



**Verified Carbon
Standard**

CLEAN COOKING - COOK STOVE FOR RURAL INDIA



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Project Title	Clean Cooking - Cook Stove for Rural India
Report Title	Clean Cooking - Cook Stove for Rural India
Version	01.2
Report ID	TQC 23822
Verification Period	16-June-2022 to 30-September-2022
Client	EKI Energy Services Limited
Pages	55
Date of Issue	29-November-2023
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Summary:

LGAI Technological Center (hereinafter referred to as Applus+ Certification) is contracted by M/s EKI Energy Services Limited to conduct the joint validation and verification of the project “Clean Cooking - Cook Stove for Rural India”, VCS ID 2942¹ against VCS standard version 4.4/^{7(b)}.

The project’s design description, baseline, monitoring plan, and compliance with applicable VCS and host party criteria are all confirmed as part of the joint validation and verification process. The monitoring plan of the Joint PD and MR (Project ID 2942) is also implemented, and the monitoring methodology is used in accordance with the VCS methodology VMR006 “Methodology for Installation of High Efficiency Firewood Cookstoves”, Version 1.1/⁶ of the methodology. A site visit was performed to confirm the information provide by PP/⁹.

The main purpose of the project is the distribution of fuel-efficient improved cook stoves (ICS) within India in the rural households with estimated planned distribution of 1,000,000 Improved Cook Stoves (ICS). Presently Project promoter has distributed ICS in Maharashtra, Chhattisgarh, Gujarat, Madhya Pradesh, Rajasthan and Bihar state of India. The Improved cookstove stoves distributed through this project have replaced the low-efficient traditional cookstoves. Through this project, the distribution, and installation of high thermal efficient improved cook stoves (ICS) has been undertaken for households. The ICS burns wood more efficiently thereby improving thermal energy transfer to pots, hence saving fuel wood and greenhouse gases. This will not only lead to reduce deforestation but will also reduce health hazards from indoor air (smoke) pollution, decrease in time spent by women and children for collecting the firewood.

The first crediting period’s expected annual average emission reductions over a ten-year period are 1,350,340 tCO₂e/year and 9,452,380 tCO₂e will be reduced during the course of the seven years of the crediting period. During the 1st monitoring period from 16-June-2022 to 30-September-2022 (inclusive of both the dates), 148,546 tCO₂e GHG emissions were reduced.

Applus+ certification now has enough proof to confirm that the stated criteria, as per VCS requirements and applied methodology, have been met after reviewing the joint Project Description and Monitoring report (Joint PD & MR) and additional documents pertaining to baseline and monitoring methodology, as well as after conducting background research, conducting follow-up interviews and speaking with stakeholders/⁹.

In particular, the project’s baseline, monitoring plan, and compliance with pertinent VCS and host party criteria was thoroughly and independently evaluated against the appropriate VCS requirements as part of the validation process. These are verified to ensure that the project design is legitimate, reasonable, and fits the specified requirements. All VCS initiatives must undergo validation, which is regarded vital to assure stakeholders of the project’s quality and the expected generation of emission reductions. The goal of Applus+ certification is to carry out a thorough, impartial evaluation of the project activity’s validation.

A review of the Joint PD & MR that is impartial and unbiased is what is meant by the validation scope. The VCS Program Guide (v4.3), VCS Standard (v4.4), Program Definitions (v4.3), Registration & Issuance Process (v4.3) applicable at the time are compared to the Joint PD & MR to ensure that the project complies with the requirements of the applied baseline and monitoring methodology, namely VMR0006, Version 1.1/⁶.

<https://vcs.org/standards/applus-project-study-1995-19>

Reviewing the Joint VCS PD & MR for the monitoring results and confirming that the monitoring methodology was applied in accordance with the monitoring plan and monitoring parameters which are the main goals of the verification. After reviewing the ER sheet, it was confirmed that the reductions due to the anthropogenic emissions by sources are sufficient, conclusive, and presented in a clear and understandable way. In order to establish that the project has been implemented in line with design and conservative assumptions, as specified, the monitoring plan, Joint PD & MR, ER sheet, and the project's compliance with relevant VCS, and host party criteria were specifically checked.

Verification of project implementation and operation with regard to the Joint PD & MR, implemented monitoring plan with the Joint PD & MR, and applied baseline & monitoring methodology were all included in the scope of the verification. It was also verified that the actual monitoring systems and procedures are adhered to, as per the monitoring systems and procedures outlined in the monitoring plan. Identification of any substantial inaccuracies in the stated GHG emission reduction estimations and articulating a conclusion with a fair degree of assurance was part of the assessment. It is confirmed by the assessment team that the stated GHG emission data is appropriately supported by evidence.

This joint validation and verification has been carried out using a risk-based methodology. 07 Corrective Action Requests (CARs) and 04 Clarification Requests (CRs) were raised during joint validation and verification and successfully closed. FAR was not raised for the current period.

The project has successfully been validated, verified, and further certified for emission reductions under VCS as it meets the criteria outlined by the Joint PD & MR template version 4.2, the VCS Standard version 4.4, and the applied methodology VMR0006, Version 1.1. The project is recommended for registration and issue after further confirmation of a combined positive validation and verification opinion showing the project complies with the relevant VCS requirements.

Our view refers to the projects' claimed GHG emissions, GHG emission reductions as a result, and to the project's legitimate baseline, monitoring, and supporting papers. Based on the information viewed and assessed, we confirm that the project activity "Clean Cooking - Cook Stove for Rural India" reduced emissions by 148,546 tCO₂e from 16-June-2022 to 30-September-2022, including both the days.

CONTENTS

1	INTRODUCTION	6
1.1	Objective	6
1.2	Scope and Criteria	6
1.3	Reasonableness of Assumptions and Level of Assurance	7
1.4	Summary Description of the Project	8
2	VALIDATION AND VERIFICATION PROCESS	10
2.1	Method and Criteria	10
2.2	Document Review	15
2.3	Interviews	15
2.4	Site Visits	16
2.5	Resolution of Findings	16
3	VALIDATION FINDINGS	17
3.1	Project Details	18
3.2	Participation under Other GHG Programs	22
3.3	Safeguards	22
3.4	Application of Methodology	24
3.5	Non-Permanence Risk Analysis	43
4	VERIFICATION FINDINGS	43
4.1	Accuracy of GHG Emission Reduction and Removal Calculations	43
4.2	Quality of Evidence to Determine GHG Emission Reductions and Removals	52
5	VALIDATION AND VERIFICATION OPINION.....	53
	APPENDIX 1: DOCUMENT REFERENCES.....	56
	APPENDIX 2: ABBREVIATIONS	57
	APPENDIX 3: FINDINGS OVERVIEW.....	58
	APPENDIX 4: COMPETENCY STATEMENTS.....	63

1 INTRODUCTION

1.1 Objective

Applus+ Certification has been contracted by M/s EKI Energy Services Limited (project proponent), to undertake the joint validation and verification of the project titled “Clean Cooking - Cook Stove for Rural India”. The assessment team have reviewed the GHG data collected for the monitoring period from 16-June-2022 to 30-September-2022(both days included) covered in this verification. The objective of the joint validation and verification is to have an independent third-party assessment of the Joint PD & MR/^{1/} and supporting documentation to ensure compliance with the rules, regulations and guidelines by VCS requirements. In particular;

- The project's baseline is assessed against “VMR0006 - Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1”/^{6/}
- The project's monitoring plan is assessed against “VMR0006 - Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1”/^{6/}
- The project's additionality justification is assessed against “VMR0006 - Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1”/^{6/}
- The projects compliance with, the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS standard version 4.4 /^{6(b)/}
- VCS standard version 4.4 /^{7(b)/}
- VCS program guide version 4.3 /^{7(c)/}

Validation and verification are a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified carbon units (VCUs). This report contains the findings and resolutions from the validation and verification of the project activity.

1.2 Scope and Criteria

For Validation:

The validation scope is given as an independent and objective review of the project design, the project's baseline study and monitoring plan (VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1)^{/6/} which are included in the VCS joint PD & MR^{/1/} and other relevant supporting documents. The scope of work covered in the validation is described as below:

- To validate whether the project activity meets the requirements of VCS Standard (v4.4) and VCS program guide (v4.3) including additionality, proof of title and compliance with local laws.
- To evaluate whether the baseline and monitoring plan are in conformance with the applied methodology from the VCS approved GHG program
- To confirm that the information presented are completed, consistent, transparent and free of omission or material error
- Background investigation and follow up interviews
- Issuance of draft validation report with CARs, CRs & FARs, if any
- Final validation opinion

The information in the VCS joint PD & MR is reviewed against the criteria of VCS Standard(v4.4); the VCS program guide(v4.3).

Applus+ Certification has performed validation based on a risk-based approach focusing mainly on the significant risks to meet the qualification criteria and the ability to generate Verified Carbon Units (VCUs).

For Verification:

The scope of the verification was the independent and objective review and ex-post determination of the monitored reductions in GHG emissions from "Clean Cooking - Cook Stove for Rural India". The verification of this project was based on the validated VCS joint project description & monitoring report and supporting documents submitted by the project proponent to the verification team. The documents were reviewed against the following guidance and protocols:

- VCS Program Guide (v4.3)^{/7(a)/}
- VCS Standard (v4.4)^{/7(b) /}
- VCS Program Definitions (v4.3)^{/7(c)/}
- VCS Registration & Issuance Process (v4.3)^{/7(d)/}
- VCS approved methodology VMR0006 (version 1.1, dated 22/07/2021)^{/6/}

The validation & verification is not meant to provide any consulting towards the client. However, stated request for clarifications and/or corrective actions may provide input for improvement of the project design.

1.3 Reasonableness of Assumptions and Level of Assurance

The level of assurance of the joint validation and verification report falls under reasonable assurance engagements as selected by the PP. The joint validation and verification team validated/verified the complete monitoring data for all the parameters of the monitoring plan and confirms that the reported emission reductions are free from any type of material errors.

1.4 Summary Description of the Project

The project presently implemented in Maharashtra, Chhattisgarh, Gujarat, Madhya Pradesh, Rajasthan and Bihar states of India. As the target populations are unable to afford these stoves (ICS), project promoters have distributed ICS free of cost.

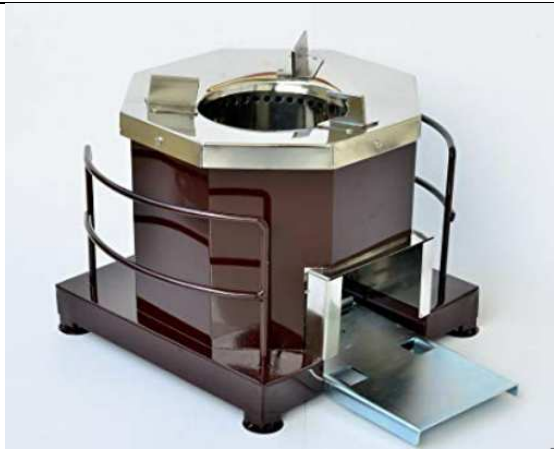
The end-user has been informed in advance that the use of ICS generates carbon finance which in turn is used to cover the price of ICS and for recovering project implementation costs. EKI identified the potential locations where the majority of the population is using the traditional cookstoves, based on previous experiences in other projects, or available information or baseline survey, for the distribution of improved cookstoves. EKI prioritized the appointment of a local implementation partner for the delivery of ICS and local men's and women's teams were deployed and trained for the implementation of ICS. This creates more employment opportunities and increases the income of local agents. Awareness about the implementation of ICS will be provided to the local community through awareness programs

The project locations for initial Project Activity Instances are in Maharashtra, Chhattisgarh, Gujarat, Madhya Pradesh, Rajasthan and Bihar states of India and may expand further to other parts of India. EKI has distributed 11,498 ICS in Maharashtra, 48,506 ICS in Chhattisgarh, 29,692 ICS in Gujarat, 42,656 ICS in Madhya Pradesh, 74,769 ICS in Rajasthan and 26,993 ICS in Bihar as confirmed based on the submitted monitoring database.

