INSTALLATION OF HIGH EFFICIENT COOK STOVES BY EKI ENERGY SERVICES LIMITED

Document Prepared by (entity)

TÜV SÜD South Asia Pvt Ltd

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Summary:

TUV SUD South Asia has performed the Validation & Verification of the aforementioned grouped project along with 35,045 nos. project activity instances.

The objective of the Validation is to have an independent evaluation of a project activity by a VVB against the requirements of the VCS standard Version 4.2 and GHG program applied, on the basis of the project design document. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant VCS requirements, GHG program requirements and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

The objective of the verification work is to comply with the requirements of Verified Carbon Standards requirements and ensure that the project activity has been implemented and operated as per the PD, and that all physical features (technology, project equipment, monitoring and metering equipment) of the project are in place. The ICS burns wood more efficiently thereby improving thermal energy transfer to pots, hence saving fuel wood and greenhouse gases. Not only will this halt the rapidly progressing deforestation but will also reduce health hazards from indoor air (smoke) pollution and women and children will have to spend less time in collecting firewood.

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.

The project involves distribution of fuel-efficient improved cook stoves (ICS) to replace the baseline traditional cook stoves in households. The ICS to be deployed under this project is energy efficient which substantially reduces fuel consumption and emissions for conducting cooking and water heating tasks in homes. The boundary of the grouped project is in India and there are 35,045 project activity instances in the state of Assam with a total number of 35,045 ICS distributed across the boundary.

3 Clarification Requests (CLs) and 1 Corrective Action Requests (CARs) have been raised during the course of Validation & Verification.

The VVB confirms that a reasonable level of assurance has been achieved during the process.

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1 INTRODUCTION

1.1 Objective

TÜV SÜD has been commissioned by the EKI Energy Services Limited to perform an independent validation & verification assessment.

The objective of the Validation is to have an independent evaluation of a project activity by a VVB against the requirements of the VCS Version 4.2 and GHG program applied, on the basis of the project design document. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant VCS requirements, GHG program requirements and host Party criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is 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).

The objective of the verification work is to comply with the requirements of Verified Carbon Standards requirements. According to this assessment TÜV SÜD shall:

- ensure that the project activity has been implemented and operated as per the PD, and that all physical features (technology, project equipment, monitoring and metering equipment) of the project are in place,
- the project's baseline is assessed against "VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1 dated 22 July 2021, Sectoral scope 3"
- the project's monitoring plan is assessed against "VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1 dated 22 July 2021, Sectoral scope 3"
- ensure that the MR and other supporting documents provided are complete, verifiable and in accordance with applicable VCS requirements,
- ensure that the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology,
- evaluate the data recorded and stored as per the applicable requirements.
- assessment of the sustainability monitoring parameters as per the VCS standard version 4.2 requirements.

1.2 Scope and Criteria

The scope of any assessment is defined by the underlying legislation, regulation and guidance given by relevant entities or authorities. The joint validation and Verification scope is to review the VCS-PD &MR against the VCS criteria which refer to VCS Version 4.2 standard and all the GHG program requirements. Validation and Verification is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the joint PD &MR.

In the case of VCS project activities, the scope is set by:

- VCS v4.2 standard requirements
- Clean Development Mechanism Validation and Verification Standard (VVS) for Project Activities v3.0
- Baselines and monitoring methodologies (including GHG inventories)
- Environmental issues relevant to the applicable sectoral scope
- Current technical and operational knowledge of the specific sectoral scope and information on best practice
- Stakeholder consultation and feedback

The assessment team has employed a risk-based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the Joint VCS PD & MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VCUs.

1.3 Level of Assurance

All the revisions of the validation & verification report before being submitted to the client were subjected to an independent internal technical review to confirm that all validation activities had been completed according to the pertinent TÜV SÜD's instructions.

The technical review was performed by a technical reviewer(s) qualified in accordance with TÜV SÜD's qualification scheme for VCS and CDM validation and verification. The level of assurance of the validation report is defined as reasonable. The VVB confirms that a reasonable level of assurance has been achieved during the verification process

1.4 Summary Description of the Project

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

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

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

Technical Specifications of Cook Stoves for all project activity instance from Manufacturer Swami Samarth Electronics Pvt. Ltd:

TECHNICAL DETAILS OF THE ICS			
A)	Cook Stove Type/Category	AGNEEKAA ECO MINI STOVE MODEL4	
		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 grade
		Insulating Material	Thermal Wool
		Insulating Material Thickness	6 to 8mm
		Top Plate	Stainless Steel SS 202 grade
		Top Plate Material Thickness	1 mm

TECHNICAL DETAILS OF THE ICS			
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)	Wight 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 stove	7 Years	
J)	Guarantee /Warranty Period	1 Years	
K)	Box Dimension	Outer Side Box Dimension	Length :- 300mm
			Width :- 300mm
			Height :- 270mm
L)	Thermal Efficiency	32.19%	

All the project activity instances in the proposed grouped project activity are located within geographical boundaries of Indian states of Assam in Udalguri district. For project activity instances, geographical area is in Assam. Thus, the KML file is submitted for Udalguri district of Assam in India which is checked by the assessment team and found correct. The geographical boundary for projects located in Udalguri district of Assam and is delineated in the form of extreme geographic coordinates of Udalguri district of Assam as follows:

Latitude – 26°46′ North

Longitude – 92°08′ East

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

Validation was conducted using TÜV SÜD procedures in line with the requirements specified in the VCS Standard version 4.2 and CDM VVS v3. Sampling process under this Validation & Verification has been done in accordance with the methodology.

The validation & verification consists of the following phases:

- Document review;
- Follow-up actions;
- The resolution of outstanding issues and
- Issuance of the final validation & verification report.

The information provided by the project participants is assessed by applying the means of verification specified in the VCS v4.2, Toolkit and the CDM VVS V3.

The audit team performs first a desk review, followed by a remote-assessment, which results in the formation of a draft report and a list of findings. The next step involves the evaluation of the findings through direct communication with the PPs and then finally the preparation of the verification report.

This verification report and other supporting documents then undergo an internal quality control by the CB "Environment and energy" before submission to the VCS.

The validation & verification team and the technical reviewers consist of the following personnel:

Role/Qualification	Last Name	First Name	Country
Team Leader, Validator, Verifier & Technical Expert	Kewat	Shailendra	India
Technical Expert (TR)	Murty	Eswar	India

2.2 Document Review

The following table lists the documentation that was reviewed during the Joint validation & verification process.

