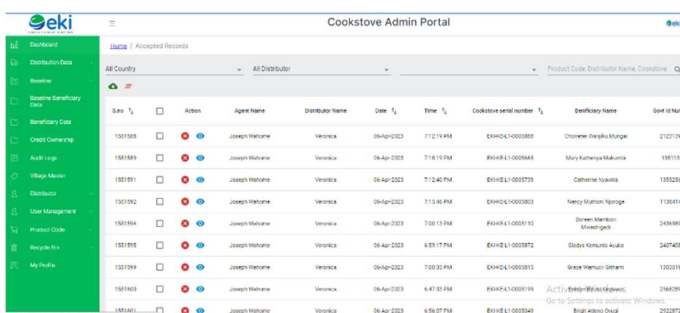
The thermal efficiency of the implemented cookstove was tested at the manufacturer's end as per BIS protocols IS: 13152: 2013. Further, continuous research and development activities are being conducted by the manufacturer to improve the efficiency, quality, and design of the stove, by incorporating 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.



Mobile Application



S.No	Action	Agent name	Distributor name	Date	Time	Cookstove serial number	Efficiency name	Cost of stove
1301503		Joseph Mathew	Veronica	06-Apr-2023	7:12:19 PM	EXH024-10030803	Chowder Rangakumar	21221296
1301505		Joseph Mathew	Veronica	06-Apr-2023	7:18:15 PM	EXH024-10030805	Mary Katherine Mathew	19511356
1301501		Joseph Mathew	Veronica	06-Apr-2023	7:12:46 PM	EXH024-10030779	Catherine Njau	19522616
1301502		Joseph Mathew	Veronica	06-Apr-2023	7:13:46 PM	EXH024-10030802	Nancy Mathew Njau	11308147
1301504		Joseph Mathew	Veronica	06-Apr-2023	7:05:13 PM	EXH024-10030110	Steven Mathew Mathew	2459891
1301505		Joseph Mathew	Veronica	06-Apr-2023	6:51:17 PM	EXH024-10030872	Clayton Mathew Aduka	24574203
1301509		Joseph Mathew	Veronica	06-Apr-2023	7:00:32 PM	EXH024-10030813	Grace Mathew Mathew	13033391
1301503		Joseph Mathew	Veronica	06-Apr-2023	6:47:30 PM	EXH024-10030119	ACTA Mathew Mathew	2459896
1301503		Joseph Mathew	Veronica	06-Apr-2023	6:56:07 PM	EXH024-10030845	Brigitte Mathew	2523751

Online database Dashboard

³ refer to Appendix 4

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 was stored in the hard copy and/or electronic database excel sheet which serves as a project database for project monitoring and sampling purposes.

In the current monitoring period (i.e., 11-May-2022 to 31-December-2022), a total of 151,154 improved cookstoves (ICS) were deployed as part of this collective project, with 24,996 ICS in Assam and 126,158 ICS in Madhya Pradesh.

1.12 Project Location

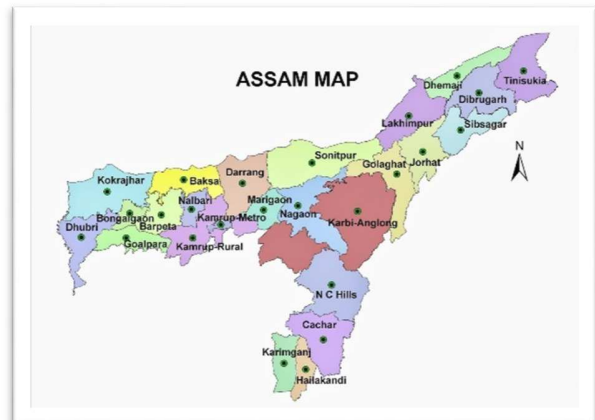
All the project activity instances installed during the current monitoring period are located within the geographical boundaries of Assam & Madhya Pradesh states of India.

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

Assam⁴:

Latitude - 26° 14' 38.9616" N

Longitude - 92° 32' 16.2312" E

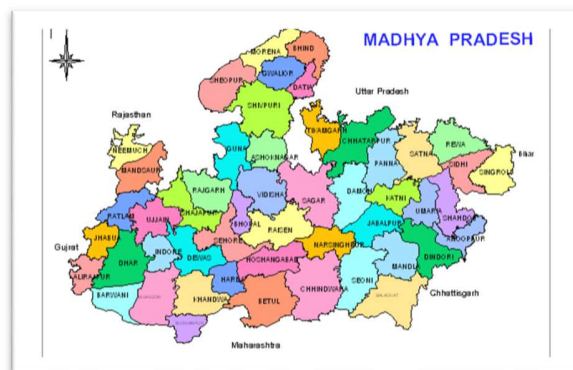


⁴ <https://www.latlong.net/place/assam-india-6684.html>

Madhya Pradesh⁵:

Latitude - 23° 28' 23.9664" 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



1.13 Conditions Prior to Project Initiation

⁵ <https://www.latlong.net/place/madhya-pradesh-india-21644.html>

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 (10% 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

1.14 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.

1.15 Participation under Other GHG Programs

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

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

1.15.2 Projects Rejected by Other GHG Programs

The project has not been rejected by any other GHG program.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

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

1.16.2 Other Forms of Environmental Credit

The project has not sought or received another form of GHG-related environmental credit.

1.16.3 Supply Chain (Scope 3) Emissions

There are no measurable Scope 3 emissions associated with the project activity.

1.17 Sustainable Development Contributions

1.17.1 Sustainable Development Contributions Activity Description

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

1.17.2 Sustainable Development Contributions Activity Monitoring

The proposed project activity decreases GHG emissions and people's reliance on behaviours and resources like time, labour, and fuel wood in terms of their net output through disseminating ICS technology. Project technologies, on the other hand, provide healthier, more environmentally friendly, and easier to use and maintain alternatives. It includes production, distribution, and monitoring activities, all of which support employment. The project activity lowers home firewood usage, which gradually eases the strain on the forest reserves. Throughout the crediting period, the relevant SDG indicators are tracked, as are the project's influence on their net change.

The information on the SDG impacts as a result of distribution, operations, and monitoring related actions is provided in the table below.

Table 1: Sustainable Development Contributions

Row number	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1)	1.1	1.1.1 Proportion of population below the international poverty line	Implemented activities to decrease	The project has increased the 589 participants' (i.e. people involved in stove manufacturing, distribution & monitoring) total monthly income to INR 12,000 – 25,000, bringing them above the international poverty line.	The project has increased the 589 participants' (i.e. people involved in stove manufacturing, distribution & monitoring) total monthly income to INR 12,000 – 25,000 , bringing them above the international poverty line.
2)	3.9	Project-specific indicator: number of users claimed the reduction in particulate matter emissions	Implemented activities to decrease	Reduce the particulate matter in 151,154 households emitted during cooking thereby improving overall health outcomes and reducing burdens of disease.	Reduce the particulate matter in 151,154 households emitted during cooking thereby improving overall health outcomes and reducing burdens of disease.
3)	7.1	7.1.2 Proportion of population with primary reliance on clean fuels and technology	Implemented activities to increase	Increase access to clean cooking technology with ICS installations in 151,154 households under the project activity	Increase access to clean cooking technology with ICS installations in 151,154 households under the project activity

4)	8.3	Project specific indicator: Total Number of jobs created.	Implemented activities to increase	Project activity created a total of 633 new job positions in different roles for manufacturing and distribution of ICS and post-implementation monitoring activity.	The project activity has created job opportunities for 415 heads (Male:Female::335:80) in the ICS manufacturing unit and 218 heads (Male:Female::187:31) in the ICS distribution and monitoring activity.
5)	13.0	Tonnes of greenhouse gas emissions avoided or removed	Implemented activities to increase	Contribute to greenhouse gas emission reduction of 164,300 tCO ₂ e	Prevented the release of 164,300 tCO ₂ e into the atmosphere
6)	15.2	15.2.1 Progress toward sustainable forest management by increasing above-ground biomass in forests	Implemented activities to increase	Contribute to the reduction of deforestation of 92,922 tonnes of woody biomass from forests surrounding the communities and reducing pressure on forest reserves	Reduced deforestation of 92,922 tonnes of woody biomass from forests surrounding the communities and reduced pressure on forest reserves

1.18 Additional Information Relevant to the Project

Leakage Management

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

Commercially Sensitive Information

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

Further Information

Not applicable.

2 SAFEGUARDS

2.1 No Net Harm

The project will only bring positive impacts on environmental and socio-economic aspects as elaborated in Section 1.17 above.

The project contributes to social, environmental, economic, and technological benefits which contribute to the sustainable development of the local environment and the country such as better cooking time & environment, reduction in indoor pollution, employment opportunities, and many more.

No potential negative environmental or socio-economic impacts have been identified for the project; thus, this section is not applicable.

2.2 Local Stakeholder Consultation

Identification of households was done based on a general survey. A baseline scenario was calculated by assessing the number of households using mud or three-stone stoves and the potential for emission reductions by replacement of mud or three-stone stoves by ICS was checked.

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), village heads, distributors, and their representatives are relevant main local stakeholders. The public notice

was placed in common places of villages and village heads were invited telephonically and personally to consult their feedback. EKI also planned to distribute cookstoves in Madhya Pradesh so two 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 – 01/05/2022

Date of Meeting – 10/05/2022

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

Date of invitation – 20/06/2022

Date of Meeting – 04/07/2022

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

Date of invitation – 21/08/2022

Date of Meeting – 19/09/2022

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

Date of Invitation – 20/08/2022

Date of Meeting – 19/09/2022

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

Date of Invitation – 07/09/2022

Date of Meeting – 09/10/2022

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. 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.

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. EKI team will plan to visit the site selection random location for this purpose and will mainly

record the information related to regular usage of ICS, the physical condition of ICS, benefits observed by the usage of ICS, information related to the usage of baseline cook stoves, etc.

2.3 Environmental Impact

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

1. Improves the local environment by reducing the rate of degradation of forests and deforestation in the project area.
2. Reduce indoor air pollution – ICS emits less smoke and PM 2.5, thus reducing indoor air pollution in the end-user households. This in turn 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.
3. Reduce global and local environmental pollution and environmental degradation by a reduction in the use of non-renewable biomass thus leading to a reduction in GHG emissions.
4. Less water and effort are needed for cleaning vessels as the cooking process is relatively smoke-free.

2.4 Public Comments

No public comments were received for the project activity.

2.5 AFOLU-Specific Safeguards

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

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

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

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

This methodology also refers AMS II.G version 12 - Energy efficiency measures in thermal applications of non-renewable biomass

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

For the calculation of the fraction of non-renewable biomass, the below tool is used “TOOL30 version 4.0: Calculation of the fraction of non-renewable biomass”

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

3.2 Applicability of Methodology

The applicability of the methodology is justified below

Applicability criterion	How the project complies
Project activities shall be implemented in domestic premises or community-based kitchen	The proposed project involves the deployment of ICS only in households. For all project activity instances, project activity is implemented in households.
The project stove shall have specified high-power thermal efficiency of at least 25% per the manufacturer's specifications and shall exclusively use woody biomass and can be single-pot or multi-pot;	Energy Efficient stoves planned to be installed under this project are single-pot portable cook stoves that have an efficiency of more than 25%. For all project activity instances, ICS with an efficiency of 36.42% is planned to be installed. For future project activity instances, the manufacturer may change, and the cook stove efficiency that should be more than 25% as mentioned in the methodology based on manufacturer specification.
Both 'Projects' and 'Large Projects' can use the methodology	Estimated average annual emission reductions for the grouped project activity are greater than 300,000 tonnes of CO _{2e} per year. Therefore, the proposed project qualifies for the “Large Projects” criteria.
Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports, or statistics;	Non-renewable biomass has been used since 31 December 1989 as demonstrated by UN Data ⁶ and as demonstrated below by referring to published literature, official reports, or statistics;
For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that: It is produced using exclusively renewable biomass (more than one type of biomass may be used)	Not applicable, as the project activity does not use processed biomass as a fuel. The ICS is introduced as an energy efficiency measure to replace baseline stoves and reduce the use of non-renewable biomass for combustion.

⁶ <http://data.un.org/Data.aspx?d=EDATA&f=cmID%3aFW>

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

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

Justification: The use of non-renewable biomass is established through a demonstration of the gap between the demand for firewood and silviculturally permissible production of biomass from forests and trees outside the forest. The fact is established using published literature referring to the following studies:

Food and Agricultural Organization of United Nation⁷ Regional Wood Energy Development Programme in Asia

⁷Regional Wood Energy Development Programme In Asia GCP/RAS/154/NET, RWEDP Report No 57, The Wood Fuel Scenario and Policy issues in India. Published by the FAO Regional Wood Energy Development Programme in Asia, Bangkok, Thailand

The literature highlights a gap in the demand and supply of firewood across the country. By the study, firewood consumption in real terms is much higher than the recorded production of about 30%; thus, leaving a wide gap leading towards unsustainable extraction of firewood. Moreover, on account of population pressure, demand for firewood has outstripped natural regeneration and planting, so much so that in some areas there is food to eat but not enough firewood is available to cook it (Mathur, 1987)⁸. The report also highlights the statistics from the Forest Survey of India (FSI1988:46) which estimated a gap of 130 million tonnes between the demand and internal production of firewood in the country in 1987.