PP has considered one cookstove as one project activity instance for this grouped project activity. The first project activity instance was implemented on 16-June-2022 under this grouped project activity. 234,114 project activity instances (ICS) have been implemented as a part of this project activity.

TECHNICAL DETAILS		
A)		AGNEEKAA ECO MINI STOVE MODEL4 SE ²

² VVB noted that other VCS project – VCS 2939 uses same Agneekaa mini stove model. However, the model used for the current project activity is the upgraded model i. e. AGNEEKAA ECO MINI STOVE MODEL4 SE whereas VCS 2939 uses the old model i. e. AGNEEKAA ECO MINI STOVE MODEL 4 with lower efficiency.

	Cook Stove Type/Category		
		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 Fuel Wood	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	

PP may adopt the modified stove models with improves efficiency for future distribution under the current grouped project activity.

Above mentioned technical details are checked with the Manufacturer's Technical specification, and found correct. Same is confirmed during the onsite assessment.

The first crediting period's expected annual average emission reductions over a seven-year period are 1,350,340 tCO₂e per year and 9,452,380 tCO₂e over the course of the seven-year crediting period.

For current first monitoring period from 16-June-2022 to 30-September-2022, the project has reduced 148,546 tCO₂e of GHG emissions.

Based on an examination of the Joint PD & MR^{/01/}, ER estimation and verification spreadsheet^{/02/}, and ICS database^{/03/}, the estimated emission reductions were validated and actual emission reductions were verified.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

Joint validation and verification was conducted using Applus+ Certification's procedures in line with the requirements specified in the VCS standard Requirements, CDM M&P, the latest version

of the CDM Validation and Verification Standard, and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The proposed implementation and operation of the project activity, as well as the measures employed to report emission reductions, must be evaluated and decided to meet with the criteria and pertinent recommendations provided by the VCS. The validation and verification process consists of the following three phases;

- A desk review of the Joint PD and MR.
- A physical site visit and follow-up interviews with project stakeholders.
- Findings were raised and resolved.
- The resolution of outstanding issues and issuance of the final report and opinion.

Since the project requires sampling, based on the provisions of CDM Standard: Sampling and surveys for CDM project activities and programmes of activities, version 9.0/23/, VVB has undertaken the following sampling plan with respect to the project validation and verification.

Para 30 and 31 of the CDM standard states:

In order to determine the sample size, the DOE should specify in advance, using its own professional judgement:

- (a) **Acceptable quality level (AQL) or the level of assurance**, that is the proportion of acceptable discrepancies between the project participants' or the coordinating/managing entity's sample records and the DOE sample records (i.e. DOE field/on-site inspection results) (e.g. 1 per cent);
- (b) **Unacceptable quality level (UQL)**, that is the proportion of unacceptable discrepancies between the project participants' or the coordinating/managing entity's sample records and the DOE sample records, e.g. 20 per cent.

Para 31 says, The maximum errors associated with the determination indicated in paragraph 30 above should remain at levels indicated below:

- (a) A 10 per cent chance that the DOE will wrongly reject the project participants' or the coordinating/managing entity's records (i.e. reject a set of records of acceptable quality);
- (b) A 10 per cent chance that the DOE will wrongly accept the project participants' or the coordinating/managing entity's records (i.e. accept a set of records which is unacceptable).

Based on the above allowance given by the sampling standard, VVB selected 8 randomised households from each state for acceptance surveying based on PP's database. The households were chosen from the 107 (Bihar), 104 (Chhattisgarh), 124 (Gujrat), 122 (Madhya Pradesh), 120 (Maharashtra), 101 (Rajasthan) households already surveyed by the CME/PD. The choice of 8 households is the minimum allowed number of samples as per the sampling standard with 0 acceptance number. Since this is an acceptance sampling, no oversampling was attempted by VVB, as it would go against the sampling guidance.

The table from the standard is provided below and the AQL,UQL, producer and consumer risk is highlighted for the present project activity decided by the VVB

Producer Risk			5%	5%		5%		5%	
Consumer Risk			5%	10%		15%		20%	
AQL	UQL	Sample Size (n)	Acceptance Number (c)	Sample Size (n)	Acceptance Number (c)	Sample Size (n)	Acceptance Number (c)	Sample Size (n)	Acceptance Number (c)
0.5%	10%	46	1	38	1	33	1	29	1
0.5%	15%	30	1	25	1	22	1	10	0
0.5%	20%	22	1	18	1	9	0	8	0
1.0%	10%	61	2	52	2	33	1	29	1
1.0%	15%	30	1	25	1	22	1	19	1
1.0%	20%	22	1	18	1	16	1	14	1
Producer Risk			5%	5%		5%		5%	
Consumer Risk			5%	10%		15%		20%	
AQL	UQL	Sample Size (n)	Acceptance Number (c)	Sample Size (n)	Acceptance Number (c)	Sample Size (n)	Acceptance Number (c)	Sample Size (n)	Acceptance Number (c)
0.5%	10%	46	1	38	1	19	0	16	0
0.5%	15%	19	0	15	0	12	0	10	0
0.5%	20%	14	0	11	0	9	0	8	0
1.0%	10%	46	1	38	1	33	1	29	1

1.0%	15%	30	1	25	1	22	1	10	0
1.0%	20%	22	1	18	1	9	0	8	0

The identified beneficiaries based on the above criteria chosen randomly from the beneficiary database is as follows;

Table: List of Beneficiaries randomly selected using random generators and Interviewed on 8 Sample

Name	Village	Tehsil
Gujrat		
Patel jivanbhai koyabhai	Velvach	Valsad
Chobadila shilaben dubhashbhai	Nanapondddha	Kaprada
Halpati shankarbhai bhulabhai	Morai	Vapi
Patel madhuben bharatbhai	Kherlav	Pardi
Patel kalpanaben vijaybhai	Ambheti	Kaprada
Patel hinaben pariksitbhai	Dulsad	Dulsad
Shekh afsanaben rafiymiyabhai	Nanapondddha	Kaprada
Nareshbhai mangubhai patel	Khuntej	Pardi
Chattisgarh		
Kachra bai sahu	Raipur	Raipur
Laxmi sahu	Raipur	Raipur
Lochchani sahu	Raipur	Raipur
Kaushilya rajput	Ramnagar	Raipur
Kalyani sahu	Murra bhatti	Raipur
Rani shrivas	Gudiyari	Raipur
Nitu nishad	Raipur	Raipur
Devandi devi yadav	Raipur	Raipur
Maharashtra		
Vatane saru bai	Peth	Peth
Yashodha vaghale	Palashibu	Peth
Somnath bansiram gawali	Pohali	Surgana
Ranjana eknath bhoys	Amalon	Peth
Mainabai agada vahut	Bhuvan	Peth
Tople bhagavan	Kpourli	Peth
Jyoti gavit	Shinde	Surgana
Zoting lalita	Borgaon	Suragana
Rajasthan		
Kesar devi	Anandpura	Kuchaman
Gora.	Khan	Bharatpur
Mukesh kumar	Teekad	Jahajpur

Rakesh	Bhanipura	Sardharsehar
Chandrwati	Khumher	Bharatpur
Fari devi	Gudha	Jahajpur
Satraj yogi	Sirohi	Newai
Kailash	Khoriya	Pratapgarh
Madhya Pradesh		
Durga bai	Banjari	Dhar
Manju bai	Dhankhedi	Dhar
Ramesh ji	Barkheda	Ujjain
Dagadi bai	Badiya	Dhar
Munni bai	Chouki	Dhar
Revsingh	Aharwas	Dhar
Rukuma bai	Barda	Dhar
Radheshyam	Dhekali	Dhar
Bihar		
Pano devi	Amari	Jamui
Raj kumari devi	Motipur	Samastipur
Channar devi	Motipur	Samastipur
Dulari devi	Mohandhi	Banka
Mala devi	Mohandhi	Banka
Susmita hansada	Lalpur	Banka
Sumeri devi	Lilawaran	Banka
Ashish gupta	Lahaniya	Banka

The on-site interviews were conducted with the end users and following questions were asked to them;

1. General information of households
 - a. Interviewee Name
 - b. ID No.
 - c. Age, Gender
 - d. Household location
2. Old cookstoves situation
 - a. Are you the main user of the Old Cookstove at home?
 - a. How many people are there in your household?
 - b. What type and number of Stoves did you use? Three-stone fire, Self-built low efficient clay stove, Traditional low efficient stove or Others. If others, the type and number of stoves are
 - c. What kind of fuel did you use for the stove(s)? Charcoal, Firewood, or Others. If others, the kind of fuel is
 - d. Do you think the Cookstove will generate smokes and cause respiratory or itching issues?
3. Project cookstoves using situation
 - a. Are you the main user of the Project Cookstove at home?
 - b. When did you buy the Project Cookstove?
 - c. Do you know you have waived ownership of ERs before used the Cookstove?

- d. What document do you sign or what information do you provide when you were distributed the Project Cookstove?
- e. When did you start using the Project Cookstove?
- f. Does your Project Cookstove have unique serial No.? if yes, the No. is
- g. After using the Project Cookstove, did the distributor come to your home to check the use of the Project Cookstove?
- h. Please specify the using frequency and cooking times.
- i. What kind of fuel do you use for project stove? Charcoal, Firewood, or Others. If others, the kind of fuel is
- j. What type and number of Project Stove are you using? If others, the type and number is
- k. Are you still using old/other cookstove(s) after buying the Project Cookstove?
- l. Do you think the Project Cookstove is cleaner than the old stove? If yes, the reason is Less smoke, less respiratory issues, less itching issues or others. If others, please specify.
- m. Do you think using a Project Cookstove saves money or time compared to using the old stove?
- n. Are there any difference in usage of project cookstove between dry and wet seasons?.

2.2 Document Review

The joint PD & MR and other related documents were reviewed as a part of the joint validation and verification process, which is described in detail in appendix 1 of this document. A assessment team uses a standard protocol to do the assessment of both validation and verification. The comparison of data from Joint PD & MR with data from additional sources, if available, the team's sectoral or local experience, and, if necessary, independent background investigations.

2.3 Interviews

The assessment team visited the site between 06-February-2023 to 11-February-2023, PP representatives and end users were questioned. The table includes information on the interviewees from PP side. ICS Users interviewed List is mentioned in the section 2.1 of this document.

Sr. No.	Name	Role	Organization
1	Kunjali Patel	Stove Distributer	Pradnya Consultants
2	Hemant Bhamre	Stove Distributer	Pradnya Consultants
1	Samir Bagchi	Stove Distributer	Enviro Queen PVT LTD
2	Bibek Bora	Stove Distributer	Bibisikha LLP
4	Aniruddha Chaliha	Stove Distributer	Quick Edge Integrated LLP
5	Monil Shrivastava	Project consultant	EKI Energy Services Limited
6	Vineet Garg	Project consultant	EKI Energy Services Limited

The topics discussed during the interview range from the project's general characteristics and implementation to its technical details, including design and technical specifications, project implementation status, project start date, location, baseline identification, monitoring survey, data recording and archiving procedures, and baseline stove use. The evaluation was created using the interview input together with the paperwork and observations.