Document Reference

VCS Standard v4.2
VCS Methodology VMR0006 v1.1 dated 22/07/2021
VCS project 2664 listing – https://registry.verra.org/app/projectDetail/VCS/2664
VCS Joint PD & MR version 1 dated 18-October-2021
ER calculations and estimates version 1 dated 18-October-2021
Cook stove data summary distribution version 1
VCS Joint PD & MR version 2 dated 10- February-2022
ER calculations and estimates version 2 dated 10- February-2022
Cook stove data summary distribution version 2
Standard for Sampling and Surveys for PA/PoA v9
Technical specification of ICS- Swami Samarth Electronics for AGNEEKAA ECO MINI STOVE MODEL4
Project boundary kml files
Thermal efficiency test result from manufacturer of ICS
TERI note-Rural energy data sources and estimations in India
India-State of Forest Report 2019
Declaration from distributor Dawda Traders for ICS distribution
Declaration/Undertaking from EKI Energy Services for the ownership , no double counting of ICS dated 10/02/2022
Declaration from manufacturer- Swami Samarth Electronics for supply of ICS for the project dated 10/02/2022
Report- REGIONAL WOOD ENERGY DEVELOPMENT PROGRAMME IN ASIA FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS Bangkok, April 1996
India-State of Forest Report 1987
Calculations for fNRB value
CSIR-NEERI- Thermal efficiency test reports for ICS-dated 04/01/2021
Invitation for Local Stakeholder consultation meeting from EKI dated 15/11/2019
Minutes of meeting report- Local stakeholder meeting dated 13/January/2020 in Udalguri district in the state of Assam.
List of Participants for LSC meeting dated 13/January/2020
Monitoring Sample Surveys done by EkI
Samples done by VVB - Checklist for acceptance sampling for Instance 1 and 2. Please refer section 2.4 for end users which are part of acceptance sampling.
LSC meeting photographs
ICS Distribution data with serial numbers and installation date
User Agreement to confirm the ownership of carbon credits with PP. Please refer section 2.4 for end users which are part of acceptance sampling.
Grievance register for project activity
Survey report for Biomass consumption in project activity ICS
Survey forms
Internal audit report
Training records
First cookstove (i.e. 15-February-2020)-commissioning receipt (stove no. 116422)

2.3 Interviews

As a result of the COVID-19 pandemic, taking into account the rules of relevant national and local authorities (local to the VVB offices as well as to locality of the site visits), World Health Organization (WHO) recommendations, policies of the VVB, email clarification for Verra guidance on site visits, notification of Covid-19 Travel Guidance for Projects https://verra.org/covid-19-travel-guidance/ and other relevant travel restrictions and guidance (for example, a requirement to self-isolate upon return from specific countries), the VVB has skipped the on-site visit. Further VCS Program does not explicitly mandate site visits as part of the validation and verification process, only that VVBs must achieve a reasonable level of assurance on all validations and verifications (per Section 4.1.2 of the VCS Standard, v4.2). Therefore, where a VVB can achieve a reasonable level of assurance without conducting a site visit, or through a remote site visit, this is in conformance with the VCS rules, and no request for an exemption or pre-approval from Verra is required. However, where a validation/verification has been conducted without a site visit, or through a remote site visit, please ensure that the applicable section of the validation/verification report includes a discussion of how a reasonable level of assurance was achieved without an in-person site visit".

Hence, the VVB has used other standard auditing techniques for validation as referred to in VCS Rules/requirements, VCS Validation and Verification Manual version 3.2.

Validation team has used the following alternative means for its assessment and to justify that they are sufficient for the purpose of validation. Along with desk review, audit team has conducted remote audit interview as follows:

A complete desk review of the VCS PD, as well as all applicable country legal requirement and supportive evidences have been checked by the validation team.

- Validation team has performed telephonic interview (i.e remote site audit on 21/01/2022-24/01/2022) with PP in order to check implementation, ownership, technology, thermal testing procedure, sampling and monitoring procedures etc.

- Cross-check evaluation, for information received from interviews, under the scope of all information and references provided in VCS PD and supporting documents.

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Patil	Ramkrishna	Enking International	21/01/2022	Project description, eligibility, baseline, additionality, Implementation of the project, O&M activities, Metering arrangements, Calibrations, On-going LSC. etc.	Shailendra K
2	Dutta	Supratik	EKI Energy Services	21/01/2022	Monitoring and Implementation	Shailendra K
3	Majumdar	Suvra	EKI Energy Services	21/01/2022	Monitoring and Implementation	Shailendra K
4	Boruah	Gyandeep	ICS Distributors	21/01/2022	Distribution approach, Survey results, Confirmation for Carbon ownership with EKI	Shailendra K
4	Kulkarni	Soumitra	Swami Samarth Electronics Pvt. Ltd. – ICS Manufacturers	21/01/2022	Model supplied and specifications of ICS, Confirmation for Carbon ownership with EKI	Shailendra K

The list of households surveyed remotely to confirm the status of the implementation of ICS are as below