State of Forest Report 1987⁸, MoEF, Govt. of India

The report highlights a gap between the demand and production of firewood as a major cause of deforestation. The reported consumption and production across the country within silvicultural permissible limits across the following years are indicated as follows –

Year	Consumption in million tones	Recorded Production in million tones
1953-54	86.3	6.49
1960-61	99.6	8.15
1965-66	109.3	9.16
1970-71	117.9	11.62
1975-76	133.1	19 m. from the forest and 30 m. from trees outside the forest

In accordance, the gap between demand and production is met through pilferage leading to the continuous depletion of forest land.

Wood Fuel Trade in India: Food and Agricultural Organisation of United Nation:

The report outlines the demand-supply gap which has referred to the expert committee report of MoEF dated 30-January-1998 as below –

In million cubic meters			
Year	Consumption	Sustainable Production	Gap
1953-54	115.0	8.8	106.2
1965-66	163.9	13.7	150.2
1975-76	199.6	28.5	171.4
1987-88	235.0	40.0	195.0

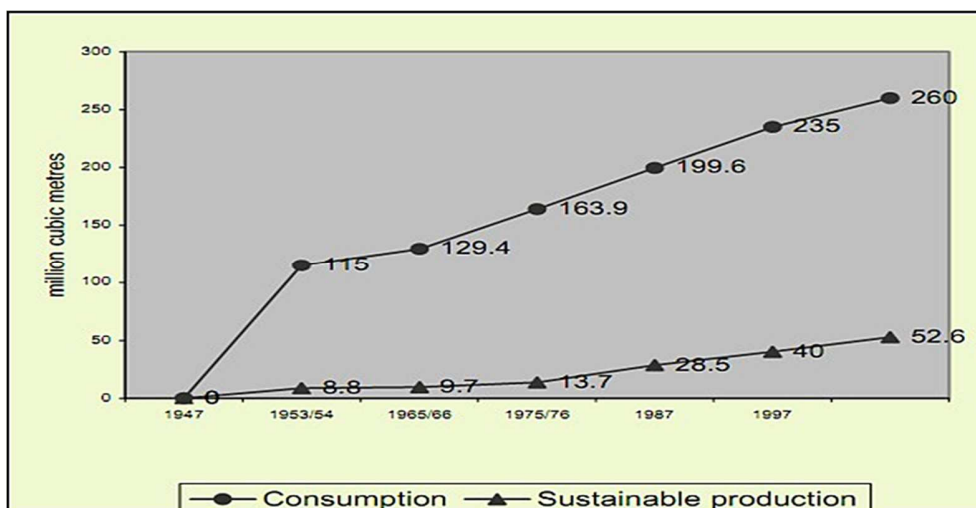
Rural Energy data sources and estimations in India – TERI⁹

⁸https://fsi.nic.in/documents/sfr_1987_hindi.pdf (refer page 44 of document, section 3.4 of Chapter III Demand On Forests”

⁹<https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.581.9840&rep=rep1&type=pdf>

The report refers to the gap between consumption and recorded production of fuel-wood has, however, increasing, indicating the seriousness of the fuel-wood scarcity in India.

Firewood consumption and sustainable production since 1947



Also, as per Forest Survey report 2011 (This is the latest survey report for India where demand and supply are determined. Due to the COVID-19 pandemic, no survey done for the year 2021), (https://fsi.nic.in/cover_2011/chapter7.pdf) has been considered for the production of fuelwood from forests 1.232 million Tonnes (table 7.4.2) and availability of firewood from trees outside the forest is 19.254 million tonnes (table 7.4.3) annual firewood consumption is 216.421 million tonnes (table 7.4.7). This indicates that demand is more than sustainable production/availability of wood, thus in the present scenario, non-renewable biomass is used in the project region

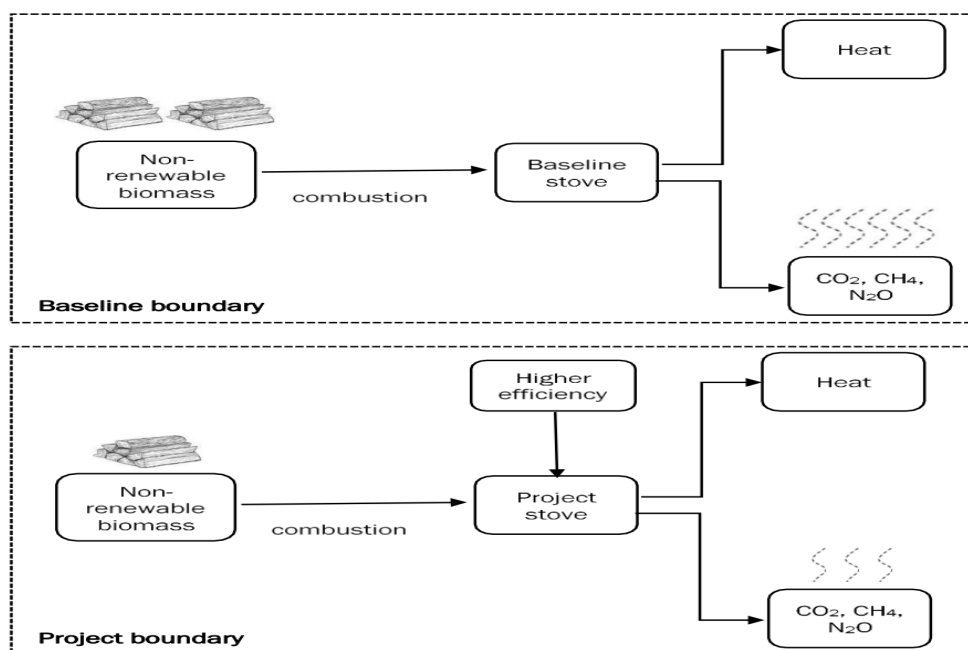
Conclusion:

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

3.3 Project Boundary

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

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



3.4 Baseline Scenario

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

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

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

3.5 Additionality

The methodology uses the activity method for the demonstration of additionality.

Activity Method

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 3.2 Applicability of Methodology, the project meets the applicability conditions of the methodology VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves, v1.1¹⁰ which represent the positive list.

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

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

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

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

The project did not apply any methodology deviations.

¹⁰ <https://verra.org/wp-content/uploads/imported/methodologies/VMR0006-Methodology-for-Installation-of-High-Efficiency-Firewood-Cookstoves-v1.1.pdf>

4 IMPLEMENTATION STATUS

4.1 Implementation Status of the Project Activity

Till the end of the monitoring period, 24,996 ICS in Assam and 126,158 ICS in Madhya Pradesh i.e. total 151,154 project activity instances (ICS) were deployed under this grouped project. Only one stove model (AGNEEKAA ECO MINI STOVE MODEL 4 SE) was distributed in the project.

VCS methodology VMR0006, version 1.1 allows the use of a correction factor of 0.95 applied to the overall emissions reductions to account for any possible leakage. This factor has been applied to the emission reductions presented in this report.

During the current monitoring period, no incident or event occurred, that could affect GHG emissions reduction and the approved monitoring plan.

5 ESTIMATED GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

The methodology does not account for baseline emissions separately but instead quantifies net emission reductions achieved by the project. Please refer to Section 5.4.

5.2 Project Emissions

The methodology does not account for project emissions separately but instead quantifies net emission reductions achieved by the project. Please refer to Section 5.4.

5.3 Leakage

Leakage shall be considered as default 0.95 in accordance with methodology.

5.4 Estimated Net GHG Emission Reductions and Removals

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

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

Where:

i	=	Indices for the situation where more than one type/model of improved cookstove is introduced to replace three-stone fire
J	=	Indices for the situation where there is more than one batch of improved cookstove of type i
ER_y	=	Emission reductions during year y in tCO ₂ e
$ER_{y,i,j}$	=	Emission reductions by improved cookstove of type i and batch j during year y in tCO ₂ e

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

Where:

$B_{y,savings,i,j}$	=	Quantity of woody biomass that is saved in tonnes per improved cookstove of type i and batch j during year y
$f_{NRB,y}$	=	Fraction of woody biomass that can be established as non-renewable biomass (f_{NRB}) ¹¹
$NCV_{wood\ fuel}$	=	Net calorific value of the non-renewable woody biomass that is substituted or reduced (IPCC default for wood fuel, 0.0156 TJ/tonne) ¹²
EF_{wf,CO_2}	=	CO ₂ emission factor for the use of wood fuel in the baseline scenario (IPCC default for wood fuel, 112 tCO ₂ /TJ) ¹³
$EF_{wf,non\ CO_2}$	=	Non-CO ₂ emission factor for the use of wood fuel in the baseline scenario (IPCC default for wood fuel, 26.23 tCO ₂ /TJ) ¹⁴
$N_{y,i,j}$	=	Number of improved cookstoves of type i and batch j operating during year y
0.95	=	Discount factor to account for leakage

¹¹ Default values endorsed by designated national authorities and approved by the Board are available at <https://cdm.unfccc.int/DNA/fNRB/index.html>

¹² 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 1 Introduction

¹³ 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion

¹⁴ 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion

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

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

where

- η_{old} = Efficiency of baseline cookstove
- $\eta_{new,y,i,j}$ = Efficiency of the improved cookstove type i and batch j determined through water boiling test (WBT) during year y
Alternatively, efficiency may be determined using Equation 4.
- $B_{y=1,new,i,j,survey}$ = Annual quantity of woody biomass used by improved cookstoves in tonnes per device of type i and batch j , determined in the first year of the implementation of the project through a sample survey.

$$\eta_{new,y,i,j} = \eta_p \times (DF_n)^{y-1} \times 0.94 \quad \text{Equation (4)}$$

where

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

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

- 1) The project will install up to ICS 151,154 ICS.
- 2) The life span of ICS is 7 years; thus, the operational lifetime of each project activity instance is taken as 7 years.
- 3) Annual stove loss rate is estimated at 5%. This is assumed for estimation. During actual ER calculation, this value may change. This value will be determined during actual verification based on survey results.
- 4) $B_{y=1, new,i, survey}$, is assumed as
 - For Assam – 3.78 kg/device/day or equal to 1.3797 tonnes/device/year.
 - For Madhya Pradesh – 3.60 kg/device/day or equal to 1.314 tonnes/device/year.

This value will be determined during the first monitoring period, based on survey results.

Determination of f_{nr} value:

The fraction of woody biomass that can be established as non-renewable is given by:

$$f_{NRB} = \frac{NRB}{NRB + RB}$$

Where:

- f_{NRB} = Fraction of non-renewable biomass in the applicable area in the relevant period (fraction or %)
- NRB = Quantity of non-renewable biomass consumed in the applicable area in the relevant period (tonnes)
- RB = Quantity of renewable biomass that is available on a sustainable basis in the applicable area in the relevant period (tonnes)

Commercial use of woody biomass for non-energy purposes (such as building or furniture) that is derived from forests or other land areas in the relevant area (tonnes)

$$NRB = H - RB$$

Where:

- H = Total consumption of woody biomass in the applicable area in the relevant period (tonnes)

The following equation accounts for all consumption within the relevant area to determine the overall consumption of woody biomass (H).

$$H = HW \times N + CE + NE$$

Where:

- HW = Average consumption of wood fuel per household, including fuelwood and charcoal, in the applicable area in the relevant period (tonnes//household)
- N = Number of households consuming wood fuel within the applicable area in the relevant period (number)
- CE = Commercial woody biomass consumption for energy applications (e.g. commercial, industrial or institutional uses of woody biomass in ovens, boilers etc.) that are extracted from forests or other land areas in the applicable area in the relevant period (tonnes)
- NE = Commercial woody biomass consumption for non-energy applications (e.g. construction, furniture) that are extracted from forests or other land areas in the applicable area in the relevant period (tonnes)

As the parameters HW and N, disaggregated value is not provided, hence we will be using an aggregated value of (H × N) in the calculations.