2.4 Site Visits

Total 48 sample were visited as part of the site visit.

The assessment team visited the site between 06-February-2023 to 11-February-2023 to perform the following tasks:

- A review of information flows for generating, aggregating, and reporting the monitoring parameters;
- Interviews with relevant personnel to ascertain whether the operational and data collection procedures are carried out in accordance with the monitoring plan in the Joint PD and MR;
- A cross check of the information collected during the above-mentioned processes
- A comparison of the ICS functioning, observations of monitoring practices, applied methodology, including relevant tool(s), and, if appropriate, the applied standardized baseline, to the Joint PD and MR standards;
- A review of the calculations and presumptions used to calculate the GHG data and emission reductions;
- A determination of the quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.
- A check of thermal efficiency test performed by an independent third party.

In order to decrease audit risk to an acceptable low level and to obtain a fair degree of certainty for the current verification, the assessment team has verified adequate appropriate audit evidences.

2.5 Resolution of Findings

The goal of this step is to identify, discuss, and draw conclusions about any problems that may affect the project activity's ability to reduce emissions or have an impact on the recording, monitoring, and reporting of those reductions. These problems may be related to the project description, technical specifications, baseline and additionality, monitoring parameters and monitoring plans, implementation status, or operations of the project activity. Based on the desk

review and site evaluation, this was carried out. The assessment team creates and/or maintains a validation and verification procedures (internal document) that documents conformities and non-conformities, which may include the following kinds of issues:

Corrective Action Request (CAR) is raised if one of the following occurs:

Non-compliance with the project description, applicability of monitoring methodology and its tools, additionality tools and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;

Non-compliance with the monitoring plan, the methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;

Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;

Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;

Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if:

Information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

Forward Action Requests (FARs) is raised if:

Information is not available during the present validation or verification process, which would need to be verified in subsequent verification or monitoring period.

07 Corrective Action Requests (CARs) and 04 Clarification Requests (CLs) were raised and successfully closed during the current joint validation and verification.

Appendix 3 contains all of the findings that are brought forward and shared with project participants during the assessment. The section also covers the project participants' responses, if any, and the assessment team's evaluation subsequently for any open findings.

2.5.1 Forward Action Requests

The project activity is undergoing Joint Validation and Verification under VCS, and no FAR issues have been raised.

3 VALIDATION FINDINGS

3.1 Project Details

Promoting improved cooking stoves (ICS) to residents of socially disadvantaged communities in rural households within India is the main focus of this project activity. In order to replace the traditional cooking stoves in the kitchen with stoves that are more efficient, the initiative aims to provide households with clean cooking alternatives. PP has planned to distribute 1,000,000 nos of ICS within the project boundary under the current project activity. By substituting traditional cooking stoves with ICS, the project will reduce deforestation through less consumption of firewood. And, family members—particularly women—will be exposed to less indoor air pollution, saving money on health-related expenses.

The project activity started on 16-June-2022, which is also the date that the first beneficiary households sign the end user agreement, marking the beginning of the first batch distribution. Therefore, the ICS's commissioning occurs when it is delivered to the beneficiary household and put into service (i.e. start cooking). As a result, the project's commercial functioning begins on the same day that ICS is delivered to the beneficiary family.

A 07 year crediting period is expected to result in annual emission reductions of 1,350,340 tCO₂e and 9,452,380 tCO₂e over the seven-year crediting period, which runs from 16-June-2022 to 15-June-2029 (inclusive of both the dates).

Assessment team has verified the ownership of the cookstoves with the help of End user agreement and found that it lies with the end-users. Moreover Ownerships of carbon rights is with the PP, which was also confirmed with the help of end-users. This was also crosschecked during the onsite assessment interviews with the end users and PP. Same is mentioned in the joint PD and MR, Hence, accepted.

The project will reduce 148,546 tCO₂e GHG emissions during the first monitoring period, which is from 16-June-2022 to 30-September-2022 (inclusive of both the dates).

Each ICS will reduce emissions by approximately 3.28 tCO₂e annually in Bihar, 3.37 tCO₂e in Chhattisgarh, 3.18 tCO₂e in Madhya Pradesh, 3.14 tCO₂e in Maharashtra, 3.29 tCO₂e in Gujrat, 3.56 tCO₂e in Rajasthan (based on total emissions projected by the total number of cookstoves), according to the computation in the section (net of leakage and continued use of the baseline stoves). The project proponent has commissioned 234,114 ICS during current monitoring period as confirmed based on ICS database.

The current initiative is a voluntary endeavour by the project proponent because there is no mandatory rule or regulation in the host country – India mandating the implementation of ICS. The project complies with all applicable statutes, laws, and regulatory frameworks. No Indian regulations, ordinances, or other regulatory frameworks are violated by the project.

Baseline scenario:

The baseline scenario that existed prior to the implementation of the project activity instances involves the use of conventional biomass fuel and inefficient cook stoves which use more

firewood and are with poor ventilation, which causes excessive indoor air pollution (IAP) and poses a serious health risk to women and children who spend a lot of time in the kitchen.

The baseline for this project is located in the same area where a similar project has already been implemented. Accordingly, the baseline for this project is the ongoing use of non-renewable wood fuel in traditional cookstoves or three-stone fire stove within a specific region. Additionally, a baseline survey is carried out at the project site between 02-March-2022 and 17-July-2022 to ensure the baseline situation. Based on the survey it is confirmed that a traditional cookstoves or three-stone fire stove is being used in project location.

As per applied 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 cookstoves in absence of project activity.

As confirmed by the assessment team, in the absence of project activity the baseline scenario would have been continued use of non-renewable wood fuel – firewood by the end users to meet similar thermal energy needs and hence, it adheres to the applied methodology.

Assessment team further confirmed that;

Project activities are implemented in domestic premises;

The project stoves have high-power thermal efficiency of 36.42% as confirmed based on the manufacturer's specifications provided ICS exclusively use woody biomass (fuel wood) and are single pot;

Since 31-December-1989, non-renewable biomass has been used in India, according to secondary research that is noted by PP in the joint PD and MR;

The project has been implemented, in order to generate less GHG emissions from the baseline for later removal, reduction, or destruction.

The application for VCS registration by the project or any of its components has been confirmed in the Joint PD & MR /1/and up to this point, it has not been registered under any GHG programme.

The assessment team affirms that the description provided in the Joint PD & MR /1/ is accurate, complete, and provides an understanding of the nature of the project based on its evaluation through review of pertinent documentation (as cited above), and the project has been implemented as described in the Joint PD & MR /1/

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

No.	Criterion	How the new project activity instances comply	VVB assessment
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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.	PP has distributed ICS with an efficiency of 36.42% and since each ICS is treated as a new instance. Hence applicable and accepted
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.	PP has distributed only one model of ICS which is energy efficient (verified from 3 rd part testing report) Hence applicable and accepted.
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. and same will be provided at free of cost.	PP has distributed only one model of ICS which is energy efficient (verified from 3 rd part testing report) Hence applicable and accepted.
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.	All the cookstoves are distributed within India. Hence applicable and accepted.
5	Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.	All new project activity instances will use the activity method for demonstration of additionality. Step 1: Regulatory Surplus There is no mandated government programme or policy in 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.	Since each instance is within India and the is no mandated government programme in host country for distribution of cookstove. Hence accepted and Applicable. The inclusion of new project activity instances complies 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	No project activity instance shall exceed the applicable limit, which is 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 0.0142 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 hence verified and accepted.	Since the project activity instances I have the same model and expected annual energy saving for each instance is less than 0.0142 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 hence verified and accepted.

	of the clusters to exceed the capacity limit.		
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3.2 Participation under Other GHG Programs

In order to receive carbon benefits during the project activity's crediting period, EKI Energy Services Limited has not registered for, nor is it pursuing registration under, any other GHG emission programme. This was confirmed by looking over the undertaking letter^{/4/} and by checking other GHG project registries like CDM, GS, GCC etc. VVB has also checked the REC registry and found that the project is not claiming any other form of environmental form of credit during then current monitoring period. Thereafter approved.

3.3 Safeguards

3.3.1 No Net Harm

The proposed project activity has not noted any potential detrimental effects on the environment or society. Because clean technology of cook stoves is installed and used, there are no greenhouse gas emissions that result due to the project activity, which supports socio-economic and environmental well-being.

The assessment team has determined that this complies with the standards of the VCS Standard (version 4.4)^{/7(b)/} and is therefore acceptable.

3.3.2 Local Stakeholder Consultation

The Joint PD & MR^{/01/}s section 2.2 contains a detailed explanation of the local stakeholder consultation process conducted. Stakeholders were defined as individuals who are impacted by project activities and those whose actions directly or indirectly affect the project.

The stakeholder consultation meeting details are as follows:

The dates of the Stakeholder Meetings are as follows:

Date of invitation – 02-September-2022

Date of Meeting – 13-September-2022

Location of Meeting – Chakai, Ghatigari, Jamui, Bihar

Date of invitation – 06-August-2022

Date of Meeting – 12-September-2022

Location of Meeting – Chandan, Panchayati, Raj Bhawan Chandan, Banka, Bihar

Date of invitation – 25-July-2022

Date of Meeting – 22-August-2022

Location of Meeting – Bari Jana, Begusarai, Bihar

Date of Invitation – 15-June-2022

Date of Meeting – 05-July-2022

Location of Meeting – Nalcha, Dhar, Madhya Pradesh

Date of Invitation – 06-May-2022

Date of Meeting – 11-June-2022

Location of Meeting – Atari, Chattisgarh, Raipur, Chattisgarh

Date of Invitation – 20-May-2022

Date of Meeting – 08-June-2022

Location of Meeting – Raude, Nashik, Maharashtra

Date of Invitation – 12-April-2022

Date of Meeting – 12-May-2022

Location of Meeting – Rata, Valsad, Gujarat

Date of Invitation – 24-june-2022

Date of Meeting – 18-July-2022

Location of Meeting – Sesar, Bharatpur, Rajasthan

Date of Invitation – 21-July-2022

Date of Meeting – 16-August-2022

Location of Meeting – Pander, Bhilwara, Rajasthan

Date of Invitation – 21-June-2022

Date of Meeting – 17-July-2022

Location of Meeting – Ajitsar, Churu, Rajasthan

Date of Invitation – 20-June-2022

Date of Meeting – 17-July-2022

Location of Meeting – Jakhali gram panchayat, Nagour, Rajasthan

Date of Invitation – 19-June-2022

Date of Meeting – 17-August-2022

Location of Meeting – Bhavan, Tonk, Rajasthan

School teachers, vendors, farmers, representatives from neighbourhood NGOs, and locals all showed up to the meeting. The purpose of the meeting was to explore any concerns that the

stakeholders may have had about the project's environmental and social implications. Throughout the stakeholders meeting, opinions and recommendations were welcomed.