Date of Sampling: 22/01/2022 to 24/01/2022

S.No	Stove ID	Name of the owner	Village	Subject	Team member
1	108001	BABITA BORO	AMGURI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
2	108116	ANSUMWI BORO	AMGURI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
3	108496	LWITHWMA BORO	AMGURI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
4	108716	DAMAYANTI BORO	AMGURI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
5	110789	PRAMILA BASUMATARY	AMGURI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
6	117534	DIPAK BORO	Hahchara	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
7	205047	PINTU URANG	Hahchara	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
8	205091	SAMOTY LAGASU	Hahchara	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
9	205139	MAHESH BHUYAN.	Hahchara	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
10	118862	SARALA BARUAH	NO.1 SONAJULI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
11	118987	SUSHMA TIGGA	NO.1 SONAJULI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
12	120880	ARCHANA BISWAS	NO.1 SONAJULI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
13	206314	KAPANA GOGOI	NO.1 SONAJULI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
14	108168	SIMA PAUL	DIMAKUCHI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
15	108212	DIPIKA BORO	DIMAKUCHI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
16	108451	RADHARANI MANDAL	DIMAKUCHI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
17	119844	RENU SAIKIA	DIMAKUCHI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
18	205290	PROTIMA GOWALA	DIMAKUCHI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
19	205455	runa gogoi	DIMAKUCHI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
20	114167	MINA DEVI THAPPA	ATHERIKHAT	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
21	111236	BHALERIYA EKKA	ATHERIKHAT	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
22	206911	RUBUL BORAH	ATHERIKHAT	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
23	120907	MANISHA SIWAKUTI	SUKLAI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
24	104042	KRISHNAMAYA THAPALIA	SUKLAI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
25	120359	LOK BAHADUR RAYA	SUKLAI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
26	119342	PUJA RAYA	SUKLAI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
27	215810	DICHEN SUNUWAL	DAULCHUBA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
28	215814	BOLIN BORUAH	DAULCHUBA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
29	110436	ASNTI CHAUDHARY	TANGLA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
30	113384	SUBALA BRAHMA	TANGLA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
31	117671	KALYANI DAS	TANGLA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
32	223266	NANDESWAR DAS	TANGLA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
33	112082	BINA GOAR	BAMUNJULI T.E	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
34	110775	BENU KUMARI PRADHAN	NO.1 BAMUNJULI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
35	208596	SARIFUL ALI	NO. 1 BAMUNJULI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
36	114237	JAMUNA DEKA	NO.2 BHULATAR	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
37	109413	SWARJILA DEKA	UTTAR JANGALPARA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
38	116196	RAHIMA PARBIN	DUI NADIR MUKH	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
39	109629	BHAB DEKA	BANGAON	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
40	208734	JITEN PEGU	PACHIM NALBARI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
41	213594	JUNTI DAS	PUB PANERI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
42	213851	ABHIJIT DEKA	PUB PANERI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
43	114654	SANGITA BORO	CHAMUAPARA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
44	109532	BIJU BALA SAIKIA	NANAIKHUTI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
45	115154	NIRU BORO	TANKI BASTI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
46	109632	SARU RABHA	BARJALAH	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
47	109717	DAIMANTI MAHALIA	DAKHIN JANGALPARA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
48	210705	SANJAY GHAR.	NO.1 UTTAR DIMAKUCHI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
49	210821	MINU RAJPUT	NO.1 UTTAR DIMAKUCHI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
50	120197	BANDHAN GORH	BARANGAJULI T.E	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
51	119793	ANJULI BORO	PACHIM PATALA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
52	109953	NIKA DAIMARY	BATABARI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
53	211096	BOLL KUMARI CHATRY	BATIYAMARI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
54	211045	ABDUL FAJAL.	BENGBARI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
55	224633	ILA SENAPOTI	BHERGAON	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
56	219377	BINANDRA SARKAR	NANAIPARA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
57	219703	PURAN MAJHI	NANAIPARA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	
58	117430	JANAKI DEVI	NABIN PARA	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
59	118350	SABITA NATH	KAWAIMARI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
60	216985	GORBARI TANTI	FULKUCHI	ICS installation confirmation, free of cost distribution, Confirmation for Carbon ownership with EKI	Shailendra K
61	118656	ANJANA MUNDA	KRISHNACHU CHAI T.E	ICS installation confirmation, free of cost distribution, Confirmation for Carbon	Shailendra K

				ownership with EKI	

2.4 Site Inspections

Please refer sec 2.3

Acceptance Sampling of cookstoves has been conducted by the VVB. The list of households surveyed remotely to confirm the status of the implementation of ICS has been listed above.

2.5 Resolution of Findings

3 Clarification Requests (CLs) and 1 Corrective Action Requests (CARs) have been raised during the course of Validation & Verification

CL ID	01	**Section no.**		**Date:** 25/01/2022
Description of CL				
Project Proponent needs to submit the below documents. 1) Ownership of the Project. 2) Commissioning date of the earliest batch of the ICS Cookstove. 3) Manufacturer's Technical Specification sheet and Thermal Efficiency Test Certificates for Tier 1, 2, 3 project stoves. 4) Supportive documents including survey methods, published literature, official reports or statistics. 5) Agreement/Deed indicating the avoidance of double counting or conflict of interest in future by relevant project stakeholders. 6) Proofs related to any engagement with local communities, Local Stakeholder documentation. 7) Monitoring survey data for annual quantity of woody biomass 8) Efficiency of baseline cookstove. ($\boldsymbol{\eta old}$)				
Project participant response				**Date:** 10/02/2022
1. The ownership of the project is with EKI Energy Services. The beneficiary households under the project activity have transferred the right of carbon credit to EKI Energy Services vide end user agreement signed between EKI Energy Services and End users/beneficiaries. The copy of end user agreement submitted to establish EKI ownership. 2. The Commissioning date of the earliest batch of the ICS cookstove is established from the end user's agreement 3. Manufacturer's Technical Specification sheet Agneekaa ICS and Thermal Efficiency Test Certificates from NEERI submitted. 4. Supportive documents submitted. 5. Agreement indicating the avoidance of double counting or conflict of interest in future from the project proponent and manufacturer submitted. 6. Proof of local stakeholders' consultation submitted 7. Monitoring survey data for 125 number of beneficiaries annual quantity of woody biomass submitted 8. The selection of beneficiary for the project activity is based on beneficiaries using traditional cookstoves/mud cook stoves. Efficiency of the baseline cookstoves is based on the methodology default efficiency values of traditional cookstoves.				
Documentation provided by project participant				

1. Sample Copies of end user agreement (SI. 1) 2. End users agreement for 1st ICS cookstoves distributed (SI. 2) 3. Manufacturer's Technical Specification sheet and Thermal Efficiency Test Certificates for ICS cook stoves (SI. 3) 4. The supporting literature and official statistics is submitted. 5. Agreement indicating the avoidance of double counting or conflict of interest in future from manufacturer submitted (SI.5). 6. Proof of local stakeholders' consultation (SI.6) 7. Monitoring survey data for annual quantity of woody biomass submitted
DOE assessment **Date:** 19/08/2022
Following is the assessment of the DOE: 1.The same copy of the end user agreement is checked and it is confirmed that ownership lies with EKI and therefore the CL is closed in this regard. 2.The Commissioning date of the earliest batch of the ICS cookstove is checked and found correct. CL is closed 3. Manufacturer's Technical Specification sheet Agneekaa ICS and Thermal Efficiency Test Certificates from NEERI is checked by the assessment team and found correct. The submission of documentary evidence lead to the closure of the CI 4. Supportive documents including survey methods, published literature, official reports or statistics is submitted to the assessment team and therefore the CL is closed 5. Agreement indicating the avoidance of double counting or conflict of interest in future from the project proponent and manufacturer is checked and found correct by the assessment team and therefore the CL is closed 6.The local stakeholder consultation attendance sheet and invitation letter is checked by the assessment team. The stakeholder consultation photographs and MoM were also checked and it is observed that stakeholder consultation is adequately covered all topics effecting the stakeholders. The overall impressions of the stakeholder is positive and therefore DOE conclude that stakeholder consultation is done adequately and based on this observation the CL is closed. 7. Monitoring survey data for annual quantity of woody biomass is checked by the assessment team and found correct. Therefore the CL is closed. 8. The explanation is acceptable and since the efficiency of the traditional cookstove (i.e. Baseline stove) is selected as per the default value of the baseline stoves as per the methodology therefore the same is conservative and acceptable to the assessment team. CL is thus closed.