	HW × N ¹⁵ (million tonnes)	CE (Million tonnes)	NE (Million tonnes)	H (Million tonnes)
Assam	11.421	0	6.235	17.656
MP	13.665	0	20.449	34.114

Procedure to estimate the quantity of renewable biomass available (RB):

$$RB = \sum (MAI_{forest,i} \times (F_{forest,i} - P_{forest,i})) + \sum (MAI_{other,i} \times (F_{other,i} - P_{other,i}))$$

Where:

- $MAI_{forest,i}$ = Mean Annual Increment of woody biomass growth per hectare in sub-category i of forest areas in the relevant period (tonnes/ha/yr)
- $MAI_{other,i}$ = Mean Annual Increment of woody biomass growth per hectare in sub-category i of other land areas in the relevant period (tonnes/ha/yr)
- $F_{forest,i}$ = Extent of forest in sub-category i in the relevant period (ha)
- $F_{other,i}$ = Extent of other land in sub-category i in the relevant period (ha)
- $P_{forest,i}$ = Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within forest areas (in sub-category i) in the relevant period (ha)
- $P_{other,i}$ = Extent of non-accessible area (e.g. protected area where extraction of wood is prohibited, geographically remote area) within forest areas (in sub-category i) in the relevant period (ha)

$$MAI_{forest,i} = 1.66 \text{ tonnes/hectare/year}^{16}$$

$$MAI_{other,i} = 1.66 \text{ tonnes/hectare/year}^{17}$$

	$MAI_{forest,i}$	$MAI_{other,i}$	$F_{forest,i}$ (Million Ha)	$P_{forest,i}$ (Million Ha)	$F_{other,i}$ (Million Ha)	RB (million tonne)
Assam	1.66	1.66	2.83	1.88	0.99	3.22
MP	1.66	1.66	7.75	7.61	2.08	3.68

¹⁵ Socio-Economic Contribution of Forests: Production and consumption of Forests Resource in India, Page 76

¹⁶ https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch04_Forest%20Land.pdf

¹⁷ https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch04_Forest%20Land.pdf

The fraction of woody biomass that can be established as non-renewable for all locations:

	H	RB	NRB	F_{nrb}
Assam	17.66	3.22	14.43	0.8175
MP	34.11	3.68	30.43	0.8920

The literature provided in paragraph 6. (b) (i) of Tool 30 version 4, received on 25 July 2014, accepted on 4 December 2014, and finally published on 19 January 2015, elucidates that “We present a spatially explicit assessment of pan-tropical wood fuel supply and demand, calculate the degree to which wood fuel demand exceeds regrowth, and estimate wood fuel-related greenhouse-gas emissions for the year 2009”. This underscores that all the values used in the report pertain to data preceding that year (2009). Moreover, it does not explicitly outline the calculation methodology employed to derive the fNRB values, introducing an element of uncertainty regarding its conformity with Tool 30 version 4”. However, PP has undertaken a state-wise calculation of fNRB, recognizing India's variations in biomass regrowth, and its geographical, ecological, and land use heterogeneity at the sub-national/state level. This substantiates the rationale for not relying on a national-level value to accurately account for the regional variations in areas where the project cook stoves are installed. A detailed comparative analysis of the estimated f_{NRB} with the literature referred by TOOL 30 is also provided in appendix 5.

Determination of efficiency of ICS during year y

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

Where

$$\eta_p = 36.42\%$$

$$DF_n = 0.99$$

Example of calculation:

If y= 1

$$\begin{aligned} \eta_{new,y,i,j} &= 36.42\% \times (0.99)^{1-1} \times 0.94 \\ &= 34.23\% \end{aligned}$$

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

Year (y)	$\eta_{new,y,i,j}$
1	34.23%
2	33.89%
3	33.55%
4	33.22%
5	32.89%

6	32.56%
7	32.23%

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

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

Example of calculation for Assam:

If y= 1,

$$B_{y,savings,i,j} = 1.3797 \times [(0.3423/0.1) - 1]$$

= 3.34 tonnes

Year (y)	$B_{y=1,new,i,survey}$	$\eta_{new,y,i,j}$	η_{old}	$B_{y,savings,i,j}$
1	1.3797	34.23%	0.1	3.34
2	1.3797	33.89%	0.1	3.30
3	1.3797	33.55%	0.1	3.25
4	1.3797	33.22%	0.1	3.20
5	1.3797	32.89%	0.1	3.16
6	1.3797	32.56%	0.1	3.11
7	1.3797	32.23%	0.1	3.07

Determination of emission reductions by ICS of year1 during year y

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

Where

$$NCV_{wood\ fuel} = 0.0156 \text{ TJ/tonne}$$

$$f_{NRB,y} = 81.75\% \text{ (for Assam) \& } 89.2\% \text{ (for MP)}$$

$$EF_{wf,CO2} + EF_{wf,non\ CO2} = 112 + 26.23 = 138.23 \text{ tCO}_2/\text{TJ}$$

Example of calculation for **Assam**:

If y=1 (11-May-2022 to 31-December-2022),

Number of Days during Year Y = 235

$$ER_{y,i,j} = 3.34 \times 0.0156 \times 0.8175 \times 138.23 \times 24,996 \times 0.95 \times (235/365)$$

$$= 90,117 \text{ tCO}_2$$

Year	$B_{y,savings,i,j}$	$NCV_{wood\ fuel}$	$f_{NRB,y}$	$EF_{wf,CO2} + EF_{wf,non\ CO2}$	$N_{y,i,j}$
1	3.34	0.0156	0.8175	138.23	24,996

2	3.30	0.0156	0.8175	138.23	23,746
3	3.25	0.0156	0.8175	138.23	22,496
4	3.20	0.0156	0.8175	138.23	21,247
5	3.16	0.0156	0.8175	138.23	19,997
6	3.11	0.0156	0.8175	138.23	18,747
7	3.07	0.0156	0.8175	138.23	17,497

Year	Emission reductions
11-May-2022 to 31-December-2022	90,117
01-January-2023 to 31-December-2023	134,254
01-January-2024 to 31-December-2024	125,875
01-January-2025 to 31-December-2025	116,991
01-January-2026 to 31-December-2026	108,677
01-January-2027 to 31-December-2027	100,570
01-January-2028 to 31-December-2028	92,935

Example of calculation for **Madhya Pradesh**:

If $y=1$ (11-May-2022 to 31-December-2022),

Number of Days during Year Y = 235

$$ER_{y,i,j} = 3.18 \times 0.0156 \times 0.892 \times 138.23 \times 126,158 \times 0.95 \times (235/365)$$

$$= 472,650 \text{ tCO}_2$$

Year	$B_{y,savings,i,j}$	$NCV_{wood\ fuel}$	$f_{NRB,y}$	$EF_{wf,CO2}$ + $EF_{wf,non\ CO2}$	$N_{y,i,j}$
1	3.18	0.0156	0.892	138.23	126,158
2	3.14	0.0156	0.892	138.23	119,850
3	3.09	0.0156	0.892	138.23	113,542
4	3.05	0.0156	0.892	138.23	107,234
5	3.01	0.0156	0.892	138.23	100,926
6	2.96	0.0156	0.892	138.23	94,619
7	2.92	0.0156	0.892	138.23	88,311

Year	Emission reductions
11-May-2022 to 31-December-2022	472,650
01-January-2023 to 31-December-2023	704,140
01-January-2024 to 31-December-2024	660,194

01-January-2025 to 31-December-2025	613,601
01-January-2026 to 31-December-2026	569,994
01-January-2027 to 31-December-2027	527,475
01-January-2028 to 31-December-2028	487,431

The above two ER estimation for project activity instances is with consideration of 151,154 ICS quantity and this quantity may vary during the actual implementation stage.

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

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
11-May-2022 to 31-December-2022	562,767	0	0	562,767
01-January-2023 to 31-December-2023	838,394	0	0	838,394
01-January-2024 to 31-December-2024	786,069	0	0	786,069
01-January-2025 to 31-December-2025	730,592	0	0	730,592
01-January-2026 to 31-December-2026	678,671	0	0	678,671
01-January-2027 to 31-December-2027	628,045	0	0	628,045

01-January-2028 to 31-December-2028	580,366	0	0	580,366
01-January-2029 to 10-May -2029	199,907	0	0	199,907
Total	5,004,811	0	0	5,004,811
Total number of crediting years				7
Average annual ERs				714,973

6 MONITORING

6.1 Data and Parameters Available at Validation

Data / Parameter	$f_{NRB,y}$
Data unit	Fraction
Description	Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass
Source of data	PP has calculated f_{NRB} by determining the share of renewable and non-renewable woody biomass in the total quantity of woody biomass consumption for the country/region
Value applied	For Assam - 81.75% (calculated as per meth tool) For Madhya Pradesh – 89.2% (calculated as per meth tool)
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined ex-ante. The default value as per the Methodological tool: Calculation of the fraction of non-renewable biomass (Tool 30 version 4.0. As per of methodological tool, the value is calculated as per the following Equation (1), $f_{NRB,y} = NRB/(NRB+DRB)$
Purpose of Data	Calculation of emission reductions
Comments	State of Forest report (Forest Survey of India Ministry of Environment, Forest & Climate Change, GoI, 2019)

	If the future project activity instances are expanded in other parts of India (other than Assam and Madhya Pradesh), then this parameter value will be calculated during future project activity instances inclusion.
--	---

Data / Parameter	NCV _{wood fuel}
Data unit	TJ/tonne
Description	The net calorific value of the non-renewable woody biomass that is substituted or reduced
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 1 Introduction
Value applied	0.0156
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value
Purpose of Data	Calculation of emission reductions
Comments	-

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

Comments	-
Data / Parameter	$EF_{wf,non\ CO_2}$
Data unit	tCO ₂ /TJ
Description	Non-CO ₂ emission factor for the use of wood fuel in the baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion
Value applied	26.23
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value
Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	$\eta_{old,i,j}$
Data unit	Fraction
Description	The efficiency of baseline cookstove
Source of data	Methodological default value
Value applied	0.1
Justification of choice of data or description of measurement methods and procedures applied	A default value of 0.1 shall be used if the baseline device is a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney. During the baseline survey, it is observed that the baseline device was a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney, hence default value of 0.1 is considered for Efficiency of the baseline cookstove.

Purpose of Data	Calculation of emission reductions
Comments	-

Data / Parameter	η_p
Data unit	Percentage
Description	The efficiency of the project stove at the start of the project activity.
Source of data	Manufacturer's specification
Value applied	36.42%
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined ex-ante
Purpose of Data	Calculation of $\eta_{new,y,i,j}$
Comments	This efficiency is for the cook stove model considered for project activity instances implemented to date. If the manufacturer or cook stove model changes, the respective model efficiency will be considered for ER calculations

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

Comments	-
Data / Parameter	Life Span
Data unit	Years
Description	Operating lifetime of project device for projects opting Equation 5 for determining project stove efficiency
Source of data	Manufacturer's specification
Value applied	7
Justification of choice of data or description of measurement methods and procedures applied	This parameter will be monitored Once at the time of the Project stove installation
Purpose of Data	Calculation of $\eta_{new,y,i,j}$
Comments	-

6.2 Data and Parameters Monitored

Data / Parameter	$N_{y,j,j}$
Data unit	Number
Description	Number of project devices of type I and batch j operating during year y
Source of data	Monitoring
Description of measurement methods and procedures applied	Measured directly or based on a representative sample. As per methodology, the minimum sample size will be determined in which case compliance with 90/10 confidence precision is not obligatory.
Frequency of monitoring/recording	At least once every two years
Value applied	151,154
Monitoring equipment	Sample survey

QA/QC procedures applied	-
Purpose of data	Calculation of emission reductions
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	$\eta_{new,y,i,j}$																
Data unit	Fraction																
Description	The efficiency of the improved cook stove type i and batch j determined as per equation 5 of methodology during year y																
Source of data	Calculation																
Value applied	For ex-ante calculation, the value below is applied <table border="1"> <thead> <tr> <th>Year(y)</th><th>$\eta_{new,y,i,j}$</th></tr> </thead> <tbody> <tr><td>1</td><td>34.23%</td></tr> <tr><td>2</td><td>33.89%</td></tr> <tr><td>3</td><td>33.55%</td></tr> <tr><td>4</td><td>33.22%</td></tr> <tr><td>5</td><td>32.89%</td></tr> <tr><td>6</td><td>32.56%</td></tr> <tr><td>7</td><td>32.23%</td></tr> </tbody> </table>	Year(y)	$\eta_{new,y,i,j}$	1	34.23%	2	33.89%	3	33.55%	4	33.22%	5	32.89%	6	32.56%	7	32.23%
Year(y)	$\eta_{new,y,i,j}$																
1	34.23%																
2	33.89%																
3	33.55%																
4	33.22%																
5	32.89%																
6	32.56%																
7	32.23%																
Justification of choice of data or description of measurement methods and procedures applied	This parameter shall be determined ex-ante. The average lifetime of the cookstove is 7 years.																
Purpose of Data	Calculation of emission reductions																
Comments	The calculation is to be performed using the equation below: $\eta_{new,y,i,j} = \eta_p \times (DF_n)^{y-1} \times 0.94$ (The project opts to determine the efficiency using equation 5 given by methodology; therefore, it is not required to monitor this																

	parameter via a Sampling survey.) However, the grouped project activity provides the option to use a different model of cookstoves for new future project activity instances to be included, hence this parameter value may vary based on a different model of future instances. A default value of 0.99 efficiency loss per year can be considered In case of ICS model changes for new project activity instances, the efficiency of the new ICS model should be determined during the verification and the same will be considered for that project activity instance.
--	--

Data / Parameter	$B_{y=1,new,i,j,survey}$
Data unit	Tonnes
Description	Annual quantity of woody biomass used by improved cook stoves in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey
Source of data	Monitoring survey
Description of measurement methods and procedures applied	The sample size was selected in line with the guidelines provided in methodology Section 8.4 option (b). Determined in the first year of the introduction of the devices (e.g., during the first year of the crediting period, $y=1$) through measurement campaigns at representative households and/or sample surveys. The conditions necessary for the use of sample surveys based solely on questionnaires or interviews (without measurement campaigns) have been found to be satisfied i.e. (a) Baseline cookstoves have been completely decommissioned, and only improved cookstoves are exclusively used in the project households. (b) In the monitoring survey, no multiple devices were found to be in use in the project households. Therefore, there is no need to differentiate the quantity of firewood used by each device, as only a single project device that consumes firewood is in use.
Frequency of monitoring/recording	Determined in the first year of project implementation
Value applied	1. For Assam - 3.78 kg/device/day or equal to 1.3797 tonnes/device/year.