The assessment team conducted stakeholder interviews on-site^{9/}. The validation team confirmed by the stakeholder's responses that the stakeholder consultation process had been carried out in accordance with the joint PD & MR^{01/}. The stakeholder acknowledged that they received an invitation to attend the meeting. The invitation procedure specified in the joint PD & MR^{01/} was determined to be consistent with this claim. When the assessment team asked stakeholders about the grievance reporting mechanism, they confirmed that they had been informed during the stakeholder consultation process. It was also confirmed that regular visits are ensured by PP so stakeholders can raise their grievances to them directly too. A copy of the grievance registry/^{15/} confirms that there were no complaints reported during the current monitoring period.

3.3.3 Environmental Impact

The validation team confirms that EIA is not mandatory as per the legal requirements due to the scale and distribution nature, and hence is not applicable for the present project activity. No negative environmental impacts have been identified from the project. Project activity supports various positive environmental impacts such as -

- Improves the local environment by reducing the rate of degradation of forests and deforestation in the project area.
- Reduce indoor pollution – ICS emits less smoke and reduces morbidity from respiratory diseases and other health hazards..
- 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.

Less water and effort are needed for cleaning vessels as the cooking process is relatively smoke-free.

3.3.4 Public Comments

The project was open for public comments from 15-April-2022 to 14-May-2023. During the time for public comment, no comments were received.

3.3.5 AFOLU-Specific Safeguards

This project is not an AFOLU project. This section is not required for non-AFOLU project.

3.4 Application of Methodology

³<https://registry.terra.org/app/projectDetail/VCS/3109>

3.4.1 Title and Reference

Title: Energy efficiency measures in thermal applications of non-renewable biomass

Type: Type II – Energy Efficiency Improved Projects

VCS Methodology: VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1

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 to the latest version of AMS II.G version 13 - Energy efficiency measures in thermal applications of non-renewable biomass

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

For 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>

3.4.2 Applicability

The project activity uses VMR0006, Version 1.1^{6/}, of the VCS methodology⁴.

The assessment team evaluated the applicability criteria for the baseline methodology through document review and interview. The project activity's compliance with the methodology's requirements is attested to by the assessment team.

S. N.	VMR0006, Version 1.1 Requirements	Project activity applicability	Means of verification
1.	Project activities shall be implemented in domestic premises or in community-based kitchen	The proposed project involves deployment of ICS only in households.	This was verified by the monitoring survey conducted by an independent third party during the annual ICS users' survey ^{13/}

⁴<https://verra.org/wp-content/uploads/2021/07/VMR0006-Methodology-for-Installation-of-High-Efficiency-Firewood-Cookstoves-v1.1.pdf>

S. N.	VMR0006, Version 1.1 Requirements	Project activity applicability	Means of verification
2.	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 (fuel wood) 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.	This was verified by the stove test certificate issued by credited laboratory (IIT Delhi) and submitted to the VVB for validation/ ⁵ /
	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 ₂ e per year. Therefore, the proposed project qualifies for the "Large Projects" criteria.	Same is verified by the assessment team from the emission reduction sheet and Joint PD and MR which is found correct Hence accepted.
3.	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;	The non-renewable biomass has been used in the country since 31 st Dec 1989. The information was derived from the literature survey	This was verified using literature references presented by PP in Joint PD and MR

S. N.	VMR0006, Version 1.1 Requirements	Project activity applicability	Means of verification
4	For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips) (a) It is produced using exclusively renewable biomass (more than one type of biomass may be used). (b) The consumption of the fuel should be monitored during the crediting period and (c) Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded.	Not applicable. The ICS is introduced as energy efficiency measure to replace baseline stoves and reduce the use of non-renewable biomass for combustion.	Not applicable.
5	Monitoring approaches for $B_{\text{savings},i,j}$ and values for parameters f_{NRB} (when Option (a) in paragraph 48(c) is chosen) and the quantity of woody biomass (fuel wood) $B_{\text{old},i,j}$ may be determined	Not applicable. The ICS is introduced as energy efficiency measure to replace baseline stoves and reduce the use of non-renewable biomass for combustion.	Not applicable.

S. N.	AMS II G Version 11.1 Requirements	Project activity applicability	Means of verification
1	The VCS PD shall explain the proposed method for	Each ICS in this project can be identified by a unique combination of	This information verified from

S. N.	AMS II G Version 11.1 Requirements	Project activity applicability	Means of verification
	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).	customer name and geographical location, as well as a serial number. The serial number is a unique number which allows for a clear distinction between the stoves. No individual serial number can be repeated within the project, thus ensuring that each stove is counted only once in the proposed project. In addition, the project has been cross-checked against other CDM project activity operating in the country using the UNFCCC, the Gold Standard, and other relevant voluntary carbon schemes to ensure that the ICS is not included in any other CDM project activity or voluntary project activity	distribution records, ICS database and carbon waiver records.
2	The CDM-PDD or CDM-PoA-DD/CPA-DD shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices.	Manufacturers/ cook stove distributors undertaking is provided that EKI is the owner of that carbon credits and Manufacturers/ cook stove distributors will not claim any credits for such cook stoves	This information verified from declaration for the carbon waiver.

Applicability of Tool 30 :

Applicability criterion	How the project complies
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This tool may be used by: (a) DNAs to submit region- or country-specific default f_{NRB} values, following the procedures for development, revision, clarification and update of standardized baselines (SB procedures); or (b) project participants to calculate project- or PoA-specific f_{NRB} values	The project participant has used this Tool to calculate project-specific f_{NRB} values.
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3.4.3 Project Boundary

The project boundary is specified as "the physical, geographical site of the efficient devices that utilise biomass" in accordance with the applicable methodology VMR0006 version 1.1 and CDM methodology AMS II G, version 13.

The Joint PD & MR ^{/01/} accurately stated the information pertaining to the project boundary. PP has distributed cook stove in various parts of India. As a result, the project boundary for the proposed VCS project activity has taken into account the entirety of India.

The assessment team certifies that there are no sources of gases inside the project boundary for the project instances, which is based on the applied methodology^{/6/}.

For the purpose of calculating project and baseline emissions for the project, the physical delineation of the project boundary and the description of the emission sources and GHGs that are included in the boundary are appropriate.

3.4.4 Baseline Scenario

The project activity, known as the green field activity, entails installing new, improved cookstove systems in homes where, before the project activity was implemented, firewood was used for thermal energy requirements. During the on-site visit^{/9/}, this was verified. The default scenario calls for increased use of firewood for home thermal energy requirements viz., for cooking purposes. As a result, it adheres to the requirements of the methodology.

The utilisation of non-renewable biomass serves as the actual baseline. According to Methodology VMR0006, Version 1.1, "The baseline scenario is the continuous use of non-renewable wood fuel by the target community to meet identical thermal energy needs as provided by project cookstoves in the absence of project activity" (firewood/charcoal/kerosene).

The initiative's targeted beneficiaries would continue using outdated, inefficient cooking stoves that used a lot of non-renewable biomasses if project activities weren't carried out.

As a result, the baseline scenario has been determined in accordance with the demands of the used methodology VMR0006, Version 1.1/⁶, and it is accepted to be reasonable and justifiable.

The baseline for this project is located in the same area where a similar project has already been implemented. Accordingly, the baseline for this project is the ongoing use of non-renewable wood fuel in traditional cookstoves or three-stone fire stove within a specific region.

VVB has checked and confirmed that following registered projects are implemented by the PP/other entity in the same area and they have established the similar baseline as envisaged for the current project and hence found acceptable.

State	Project ID
Madhya Pradesh	VCS 2754 ⁵
Chhattisgarh	VCS 3158 ⁶
Bihar	VCS 3158
Maharashtra	VCS 3007 ⁷

Additionally, a baseline survey is carried out at the project site between 02-March-2022 and 17-September-2022 to ensure the baseline situation. PP had conducted the survey based on sampling guidelines, version 4.0. From each state, PP has randomly interviewed 100 households applying random sampling method. The data was collected through questionnaire survey form used by third party surveyor and a detailed survey report was prepared which is submitted to VVB. PP has provided the example of data collected as a part of questionnaire in section 3.4 of PD/MR which was checked against the submitted survey results and further cross checked during on-site interviews.

The submitted “2942 Baseline Excel Sheet”/¹³/ and supporting questionnaire/¹³/ were checked to confirm that the identified baseline is ongoing use of non-renewable wood fuel in traditional cookstoves or three-stone fire stove which is justified based on submitted survey records and can be deemed reasonable. PP has provided the survey results in table in section 3.4 of Joint PDMR which was confirmed based on survey results submitted.

VVB during the on-site visit has checked that the baseline device for all the interviewed stakeholders was a three-stone fire using firewood as a fuel and also confirmed through visual inspections of baseline sample households visited.

VVB further confirms that there is not national and/or sectoral policies and/or circumstances which affect the baseline identification, PP has followed correct procedures for identifying the baseline scenario i. e. conducting random sampling surveys and the identified scenario reasonably represents what would have occurred in the absence of the project.

⁵ <https://registry.verra.org/app/projectDetail/VCS/2754>

⁶ <https://registry.verra.org/app/projectDetail/VCS/3158>

⁷ <https://registry.verra.org/app/projectDetail/VCS/3007>

Based on the survey it is confirmed by the PP and verified by the VVB during the onsite assessment interviews with the end users that the traditional cookstoves or three-stone fire stove were being used in project location.

The Start and End dates of Baseline Survey location wise is given below:

- Chhattisgarh - Start date – 01-May-2022, End date - 29-June-2022
- Rajasthan - Start date – 20-April-2022 , End date – 17-July-2022
- Gujarat - Start date – 02-March-2022, End date – 29-March-2022
- Bihar - Start date – 01-May-2022 , End date – 30-June-2022
- Maharashtra - Start date – 12-March-2022, End date – 24-March-2022
- Madhya Pradesh - Start date – 06-May-2022, End Date – 30-May-2022

3.4.5 Additionality

The project's additionality is shown by how well it adheres to the standards established in VMR0006, Version 1.1/⁶.

Activity Approach

Step 01: Regulatory excess

The distribution of residential fuel-efficient cookstoves is not mandated by any government programme or policy in the country where this project is being implemented. The project is not required by any legislation, statute, regulatory framework, or for UNFCCC non-Annex I nations, any law, statute, or other regulatory structure that is consistently applied.

Only voluntary participation is allowed from households in this study. EKI Energy Services Limited declaration of the voluntary participation of the planned project was verified and found to be appropriate/¹⁹.

Step 02: Positive List

The positive list is represented by the application requirements of this methodology. The project satisfies each of the requirements for applicability listed in Section 3.2. The project also follows the conditions stated below:

1. The project distributes or installs stoves at no cost to the end user and derives all of its funding from the sale of GHG credits.
2. Neither the initiative nor its activities are funded by multilateral agencies or government programmes. Therefore, the project is additional and voluntary.

Verification team checked the end user agreements and also confirmed from the end users during the on-site audit that the ICS were distributed at free of cost. Team also checked the

national and the sated governments schemes portal to verify that the project is not implemented as a part of any government scheme. Based on the aforementioned data, the Validation Team draws the conclusion that the data in the joint PD and MR complies with methodology requirements.

3.4.6 Quantification of GHG Emission Reductions and Removals

In the Joint PD & MR ^{/1/}, the equations and choices specified in the applied methodology VMR0006, Version 1.1^{/6/}, are accurately cited. The formulas listed in the applied methodology (06) are used to calculate the project's emission reductions.