CL ID	02	**Section no.**		**Date:** 25/01/2022
Description of CL				

Annual quantity of woody biomass used by improved cook stoves in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey is mentioned as 4.9 kg/device/day. However as per report "Household Consumption of Various Goods and Services in India 2011-12", the value is much lower for household per day for Assam. Please clarify how the value of 4.9 kg/day is considered with supporting evidences.
Project participant response **Date:** 10/02/2022
The post distribution wood consumption of 4.9 kg/day/households referred to in the joint MR-PD for estimation of emission reduction is based on the user survey of 125 numbers of beneficiaries during the first year of the crediting period (carried out in April 2022 due to COVID -19 restriction during January-March). It is to be noted that the beneficiaries under the project activity are reliant only on biomass (wood lot) used in improved cookstoves for the purpose of cooking. Biomass in the pre-project scenario were used in traditional cookstoves for the purpose of cooking. The fuel wood consumption reported in "Household Consumption of Various Goods and Services in India 2011-12" for the rural areas of Assam is based on the sample survey carried out by National Sample Survey Office in accordance to Schedule 1.0, consumer expenditure. In accordance to 6 of the schedules: consumption of energy (fuel, light & household appliances) consumption of coke, firewood and chips, electricity, dung cake, Kerosene, LPG excluding conveyance, charcoal is monitored across the sample households and averaged. Therefore, the monthly consumption of wood of 29.864 kg should be considered along with: Coke consumption of – 0.061 kg kerosene – P.D.S. (litre) -0.426 lt kerosene – other sources (litre) – 0.242lt coal -0.001 kg L.P.G. – 0.429 kg Charcoal – 0.001 kg
Documentation provided by project participant
Detailed findings of beneficiary survey submitted.
DOE assessment **Date:** 13/02/2022

The post distribution wood consumption of 4.9 kg/day/households referred to in the joint MR-PD for estimation of emission reduction is based on the user survey of 125 numbers of beneficiaries during the first year of the crediting period (carried out in April 2021 due to COVID -19 restriction during January-March).

Moreover, the fuel wood consumption reported in "Household Consumption of Various Goods and Services in India 2011-12" for the rural areas of Assam is based on combination of fuel i.e. coke, firewood and chips, electricity, dung cake, Kerosene, LPG excluding conveyance, charcoal along with Wood and therefore the consumption cannot be limited to consumption of wood of 29.864 kg and thus this explanation is acceptable to the assessment team and therefore the CL is closed.

CL ID	03	**Section no.**		**Date:** 25/01/2022
Description of CL				
In the Calculation of fNRB: 1) Proper detail references for the values taken to calculate Tool 30 is not presented in the fNRB calculation sheet for Assam. 2) NSS report reference also made from 2011-12 and not latest data for rural and urban household using firewood				
Project participant response				**Date:** 10/02/2022
1. Reference included in the FNRB estimation sheet. 2. Since NSS report of 2011-12 published in 2014, is the latest report in alignment with the population census of 2011 the value referenced in the report regarding percentage of households using biomass consumption is considered.				
Documentation provided by project participant				
Revised FNRB calculation sheet with reference submitted				
DOE assessment				**Date:** 13/02/2022
The revised FNRB calculation is found correct considering NSS report of 2011-12 published in 2014. 2014 is the latest report in alignment with the population census of 2011 the value referenced in the report regarding percentage of households using biomass consumption is considered. The same is correct and therefore the CL is closed.				

CAR from VALIDATION

CAR ID	01	**Section no.**		**Date:** 25/01/2022
Description of CAR				

1) As per the VMR0006 methodology, as the project target population is greater than 1000, Sample Size of 100 is to be produced. ER sheet contains target population, but the sample is not defined. 2) Project Proponent needs to submit the survey results for the identification of the target population in the applicability clause 3 of section 3.2 of the Joint PD-MR. 3) ERy,i,j in section 4.4 is not calculated properly. 4) In Section 6.1 of Joint PD-MR, again the estimated value of $\boldsymbol{By{=}1,new,i,j,survey}$ is used which is overestimated. 5) In Section 6.5 Project Instance 2,3 &4 Tables contains typo mistake in Year.
Project participant response **Date:** 10/02/2022
1. Detailed of the sample population (125 beneficiaries) surveyed submitted. 2. Survey results submitted 3. Estimation of ERy,i,j in section 4.4 modified 4. The estimated value of $\boldsymbol{By{=}1,new,i,j,survey}$ is based on the sample survey of population relying solely on biomass for cooking 5. In Section 6.5 of the joint MR-PD modified
Documentation provided by project participant
1. Sample survey 2. Update ER sheet for the monitoring period submitted 3. Updated ER sheet -ex-ante submitted 4. Updated joint MR-PD submitted
DOE assessment **Date:** 13/02/2022
Following is the assessment of the DOE: 1. Detailed of the sample population (125 beneficiaries) is checked and found correct by the assessment team. CAR is closed. 2. The survey result is submitted and checked by the assessment team. The relevant section of the joint PD and MR is updated 3. ERy,i,j in section 4.4 of the revised joint PD and MR version 02 dated 15/08/2022 is checked and found correct and as per the requirement of the methodology. CAR is closed. 4.The estimated value of $\boldsymbol{By{=}1,new,i,j,survey}$ is based on the sample survey of population relying solely on biomass for cooking. The same is now updated in section 6.1 of the joint PD and MR version 02 dated 15/08/2022. CAR is thus closed 5. Section 6.5 of the MR is now corrected. CAR is closed.

2.5.1 Forward Action Requests

NO FAR raised for present validation and verification.

3 VALIDATION FINDINGS

3.1 Project Details

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

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

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

The project ownership is with EKI Energy Services Limited which has been checked by the audit team based on the declarations and the user agreements submitted by them. The commissioning date of the first ICS under first project instance is 15-February-2020. The same has been checked by the audit team from the commissioning certificate.