	2. For Madhya Pradesh – 3.6 kg/device/day or equal to 1.314 tonnes/device/year.											
Monitoring equipment	Weighing Scale											
QA/QC procedures applied	Calibration of weighing scales used for measuring the firewood was done in-house before starting using on site											
	<table><tr><th>Sr. No. of the equipment</th><th>Type</th><th>Accuracy class/ Sensitivity</th><th>Date of calibration</th></tr><tr><td>EKI-01679</td><td rowspan="4">Digital</td><td rowspan="4">±5gm (0 - 5kg) ±10gm (10 – 50kg)</td><td rowspan="4">27/12/2022</td></tr><tr><td>EKI-01681</td></tr><tr><td>EKI-01683</td></tr><tr><td>EKI-01685</td></tr></table>	Sr. No. of the equipment	Type	Accuracy class/ Sensitivity	Date of calibration	EKI-01679	Digital	±5gm (0 - 5kg) ±10gm (10 – 50kg)	27/12/2022	EKI-01681	EKI-01683	EKI-01685
Sr. No. of the equipment	Type	Accuracy class/ Sensitivity	Date of calibration									
EKI-01679	Digital	±5gm (0 - 5kg) ±10gm (10 – 50kg)	27/12/2022									
EKI-01681												
EKI-01683												
EKI-01685												
Purpose of data	Calculation of emission reductions											
Calculation method	This is monitored value											
Comments	No comments											

6.3 Monitoring Plan

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

Monitored Parameters

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

No.	Monitoring Parameters	Sampling parameters	Parameter type	Monitoring frequency
1	$N_{y,j,k}$ Number of project devices of type i and batch j operating during year y	The proportion of ICS is still in operation.	Proportion	Biennially (at least once in two years)
2	$B_{y=1,new,l,j,survey}$ Quantity of woody biomass used by project devices in tonnes per device of type i. and batch j	Daily consumption of woody biomass per ICS	Mean value	in the first year of project implementation

Target Population

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

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

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

$N_{y,j,j}$	Visual inspection of the premises to see if ICS is operational and in use. Interview with the end user if required to verify that ICS is still in use (Yes/No)
$B_{y=1,new,l,j,survey}$	Interview with the end user and estimate the daily consumption of woody biomass of ICS (Weekly/Daily consumption of woody biomass)

Sample Size

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

The project proponent will choose to use the same sample to monitor both 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 will sample a combination of two parameters i.e. $N_{y,j,j}$ and $B_{y=1,new,l,j,survey}$ in the same sample. Sampling more than one parameter within the same sample (household) helps reduce travel needs for monitoring and the associated costs.

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

Sampling Frame

The sampling frames shall be defined below. Overall, ICS will 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 for each ICS model regardless of how the end user group and distribution/installation location are defined.

Data to be collected

Field Measurement:

The table below summarizes field measurement data requirements:

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

$N_{y,j,j}$

The survey involves a visual inspection of the premises to see if ICS is operational and in use. An interview with the end user will also be conducted if required to verify that ICS is still in use. Based on the response received from the end user, the value of the parameter will be calculated.

$B_{y=1,new,l,j,survey}$	Monitoring will occur within the first year after installation	The first year of installation	Interview with the end user for determining the average quantity of firewood used in the project stove per week/day. Sample surveys has been used for estimation of consumption of firewood in project households. (Wood fuel quantity)
--------------------------	--	--------------------------------	---

$B_{y=1,new,l,j,survey}$

This survey involves interviews with the end user and estimating the daily consumption of woody biomass of ICS (Weekly/Daily consumption of woody biomass). The staff will visit the site and ask each household about their daily consumption of firewood for the project stove. A bundle of the said quantity of firewood will be made from the firewood stock available with the user and then weighed using a weighing scale. The weight of firewood used in survey households will be noted down similarly and then averaged for the final value of the parameter.

Soft copies of the surveys will be kept, and the database will have a backup. The original survey questionnaires filled by the survey team and signed by the users will be stored in the project office. A backup of the survey results will also be stored on an electric medium. All data monitored

and required for verification and issuance will be kept for two years after the end of the crediting period or the last issuance of credits for the project activity, whichever is later.

Quality Assurance/Quality Control

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

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

The sampling plan has the following procedures in place to ensure good-quality data. The project proponent will ensure that field personnel have reviewed, understand, and 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 will be 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 will train 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 will be used. The surveyor at the site will get training from EKI for the monitoring survey, which includes interviewing the beneficiaries and weighing the firewood to use with weighing equipment. Additionally, give weighing machine calibration instructions.

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

Data collection and management methods

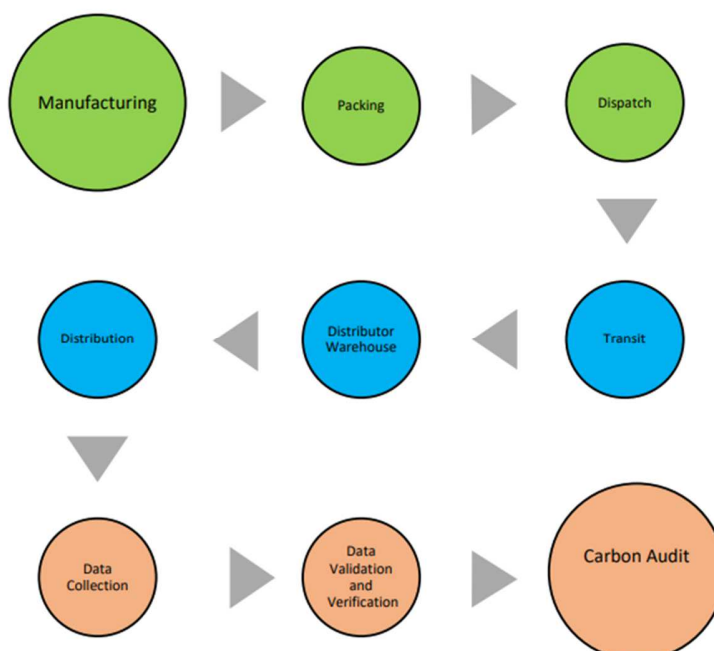
The methods for Distribution, Monitoring, and reporting data and parameters are described below.

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 unique serial numbers provide the basis for monitoring activities and prevent instances of double counting. Other than the unique serial number, the following is the minimum information that will be captured for each project device in order to be eligible for inclusion in this project:

1. Date of distribution
2. Geographic area of distribution
3. Model of project technology distributed
4. Quantity of project technologies distributed
5. Name and address of the recipient/end-user

The ICS is transported by the distributing entity around the Project site. Users receive the ICS through distributing entities. The ICS data management and collection procedure uses a safe, data storage system via ICT i.e., using the mobile app. In the starting phase, the ICS data was collected using an offline mechanism i.e., manual entry, further EKI has developed the online mechanism for data collection. Developing an app will allow for much larger-scale data collection. Additionally, the app will offer details on the activities of distribution partners and accumulated data sets.

The ICS flow is described in the following figure:



Monitoring questionnaires

The distributing entities record each sample ICS user's contact information and pertinent data on standardized monitoring questionnaires concerning the corresponding serial number of the ICS that was distributed.

For the first monitoring survey, the interviewer filled out the monitoring questionnaire manually. Further, for consecutive monitoring surveys, EKI will plan to collect the survey data 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 will be 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. This includes:

- Stove Serial No. /Unique ID, Date of ICS Receipt/onset of usage, Address, Beneficiary Name, etc.
- Improved Cookstove Specific Information such as the functioning of ICS, benefits observed from the use of improved cook stoves
- Traditional Cookstove Specific uses information
- Other Cooking fuel-specific information – LPG, Kerosene, etc.
- Fuel use pattern of your household – Purpose of fuel use
- Fuel Details – Quantity, sources, Cost, Quantity, Problem in collecting fuel, etc.

Calibration procedures for monitoring equipment:

To measure the weight of fuelwood consumed by the project stove in a day/week, a weighing scale will be required. The weighing scale used for monitoring purposes will be calibrated before starting the survey, as per the national/international standard, or as specified in the user manual.



Analysis

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

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

Data obtained from the samples will be used to estimate proportions and mean values for the parameters described above. The values will then be factored into the emissions reduction calculations and result in the request for 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.

Implementation

The project participant followed the simple random sampling approach and the minimum sample size was determined as per the following guidelines:

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

The simplified approach was used to determine the minimum sample size for parameters to be monitored so that for the sample compliance with 90/10 confidence precision is not obligatory.

As per the requirement of applied VCS methodology VMR0006, a minimum sample size of 100 is required to be surveyed for the project population greater than 1000. However, to get more accurate and reliable results, EKI selected 300 samples for both locations (i.e., Assam & Madhya Pradesh) to conduct the 1st monitoring survey.

For further verification, EKI may plan to conduct a kitchen performance test (KPT) for some of the households, to get a more reliable value of the fuelwood consumption for the project stove. EKI will report the changes and update the documents accordingly during the respective period.

Sampling for emission reduction calculation and elaboration of the monitoring report occurred at the end of the monitoring period. This sampling was conducted by trained personnel from the project proponent. The credentials and/or training materials for the sampling personnel will be provided to the VVB at verification. The maximum length of one monitoring period will be two years (duration, not calendar years), with an option for annual or biennial monitoring. However, EKI will plan to conduct the monitoring survey annually. The project proponent is responsible for managing household data collection and entry into the project database. Field personnel

received training on how to properly deal with surveying techniques and reduce errors and checked that there is no conflict of interest among those involved in data collection and analysis. The project proponent will record the start and end dates of each monitoring period and calculate the emission reductions attributable to each monitoring period.

The operation team of EKI selected the survey samples randomly using online software. To get more reliable results, EKI has selected 300 samples for both locations (i.e., Assam & Madhya Pradesh) instead of considering the minimum sample size of 100. Furthermore, 20% of oversamples were selected considering non-response, resulting 375 samples for each location. The training to understand the survey process, for awareness of the questions to be asked, and for the measurement of fuelwood consumption on the project stove, was conducted for the survey team before starting the monitoring survey. The survey team visited the sample households in person and collected the required information as per the questionnaire with the person using the cookstove. For the assessment of fuelwood consumption on the project cookstove, the surveyor asked to end user to make a bundle of fuelwood required in a day for the project stove and then weighed the same using the weighing scale. The survey team was equipped with a pre-calibrated weighing scale for weighing the fuelwood.



Survey results:

The following parameters were obtained through sampling:

1. $N_{y,i,j}$: Number of stoves in operation
2. $B_{y=1,new,i,j,survey}$: Quantity of woody biomass used by improved cookstoves

375 samples were selected (considering 20% non-response) from each location (i.e., Assam & Madhya Pradesh) for all monitoring parameters by section 8.4 option (b) of the applied methodology VMR0006. The survey team has surveyed 300 samples each on the ground from the 375 selected samples. The objective was to obtain reliable and unbiased estimates of the monitoring parameters.

A single homogeneous population was considered for both parameters.

The following table summarizes the sample sizes and results.

Monitored Parameter	Sample size		Survey Results	
	Assam	MP	Assam	MP
Number of stoves in operation ($N_{y,i,j}$)	300	300	100%	100%
Quantity of woody biomass used by improved cookstoves ($B_{y=1,new,i,j,survey}$)	300	300	3.78 Kg/day/stove	3.6 Kg/day/stove

Although 100% of the stoves were found to be operating during the 1st monitoring survey, since some users may go out for a few days during the year, for a family function or some festival, EKI has decided to consider a 10% reduction in the number of stoves in operation for current monitoring period.

Similarly, taking a conservative approach to the quantity of fuelwood used for the project stove, EKI has voluntarily decided to consider a 10% reduction in the value obtained by the survey results for both the locations for current monitoring period.

Appropriate record-keeping procedures have been implemented to ensure that each monitoring period data set can be transparently attributed to its corresponding project, preventing any occurrences of double counting. An internal review of the project database was conducted to determine the current status of each device — the duration of previous monitoring periods, the households delivering monitoring data, and current verification activities.

(i) Assessment for Leakage

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

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

(ii) Monitoring Reporting

The project proponent will assess all monitoring data and produce a monitoring record for the VVB to verify the corresponding to the preceding monitoring period. This record will present the data relating to the survey results conducted for the respective monitoring period.

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

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

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

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

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

EKIESL/its 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.

EKIESL team will also plan to visit the site regularly to ensure proper use of stoves, take feedback and make the end user aware of their health and environmental sustainability as well as the benefits of saving time and money with the use of ICS. The team will also check the grievances of the local stakeholders from the project activity and will try to resolve those issues on the ground.

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

- Name of the User

- Total Family Members
- Location/Address
- Installation Date
- Unique ID

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

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

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

The 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 VVBs 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 will be responsible for deploying the ICS at the household and registering the end user in the digital tool. They will also be 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 will also conduct 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.

7 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

7.1 Data and Parameters Monitored

Data / Parameter	$N_{y,i,j}$
Data unit	Number

Description	Number of project devices of type I and batch j operating during year y		
Value applied:	Number of ICS distributed	The proportion of ICS operational (based on sample survey)	Number of ICS operational during the monitoring period
	151,154	90%	136,039
Comments	As explained above under section 6.3 “Monitoring plan,” PP has considered 90% stoves in operation for current monitoring period. The proportion of operational stoves obtained from the survey is multiplied by the total commissioned stoves to arrive at this value. The survey will be conducted at least once every two years basis after the implementation of the project activity instance.		

Data / Parameter	$\eta_{(new,y,i,j)}$
Data unit	Fraction
Description	The efficiency of the improved cookstove type i and batch j determined using equation 5 of applied methodology during year y
Value applied:	34.23%
Comments	No comments

Data / Parameter	$B_{y=1,new,i,j,survey}$
Data unit	Tonnes
Description	Annual quantity of woody biomass used by improved cookstoves in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey
Value applied:	1. For Assam – 3.40 kg/device/day or equal to 1.2417 tonnes/device/year.