The validation team certifies that the formulas are accurately stated for the determination of emissions reductions based on their review of the Joint PD & MR ^{/1/}. The facts and requirements supplied in the applied methodology^{/06/} have been compared with the parameters and equations presented in the Joint PD & MR ^{/01/} and other pertinent papers. In order to establish compatibility between all the formulas contained in the Joint PD & MR^{/01/} and ER validation spreadsheet ^{/02/} and the applied methodology ^{/06/}, an equation comparison has also been done.

PP has applied a value of η_{old} which is 0.1 for this project based on the usage of old traditional cookstoves in the baseline scenario as observed in similar projects of the pp. Also based on the survey it is confirmed that a traditional cookstoves or three-stone fire stove is being used in project location. This value corresponds with the guidelines stated in VMR0006 Version 1.1, which stipulates that a default value of 0.1 should be used for baseline devices that are either three-stone fires utilizing firewood (not charcoal), or conventional devices lacking an improved combustion air supply or flue gas ventilation and without a grate or chimney. Same has been assessed and found correct and conservative by the assessment team.

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

$$ER_y = \sum_i \sum_j ER_{y,i,j} \quad \text{Equation (1)}$$

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 tCO₂e

$ER_{y,i,j}$ = Emission reductions by improved cookstove of type i and batch j during year y in tCO₂e

$$ER_{y,i,j} = B_{y,savings,i,j} * NCV_{woodfuel} * f_{NRB,y} * (EF_{wf,CO2} + EF_{wf,nonCO2}) * N_{y,i,j} * 0.95 \quad \text{Equation (2)}$$

Where

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

Determination of $B_{y,savings,i,j}$

The quantify of woody biomass (fuel wood) saved due to implementation of improved cookstoves to be estimated using 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 (fuel wood) 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.

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

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

- 1) Installed 236,500 ICSs.
- 2) The life span of each ICS is 7 years; thus, the operational lifetime of each project activity instance is taken as 7 years.
- 3) Annual stove loss rate is estimated at 0%. This is assumed for estimation. During actual ER calculation, this value may change. This value is determined during actual verification based on survey results.
- 4) $B_{y=1, \text{ new, i, survey,}}$ is assumed as
 - For Bihar – 3.71 kg/device/day or equal to 1.354 tonnes/device/year.
 - For Madhya Pradesh – 3.59 kg/device/day or equal to 1.310 tonnes/device/year.
 - For Chhattisgarh– 3.81 kg/device/day or equal to 1.391 tonnes/device/year.
 - For Gujarat– 3.71 kg/device/day or equal to 1.356 tonnes/device/year.
 - For Rajasthan– 4.03 kg/device/day or equal to 1.470 tonnes/device/year.
 - For Maharashtra– 3.55 kg/device/day or equal to 1.294 tonnes/device/year.

This value has been determined during the first monitoring period, based on survey results.

Determination of F_{NRB} value:

The fraction of woody biomass (fuel wood) 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 (fuel wood) 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 (fuel wood) 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 (fuel wood) (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 (fuel wood) consumption for energy applications (e.g. commercial, industrial or institutional uses of woody biomass (fuel wood) 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 (fuel wood) 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 (million tonnes)	CE (Million tonnes)	NE (Million tonnes)	H (Million tonnes)
Bihar	11.475	0	08.105	19.580
Madhya Pradesh	13.665	0	20.449	34.114
Chhattisgarh	04.366	0	09.798	14.164
Gujarat	09.731	0	19.012	28.743
Rajasthan	18.782	0	07.945	26.727
Maharashtra	09.508	0	44.409	53.917

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 (fuel wood) 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 (fuel wood) 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)

$MAI_{forest,i} = 1.66$ tonnes/hectare/year⁸

$MAI_{other,i} = 1.66$ tonnes/hectare/year⁹

	$MAI_{forest,i}$	$MAI_{other,i}$	$F_{forest,i}$ (Million Ha)	$P_{forest,i}$ (Million Ha)	$F_{other,i}$ (Million Ha)	RB (million tonne)
Bihar	1.66	1.66	0.74	0.74	0.49	0.81
Madhya Pradesh	1.66	1.66	7.75	7.61	2.08	3.36
Chhattisgarh	1.66	1.66	5.57	4.64	1.86	4.63
Gujarat	1.66	1.66	1.49	1.22	1.06	2.21

⁸ https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch04_Forest%20Land.pdf

⁹ https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch04_Forest%20Land.pdf

Rajasthan	1.66	1.66	1.67	1.56	1.28	2.30
Maharashtra	1.66	1.66	5.19	4.64	2.69	5.19

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

	H	RB	NRB	F _{nrb}
Bihar	19.58	0.81	18.77	95.85%
Madhya Pradesh	34.11	3.36	30.43	89.20%
Chhattisgarh	14.16	4.63	09.53	67.30%
Gujarat	28.74	2.21	26.53	92.31%
Rajasthan	26.73	2.30	24.42	91.38%
Maharashtra	53.92	5.19	48.73	90.38%

VVB noted that as per requirement of tool 30 version 4.0, the values presented above for fNRB shall be compared with literature, preferably with, Bailis, R.; Drigo, R.; Ghilardi, A. & Masera, O. (2015). The carbon footprint of traditional wood fuels. Nature Climate Change, 5(3), pp. 266–272.

PP has prepared a detailed analysis as how and why comparative analysis with the above report is not appropriate for the current project which is presented in appendix 2 of joint PDMR. Based on the analysis, VVB noted the following points which affected the calculation of fNRB value and appropriateness of the value considered in the VCS JPDMR:

VVB noted that PP has selected fNRB demonstration on a regional level i. e. state level. This is found appropriate. As per para 3 of tool 30, PP can identify and clearly delineate the applicable area for fNRB. PP has demonstrated in the joint PDMR that to assess and use the area from which woody biomass is sourced for end-users included in the project activity, PP has to consider regional (state) specific databases as 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 is acceptable as it also satisfies requirement of par 6 (b) of tool 30 i. e. *“Calculate fNRB by determining the share of renewable and non-renewable woody biomass in the total quantity of woody biomass consumption for the country/region or the project area (hereinafter referred as the applicable area)”*.

The same para mentions that *“The project participants shall compare and analyse the calculated values against the values for fNRB reported in relevant scientific literature and justify any differences. This analysis shall be included in the appropriate section of the PDD”*. PP has demonstrated the comparison with the relevant scientific literature (Bailis, Drigo, & Ghilardi, 2015), referenced in Tool 30 in the

appendix 2 of joint PDMR. VVB found the PP's approach correct and VVB noted that the concerned literature does not use the most recent data,

Bailis report uses global-level data from the Food and Agriculture Organization (FAO), the International Energy Agency (IEA) and the United Nations (UN) for various data along with other published literature for specific countries and is not state specific data from the local government. E. g. VVB noted that for specific f_{NRB} data for India, Bailis report estimates the NRB values of the region using the WISDOM Model which takes the values of supply and demand module of a given spatial base of the region, and reliance on the local surveys for the same was one of the parameters in the model. However, there was no survey conducted in the project region for the demand of the woodfuel, the Bailis report has referred to the published data of woodfuel consumption for India as per two reference literature as below;

- a) Paper titled "Comparative study of fuelwood consumption by villagers and seasonal "Dhaba owners" in the tourist affected regions of Garhwal Himalaya, India". This report refers to wood fuel consumption for "Dhaba owners" i.e., small restaurants in local language. The region of study was tourist affected region of Garhwal which is in Uttarakhand state of India. This paper was published in year 2010 and VVB noted that it is not associated with the project region.
- b) Paper titled "Firewood consumption along an altitudinal gradient in mountain villages of India". This report refers to fuel wood consumption of village households in Uttaranchal state of India. This paper was published in year 2004 and VVB noted that it is not associated with the project region.

Thus, the data used by Bailis report specifically for India is based on a paper of 2004 and 2010 and does not represent the latest data as published by the national agencies as well as regional data available for the project boundary, i.e. for each state within the project boundary. There is considerable difference in the values as published by the national agencies. VVB found that this inference is appropriate

VVB also noted that in section "Discussion and Implementation" on page 4 of Bailis report, it is mentioned that *"One limitation of the study is a lack of reliable wood fuel consumption data. When possible, we used national and sub national data sets. However, for most countries, we relied on data compiled by international organizations containing unknown uncertainties that make it difficult to communicate the uncertainty in these results. A second limitation is that the analysis considers a single year and does not account for potential behavioural changes among wood fuel users"*. Thus, VVB found argument by PP that Bailis report is not a correct representative of the f_{NRB} for the given project boundary, multiple states within India as the report itself has submitted the limitations if faced. Whereas, PP has calculated the value based on the most recent available data for the project region from the government agencies and hence is acceptable to VVB.

PP has further detailed out comparison for each parameter in the appendix 2 of joint PDMR with the supporting evidences in the form of reports/weblinks which were assessed by VVB and the comparative account provided proves that the approach selected by PP is the most appropriate.

VVB has noted that there is no other scientific literature available for f_{NRB} value within India for the identified regions available which can be used to compare the value calculated by PP.

PP in the appendix 2 has further presented for countries like Myanmar, Bolivia, Columbia and Guatemala, the f_{NRB} values which are calculated are substantially higher than calculated as per Bailies report. The detailed information presented in the joint PDMR was checked and this is found correct by VVB. This

further substantiates that though value calculated by PP is on higher side than as per the literature referred by Tool 30 , it is also the case for other countries too.

Further, the data presented by PP in the table for registered project and fNRB values used in the same, demonstrates that PP has used a conservative value of fNRB.

VVB has assessed the presented analysis and accepted that with the most recent data available to PP, use of correct sources for data to be used in the equation and use of renewable biomass/non-renewable biomass, the fNRB value calculated by PP for the current project is appropriate and hence accepted.

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

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 below assumptions were applied:

- 5) Installed 236,500 ICSs.
- 6) The life span of each ICS is 7 years; thus, the operational lifetime of each project activity instance is taken as 7 years.
- 7) Annual stove loss rate is estimated at 0%. This is assumed for estimation. During actual ER calculation, this value may change. This value are determined during actual verification based on survey results.
- 8) $B_{y=1, new, i, survey}$ is assumed as
 - For Bihar – 3.71 kg/device/day or equal to 1.3538 tonnes/device/year.
 - For Madhya Pradesh – 3.59 kg/device/day or equal to 1.311 tonnes/device/year.
 - For Chhattisgarh– 3.81 kg/device/day or equal to 1.390 tonnes/device/year.
 - For Gujarat– 3.71 kg/device/day or equal to 1.355 tonnes/device/year.
 - For Rajasthan– 4.03 kg/device/day or equal to 1.47 tonnes/device/year.

- For Maharashtra– 3.55 kg/device/day or equal to 1.294 tonnes/device/year.

This value has been determined during the first monitoring period, based on survey results.