All the project activity instances in the proposed grouped project activity are located within geographical boundaries of Indian states of Assam in Udalguri district. For project activity instances, geographical area is in Assam. Thus, the KML file is submitted for Udalguri district of Assam in India which is checked by the assessment team and found correct. The geographical boundary for projects located in Udalguri district of Assam and is delineated in the form of extreme geographic coordinates of Udalguri district of Assam as follows:

Latitude – 26°46′ North

Longitude – 92°08′ East

There are no laws and regulations governing the use of improved cookstoves in India for households. The project is a voluntary effort by the project proponent. Though, the government of India promotes use of clean fuel e.g. LPG, however due to the initial capital cost and operating cost, the usage levels are low and most of the rural households still use traditional stoves for cooking. There is no specific concern made on improved cookstoves project from the above laws and regulations.

The project has not been registered, nor is it seeking registration or rejected under any other GHG program as checked from the declarations of project owner.

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

The eligibility criteria for inclusion of new project activity instances under this grouped project has been assessed by the audit team as given below.

Sr. No	Criterion	Justification by PP	Audit team conclusion

1	Meet the applicability conditions set out in the methodology applied to the project	New project activity instances (Energy Efficient Cook Stoves) will meet the applicability conditions set out in Section 3.2 where the target of the end-user is household and the ICS deployed is at least 25% of thermal efficiency.	The new project instances comply with the methodology VMR0006 as checked by the audit team. The ICS deployed in the households have an efficiency greater than 25% as checked from the ICS technical specifications and thermal efficiency test reports. The EFFICIENCY test reports was conducted by CSIR-NEERI. The Thermal efficiency test reports for ICS-dated 04/01/2021 and the same is checked by the assessment team to confirm that the ICS deployed have thermal efficiency greater than 25%.
2	Use the technologies or measures specified in the project description.	The technology used for project activity is energy efficient cook stoves. Only energy efficient cook stoves to be adopted in the project by replacing traditional cook stoves in household.	Technology employed is the ICS as verified from the technical specifications.
3	Apply the technologies or measures in the same manner as specified in the project description.	Only energy efficient cook stoves to be adopted in the project by replacing traditional cook stoves in household.	Technology employed is the ICS as verified from the technical specifications.
4	Are subject to the baseline scenario determined in the project description for the specified project	The new project activity instances will be installed within India subject to the same baseline scenario determined in Section 3.4.	Project instances are installed in the state of Assam India and is within the geographical region defined by the project. The ICS are subject to the baseline scenario defined in

	activity and geographic area.		sec 3.4. The baseline scenario is verified through interview with households as mentioned in section 2.2
5	Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.	All new project activity instances will use the activity method for demonstration of additionality. Step 1: Regulatory Surplus There is no mandated government programme or policy in host country of this project ensuring the distribution of new energy efficient cook stoves for each project activity instances. Step 2: Positive List The inclusion of new project activity instances will comply with positive list as it satisfies criterion 1 where it meets all the applicability conditions of the methodology.	The project activity instances use the activity method for demonstration of additionality and complies with positive list as it satisfies criterion 1 where it meets all the applicability conditions of the methodology. The distribution of cook stoves free of cost to households has been checked through interview with households as mentioned in section 2.2.
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,	No project activity instance shall exceed the applicable limit, which is 180 GWhth/y. Thus no divide of project activity instance into clusters is required.	The expected annual energy saving of ICS is below the threshold of 180 GWhth/y. The energy saving from each project activity instance is checked from ER calculation sheet. The each project activity instance is within capacity limit of thermal energy saving of180 GWhth/y and does not exceed the capacity limit. The cluster guideline is not applicable as the instances are considered separate and therefore the inclusion will also follow the

	determined as follows: Each project activity instance that exceeds one percent of the capacity limit shall be identified. Such instances shall be divided into clusters, whereby each cluster is comprised of any system of instances such that each instance is within one kilometer of at least one other instance in the cluster. Instances that are not within one kilometer of any other instance shall not be assigned to clusters. None of the clusters shall exceed the capacity limit and no further project activity instances shall be added to the project that would cause any of the clusters to exceed the capacity limit.		same guideline.
Along with above eligibility criteria, the new project activity instance will follow below criteria during inclusion in the grouped project activity			
1	Occur within one of the designated	New project activity instances (Energy Efficient	Project instances are installed in Assam state of India and is

	geographic areas specified in the project description	Cook Stoves) will be occurred in the designated geographic areas specified in the project description.	within the geographical region defined by the project. The location is verified through interview with households as mentioned in section 2.2
2	Comply with at least one complete set of eligibility criteria for the inclusion of new project activity instances. Partial compliance with multiple sets of eligibility criteria is insufficient.	New project activity instances will comply with complete set of eligibility criteria as mentioned above for the inclusion of new project activity instances.	New project activity instances comply with complete set of eligibility criteria as mentioned above for the inclusion of new project activity instances.
3	Be included in the monitoring report with sufficient technical, financial, geographic and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body.	New project activity instances information be included in the monitoring report with sufficient technical, financial, geographic and other relevant information to demonstrate compliance with the applicable set of eligibility criteria and enable sampling by the validation/verification body	New project activity instances comply with complete set of eligibility criteria as mentioned above for the inclusion of new project activity instances
4	Be validated at the time of verification against the applicable set of eligibility criteria	New project activity instances should be included by validating eligibility criteria as mentioned in this document	The eligibility criteria has been assessed by the team for the project instances. All the project activity instances meet the eligibility criteria.

5	Have evidence of project ownership, in respect of each project activity instance, held by the project proponent from the respective start date of each project activity instance (i.e., the date upon which the project activity instance began reducing or removing GHG emissions)	New project activity instances ownership need to be evidenced from start date of respective project activity instance.	The declaration, undertaking from the project owner and the user agreements have been checked by the audit team to confirm the project ownership. The start date of the first project instance has also been checked by the audit team.
6	Have a start date that is the same as or later than the grouped project start date	New project activity instances start date should be after the start date of grouped project activity.	The start date of the project instance is on or after the start date of grouped project. the project activity instances started commissioning on 15-February-2020, thus meets the start date criteria.
7	Be eligible for crediting from the start date of the instance through to the end of the project crediting period (only). Note that where a new project activity instance starts in a previous verification period, no credit may be sought for GHG emission reductions or removals generated	New project activity instances is eligible to claim credits from crediting period start date to the end of the project crediting period.	New project activity instances is eligible to claim credits from crediting period start date to the end of the project crediting period. The start date of project activity is considered as 15-February-2020, thus the project activity instances added in project activity have start date on or after the 15-February-2020. All future activity instances must have start date on or after 15-February-2020 to meet the eligibility criteria. Single

	during a previous verification period (as set out in Section 3.4.4 of VCS standard version 4.2) and new instances are eligible for crediting from the start of the next verification period		verification will be carried for all eligible project activity instances for specific monitoring period.