	2. For Madhya Pradesh – 3.24 kg/device/day or equal to 1.1826 tonnes/device/year. Estimated based on the survey result
Comments	The survey was conducted to determine this value in the first year of project implementation. However, As explained above under section 6.3 “Monitoring plan,” PP has considered 90% reduction in the value obtained by the survey results for both the locations for current monitoring period.

7.2 Baseline Emissions

The methodology does not account for baseline emissions separately but instead quantifies net emission reductions achieved by the project. Please refer to Section 7.5 below.

7.3 Project Emissions

The methodology does not account for project emissions separately but instead quantifies net emission reductions achieved by the project. Please refer to Section 7.5 below.

7.4 Leakage

Leakage shall be considered as default 0.95 in accordance with methodology.

7.5 Net GHG Emission Reductions and Removals

PP has calculated the emission reduction for each ICS installed under the project activity separately. In this section example of ER calculation of one ICS (stove serial number GHG-22D/0141552) is provided:

Date of installation: 16-July-2022

Location: Madhya Pradesh

For the year 2022, vintage for the stove: Vintage 1

No. of days for vintage 1: 169 (16-July-2022 to 31-December-2022)

Year fraction: $169/365 = 0.463$

Determination of efficiency of ICS during year y

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

Where

$$\eta_p = 36.42\%$$

$$DF_n = 0.99$$

Example of calculation:

If $y = 1$

$$\eta_{new,y,i,j} = 36.42\% \times (0.99)^{1(1-1)} \times 0.94$$

$$= 34.23\%$$

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

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

Example of calculation:

If $y = 1$,

For Madhya Pradesh

$$B_{y=1,new,i,j,survey} = 1.1826$$

$$B_{y,savings,i,j} = 1.1826 \times [(0.3423/0.1) - 1]$$

$$= 2.87 \text{ tonnes/year}$$

Calendar Year	Period	$B_{y=1,new,i,survey}$	$\eta_{new,y,i,j}$	η_{old}	$B_{y,savings,i,j}$
2022	16-July-2022 to 31-December-2022	1.1826	34.23%	0.1	2.87

Determination of emission reductions

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

Where,

$$NCV_{wood\ fuel} = 0.0156 \text{ TJ/tonne}$$

$$f_{NRB,y} = 0.892$$

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

Example of calculation:

If $y = 1$

$$ER_{y,i,j} = 2.87 \times 0.0156 \times 0.892 \times 138.23 \times 1 \times 0.95 \times 0.463$$

$$= 2.425 \text{ tCO}_2$$

The total emission reductions for all the project activity instances are as below

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
Year 2022 (11-May-2022--31-December-2022)	164,300	-	-	164,300
Total	164,300	-	-	164,300

<u>Ex-ante emissions reductions /removals</u>	<u>Achieved emissions reductions /removals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
460,325	164,300	-64.31%	All the project ICS were not installed on the first date of monitoring & PP has considered 10% reduction in each of the stove stoves in operation and fuelwood consumption in project stoves.

APPENDIX 1: <LOCAL STAKEHOLDER MEETING EVIDENCE>

Invitation Notice – Local Stakeholder Consultation Meeting, Assam

Public Notice

Date:

Subject: Invitation for Local Stake holder meeting of the Project Activity titled “- Clean Cookstoves for Rural India

Respected Stakeholder,

We, EKI Energy Services Ltd. are the investor for the project activity titled “-Clean Cookstoves for Rural India

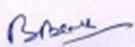
For this project activity, EKI Energy Services Ltd. has planned to distribute the energy efficient cookstoves in India.

Being a part of the same project activity, Local Stake Holder are invited to give their feedback and comments about project activity. We are conducting the Local Stakeholder meeting and in this regards, any kind of comments or views from your side are welcome and we are pleased to invite you for the same.

The details of the meeting are, as:-

Organizer :-	EKI Energy Services Ltd.		
Venue:-	SIKARIDAMGA	Date:-	10/05/2022
District:-	UDALGURI	Start Time:-	Hrs. 13:00
State:-	ASSAM	End Time:-	Hrs. 14:00

For EKI Energy Services Ltd. / PP representative


Authorized Signatory



List of Attendees – Local Stakeholder Consultation Meeting, Assam

Local Stakeholder Consultation Meeting

Project Title: Clean Cookstoves for Rural India

Location: Sikanidanga

Project Investor: SEITCO (Shell International Eastern Trading Company)

Attendance Sheet

Sl. No.	Name	Age	Sex (M/F)	Occupation	Village	Signature/ RTI
1	Sonathi Basumatary	43	F	H/W	Sikanidanga	Sonathi Basumatary
2	Ansuli Narzari	32	F	"	"	Ansuli Narzari
3	Simangsee Boro	45	F	"	"	Simangsee Boro
4	Lionkhri Basumatary	61	F	"	"	asta Basumatary
5	Jeeta Basumatary	33	F	"	"	
6	Pamita Basumatary	34	F	"	"	
7	Rita Boro	39	F	"	"	Rita Boro
8	Samir Ch. Boro	44	M	Farmer	"	Samir Ch. Boro
9	Makam Basumatary	49	F	H/W	"	
10	Bina Narzari	32	F	"	"	
11	Romila Boro	51	F	"	"	Romila Boro
12	Lalhari Basumatary	43	F	"	"	
13	Rahay Narzari	63	F	"	"	
14	Bina Boro	50	F	"	"	Bina Boro
15	Mama Boro	42	F	"	"	Mama Boro
16	Sanjeev Boro	52	F	"	"	
17	Jutika Basumatary	49	F	"	"	Jutika Basumatary
18	Lobapi Boro	55	F	"	"	Lobapi Boro
19	Lakshmi Boro	33	M	Farmer	"	
20	Badai Basumatary	61	F	H/W	"	
21	Rebani Boro	44	F	"	"	
22	Somina Swargiam	50	F	"	"	
23	Moni Boro	47	F	"	"	moni Boro
24	Simangsee Basumatary	34	F	"	"	
25	Lolita Basumatary	38	F	"	"	Lolita Basumatary
26	Kameswari Ramcheary	45	F	"	"	
27	Lalita Ramcheary	40	F	"	"	Lalita Ramcheary
28	Swarni Narzari	40	F	"	"	
29	Somswari Basumatary	40	F	"	"	
30	Bayjanti Basumatary	31	F	"	"	
31	Anima Narzari	39	F	"	"	Anima Narzari
32	Budali Boro	51	F	"	"	
33	Tari Boro	60	F	"	"	
34	Pimjim Boro	31	F	"	"	
35	Tarow Boro	22	F	"	"	
36	Dabi Boro	48	F	"	"	Dabi Boro
37	Khaoli Boro	53	F	"	"	Khaoli Boro
38	Somswari Ramcheary	33	F	"	"	
39	Lakshmi Basumatary	40	F	"	"	Lakshmi Basumatary

Local Stakeholder Consultation Meeting

Project Title: Clean Cookstoves for Rural India

Location: Sikanidanga

Project Investor: SEITCO (Shell International Eastern Trading Company)

Attendance Sheet

Sl. No.	Name	Age	Sex (M/F)	Occupation	Village	Signature/RTI
40	Mira Boro	36	F	H/W	Sikanidanga	Mira Boro
41	Ribita Boro	27	F	"	"	Ribita Boro
42	Bibhapani Basumatary	30	F	"	"	
43	Ansumasi Basumatary	40	F	"	"	
44	Mamoni Basumatary	48	F	"	"	Mamoni Basumatary
45	Prinja Basumatary	20	F	"	"	Prinja Barty
46	Sitarani Basumatary	51	F	"	"	
47	Prinai Narzary	48	F	"	"	Prinai Narzary
48	Sumkhya Boro	27	M	Farmen	"	
49	Rupen Basumatary	44	M	"	"	
50	Runi Basumatary	32	F	H/W	"	
51	Someswari Basumatary	39	F	"	"	
52	Sansurong Basumatary	46	M	Farmen	"	
53	Ridigh Boro	25	M	"	"	
54	Simanaga Basumatary	37	M/F	H/W	"	
55	Kapali Hazarika	46	F	"	"	Kapali Hazarika
56	Dhananjoy Boro	27	M	Farmen	"	Dhananjoy Boro
57	Renuka Deka	52	F	H/W	"	
58	Bulu Koch	45	F	"	"	
59	Pranita "	35	F	"	"	
60	Kunti "	48	F	"	"	
61	Jaya Deka	37	F	"	"	
62	Kalpana Koch	47	F	"	"	
63	Sangita Saikia	18	F	"	"	Sangita Saikia
64	Malati Rai	47	F	"	"	
65	Someswari Saikia	40	F	"	"	
66	Minu Deka	35	F	"	"	Minu Deka
67	Lagan Daimary	47	F	"	"	
68	Puja Das	29	F	"	"	Puja Das
69	Kanika Daimary	24	F	"	"	Kanika Daimary
70	Lohita Saikia	50	F	"	"	
71	Dharmendra Biswas	26	M	Farmen	"	D. Biswas
72	Bhonu Deka	44	F	H/W	"	Bhonu Deka
73	Arati Koch	24	F	"	"	
74	Chibiy Mahato	45	F	"	"	
75	Sabita Daimary	25	F	"	"	
76	Papori Medhi	22	F	"	"	
77	Someshwari Deka	50	F	"	"	
78	Dhameshwari "	52	F	"	"	

Local Stakeholder Consultation Meeting

Project Title: Clean Cookstoves for Rural India

Location: Sikanidanga

Project Investor: SEITCO (Shell International Eastern Trading Company)

Attendance Sheet

Sl. No.	Name	Age	Sex (M/F)	Occupation	Village	Signature/ RTI
79	Khesha Deka	30	F	H/W	Madalga Deka	Khesha
80	Krishna Deka	25	F	"	"	Krishna Deka
81	Pampi Saikia	29	F	"	"	Pampi Saikia
82	Maya Rani Basumaty	22	F	"	"	Maya Rani Basumaty
83	Monika Nath	28	F	"	"	Monika Nath
84	Bina Biswas	37	F	"	Sikanidanga	-
85	Bhabani Deka	55	F	"	"	-
86	Sugumdo Basumaty	39	M	Farmer	"	Sugumdo Basumaty
87	Seben Deka	55	M	"	"	-
88	Fulmi Changma	73	F	H/W	"	-
89	Babul Saikia	35	M	Farmer	"	Babul Saikia
90	Maheshon Saikia	64	M	"	"	-
91	Sasti Deka	42	F	H/W	"	-
92	Jatin Datta	46	M	Farmer	"	-
93	Pranab Kumar Deka	42	M	"	"	-
94	Rupa Baruah	40	F	H/W	"	-
95	Hareeswari Changma	42	F	"	"	-
96	Racharani Singh	52	F	"	"	-
97	Tarun Baruah	40	M	Farmer	"	-
98	Dulmoni Baruah	39	F	"	"	-
99	Charan Brahma	46	M	"	"	-
100	Minoti Saikia	62	F	H/W	"	-
101	Manisha Deka	33	F	"	"	Manisha Deka
102	Rakha Tamuli	32	F	"	"	Rakha Tamuli
103	Rita Baruah	36	F	"	"	Rita Baruah
104	Prabha Hazarekha	44	F	"	"	Prabha Hazarekha
105	Dulmoni Baruah	37	F	"	"	-
106	Drupam Deka	31	M	Farmer	"	-
107	Rohita Brahma	49	F	H/W	"	-
108	Jayanti Basumaty	29	F	"	"	-
109	Narayan Saikia	51	M	Farmer	"	-
110	Kanchan Monok	50	F	H/W	"	-
111	Nabin Deka	65	M	Farmer	"	-
112	Srimangsha Brahma	27	M	"	"	Srimangsha Brahma
113	Manika Basumaty	21	F	H/W	"	Manika Basumaty
114	Bipin Saikia	49	M	Farmer	"	-
115	Hitesh Saikia	35	M	"	"	-
116	Utpal Saikia	33	M	"	"	-
117	Ananti Brahma	49	F	H/W	"	-

Local Stakeholder Consultation Meeting

Project Title: Clean Cookstoves for Rural India

Location: **Sikaridanga**

Project Investor: SEITCO (Shell International Eastern Trading Company)