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

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

$$34.23\%$$

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 (fuel wood) 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 Bihar:

If y= 1,

$$B_{y,savings,i,j} = 1.354 \times [(0.3423/0.1) - 1]$$

$$= 3.28 \text{ tonnes}$$

Year (y)	$B_{y=1,new,i,survey}$	$\eta_{new,y,i,j}$	η_{old}	$B_{y,savings,i,j}$
1	1.354	34.23%	0.1	3.28
2	1.354	33.89%	0.1	3.23
3	1.354	33.55%	0.1	3.19
4	1.354	33.22%	0.1	3.14
5	1.354	32.89%	0.1	3.10
6	1.354	32.56%	0.1	3.05

7	1.354	32.23%	0.1	3.01
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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

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

$$f_{NRB,y} = 0.9585 \text{ (for Bihar)}$$

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

Example of calculation for **Bihar** ($N_{y,i,j} = 27,000$):

If $y=1$,

$$ER_{y,i,j} = 3.28 \times 0.0156 \times 0.9585 \times 138.23 \times 27,000 \times 0.95$$

$$= 174,065 \text{ tCO}_2$$

Year	$B_{y,savings,i,j}$	$NCV_{wood\ fuel}$	$f_{NRB,y}$	$EF_{wf,CO2} + EF_{wf,non\ CO2}$	$N_{y,i,j}$	$ER_{y,i,j}$
1	3.28	0.0156	0.9585	138.23	27,000	174,065
2	3.23	0.0156	0.9585	138.23	27,000	171,606
3	3.19	0.0156	0.9585	138.23	27,000	169,172
4	3.14	0.0156	0.9585	138.23	27,000	166,762
5	3.10	0.0156	0.9585	138.23	27,000	164,376
6	3.05	0.0156	0.9585	138.23	27,000	162,014
7	3.01	0.0156	0.9585	138.23	27,000	159,676

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
Year 2022-23(16-June-2022 - 15-June-2023)	1,409,070	0	0	1,409,070
Year 2023-24(16-June-	1,389,166	0	0	1,389,166

2023 - 15-June-2024)				
Year 2024-25(16-June-2024 - 15-June-2025)	1,369,458	0	0	1,369,458
Year 2025-26(16-June-2025 - 15-June-2026)	1,349,949	0	0	1,349,949
Year 2026-27(16-June-2026 - 15-June-2027)	1,330,636	0	0	1,330,636
Year 2027-28(16-June-2027 - 15-June-2028)	1,311,516	0	0	1,311,516
Year 2028-29(16-June-2028 - 15-June-2029)	1,292,585	0	0	1,292,585
Total	9,452,380	0	0	9,452,380
Total number of crediting years				7
Average annual ERs				1,350,340

The assessment team certifies that the relevant tools and the applied methodology were used correctly to determine baseline emissions and net GHG emission reductions during the project crediting period.

3.4.7 Methodology Deviations

Not Applicable.

3.4.8 Monitoring Plan

The project uses VCS methodology, specifically VMR0006, Version 1.1, and in accordance with that approach, the following parameters will be monitored ex-post:

Parameters to be monitored are:

Parameter (s)	Units	Description	Source of monitoring data
$N_{y,i,j}$	Number	Number of project devices of type i and age a that are operating in year y	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
$\eta_{new,y,i,j}$	Fraction	The efficiency of the improved cook stove type i and batch j determined as per equation 5 of methodology during year y	Based on the efficiency test report from a certified laboratory for 1 st year than calculated using equation 5 of methodology.
$B_{y=1,new,l,j,survey}$	Fraction	Annual quantity of woody biomass (fuel wood) 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	Based on the monitoring survey,

The annual ICS survey shall be the source of the annual values of the monitoring parameter, as indicated in the Joint PD & MR. The annual survey data on functioning devices will be the foundation for the calculations of emission reductions. The evaluation team will examine it to confirm the results of the emission decrease.

The evaluation team affirms that thorough monitoring procedures, monitoring structure, management team, monitoring items, and monitoring functions have been amply proven based on the review of the Joint PD & MR^{/01/}

All data will be electronically archived and maintained for the duration of the crediting period and an additional two years.

3.5 Non-Permanence Risk Analysis

Since the present project activity is a non-AFLOU project, this section is not applicable as per the guidance of Verra.

4 VERIFICATION FINDINGS

4.1 Accuracy of GHG Emission Reduction and Removal Calculations

The following list includes the information and factors used to determine the removal and reduction of GHG emissions:

Ex-ante parameters (parameters having default values):

SI No	Parameter	Description	Value	Unit	Source
1.	$f_{NRB,y}$	Fraction of woody biomass (fuel wood) saved by the project activity during year y that can be established as non-renewable biomass	For Bihar - 0.9585 (calculated as per meth tool) For Chhattisgarh - 0.673 (calculated as per meth tool) For Gujarat - 0.9231 (calculated as per meth tool) For Maharashtra - 0.9038 (calculated as per meth tool) For Rajasthan - 0.9138 (calculated as per meth tool) For Madhya Pradesh - 0.892 (calculated as per meth tool)	%	Fraction of non-renewable biomass is calculated as per the f_{NRB} calculation TOOL30: Calculation of the fraction of non-renewable biomass ^{/14/} in ER sheet tab “ f_{NRB} ” ^{/2/} . Further sources used to calculate f_{NRB} in ER sheet have been verified from weblinks provided in the sheet and the evidences submitted. PP has referred State of Forest report (Forest Survey of India Ministry of Environment, Forest & Climate Change, GoI, 2019). Assessment team found that the report is publicly available and the reference have been checked and found correct. Hence accepted.
2.	$NCV_{wood\ fuel}$	Net calorific value of the non-renewable woody biomass (fuel wood) that is substituted or reduced	0.0156	TJ/tonne	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 1 Introduction
3.	EF_{wf,CO_2}	CO ₂ emission factor for the use of wood fuel in baseline scenario	112	tCO ₂ /TJ	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion
4.	$EF_{wf,non\ CO_2}$	Non-CO ₂ emission factor for the use of wood fuel in baseline scenario	26.23	tCO ₂ /TJ	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2

					Energy, Chapter 2 Stationary Combustion
5.	$\eta_{old,i,j}$	The efficiency of baseline cookstove	0.1	Fraction	Methodology default value
6.	η_p	The efficiency of the project stove at the start of project activity	0.3642	Fraction	Manufacturer's specification, third party verified
7.	DF_n	Discount factor to account for efficiency loss of project cookstove per year of operation (fraction).	0.99	Fraction	Methodology default value
8.	Leakage factor	Discount factor to account for leakage	0.95	Fraction	In-line with the applied methodology VMR0006, ver. 1.1 Section 8.3.
9.	Life Span	Operating lifetime of project device for projects opting Equation 5 for determining project stove efficiency	7	Years	Manufacturer's specification. Which is verified by the technical specification certificates submitted by the PP and found correct.

As a part of monitoring plan, the assessment team found, checked and confirmed that following sustainable development goals are considered which are appropriate and are measurable.

Sr. No.	SDG Target	SDG Indicator	Current Project contribution
1.	1.1	1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)	The project has increased the 539 individuals (employed for manufacturing, distribution and monitoring of the project activity) total daily income to INR 12000 – 15000 per month, bringing them above the international poverty line.
2.	3.9	Project-specific indicator: Number of households experiencing reduction in particulate matter.	234,114 households experiencing reduction in particulate matter 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	Increase access to clean cooking technology with ICS installations in 234,114 households under the project activity
4.	8.3	Project specific indicator: Total Number of jobs created.	Project activity created a total of 652 new job positions in different roles for manufacturing and distribution of ICS and post-implementation monitoring activity.
5.	13.0	Tonnes of greenhouse gas emissions avoided or removed	Contribute to greenhouse gas emission reduction of 148,546 tCO _{2e}

6.	15.2	15.3.1 Proportion of land that is degraded over total land area	Contribute to the reduction of deforestation of 87,230 tonnes of fuel wood from forests surrounding the communities and reducing pressure on forest reserves
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Parameter(s) monitored ex-post

Parameter	N _{y,ij} (Number of project devices of type i and batch j are operating in year y)	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	At least once every two years. For current monitoring period it is measured through survey which is checked and confirmed.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the Joint PD & MR and monitoring methodology. This parameter is monitored once every two through ICS survey.
	Monitoring equipment	Sample survey
	Value applied	236,500 The value is checked and confirmed based on sample survey submitted.
	How were the values in the monitoring report verified?	Measured directly or based on a 90-representative sample. PD has used sampling standard, version 4.0 to determine the sample size to achieve 90/10 confidence precision. From each state, PP has randomly selected the ICS applying random sampling function in excel and

		accordingly the target ICS sample is determined for survey. Data collected: Questionnaire survey form used by third party surveyor and a detailed survey report has been provided. Since the relative margin of error obtained is less than 10% for the monitored parameter, relative precision of the data is statistically acceptable and deemed representative of the population. The submitted survey was checked and confirmed.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	On-site assessment of the project activity confirms that the necessary QA/QC procedures are in place and the data management system is effective and reliable. Assessment team verified operational ICS during the on-site visit from ICS survey report.
a.		
Findings	No findings were raised.	
Conclusion	The parameter has been monitored appropriately, in accordance with the monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

Parameter	$\eta_{new,y,i,j}$ The efficiency of the improved cook stove type i and batch j determined as per equation 5 of methodology during year y	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	PP has decided to measure the efficiency once at the time of project cookstove installation which is appropriate.
	Is measuring and reporting frequency in accordance with the	Yes. The reporting frequency is in line with the monitoring plan as outlined in the Joint PD & MR and monitoring methodology. It

	monitoring plan and monitoring methodology? (Yes / No)	will be monitored at time of each new cookstove installation which is acceptable.		
	Monitoring equipment	PP has selected option V as per the applied methodology due to which it was possible to measure the efficiency ex-ante. However, the grouped project may add a different type of cook stove during its operational life time and hence PD has decided to measure this parameter ex-post which is acceptable.		
	Value applied	Year 1	34.23%	
		Year 2	33.89%	
		Year 3	33.55%	
		Year 4	33.22%	
		Year 5	32.89%	
		Year 6	32.56%	
Year 7		32.23%		
How were the values in the monitoring report verified?	Efficiency test carried out by third party who is authorized by government. PD has submitted efficiency test report by IIT Delhi, Government of India which was checked for the value and was found correct. Further, in line with equation 5, PD has decided to apply efficiency loss per year which is correct.			
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	On-site assessment of the project activity confirms that the necessary QA/QC procedures are in place and the data management system is effective and reliable.			
b.				
Findings	No findings were raised.			

Conclusion	The parameter has been monitored appropriately, in accordance with the monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.
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Parameter	By=1,new,I,j,survey Annual quantity of woody biomass (fuel wood) 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	
Means of verification		
	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	Determined in the first year of project implementation through monitoring survey which is submitted, checked and confirmed.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the Joint PD & MR and monitoring methodology. This parameter is determined in the first year of project implementation.
	Monitoring equipment	Weighing Scale. PD had carried out calibration of weighing scale prior to fuel measurement which is acceptable. The details of calibration and purchase date for each weighing scale which is used are provided in appendix 5 below,
	Value applied	1. For Bihar – 3.71 kg/device/day or equal to 1.354 tonnes/device/year. 2. For Madhya Pradesh – 3.59 kg/device/day or equal to 1.310 tonnes/device/year. 3. For Chhattisgarh– 3.81 kg/device/day or equal to 1.391 tonnes/device/year.

		4. For Gujarat– 3.71 kg/device/day or equal to 1.356 tonnes/device/year. 5. For Rajasthan– 4.03 kg/device/day or equal to 1.470 tonnes/device/year. 6. For Maharashtra– 3.55 kg/device/day or equal to 1.294 tonnes/device/year.
	How were the values in the monitoring report verified?	PD has decided to conduct monitoring survey and 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 conducted surveys were submitted and checked by the assessment team and found correct.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	On-site site assessment of the project activity confirms that the necessary QA/QC procedures are in place and the data management system is effective and reliable.
C.		
Findings	No findings were raised	
Conclusion	The parameter has been monitored appropriately, in accordance with the monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

The Joint PD & MR formulae for calculating emission reductions, as certified by the used methodology VMR0006 Version 1.1 have been examined and deemed to be accurate. The Joint PD & MR values and the ER verification sheet values have been compared. Additionally, the formulas used in the ER spreadsheet were examined and confirmed to be in line. The assessment team certifies that all calculations are performed in accordance with the formulae specified in the applied methodology VMR0006 Version 1.1 and the monitoring plan requirements, that all parameters are used correctly, that all results are transparent and verifiable, and that all assumptions are described and supported by verifiable evidence.