The project adopts a net gross adjustment factor of 95% to account for leakage. No commercially sensitive information has been excluded from the public version of the project description. The project contributes to social, environmental, economic and technological benefits which contribute to sustainable development of the local environment and the country. The key benefits are provided below which have been assessed by the audit team.

- Reduces drudgery to women due to reduced fuel wood use
- Improves overall health of women and children by reducing smoke
- Better cooking time
- Reducing rate of degradation of forests and deforestation in the project area.
- Reduction in use of non-renewable biomass thus leading to reduction in GHG emissions.
- Employment opportunities for local communities through the CDM activity.
- Introduction of new technology to the rural communities

PP and other entity Details

Assessment team checked during the remote audit as well from the documentation verification and confirms that the details of the project proponent and confirms that EKI Energy Services Limited in PP for the project activity. The same entity is project consultant.

Project Start Date

As per the project description (PD), the start date of the project activity is stated as 15-February-2020 which is based on the date of commissioning of the batch. Validation team has verified the same through the project database and commissioning certificate shared by the PP and confirmed that this is in accordance with VCS standard, Version 4.2 and hence accepted.

Project Crediting period

Assessment team confirms that the crediting period dates for the project is as below:

15- February-2020 to 14- February-2027, seven years renewable crediting period. Being renewable crediting period, total crediting period of grouped project activity is 21 years

The same is acceptable to the assessment team as the same is as per te requirement of VCS standard version 4.2.

As per Updates to the VCS Version 4 dated 19/04/2022, the "Project Start Date' and 'Project Crediting Period Start Date' are the same and is accepted.

Project Scale and estimation of GHG

Assessment team confirms that the project activity is grouped project and project activity instance thermal energy saving is below 180 GWhth/year. The average Annual estimation of the project activity considering all the instances is 211,856 TCO_{2e}. The ER estimation is with consideration all project activity instances and total 35,045 cook stoves and with 365 days of operation per year with 0% annual loss or non- operation of ICS assumption. Based on survey result, annual loss or non-operation of ICS will be considered for actual ER calculations. The average lifetime of cook stove is 7 years, but it may expect that cook stove will be in operation beyond 7 years also. Thus, above ER estimation is determined considering the 7 years of operationAs the estimated annual average GHG emission reductions or removal per year is less than 300,000 tCO_2e/Year, thus each project activity instance falls in the category of "Project".

Project Scale	
Project	✓
Large project	

Conditions prior to project initiation

Assessment team during the desk review and remote audit confirms that the project is a installation of energy efficient cook stove project. The baseline as described in section 3.4.4 of this report will continue to be the baseline in the absence of project activity. The baseline scenario is the continued use of non-renewable wood fuel (firewood/charcoal) or fossil fuel (coal/kerosene) by the target population to meet similar thermal energy needs as provided by project cook stoves in absence of project activity.

For initial project activity instances to be included in this grouped project activity, the baseline scenario is the continued use of non-renewable wood fuel (firewood) by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of project activity. This has been checked during remote audit and found to be appropriate

Project contribution to sustainability:

The sustainability indicators as mentioned below is checked by the assessment team and found correct. PP considered 3 SDG i.e. SDG 7, 3 and 13.

SDG 7 refer to Affordable and clean energy and indicator is selected as 7.1.2. Proportion of population with primary reliance on clean fuels and technology. The ICS technology helps in replacing the use of baseline inefficient cookstoves has resulted in increase in population with reliance on clean technology. Therefore the project will contribute in increased reliance on clean technology through distribution of 35,045 numbers of improved cookstoves.

SDG 3 refer to Good health and well being and indicator is selected as 3.9.1 Mortality rate attributed to household and ambient air pollution. The ICS technology helps in Lowered indoor air pollution in 35,045 households by facilitating use of improved cookstoves. Therefore the project will contribute to reduction of indoor air pollution and hence complying with the SDG 3 goals.

SDG 13 refer to climate action and the indicator is selected as 13.2 i.e. Tonnes of greenhouse gas emissions avoided or removed. The ICS technology helps to avoid the release of 404,947 tonnes of carbon-dioxide into the atmosphere which would have happened in case of continuous use of baseline stoves. Therefore the project activity complies with the requirement of SDG 13.

The validation team concludes that the project description is accurate, complete, and provides an understanding of the nature of the project.

3.2 Participation under Other GHG Programs

The project has not been registered, nor is it seeking registration or rejected under any other GHG program as checked from the declarations of project owner.

3.3 Safeguards

3.3.1 No Net Harm

No potential negative environmental or socio-economic impacts have been identified for the project,

3.3.2 Local Stakeholder Consultation

The stakeholder consultation details are as follows:

Date of meeting	*Location*	*District*	*State*
13/01/2020	*3 No Uttar Dimakuchi*	*Udalguri*	*Assam*
13/01/2020	*2 No Hattigon*	*Udalguri*	*Assam*
13/01/2020	*Tangla Ward no 2*	*Udalguri*	*Assam*

All the relevant stakeholders have been invited which consist of villagers (local community),

NGOs and other officials. The stakeholders are invited via public notice and the same was communicated dated 15/11/2019 to the members of Gaon Panchayats (GPs) including Sarpanch about the purpose and agenda of the project and stakeholders' consultation meeting for dissemination of information regarding the consultation meeting. concerned institutional stakeholders were also invited through invitation letter submitted directly at the office/institutions of the stakeholder's concerned.

The PP has given the brief introduction of the project activity and explained the social, environmental and economic benefits of the project. The participants enquired regarding the benefits related to employment generation and uses of the ICS.

The audit team has checked the stakeholder related documentation- invitations, summary provided to participants, attendance sheet and feedback by the local community. For the verification stage, the VVB has also conducted sampling of few households through remote assessment and found that there were no negative comments raised during the consultation process, and participants were aware about the benefits of using Improved Cookstove over the traditional low efficient stove and users were also aware about the benefits of the improved cookstove, including lesser smoke, lesser time in wood collection, lesser wood consumption, etc.

All questions raised by stakeholders were answered and documented by the PP and their representative. Stakeholder had no comments/complaints/grievances by the end of the meeting which could have any significant modification in the project description or its design. This information was cross-checked and confirmed from sample stakeholders who were interviewed by the validation team during the remote audit. VVB validation team was able to confirm that these stakeholders were part of the LSC meeting conducted by project developer and were found to be aware about the proceedings of the meeting. As per the VVB's assessment, PP has addressed all questions and responses of all the stakeholders with satisfaction and for future grievances PP has provided the communication details that can be used for placing the complaints after the implementation of the project.