Attendance Sheet

Sl. No.	Name	Age	Sex (M/F)	Occupation	Village	Signature/ RTI
118	Baekhtam Basumatary	60	M	Farmer	Sikaridanga	
119	Jeni Deka	34	F	u	do	Jeni Deka
120	Shireen Baruah	52	M	u	do	Shireen Baruah
121	Daloni Deka	29	F	u	do	Daloni Deka
122	Ela Machahary	29	F	u	do	Ela Machahary
123	Jayanti Boro	29	F	u	do	Jayanti Boro
124	Anima Basumatary	30	F	u	do	Anima Basumatary
125	Neha Boro	29	F	u	do	Neha Boro
126	Hariwari Narangy	23	F	u	do	Hariwari Narangy
127	Santi Basumatary	38	F	u	do	Santi Basumatary
128	Maloti Boro	40	F	u	do	Maloti Boro
129	Priyanka Basumatary	21	F	u	do	Priyanka Basumatary
130	Kamini Boro	47	F	u	do	Kamini Boro
131	Sambari	52	F	u	do	Sambari
132	Ganga Boro	44	F	u	do	Ganga Boro
133	Jashram Dainmy	45	M	Businessman	do	Jashram Dainmy
134	Rijoni Dainmy	62	F	Farmer	do	Rijoni Dainmy
135	Baleshi Barua	57	F	Farmer	do	Baleshi Barua
136	Dakshini Basumatary	34	F	u	do	Dakshini Basumatary
137	Rita Brahma	22	F	u	do	Rita Brahma
138	Balrama Boro	32	F	u	do	Balrama Boro
139	Balaram Boro	46	M	u	do	Balaram Boro
140	Khanga Boro	52	F	Businessman	do	Khanga Boro
141	Sulek Basumatary	39	F	Farmer	do	Sulek Basumatary
142	Maima Boro	25	F	u	do	Maima Boro
143	Damayanti Machahary	31	F	u	do	Damayanti Machahary
144	Anima Basumatary	29	F	u	do	Anima Basumatary
145	Kapali Boro	47	F	u	do	Kapali Boro
146	Jaru Basumatary	30	F	u	do	Jaru Basumatary
147	Lakhi Shri Boro	30	F	u	do	Lakhi Shri Boro
148	Mamoni Swangmy	31	F	u	do	Mamoni Swangmy
149	Jade Boro	35	F	u	do	Jade Boro
150	Parvina Swangmy	30	F	u	do	Parvina Swangmy
					do	
					do	
					do	
					do	
					do	

Meeting Minutes – Local Stakeholder Consultation Meeting, Assam

INSTALLATION OF HIGH EFFICIENT COOK STOVES BY EKI ENERGY SERVICES LIMITED

Meeting Minutes

Meeting Date: 10/05/2022

Meeting Location: Udalguri, Assam

1 Meeting Location

Site: SIKARIDANGA,

District: Udalguri,

State: Assam

Meeting Timings

Meeting Schedule Start: 13:00 Hrs

Meeting Actual Start: 13:10 Hrs

2 Agenda

The Agenda of the meeting is given below:-

- Opening of meeting
- Explanation of the project by Project Proponent
- Questions for clarification about project explanation
- Closures of Meeting

The stakeholders gathered at the venue, as per the scheduled time. The meeting was opened by the PP representative with a welcome remark.

The meeting was outlined towards making aware stakeholder & local community people, about the Energy Efficient Cook stove project activity & how does it leads to reduction of the GHG gases emission. Details regarding the proposed project cycle & also the role of local stakeholders in the project was outlined.

Explanation about the main purpose of the project activity i.e. 'to distribute Energy Efficient Cook stove and reduce GHG emissions' was narrated. Furthermore it was elaborated that the said project also conceives the following:-

- Use of energy efficient cookstove will change consumption pattern & will mitigating the immense stress on the environment.
- Spread of the commercialization of the Energy Efficient Cook stove projects in the region.
- Contribute to sustainable development of the region, socially, environmentally & economically.

After the detailed discussion, some of the stakeholders raised questions on the Energy Efficient Cook stove project to clear their doubts. Following questions were asked (translated from local language to English) which were adequately explained and answered:

Pictures - Local Stakeholder Consultation Meeting, Assam



Invitation Notice - Local Stakeholder Consultation Meeting, Madhya Pradesh

1. District - Dhar

ENVRO QUEEN PVT LTD

HO -130, MG ROAD DHAR (MP) 454001

Date- 20th June 2022

LH/101/ 233

Public Notice

Date:

Subject: Invitation for Local Stake holder meeting of the Project Activity titled "- Clean Cookstoves for Rural India.

Respected Stakeholder,

We, EKI Energy Services Ltd. are the investor for the project activity titled "-Clean Cookstoves for Rural India.

For this project activity, EKI Energy Services Ltd. has planned to distribute the energy efficient cookstoves in India.

Being a part of the same project activity, Local Stake Holder are invited to give their feedback and comments about project activity. We are conducting the Local Stakeholder meeting and in this regards, any kind of comments or views from your side are welcome and we are pleased to invite you for the same.

The details of the meeting are, as:-

Organizer :-	EKI Energy Services Ltd.		
Venue:-	Get Pura		Date:- 4 th July 2022
District:-	Dhar		Start Time:- Hrs. 11:40am
State:-	Madhya Pradesh		End Time:- Hrs. 2:00 PM

For EKI Energy Services Ltd. / PP representative

(Sachin Agrawal)

Authorised Signatory

1 | Page

2. District – Sheopur

Public Notice

21/08/2022
देवना

Public Notice for Local Stakeholder meeting of the Project Activity titled “- Clean Cookstoves for Rural India”

Respected Stakeholder,

EKI Energy Services Ltd. are the investor for the project activity titled “-Clean Cookstoves for Rural India”. For this project activity, EKI Energy Services Ltd. has planned to distribute the energy efficient cookstoves in India.

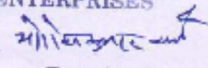
Being a part of the same project activity, Local Stake Holder are invited to give their feedback and comments on the project activity. We are conducting the Local Stakeholder meeting and in this regards, any kind of comments or views from your side are welcome and we are pleased to invite you for the same.

Details of the meeting are as follows:

Project Activity	EKI Energy Services Ltd.	Date:-	19/09/2022
Location	देवना	Start Time:-	Hrs. 9:00
Time	2:00 PM	End Time:-	Hrs. 6:00
Topic	महत्वपूर्ण		

EKI Energy Services Ltd. / P representative

For JPS ENTERPRISES

Authorized Signatory 
Proprietor


प्रधान

श्रीम. पद्मावती देवना
बनारस

Location:-

Project Manager:-

Function:-

3. District – Shivpuri

Public Notice

Date: 20/08/2022

Subject: Invitation for Local Stake holder meeting of the Project Activity titled "- Clean Cookstoves for Rural India

Respected Stakeholder,

We, EKI Energy Services Ltd. are the investor for the project activity titled "-Clean Cookstoves for Rural India

For this project activity, EKI Energy Services Ltd. has planned to distribute the energy efficient cookstoves in India.

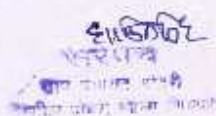
Being a part of the same project activity, Local Stake Holder are invited to give their feedback and comments about project activity. We are conducting the Local Stakeholder meeting and in this regards, any kind of comments or views from your side are welcome and we are pleased to invite you for the same.

The details of the meeting are, as:-

Organizer :-	EKI Energy Services Ltd.	Date:-	10/08/2022
Venue:-	Gonadi	Start Time:-	Hrs. 4:00 PM
District:-	Shivpuri	End Time:-	Hrs. 6:00 PM
State:-	Madhya Pradesh		

For EKI Energy Services Ltd. / PP representative

Authorised Signatory



For JPS ENTERPRISES
21/08/2022
Proprietor

Public Notice

Date: 07/09/2022

Subject: Invitation for Local Stake holder meeting of the Project Activity titled "Clean Cookstoves for Rural India"

Respected Stakeholder,

We, EKI Energy Services Ltd. are the investor for the project activity titled "Clean Cookstoves for Rural India".

For this project activity, EKI Energy Services Ltd. has planned to distribute the energy efficient cookstoves in India.

Being a part of the same project activity, Local Stake Holder are invited to give their feedback and comments about project activity. We are conducting the Local Stakeholder meeting and in this regards, any kind of comments or views from your side are welcome and we are pleased to invite you for the same.

The details of the meeting are, as:

Organizer :-	EKI Energy Services Ltd.	Date:-	09/10/2022
Venue:-	Gandhiji House Kotha	Start Time:-	Hrs. 8 PM
District:-	JABALPUR	End Time:-	Hrs. 10 PM
State:-	MADHYA PRADESH		

For EKI Energy Services Ltd. / PP representative

Authorized Signature



विनीता
 सरपंच
 ग्राम पंच. कोहला
 जन. पंच. राहपुरा-मिलेनी

List of Attendees – Local Stakeholder Consultation Meeting, Madhya Pradesh

1. District - Dhar

ENVRO QUEEN PVT LTD
 HO -130, MG ROAD DHAR (MP) 454001

Date: 4th July 2022 LH/101/233

Local Stakeholder Consultation Meeting

Project Title: Clean Cookstoves for Rural India
 Location: Jitpura
 Project Investor: SEITCO (Shell International Eastern Trading Company)

Attendance Sheet Date: 4th July 2022

S No	Name	Age	Sex (M/F)	Occupation	Village	Signature/ RTI
1	रायसिंग गिरवात	60	M	Farmer	कुशाडिया	रायसिंग
2	शंकर ठोसारी	41	M	Farmer	कुशाडिया	शंकर
3	सुखराम गिरवात	42	M	Farmer	कुशाडिया	
4	राधेधाम गिरवात	45	M	Farmer	कुशाडिया	
5	महाविर गिरवात	40	M	Farmer	कुशाडिया	महावीर
6	विक्रम गिरवात	45	M	Farmer	कुशाडिया	विक्रम
7	देवाराम भाभर	45	M	Farmer	कुशाडिया	

8	भारंगी गिरवात	40	M	Farmer	कुराडिया	भारंगी
9	धन गिरवात	42	M	Farmer	कुराडिया	धन
10	गेंदी बई बुरिया	35	F	House wife	बेडापुरा	
11	बलीता चौहान	30	F	House wife	बेडापुरा	बलीता
12	अमिता यादव	46	F	Housewife	आवदा	अमिता
13	लिसा भार	50	F	House wife	बेडापुरा	
14	पुंजी बई परमार	45	F	House wife	बेडापुरा	
15	ममता चौहान	24	F	Housewife	बेडापुरा	ममता
16	किरण परमार	21	F	House wife	बेडापुरा	किरण
17	सुगरी बई बुरिया	60	F	Housewife	बेडापुरा	
18	सुगरी बई बुरिया	55	F	House wife	बेडापुरा	
19	शारदा सावर	50	F	House wife	बेडापुरा	शारदा

20	विद्या डावर	20	F	Housewife	वेडापुरा	विद्या
21	रितिक थापल	19	M	Farmer	नावछा	रितिक
22	अन्न थापल	19	M	Farmer	नावछा	अन्न
23	भुमि राठोड	20	F	Farmer	नावछा	भुमि
24	मनिष थापल	24	M	Farmer	नावछा	मनिष
25	आरति शायब	30	F	Housewife	नावछा	आरती
26	कापुगम भावर	44	M	Farmer	वेडापुरा	कापु
27	लमनाबाई डावर	45	F	Housewife	वेडापुरा	लमना
28						

2. District – Sheopur

Local Stakeholder Consultation Meeting

Project Title: Sheopur District: Sheopur

Organized by: Eastern Trading Company

Date: 13/03/2022

No.	Name	Age	Sex (M/F)	Occupation	Village	Signature
1	बूडा बई	28	F	मजदुरी	डेगा	
(2)	मीना बई	37	F	मजदुरी	डेगा	मीना
3	सलजनी बई	32	F	मजदुरी	=/-	
4	सोना बई	27	F	मजदुरी	डेगा	
5	सुजो बई	48	F	मजदुरी	डेगा	
6	खोडी बई	32	F	मजदुरी	डेगा	खोडी
7	बापा बई	55	F	मजदुरी	डेगा	
8	सोना बई	50	F	मजदुरी	डेगा	
9	रेखा बई	35	F	मजदुरी	डेगा	
10	कान्दरी बई	65	F	मजदुरी	डेगा	
11	रामलक्ष्मी बई	60	F	मजदुरी	डेगा	

For JPS ENTERPRISES

3. District – Shivpuri

Local Stakeholder Consultation Meeting

Project Title: Clean Cookstoves for Rural India

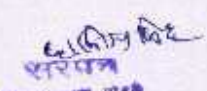
Location: Gondarsi

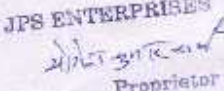
Project Investor: SEI/CO (Shell International Eastern Trading Company)

Date: 19/09/2022

Attendance Sheet

S No	Name	Age	Sex (M/F)	Occupation	Village	Signature/ RTI
01	महेश्वरी लाल	48	m	मजदूरी	गोंदरी	महेश्वरी
02	अशोक शर्मा	55	m	कृषि	गोंदरी	अशोक शर्मा
03	शशीकान्त दुबे	33	m	मजदूरी	गोंदरी	शशीकान्त
04	उपमासिंह पारमर	29	m	मजदूरी	गोंदरी	उपमासिंह
05	लक्ष्मण लाल	46	m	कृषि	गोंदरी	लक्ष्मण लाल
06	उमेश लाल	26	m	कृषि	गोंदरी	उमेश लाल
07	शशीकान्त दुबे	47	m	कृषि	गोंदरी	शशीकान्त
08	लक्ष्मण शर्मा	49	m	कृषि	गोंदरी	लक्ष्मण शर्मा


 महेश्वरी लाल
 Proprietor

For JPS ENTERPRISES

 महेश्वरी लाल
 Proprietor

Local Stakeholder Consultation Meeting

Project Title: Clean Cookstoves for Rural India

Location: ग्राम - बेहरी ग्राम पंच कोठला

Project Investor: SEITCO (Shell International Eastern Trading Company)