For the monitoring period from 16-June-2022 to 30-September-2022 (inclusive of both the dates) PD has achieved to reduce 148,546 tCO₂e GHG emissions. The ER sheet was used to verify the emission calculation, which was confirmed to be accurate and accepted.

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)
16-June-2022 – 30 - September-2022	148,546	-	-	148,546
Total	148,546	-	-	148,546

4.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

Review of ER sheet reveals that the comparison of actual GHG emission reductions with those in PD estimates:

Ex-ante emissions reductions/removals	Achieved emissions reductions/removals	Percent difference	Justification for the difference
395,853	148,546	- 62.47%	All the project ICS were not installed on the first date of monitoring

Since the present project activity combined both validation and verification together, there is no data to compare the present emission reductions with respect to the validated figures. Hence this section is not applicable.

5 VALIDATION AND VERIFICATION OPINION

EKI Energy Services Limited hired LGAI Technological Center, S.A. (also known as Applus+ Certification), to carry out a joint validation and verification of the VCS project activity "Clean Cooking - Cook Stove for Rural India."

The VCS Standard (version 4.4), VCS Program Guide (version 4.3), and Registration & Issuance Process (version 4.3)^{07/} were all used as the foundation for the collaborative validation and verification process.

The findings of the joint validation and verification process can each be summed up as follows:

The project activity complies with the requirements of the applied baseline & monitoring methodology, VMR0006, Version 1.1^{6/}, and according to Applus+ Certification, delivers the information in Joint PD & MR as needed by VCS Standard, version 4.4^{7(b)} /. As previously mentioned, the validation was carried out utilising a risk-based methodology. The project activity is anticipated to reduce emissions by 9,452,380 tCO₂e over the length of its crediting period (seven years).

As stated in the Joint PD & MR ^{1/}, Applus+ Certification concludes the validation with a positive opinion and affirms that the VCS Project Activity "Clean Cooking - Cook Stove for Rural India" complies with all applicable VCS requirements, including those outlined in the CDM Project Standard, version 3.0, methodologies, tools, and guidelines.

Verification Analysis: The verification strategy used by Applus+ Certification is based on an understanding of the risks involved in reporting GHG emission data and the mitigation measures put in place. In order to provide a reasonable level of assurance that reported GHG emission reductions are accurately stated, Applus+ Certification prepared and carried out the verification by gathering documentation, additional information, and justifications.

In our opinion, the joint PD and MR^{01/} accurately states the GHG emissions reductions reported for the project activities for the time period of 16-June-2022 to 30-September-2022 (inclusive of both the dates). Based on the approved baseline & monitoring methodology, as well as the VCS standard, the GHG emission reductions were computed accurately.

Estimated Emission reduction over the crediting period are:

year	Estimated GHG emission reductions or removals (tCO ₂ e)
Year 2022-23(16-June-2022 – 15-June-2023)	1,409,070
Year 2023-24(16-June-2023 – 15-June-2024)	1,389,166
Year 2024-25(16-June-2024 – 15-June-2025)	1,369,458
Year 2025-26(16-June-2025 – 15-June-2026)	1,349,949
Year 2026-27(16-June-2026 – 15-June-2027)	1,330,636
Year 2027-28(16-June-2027 – 15-June-2028)	1,311,516
Year 2028-29(16-June-2028 – 15-June-2029)	1,292,585
Total estimated ERs	9,452,380
Total number of crediting years	7
Average annual ERs	1,350,340

Period of verification: from 16-June-2022 to 30-September-2022 (including both days). Verified reduction to and removals from GHG emissions over the aforementioned verification period:

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 A(16-June-2022 – 31-September-2022)	148,546	-	-	148,546
Total	148,546	-	-	148,546

Year	Ex-ante emissions reductions/removals	Achieved emissions reductions/removals	Percent difference	Justification for the difference
Year A(16-June-2022 – 31-September-2022)	395,853	148,546	-62.47%	All the project ICS were not installed on the first date of monitoring

APPENDIX 1: DOCUMENT REFERENCES

Use appendices for supporting information. Delete this appendix (title and instructions) where no appendix is required.

No.	Author	Title	References to the document	Provider
1.	PP	Joint PD & MR (Initial) Joint PD & MR (Final)	Version 01 dated 13-April-2022 Version 05 dated 16-November-2023	PP
2.	PP	Emission reduction spreadsheet (Final) Estimated Emission reduction spreadsheet (Final)	Version 01 dated 13-April-2022 Version 03 dated 14-March-2023	PP
3.	NA	ICS Distribution data and carbon waiver records of ICS	-	PP
4.	PP	Declaration(s) from Project proponent on double accounting	23-February-2023	PP
5.	NA	Efficiency certificate of ICS issued by IIT Delhi	09-July-2022	PP
6.	NA	VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves	https://verra.org/methodologies/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/	VERRA
7.	NA	VCS Requirements: a) Verified Carbon Standard Program Guide, version 4.3; b) Verified Carbon Standard, version 4.4; c) VCS Program Definitions, version 4.3 d) VCS Registration and Issuance Process, version 4.3 e) VCS Joint Project Description & Monitoring Report Template, version 4.2 f) VCS Joint Validation & Verification Report Template, version 4.1	-	VERRA
8.	NA	Life span certificate		PP
9.	NA	Site assessment –interviews of staff personnel, photographs, physical inspection of monitoring system	-	PP
10.	PP	Employment records	-	PP
11.	PP	Skilled training records	-	PP
12.	PP	Local Stakeholder Meeting records	-	PP
13.	PP	Baseline survey report questionnaire 2942 Baseline Excel Sheet ICS Survey Report	-	PP

No.	Author	Title	References to the document	Provider
14.	UNFCCC	Methodological Tool: Calculation of the fraction of non-renewable biomass, version 4.0	https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v4.0.pdf	UNFCCC CDM page
15.	PP	Photos of grievance register		PP
16.	PP	Sample copy of carbon waiver records		PP
17.	-	Technical Specifications of the ICS		PP
18.	UNFCCC	Sampling and surveys for CDM project activities and programmes of activities, version 9.	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20210531160756474-Meth_Stan05.pdf/Meth_Stan05.pdf?t=a0h8cm_djY2hufDB3trwzZ7tid7m_L2VQBOSR	UNFCCC CDM page

APPENDIX 2: ABBREVIATIONS

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM VVS	Clean Development Mechanism Validation and Verification Standard
ER	Emission Reductions
CL	Clarification Request
DOE	Designated Operational Entity
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
ICS	Improved Cook Stove
IPCC	Intergovernmental Panel on Climate Change
Joint PD & MR	Joint project description and monitoring report
MP	Monitoring Plan
MR	Monitoring Report
PD	Project Description
PP	Project Proponent
PS	Project Standard
TR	Technical Review

UNFCCC	United Nations Framework Convention on Climate Change
VVB	Validation and Verification Body
VVS	Validation and Verification Standard

APPENDIX 3: FINDINGS OVERVIEW

CL ID	01	Section no.	3.1	Date : 18-February-2023
Description of CL				
PP shall submit documents to confirm,				
1. Project design 2. Project ownership 3. Project proponent 4. Project start date 5. Project scale 6. Project description 7. Participation under other GHG program 8. Information provided to the end user about the use of ICS generated carbon finance which in turn is used to cover the price of ICS and for recovering project implementation costs 9. Project satisfies positive list 10. Average life time of improved cook stove (ICS) 11. Technical specification of ICS 12. Survey results for the value of values considered ex-ante and ex-post as the meth requirements 13. Project database				
Project participant response				Date: 24-February-2023
All relevant documents have been now submitted to VVB for further review.				
Documentation provided by project participant				
1. Project design – “Joint PD MR_VCS2942 project 23.02.2023.docx” 2. Project ownership – Folders “Undertaking Distributors”, “Undertaking Manufacturer” and “Enduser agreement” 3. Project proponent - 4. Project start date – Folder “First End User Agreement 16-06-2022” 5. Project scale – Folder “Database” 6. Project description - “Joint PD MR_VCS2942 project 23.02.2023.docx” 7. Participation under other GHG program – Folder “Double counting declaration” 8. Information provided to the end user about the use of ICS generated carbon finance which in turn is used to cover the price of ICS and for recovering project implementation costs – Folder “LSC Docs” 9. Project satisfies positive list – Folder “Monitoring_Survey_data_Excel_Sheet_2942 (1).xlsx” 10. Average life time of improved cook stove (ICS) – “Technical_Details_Agneekaa_Ecomini_Model_No._4SE.pdf”				

11. Technical specification of ICS – “Technical_Details_Agneekaa_Ecomini_Model_No._4SE” 12. Survey results for the value of values considered ex-ante and ex-post as the meth requirements – Folder “Baseline docs” and “Monitoring_Survey_data_Excel_Sheet_2942 (1).xlsx” Project database	
VVB assessment	Date: 05-March-2023
1. VVB has verified the project design with the help of Joint PD MR_VCS2942 project 23.02.2023.docx submitted by the PP and found it correct. Hence accepted. 2. VVB has verified the project ownership with the help of End user agreement, Undertaking by the manufacturer and the undertaking of the distributor and found that EKI Energy Services Limited holds the ownership which is consistent with the section 1.7 of the MR hence accepted. 3. VVB has verified the project proponent with the help of End user agreement, Undertaking by the manufacturer and the undertaking of the distributor and found that EKI Energy Services Limited is the project proponent which is consistent with the section 1.7 of the joint PD&MR hence accepted. 4. VVB has verified the project start date with the help of First end user agreement and same is mentioned in the submitted joint PD and MR hence accepted. 5. VVB has verified the project scale based on the project database and found that the project is large scale and same is mentioned in the joint PD and MR hence accepted. 6. VVB has verified the project description with the help of submitted joint PD and MR and found it correct. Hence accepted. 7. PP has submitted undertaking to avoid double counting which is verified and found correct by the VVB hence accepted. 8. VVB has verified the LCS document and the end user agreement to verify the ownership of the carbon credits same is mentioned in the registered joint PD and MR hence accepted. 9. VVB has verified the end user agreement and the project data base and found that the project is distributed at free of cost and under no government scheme. Hence accepted. 10. VVB has verified the average life time of cookstove with the help of Technical_Details_Agneekaa_Ecomini_Model_No._4SE hence accepted. 11. VVB has verified the technical specification of the stoves with the help of Technical_Details_Agneekaa_Ecomini_Model_No._4SE and same is mentioned in the submitted PD and MR hence accepted. 12. VVB has verified the survey reports submitted by the PP and found correct. hence accepted. 13. VVB has verified the project database submitted by the PP and found correct. hence accepted. CL closed.	