A continuous grievance mechanism has been established and local stakeholders have confirmed that it was described during the meeting as well as the contact information of project proponent representatives was shared with them, thus establishing a continuous grievance mechanism in conformance to the VCS guidelines

PP has maintained a register as a part of on-going communication with local stakeholders, end users are informed about grievance register. The distributors have the responsibility to take grievances regarding the project activity and same will be conveyed to PP during operation of project activity. Thus, ongoing communication of stakeholders is followed through grievance mechanism. The audit team has checked the grievance register and no grievances have been reported during the first monitoring period for the all the project instances.

The VVB confirms that the local stakeholder consultations have been done in accordance with VCS v4.2 requirements.

3.3.3 Environmental Impact

No potential negative environmental or socio-economic impacts have been identified for the project

3.3.4 Public Comments

No comments have been received (https://registry.verra.org/app/projectDetail/VCS/2664)

3.3.5 AFOLU-Specific Safeguards

This section is not applicable.

3.4 Application of Methodology

3.4.1 Title and Reference

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

TOOL30: Calculation of the fraction of non-renewable biomass"- Version 04.0

3.4.2 Applicability

The applicability of the methodology has been assessed as given below

Criteria	Justification by PP	Audit team conclusion
Project activities shall be implemented in domestic premises or in community-based kitchen	The proposed project involves deployment of ICS only in households i.e. domestic premises	The proposed project instances are implemented in households which is domestic premises, which has been checked by the audit team from the user agreements.

The project stove shall have specified high- power thermal efficiency of at least 25% per the manufacturer's specifications and shall exclusively use woody biomass and can be single pot or multi-pot;	Energy Efficient stoves planned to be installed under this project are single pot or multi pot portable or an in-situ wood cook stoves that have an efficiency more than 25%. For the project activity instances, efficiency of 32.19% cook stoves installed as per the manufacturer's specifications. For future project activity instances, Manufacturer may change and that cook stove efficiency should be more than 25% as mentioned in methodology based on manufacturer specification.	Energy Efficient stoves is installed under this project are single pot portable cook stoves that have an efficiency more than 25%. For all project activity instance, ICS with efficiency of 32.19% is installed as per the manufacturer's specifications.
Both 'Projects' and 'Large Projects' can use the methodology	Each project activity instance will be Projects	Confirmed by the audit team.
Non-renewable biomass has been used in the project region since 31 December 1989, using survey methods or referring to published literature, official reports or statistics;	Non-renewable biomass has been used since 31 December 1989 in India as demonstrated at below by referring to published literature, official reports or statistics; For project activity instance to be located in other country, the same will be justified at the time of project activity instance inclusion.	The criteria has been checked based on publicly available literature and reports of Food and Agricultural Organization of United Nation and State of Forest Report 1987. The project instances have applied the same criteria. Also as per Forest Survey report 2011 (In India, Forest survey was happening every 10 years, and this is latest survey report for India. Due to COVID-19, no survey done for year 2021), the demand is more than supply, thus continued use of non-

		renewable biomass in India is justified.
For the specific case of biomass residues processed as a fuel (e.g. briquettes, wood chips), it shall be demonstrated that: 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 Energy use for renewable biomass processing (e.g. shredding and compacting in the case of briquetting)	Not applicable as project activity uses non- renewable biomass as a fuel. The ICS is introduced as energy efficiency measure to replace baseline stoves and reduce the use of non-renewable biomass for combustion.	Not applicable to the project.
The VCS PD shall explain the proposed method for distribution of project devices including the method to avoid double counting of emission reductions such as unique identifications of product and end-user locations (e.g. programme logo) The above criteria is as per below VCS meth requirement and para 7 of latest version of meth AMS II.G version 12 is followed.	Each ICS have unique serial number, thus unique identification of product and end user is followed. The distributor has identified village representative to distribute the cook stove, make the installation data for baseline scenarioand project activity details. The Project Owner have provided the undertaking that no double counting of emission reductions occurred due to unique	Each ICS has a unique ID which has been checked from the stove installation database and also end user agreements. The Project Owner have provided the undertaking that no double counting of emission reductions occurred due to unique identifications of product and end-user location. Please refer the section 2.4 of report for serial numbers

(Additionally, applicability criteria numbers 8 and 9 set out in Section 2.2 of AMS II.G, version 11.1 shall apply)	identifications of product and end-user location.	of ICS reviewed during audit process.
The VCS PD shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices. The above criteria is as per below VCS meth requirement and para 8 of latest version of meth AMS II.G version 12 is followed. (Additionally, applicability criteria numbers 8 and 9 set out in Section 2.2 of AMS II.G, version 11.1 shall apply)	Manufacturers/ cook stove distributors undertaking is provided that there is no any double accounting for carbon emissions associated with ICS supplied to households under the project activity having Project Owner (EKI Energy Services Ltd.) . EKI will be owner of that carbon credits and Manufacturers/ cook stove distributors will not claim any credits for such cook stoves.	The Project Owner have provided the undertaking that no double counting of emission reductions occurred due to unique identifications of product and end-user location

3.4.3 Project Boundary

The project boundary includes emission from use of non- renewable biomass from baseline and project cook stoves. The details of this boundary have been checked form the ICS commissioning certificates and all related project documentation. CO_2, CH_4 and N_2O are the major source of GHG and the same has been assessed by the audit team. This is in line with table 1 of methodology and found to be appropriate. The emission reductions are calculated as per equation 1 of methodology which considers the CO2 emission factor and non-CO_{2e} emission factor.

3.4.4 Baseline Scenario

PP has conducted the baseline survey to justify the use of traditional cookstoves by the households in the absence of the project activity and it was observed that there was a predominance in the use of traditional low efficiency cookstoves.

As per the para 51 of the applied methodology, the baseline scenario is the continuous use of the inefficient baseline technology, which can be clearly concluded from the results of the baseline surveys which was conducted by the PP. The predominant usage of inefficient traditional stoves is evident and independent research by validation team has led to the conclusion that no mandatory laws prevail in the host country for usage of improved efficient cookstoves.

Therefore, the baseline scenario has been found to be appropriately described under the section 3.4 of the PD and the baseline conditions are verified by the VVB through end-user interviews.

Following the guidance in Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0, which was found to be appropriately applied for sample size determination of baseline surveys, PP conducted surveys of 125 households. As per the section 6 of the applied methodology, the baseline scenario is the continuous use of the in-efficient use of non-renewable wood fuel firewood by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of group project activity. This has been clearly demonstrated from the findings of the baseline survey which was conducted by the PP.