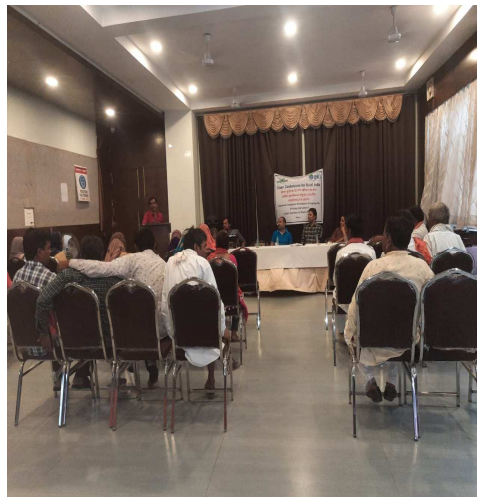
Attendance Sheet

Date: 09/10/2022

S No	Name	Age	Sex (M/F)	Occupation	Village	Signature/ RTI
	मुरी-बेडि	44	F	मजदूरी		मुरी-
	अमरी	35	F	किसान		अमरी
	बाधा	40	F	मजदूरी		बाधा
	नन्ही	34	F	मजदूरी		नन्ही
	राम बेडि	60	F	गृहणी		राम बेडि
	वितीता	30	F	मजदूरी		वितीता
	प्रियंका	40	F	किसान		प्रियंका
	नन्दी	32	F	किसान		नन्दी

Pictures - Local Stakeholder Consultation Meeting, Madhya Pradesh

1. District - Dhar



2. District – Sheopur



3. District – Shivpuri



4. District - Jabalpur



APPENDIX 2: < OTHER SUPPORTING EVIDENCE >

Employment Declaration (Manufacturer)



GHG REDUCTION TECHNOLOGIES PRIVATE LIMITED
CIN : U31909MP2022PTC059070
Nashik Office Address: Plot No. A-11/2/3, Nagargoje Industries Pvt. Ltd., Sumeet Compound,
 Ambad MIDC, Nashik, Maharashtra, 422010
 E-Mail : ghgreductiontech@gmail.com
 Phone No. : +91 9822872133

Date: 23.01.2023

This is to declare that GHG Reduction Technologies Pvt LTD has employed **415 employees** for improved cookstove manufacturing to execute Enking orders of improved cook stoves from April 2022 onwards. Details of same is as below:

Blue collar Workers :- **387 Nos (307 male and 80 female)**, Average salary Rs. **12000 to 15000** per month.

Staff :- **28 Nos (Male)**, Average salary Rs **30000 to 35000** per month.



GHG REDUCTION TECHNOLOGIES PVT.LTD.

 Authorised Signatory

Employment Declaration (Distributor) - Jabalpur & Dindori

GSTIN-23AQXPP327H1Z9
Mob. 8821930305



AARANSH AGRO TECH

1782 Kripal Chouk Gupteshwar
Jabalpur (M.P.) 482001

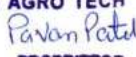
email - aaranshgroup@gmail.com

Date: 20.01.2023

This is to declare that AARANSH AGRO TECH has employed 79 for Improved Cookstove Distribution to execute EKI Energy Services Ltd orders from April 2022 onwards.

Details of same is as below:

Distribution Staff	:- Actual Numbers 74 (No of male- 68 and no of female-6), Average salary Rs 12000 per month
Backend Staff	:- Actual Nos 5 Average salary Rs 18000 to 20000 per month.

AARANSH AGRO TECH

Proprietor

Employment Declaration (Distributor) - Sheopur Shivpuri

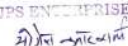


Date: 20.01.2023

This is to declare that JPS ENTERPRISES has employed 29 for Improved Cookstove Distribution to execute EKI Energy Services Ltd orders from April 2022 onwards.

Details of same is as below:

Distribution Staff	:- 25 (No of male 25) Average salary Rs 20000-25000
Backend Staff	:- 4 (Male), Average salary Rs 20000 to 25000 per month.

For JPS ENTERPRISES

Proprietor

Employment Declaration (Distributor) - Assam


www.bibsiקה.in

Date- 20/01/2023

TO WHOMSOEVER IT MAY CONCERN

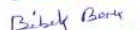
This is to declare that BIBSIKHA LLP has employed 85 nos of Persons for improved cookstove Distribution to execute Enking orders of improved cook stoves from April 2022 onwards. Details of same is as below:

Distribution Staff : 80 Nos (60 male and 20 female), Average salary Rs 15000 to 17000 per month.
As per Govt Norms minimum wage per month.

Backend Staff : 05 Nos (Male), Average salary Rs 20000 to 25000 per month.

For BIBSIKHA LLP

BIBSIKHA LLP



Designated Partner
(Bibek Bora)

Designated Partner, BIBSIKHA LLP

bibek@bibsiקה.in

+91 70025 13935



Employment Declaration (Distributor) - Dhar

Envro Queen Pvt Ltd

MG Road, Dhar MP -454001

LH-1002/23

Date: 20.01.2023

This is to declare that Envro Queen Pvt Ltd has employed 25 for Improved Cookstove Distribution to execute EKI Energy Services Ltd orders from April 2022 onwards.

Details of same is as below:

Distribution Staff : - No. of male 18

No. of female 5

Average salary Rs 15000 to 20000 per month.

Backend Staff : - No of male 2, Average salary Rs 20000 to 25000 per month.



For- Envro Queen Pvt Ltd

APPENDIX 3: < END USER AGREEMENT >

Carbon Credit Ownership Agreement Agreement No -

This Agreement is made on this _____ Day of _____ 20__ between _____ herein after referred to as "user" of Improved Cookstoves and EKI Energy Services Ltd. herein after to be referred as "Enking International" and "Project Participant". All above expression shall, unless represent to the subject context or meaning thereof means and includes the legal heirs, successors, legal representatives and permitted assigns.

Whereas the users are being made available with the Improved Cook Stoves (ICS) by the Enking International in association through its distributor _____ on this _____ Day of _____ 20__ with ICS Serial No/ID _____.

The cookstove is provided to "user" at free of cost to user. Enking International have factored in carbon credit revenue to cover ICS manufacturing cost, cost of distribution and maintenance cost throughout the lifetime of the project and is developing GHG projects by aggregating improved cooking stoves distributed to users including cookstoves under the current agreement.

Parties under the contract unanimously agreed that carbon credit ownership lies with Enking International and Mr. Manish Dabkara, MD & CEO of Enking International will act as the authorized signatory and focal point, for execution of GHG project/projects.

Obligation of User

1. The user by virtue of this agreement agree that carbon credits ownership is with Enking International.
2. Obligated to use the ICS and refrain from use of existing less efficient traditional cook stove used prior to the receipt of ICS. In case the user is shifting to other location the same will be intimated to representatives of Enking International.
3. The user cannot give away/rent/sub-let/sell the ICS to other users.
4. Obligated to provide all related information to Enking International representative, third party project verifier as and when required.
5. Obligated to support Enking International representative in survey, monitoring, maintenance and continuation of use. In case the user is not supporting the project participant for the monitoring activity the contract will be considered terminated.

6. The contract will also will be terminated in case during spot check and periodic verification by the project participant/distributor/O&M contractor it is observed that the user is continuing using traditional cook stove or have shifted to other location.
7. The contract will also be terminated in case the user decides or shift to other fuel options like coal, LPG or any high carbon intensity fuel etc. In case the user is shifting to other fuel options the same will be intimated to representatives of Enking International.
8. Enking has provided all the required training related to use, operation and handling of ICS. In case of any injury or any unfortunate accident while using ICS, Enking will not be responsible

Obligation of the Project Participant or it's representative/ Owner of Carbon Credit

1. To facilitate distribution of cook stoves, training of improved cookstove users or maintenance staff, undertake scheduled and unscheduled maintenance and post life time replacement. However, such activity will only be undertaken subjected to successful registration of the project under GHG Mechanism and issuance of carbon credits from the project or program activity.
2. Facilitate maintaining of database of ICS users.
3. Facilitate to conduct survey/ monitoring requirement as per project requirement across the crediting period.
4. Obligated to facilitate development of GHG project documentation.
5. Facilitate and bear cost relating to Registration and sequent issuance of carbon credits project activity.

In witness whereof, the parties hereto have used this contract to be signed in their respective names as of the day and year above written.

ICS User

Name
Contact Details
Address
Village
District
State
ICS Serial No/ID

Enking International or it's representative

Name
Designation
Contact Details
Address

(Signature)

(Signature)

APPENDIX 4: < STOVE EFFICIENCY CERTIFICATE >



Dr. S. K. TYAGI
Associate Professor

भारतीय प्रौद्योगिकी संस्थान दिल्ली
INDIAN INSTITUTE OF TECHNOLOGY DELHI

Centre for Energy Studies
हौज खास, नई दिल्ली-110016
Hauz Khas, New Delhi-110016
Tel +91-11-2659 1320, Mobile +91-8558864525
E-mail tyagisk@iitd.ac.in, sudhirtyagi@yahoo.com

Ref. No: IITD/IRD/RP04288N/2022/01
Date: 09.07.2022

To

Mr. Soumitra Kulkarni,
Director,
Swami Samarth Electronics Pvt. Ltd.
Plot No. M-63, MIDC, Ambad, Nashik,
Maharashtra, India

Subject: Testing results of solid biomass cookstove as per revised BIS protocols

Dear Mr. Kulkarni,

Please find the below results of solid biomass cookstove Angeekaa Eco Mini Model 4 SE as per revised BIS protocols IS:13152: 2013.

Model No.	Type of Fuel	Efficiency (%)	PM _{2.5} (mg/MJd)	CO (g/MJd)
Angeekaa Eco Mini Model 4 SE	Dry Wood*	36.42	285.25	4.02

* Provided by the cookstove manufacturer

The above results are the average values, obtained following the revised BIS testing protocols, mentioned above.

Thanking you,

Yours Sincerely,


S. K. Tyagi 9/7/22

APPENDIX 5: < A COMPARATIVE ANALYSIS OF THE ESTIMATED FNRB WITH THE LITERATURE REFERRED BY TOOL 30 >

Estimation of Fraction of Non-Renewable Biomass (fNRB)

The process of determining the non-renewable fraction of woody biomass aligns with the guidelines outlined in Tool 30. This estimation hinges on evaluating the proportion of biomass consumed that has not been extracted or harvested sustainably. Notably, the consumption of fuel wood (*Bošković, Chakravorty, Pelli, & Risch, January 2023*) serves as a primary driver of deforestation in India, a consequence of unsustainable extraction and harvesting practices.

The decision to consider subnational or state boundaries for fNRB estimation is rooted in the demarcation of forest boundaries by the Government of India. This delineation serves the dual purpose of regulation and conservation of forested areas. Additionally, several justifications bolster the argument for utilizing subnational boundaries in fNRB estimation:

1. Ecological conditions vary significantly at the subnational level in India, resulting in differences in the mean-annual growth of wood biomass within and outside forested areas. This discrepancy translates into variations in the sustainable extraction potential of woody biomass across defined geographical regions. This difference is further emphasized by variations in the availability of land area under forest cover and for trees outside of forests across states, impacting the potential to sustainably extract wood to meet local demand.
2. While "forest" is included in the Concurrent list of the Indian Constitution, its delineation and boundary definition occur at the subnational level. Regulatory provisions under the Forest Conservation Act 1980 and Forest Conservation Rules 2003, which permit wood harvesting, are overseen by State Forest Departments. This framework does not allow for cross-boundary wood extraction or harvest, further supporting the use of state boundaries for supply provision estimation.
3. The regulatory provisions outlined in "The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006" enable the collection of Non-Timber Forest Products (NTFP), including firewood, exclusively for traditional forest dwellers. This restricts forest rights to local communities and does not provide for cross-boundary collection.
4. Given that a substantial portion of the woody biomass used as fuel wood, particularly in villages and peri-urban areas, is locally collected, the state or subnational boundary is the most relevant for estimating both fuel wood demand and supply.

Furthermore, in accordance with para 6 (b) of Tool 30, the selection of the project area is permitted, allowing for the consideration of state boundaries in the calculation of fNRB.

Summary of Considerations for Subnational Boundary Use:

- Ecological conditions vary, impacting sustainable biomass extraction.
- "Forest" delineation and regulation occur at the subnational level.
- Regulatory provisions restrict cross-boundary wood extraction.
- Rights for NTFP collection are localized.
- Localized collection of fuel wood is predominant.

Thus, in line with Tool 30, state boundaries are a suitable consideration for fNRB calculation.

Comparison with Scientific Literature

The calculation of fNRB involves establishing the ratio between the quantity of non-renewable biomass (NRB) consumed within the applicable area and the total quantity of both non-renewable biomass (NRB) and renewable biomass (RB). As defined by the tool, NRB is determined as the difference between the total consumption of woody biomass (H) and the quantity of renewable biomass.

In accordance with paragraph 6 of Tool 30, this section undertakes a comparative analysis of the calculated fNRB values against those reported in pertinent scientific literature, providing justifications for any disparities.

1. Total Wood Consumption

- The entire premise of fNRB centers around the unsustainable extraction and harvest of wood for both fuel and commercial applications. The relevant scientific literature (Bailis, Drigo, & Ghilardi, 2015), referenced in Tool 30, estimates fNRB, or rather NRB (as denoted in the report), based solely on wood fuel demand, with 2009 as the base year. According to Equation 3 of Tool 30, the total wood demand encompasses the average consumption of wood fuel per household, encompassing fuel wood and charcoal, along with commercial woody biomass consumption for energy and non-energy applications. This differs from the literature, which considers only the demand for wood fuel. Since the estimate of fNRB is directly linked to the quantity of wood consumed, this exclusive focus on wood fuel may potentially result in a lower fNRB value in the literature compared to the estimates made for the purpose of GHG emission avoidance.