CL ID	02	Section no.	3.1	Date : 18-February-2023
Description of CL				
PP requested to clarify the exact number of ICS distributed in the submitted VCS joint PD&MR.				
Project participant response				Date: 24-February-2023
PP is now stated the exact number of ICS distributed in the submitted VCS joint PD&MR				
Documentation provided by project participant				
Folder “Database”.				
VVB assessment				Date: 05-March-2023
VVB has verified the number of ICS distributed with the help of project database and same is mentioned in the submitted joint PD and MR and found consistency hence accepted. CL closed.				

CL ID	03	Section no.	3.1	Date : 18-February-2023
Description of CL				
1. PP is requested to clarify the title of the project activity as it is inconsistent from the project webpage.				
Project participant response				Date: 24-February-2023
At the time of listing Project has different title and after the title change now it is consistent with the Project web page				
Documentation provided by project participant				
VVB assessment				Date: 05-March-2023
PP has updated the title of the project activity in the revised PD&MR which is now consistent with the VCS project webpage. Hence accepted.				
CL closed.				

CL ID	04	Section no.	3.1	Date : 18-February-2023
Description of CL				
1. PP is requested to clarify and provide appropriate calculation to explain why no clusters are required for instances.				
Project participant response				Date: 24-February-2023
As PP has consider 1 ICS 1 Instance so, no project activity instance shall exceed the applicable limit, which is 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 0.0142 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.				
Documentation provided by project participant				
VVB assessment				Date: 05-March-2023
Since PP has considered each ICS as an instance and total energy saving from each instance is within the applicable limit hence correct and accepted.				
CL closed				

CAR ID	01	Section no.	3.1	Date: 18-February-2023
Description of CAR				
1. Standard template alteration is seen in the submitted joint PD& MR. PP is requested to use the latest version of the applicable standard for the joint PD& MR.				
2. Implementation of guideline to complete the various sections of VCS PD found missing. Thus, corrective action sought				
3. Geographic map is different from the host country's official website. Correction sought.				
4. Notations of the parameters found not inline with the applied methodology. Corrective action sought.				
5. Cover page is not according to VCS joint PD and MR requirements. Correction sought.				
6. Report is not according to the latest version of VCS applicable standard. Correction sought.				

Project participant response	Date: 24-February-2023
All the above points are now corrected as in fresh PDMR in new version 4.2	
Documentation provided by project participant	
VVB assessment	Date: 05-March-2023
1. VVB has verified the template version used in the submitted revised Joint PD and MR and found correct hence accepted. 2. VVB has verified the revised joint PD and MR and found the section are completed as per the guideline hence accepted. 3. Geographic map is verified and found correct. Hence accepted. 4. VVB has verified the notation of the parameters as per the Methodology and found correct. Hence accepted. 5. Cover page of revised PD and MR is found accurate as per the VCS requirements. Hence accepted. 6. VVB has verified the revised Joint PD and MR and found that the report is now as per the latest VCS standard version 4.4. Hence accepted.	
CAR closed.	

CAR ID	02	Section no.	3.1	Date: 18-February-2023
Description of CAR				
PP is requested to submit an undertaking for no double accounting for current monitoring period for project activity for participation in other GHG program other than VCS as well as host country/international Renewable Energy Certificate (REC) mechanisms. Kindly submit.				
Project participant response				Date: 24-February-2023
PP has now submitted the undertaking for no double accounting.				
Documentation provided by project participant				
Folder "Double counting declaration".				
DOE assessment				Date: 05-March-2023
PP has submitted the undertaking to avoid double counting which have been verified by the VVB hence accepted.				
CAR Closed.				

CAR ID	03	Section no.	3.1	Date: 18-February-2023
Description of CAR				
PP is requested to submit the estimate ER sheet and the ER sheet. Verification Emission reduction is put on hold until that.				
Project participant response				Date: 24-February-2023
PP has now submitted the Estimated ER and actual ER				
Documentation provided by project participant				
Estimated ER - "ER Estimation_2942_Ver. 02 (1).xlsx" and Actual ER - "Actual ER Sheet 2942_MP 1_Ver. 1 (2).xlsx"				
DOE assessment				Date: 05-March-2023
PP has submitted the Estimated ER sheet and the Actual ER sheet. VVB has verified the values of emission reduction and the calculation to calculate these values and found them correct. Hence accepted.				
CAR closed.				

CAR ID	04	Section no.	3.3.2	Date: 18-February-2023
Description of CAR				

In section 2.2 of VCS PD, found not in line with guideline to complete VCS PD template. Thus, corrective action sought.	
Further, PP is requested to provide complete details of LSHM & submit records of LSC meeting & ongoing local stakeholder consultation including grievance register etc. Kindly submit.	
Moreover, Section 2.4 Public Comments of the Joint VCS PD & MR, found not in line with guideline to complete Joint VCS PD & MR template. Thus, corrective action sought.	
Project participant response	Date: 24-February-2023
PP has now included complete LSC information along with the Q&A	
Documentation provided by project participant	
Folder "LSC Docs" and "Joint PD MR_VCS2942 project 23.02.2023.docx"	
DOE assessment	Date: 05-March-2023
VVB has verified the LCS information provided by the PP and found correct. Hence accepted.	
CAR closed.	

CAR ID	06	Section no.	3.3.4	Date: 18-February-2023
Description of CAR				
Calculation of emission reduction is not provided in the joint PD and MR. Correction sought.				
Project participant response				Date: 24-February-2023
PP has now provided the Calculation of emission reduction in joint PD and MR				
Documentation provided by project participant				
Joint PD MR_VCS2942 project 23.02.2023.docx				
DOE assessment				Date: 05-March-2023
PP has submitted revised PD&MR mentioning the calculation of the emission reduction values which is found correct. Hence accepted.				
CAR closed.				

CAR ID	07	Section no.	3.3.6	Date : 18-February-2023
Description of CL				
Sources of the various assumptions and values of ex-ante & ex-post parameters chosen in line with the applied methodology, found missing in the VCS PD & ER sheet. Corrective action sought.				
Further, details of the baseline survey found missing in the VCS PD, ER sheet and supporting documents found missing. Corrective action sought.				
Project participant response				Date : 24-February-2023
PP has provided the source of ex-ante & ex-post parameters chosen in line with the applied methodology.				
Documentation provided by project participant				
"Joint PD MR_VCS2942 project 23.02.2023.docx" and "Actual ER Sheet 2942_MP 1_Ver. 1 (2).xlsx".				
VVB assessment				Date: 05-March-2023
VVB has verified the revised Joint PD and MR and found that the sources of the values used in the calculations are now provided. Hence accepted.				
CAR closed.				

APPENDIX 4: COMPETENCY STATEMENTS

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interviews	Verification findings
1.	Lead Auditor/Technical Expert	OR	Kumar	Pankaj	TQC-Outsourced entity	Yes	Yes	Yes	Yes
2.	Technical Expert in Training	OR	Takarkhede	Atul	TQC-Outsourced entity	Yes	No	Yes	Yes
3.	Technical Expert in Training	OR	Pundlik	Deepak	TQC-Outsourced entity	Yes	Yes	Yes	Yes

Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e. g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer (TR)	EI	Shen	Simon	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustin	Applus+ Certification

Short CVs of the Team:

1. **Mr. Pankaj Kumar** worked as team leader – Bihar for South Asia Climate Proofing and Growth Development (CPGD) – Climate Change Innovation Programme (CCIP) supported by DFID that seeks to mainstream climate change resilience into planning and budgeting at the national and sub-national level in India, Pakistan, Nepal, and Afghanistan. Pankaj Kumar has worked previously with IL&FS Infrastructure Development Corporation and BUIDCO (Bihar Urban Infrastructure Development Corporation), Govt. of Bihar as Environmental Specialist for WB & ADB funded projects. Prior to this, he worked with Carbon Check (UNFCCC accredited DoE), Johannesburg, RSA as Team Leader for validation, verification of around 100 GHG projects in Asia, Africa, USA, Asia Pacific & Americas. Pankaj is accredited Lead Auditor, Validator, Verifier and Technical Expert for Sectoral Scope/Technical Area – 1.1, 1.2, 3.1 & 13.1 by UNFCCC DoE (Designated Operational Entity), APPLUS, Spain. He is also member of task force on

climate change & human health, Health Department, GoB and on roster of UNICEF's WASH experts. He is an experienced, qualified and result oriented Environment Professional having more than 14 yrs. of relevant experience in Climate Change (Mitigation & Adaptation), Environmental Due Diligence, Disaster Risk Reduction, Validation and Verification of GHG project under CDM, Verified Carbon Standard, Gold Standard & Social Carbon Standard, Brazil. He provides technical support for environmental investigative, consultative and remedial projects involving air, water and soil, Waste management, EIA, Environmental Compliance, ISO 14001, OHSAS 18001, GHG accounting (ISO 14064) and Carbon foot printing. Pankaj Kumar is Masters in Environment Management from Forest Research Institute (University), I.C.F.R.E, Dehradun, which is Centre of Excellence in South East Asia for Forestry education & research and PGDEL from National Law School of India University, Bangalore (India).

2. **Dr. Atul Takarkhede** is Ph.D. (Environmental Sciences) from Institute of Science, RTM Nagpur University, Nagpur, and he has already published different technical papers related to environmental sciences. He counts with more than 11 years of experience in field of Environmental Auditing, consulting and accreditation. He is an expert in ISO 9001-14001, CO2/GHG Reporting, Carbon Foot Print, Energy, Water and Waste Management reporting for organizations' environmental performance. His professional portfolio is mainly related with carrying out EIA, conducting QA/QC of EIA Reports; conducting environmental/water audits; NABET requirements appliance, functional area expert in Water Pollution & Solid & Hazardous Waste management among others. Furthermore, he counts with solid experience on CDM-VCS-GS consultancy and auditing. Currently he is associated with True Quality Certifications Private Limited and empanelled with Applus+ Certification to carry out GHG audits in the aforementioned schemes.
3. **Mr. Deepak Pundlik** has experience in climate change, waste management and environmental management. After completing Masters in Environment Sciences from Pune university, He has worked in waste management field. As a GHG consultant, he handled projects under renewable energy, waste management sectors during his stint with companies - MITCON and Thermax Limited. As a GHG auditor, he has validated/verified projects under CDM/VCS/GS and GCC mechanisms from renewable energy, energy demand, waste management sectors.
4. **Mr. Simon Shen** (Master's Degree in Thermal Energy Engineering, Bachelor's Degree in Environmental Engineering) is an Auditor appointed by Applus+ LGAI for the GHG project assessment, auditing and technical review. He has more than 6 years of work experience in CDM/GS4GG/VCS project assessment and review with Applus+, apart from the years of experience working as GHG Auditor and ISO 9001/14001 in TUV SUD for 3.5 years before he joined Applus+. Mr. Simon Shen has extensive experience also as former Applus+ Shanghai CDM Technical Manager. Mr. Simon Shen is based in Shanghai, China. Mr. Simon Shen participate in the project's technical review.

APPENDIX 5: WEIGHING SCALES DETAILS

Sr. No	State	Equipment make	Date of purchase	Calibration date
1	Bihar	Phoenix phs-50 cap.50kg	06-November-2022	10-November-2022
2	Chhattisgarh	Portable	07-November-2022	10-November-2022
3	Gujarat	Hanging Scale	04-November-2022	11-November-2022
4	Madhya Pradesh	Atom Hanging Scale A-302	03-November-2022	12-November-2022
5	Maharashtra	Atom Hanging Scale A-302	03-November-2022	11-November-2022
6	Rajasthan	Atom Hanging Scale A-302	03-November-2022	10-November-2022