For instance, let us take the state of Madhya Pradesh (MP) as an example. The table below provides data on wood consumption in MP based on secondary sources...

Consumer type	Quantity	Cumulative Consumption	Percentage of total consumption
Domestic	13.67 million tonnes	13.67 million Tonnes ¹⁸	83%
Commercial Wood Consumption	1.149 million tonnes	1.78 million Tonnes ¹⁹	7%

¹⁸ https://fsi.nic.in/cover_2011/chapter7.pdf

¹⁹ https://fsi.nic.in/cover_2011/chapter7.pdf

Small timber by Forest Infringe	0.964 million tonnes	0.964 million Tonnes ²⁰	6%
Bamboo collection by million tonnes	0.63 million tonnes	0.63 million Tonnes ²¹	4%

- 1) Based on the example from Madhya Pradesh provided above, it is evident that approximately 17% of wood consumption has not been accounted for in the scientific literature (Bailis, Drigo, & Ghilardi, 2015). This omission has resulted in a lower calculated value for fNRB.
- b) The total consumption of woody biomass, for example, in the state of Madhya Pradesh, is conservatively derived from a report published by MoEFCC (Ministry of Environment, Forest and Climate Change, Government of India) in 2011 (MoEFCC, 2011). This data is more recent compared to that utilized in the referenced literature (which was based on 2009 data extracted from wood fuel demand available from national and sub-national studies, supplemented by data from the Food and Agriculture Organization (FAO), International Energy Agency (IEA), and United Nations (UN)). Given that the publication of wood demand by MoEFCC aligns with the provisions outlined in Data/Parameter table 1 of Tool 30, it is considered appropriate to incorporate this information.
- c) Furthermore, a cross-verification process was conducted to assess the wood fuel demand, which accounts for 83% of the cumulative wood demand, in the state of Madhya Pradesh. This was done using an alternative approach as specified in Equation 3 of Tool 30. The estimated value of fuel wood demand²² provided by MoEFCC for the state of Madhya Pradesh was found to be more conservative and was therefore utilized in the estimation of the total consumption of woody biomass.

Parameters	Value	Unit	Source	
Total Population	72626809	Nos.	Census 2011	https://censusindia.gov.in/census.website/data/census-tables
Rural Population	52557404	Nos.	Census 2011	https://censusindia.gov.in/census.website/data/census-tables
Total Household	15093256	Nos.	Census 2011	https://censusindia.gov.in/census.website/data/census-tables
Rural Household	11080278	Nos.	Census 2011	https://censusindia.gov.in/census.website/data/census-tables
Persons/household (Rural)	4.74			

²⁰ Estimated based on the small timber consumption value obtained from <https://fsi.nic.in/isfr19/vol1/chapter10.pdf> and wood density of specific species sourced from <https://www.fao.org/3/w4095e/w4095e0c.htm#TopOfPage>

²¹ <https://fsi.nic.in/isfr19/vol1/chapter10.pdf>

²² Against wood fuel demand specified in the MoEFCC report

Parameters	Value	Unit	Source	
Rural Household using firewood	93.8%		NSS Report No. 558: Household Consumption of Various Goods and Services in India, 2011-12	https://www.mospi.gov.in/sites/default/files/publication_reports/Report_no558_rou68_30june14.pdf
Default per capita firewood usage	0.4	ton/capita	Tools for f_{NRB} calculation	
Default per capita firewood usage	0.4	ton/capita	Tools for f_{NRB} calculation	
Rural Household firewood usage	1.897	tonne/annum		
Total Firewood usage (rural)	19.72	million tonnes		
Total Firewood usage	19.72	million tonnes		

Therefore, from the above information, it can be deduced that the wood consumption considered for the estimation of f_{NRB} is more recent, conservative, and authenticated, as it is published by the Government of India's authorized agency.

2. Renewable Biomass

2) According to Paragraph 19 and Equation 4 of Tool 30, renewable biomass (RB) available in the applicable area is estimated as a factor of the annual increment of woody biomass in both forest and non-forest areas. The renewable biomass component, as estimated under the project activity, takes into account plantation across both forested and non-forested areas, as published by MoEFCC in 2021, and the mean annual increment of different Indian forest types published at the national level. In contrast, the renewable biomass component estimated in the referenced literature is based on satellite images of specific locations during 2009.

The quantity of renewable biomass available in a particular geography is influenced by deforestation. The status of deforestation in India, as outlined below through a review of secondary literature, contradicts the literature referenced (Bailis, Drigo, & Ghilardi, 2015), which emphasizes afforestation efforts in state forests in India.

According to Global Forest Watch²³, India lost 393 thousand hectares of humid primary forest during 2002-2022, accounting for 18% of its total tree cover loss in the same period. This is equivalent to a decrease in the total area of humid primary forest in India by 3.9%. The year-wise deforestation is illustrated in the figure below.

²³ <https://www.globalforestwatch.org/dashboards/country/IND/?category=undefined>



This deforestation also encompasses the loss of 2.19 million hectares of tree cover, equivalent to a 5.6% decrease in tree cover since 2000. The deforestation in the country is further confirmed by a report published by "Down to Earth"²⁴, which outlines a deforestation of 668,400 hectares between 2015 and 2020, making India the second-highest country in terms of deforestation after Brazil²⁵. This level of deforestation is significantly higher when compared to the loss of 384,000 hectares of forests between 1990 and 2000.

3. Difference in AGB

In the referred literature, Above Ground Biomass (AGB) is the pivotal component for estimating Renewable Biomass. It is crucial to highlight the disparity between the statistics presented in the referred literature and the nationally published data:

Referred Literature	India State of forest Report 2021 ²⁶
15067 million tones	2319 million tonnes

As Renewable Biomass (RB) is inversely proportional to the estimate of fraction of Non-Renewable Biomass (fNRB), a higher RB value results in a lower fNRB, as illustrated in the referred literature.

4. Approach for Estimating fNRB

According to the referred literature, recent maps of land cover and ecological zones undergo an assignment of an Above Ground Biomass (AGB) stock. This process utilizes three distinct sources:

- AGB distribution maps
- Geo-referenced field plots

²⁴ <https://www.downtoearth.org.in/news/wildlife-biodiversity/india-lost-668-400-ha-forests-in-5-years-2nd-highest-globally-report-88337>

²⁵ <https://indiacr.in/india-has-lost-around-668400-hectares-of-forestry-to-deforestation-2nd-highest-in-the-world/>

²⁶ Referrer: "Bibliography"

- iii. Forest inventories from known locations for specific forest types, where AGB distribution is derived from different datasets.

To account for discrepancies in the datasets, components of woody biomass that are not typically used for wood fuels, such as twigs, leaves, and stumps, are subtracted. This action aids in constructing a map of "Dendro-energy" biomass (DEB) stock. The supply of wood fuel is then estimated based on the "mean annual increment" (MAI) of DEB. This estimation is modelled through a functional relationship established from approximately 2,800 spatially explicit field observations of MAI and corresponding AGB.

Changes in land cover are accommodated by estimating the amount of DEB produced through deforestation and afforestation processes. This estimation is based on data from the Food and Agriculture Organization (FAO) and utilizes information from Forest Monitoring for Action (FORMA).

While this approach has undergone peer review, it deviates from the guidelines outlined in paragraph 19, which provides the methodology for estimating the quantity of renewable biomass.

Comparison of Calculated fNRB Values with values published in different registries

In addition to the preceding explanation, it is worth noting that there are references available for calculated fNRB values. For example, the fNRB value calculated for Myanmar came into effect on the CDM website on 23 December 2020²⁷ and will remain valid until 25th December 2025. This fNRB value has been calculated in accordance with TOOL 30 standard. It is discernible that the actual fNRB value (61.5%) exhibit a significant variance, notably higher, from the one (9.8%) presented in the reference literature (Bailis, R.; Drigo, R.; Ghilardi, A. & Masera, O. (2015)). The carbon footprint of traditional wood fuels. *Nature Climate Change*, 5(3), pp. 266–272)²⁸, as mentioned in paragraph 6. (b) (i) of TOOL 30.

Country	Calculated fNRB Values following TOOL 30 CDM registry	fNRB Value from Literature ²⁹
Myanmar ³⁰	61.5%	9.8%

Furthermore, there are additional references available for fNRB values documented in other reputable registries, which demonstrate that the actual fNRB values exhibit a significant variance, notably higher, from those presented in the reference literature (Bailis, R.; Drigo, R.; Ghilardi, A. & Masera, O. (2015)), as mentioned in paragraph 6. (b) (i) of TOOL 30.

²⁷ https://cdm.unfccc.int/methodologies/standard_base/2015/sb160.html

²⁸ <https://www.nature.com/articles/nclimate2491>

²⁹ <https://www.nature.com/articles/nclimate2491>

³⁰ https://cdm.unfccc.int/methodologies/standard_base/2015/sb122.html

Country	Calculated f _{NRB} Values available in GS registry ³¹	f _{NRB} Value from Literature ³²
Bolivia	82.59%	32.5%
Colombia	83.08%	34.6%
Guatemala	62.74%	34.9%

All these disparities are noteworthy and strongly suggest the incomparability of the values mentioned in the reference literature (Bailis, R.; Drigo, R.; Ghilardi, A. & Masera, O. (2015)) with the values calculated by the project activity in line with TOOL 30.

Comparison of the calculated f_{NRB} value with other projects registered under VERRA

Given the absence of other publicly available literature outlining the value of f_{NRB} for the different states of India, a comparison has been made with the f_{NRB} values under which ICS projects are registered with VERRA in the table below.

PROJECT ID	Project Registration Date	Madhya Pradesh	Assam	Chhattisgarh	Bihar	Gujarat	Maharashtra	Rajasthan	Jharkhand
Values calculated by PP		89.20%	81.75%	67.30%	95.85%	92.31%	90.38%	91.38%	85.50%
VCS 3245	05-06-2023				94%				95%
VCS 2754	13-02-2023	92.87%					91.30%		
VCS 3158	21-12-2022			92%	99%				
VCS 2664	23-11-2022		85.20%						
VCS 2533	02-07-2022	90.10%							
Whether the f _{NRB} values calculated by PP is conservative/non-conservative?		Conservative	Conservative	Conservative	Conservative	Conservative	Conservative	Conservative	Conservative

The above comparison of the f_{NRB} for the current project with other registered project activities distinctly demonstrates that the considered values are conservative in nature.

Conclusion

In summary, the preceding rationale firmly establishes the credibility of the f_{NRB} estimate, harmonizing seamlessly with the principles elucidated in Tool 30. Our methodology rigorously adheres to the guidance provided in paragraph 10 of Tool 30, emphasizing the imperative use of the most recent historical data for ex ante f_{NRB} computations. Moreover, the observed variance in f_{NRB} values between reputable registries and those outlined in the reference literature (Bailis, R.; Drigo, R.; Ghilardi, A. & Masera, O. (2015)) renders direct comparisons untenable.

Upon comparison with other registered project activities, our current project's f_{NRB} appears notably conservative. The unregulated and unmonitored collection of biomass by households leads to a discernible decline in the overall carbon pool. This decline is primarily attributed to the absence of effective management and oversight in the collection process, culminating in a gradual reduction of both biomass and carbon stocks over time. In the absence of adequate measures to facilitate tree regrowth, this practice introduces a perturbation to the carbon balance within the environment. Consequently, if a localized

³¹ https://www.goldstandard.org/sites/default/files/documents/fnr_b_assessment_final_clean.docx

³² <https://www.nature.com/articles/nclimate2491>

assessment of the fraction of non-renewable biomass could have been conducted, it would suggest that this value may potentially approach 100%, further emphasizing the substantial impact of this practice on the carbon ecosystem.

BIBLIOGRAPHY

Bailis, R., Drigo, R., & Ghilardi, A. &. (2015). *The carbon footprint of traditional woodfuels*. Nature Climate Change.

MoEFCC. (2011). *India State of Forest Report*. https://fsi.nic.in/cover_2011/chapter7.pdf.

State wise AGB³³(Source: Chapter 13, State of Forest Report 2021, by the Forest Survey of India, an organization under the Ministry of Environment, Forest and Climate Change (MoEFCC), Govt of India)

State/UT	AGB (million Tonnes)
Andhra Pradesh	63.951
Arunachal	340.351
Assam	87.07
Bihar	14.743
Chhattisgarh	152.714
Delhi	0.263
Goa	8.863
Gujrat	28.602
Haryana	2.326
Himachal Pradesh	114.269
Jharkhand	51.017
Karnataka	122.741
Kerala	61.802
Madhya Pradesh	171.587
Maharashtra	137.831
Manipur	47.59
Meghalaya	55.241
Mizoram	48.157

³³ Above Ground Biomass

State/UT	AGB (million Tonnes)
Nagaland	39.339
Odisha	131.015
Punjab	3.42
Rajasthan	26.714
Sikkim	18.024
Tamil Nadu	60.459
Telangana	44.413
Tripura	24.349
UP	32.543
Uttarakhand	159.674
WB	45.365
Andaman	47.56
Chandigarh	0.047
Dadra NH	0.558
J&K	163.897
Ladakh	13.293
Lakshadweep	0.046
Puducherry	0.076
	2319.91