Thus, the baseline was established. Acceptance sampling allowed the validation team to confirm the acceptability of baseline scenario reported by project developer on the basis of the baseline survey

3.4.5 Additionality

The PP has demonstrated the additionality in line with methodology requirement as below.

The PP uses activity method for the demonstration of additionality.

Activity Method

Step 1: Regulatory Surplus

There is no mandated government programme or policy in host country of this project ensuring the distribution of domestic fuel-efficient cookstoves. The project is not mandated by any law, statute or other regulatory framework, or for UNFCCC non-Annex I countries, any systematically enforced law, statute or other regulatory framework. The assessment team has been checked through search of any laws which are mandated to install ICS is India and found that there are no any such mandated laws for implementation of project activity. Also PP, Manufacturer, Distributor and household owners are interviewed during audit and confirmed that this project activity is voluntary and not mandated by any laws.

Households may only participate voluntarily in this project. It is hereby confirmed that the proposed project is a voluntary coordinated action by EKI. This has been assessed by the project ownership and undertaking documents.

Step 2: Positive List

As per Section 3.2 of joint VCS PD & MR, the project meets the applicability conditions of the methodology and also meets below conditions which represent the step 2 positive list.

1. The project installs the ICS at zero cost to the household and PP has no other source of revenue other than the sale of GHG credits. This has been checked through interview with household owners, PP, manufacturer and distributors. Thus project activity is deemed to found additional.

2. The project is not implemented as part of government schemes or supported by multilateral funds. PP has invested for purchase, distribution and commissioning of ICS to household owners and household owners receives the ICS at free of cost.

Since the project fulfils the conditions above, it is deemed additional.

3.4.6 Quantification of GHG Emission Reductions and Removals

The emission reductions from the project activity have been calculated by PP based on the methodology formula.

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

Where:

$B_{y,savings,i,j}$	=	Quantity of woody biomass that is saved in tonnes per improved cookstove of type *i* and batch *j* during year *y*
$f_{NRB,y}$	=	Fraction of woody biomass that can be established as non-renewable biomass (fNRB)[5]
$NCV_{wood\ fuel}$	=	Net calorific value of the non-renewable woody biomass that is substituted or reduced (IPCC default for wood fuel, 0.0156 TJ/tonne)[6]
$EF_{wf,CO2}$	=	CO2 emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 112 tCO2/TJ)[7]
$EF_{wf,non\ CO2}$	=	Non-CO2 emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 26.23 tCO2/TJ)[8]
$N_{y,i,j}$	=	Number of improved cookstoves of type *i* and batch *j* operating during year *y*
0.95	=	Discount factor to account for leakage

The quantify of woody biomass saved due to implementation of improved cookstoves to be estimated using equation below (Equation 5 of methodology)

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

where

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

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

where

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

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

For ex-ante calculation purpose, the assumption below is applied for first project activity instance.

1) The first project activity instance installs 35,045 numbers of ICS.
2) The life span of ICS is 7 years; thus the operational lifetime of each project activity instance is taken as 7 years. It will extend 10 years or beyond 7 years after proper repair and maintenance. The end users can repair the ICS through the service providers (PP representative) who will repair the cook stove for further use. After 7 years of lifetime, a report from Maintenance Company will be provided to confirm the extended life of cook stove. The project will claim credits beyond 7 years only for balanced year till cook stove is replaced by new cook stoves.

3) Annual stove loss rate is estimated at 0%. This is assumed for estimation. During actual ER calculation, this value is varies. This value will vary during actual verification based on survey results. During current monitoring period, there is no any non operational cook stove

4) 6) By=1, new,i, survey, is assumed as 1.7885 tonnes / device / year. This is considered as 4.9 Kg of biomass is required per device and 365 days of operations. This is based on survey results

Determination of number of ICS operating during year y

$N_{y,i,j}$ = 35,045 x [1 - (y-1) x 0%]

Example of calculation:

If y = 2,

$N_{y,i,j,,}$ = 35,045 x [1 - (2-1) x 0%]

= 35,045

Hence, the number of ICS operating during year y is as below:

Year (y)	Ny,i,j
1	35,045
2	35,045
3	35,045
4	35,045
5	35,045
6	35,045
7	35,045

Determination of efficiency of ICS during year y

$\eta_{new,,,}$ = ηp × $(DFn)y-1$ × 0.94

Where

ηp = 32.19%

DFn = 0.99

Example of calculation:

If y= 2

$\eta_{new,,,}$ = 32.19% X (0.99)2-1 X 0.94

= 29.96%

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

Year (y)	$\eta new,y,i,j$
1	30.26%
2	29.96%
3	29.66%
4	29.36%
5	29.07%
6	28.78%
7	28.49%

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

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

Example of calculation: If y= 2,

$B_{y,}$savings,i,j= 1.7885X [(0.2996/0.1) -1]
= 3.57 tonnes

Year (y)	$B_{y=1,new,i,survey}$	$\eta new,y,i,j$	ηold	$B_{y,savings,i,j}$
1	1.7885	30.26%	0.1	3.62
2	1.7885	29.96%	0.1	3.57
3	1.7885	29.66%	0.1	3.52
4	1.7885	29.36%	0.1	3.46
5	1.7885	29.07%	0.1	3.41
6	1.7885	28.78%	0.1	3.36
7	1.7885	28.49%	0.1	3.31

Note - The lifespan of cook stove is 7 years, however with proper repair and maintenance, the lifespan can be extended beyond 7 years, and hence ER estimation is determined for 7 years. After 7 years of lifetime, a report from Maintenance Company will be provided to confirm the extended life of cook stove. The project will claim credits beyond 7 years only for balanced year till cook stove is replaced by new cook stoves.

Determination of emission reductions by ICS of batch 1 during year y

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

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

$f_{NRB,}$ = 0.8520. As per calculation of methodological tool, the fraction is determined and same is considered for ER estimation. The calculations are done as per tool.
$EF_{wf,2}$ + $EF_{wf,non\ CO2}$ = 112 + 26.23 = 138.23 tCO_2/TJ

Example of calculation:
If y=2,
$ER_{y,i,j}$ = 3.57 X 0.0156 X 0.852 x 138.23 X 35,045 X 0.95
= 218,312 tCO2e

Thus 7 years estimation for Project Activity Instance 1 is as below

ER estimation is done for Project Activity Instance 1 (9,986 ICS quantity)

Year	$By,savings,i,j$	$NCVwood\ fuel$	$fNRB,y$	$EFwf,CO2+EFwf,non\ CO2$	Ny,i,j	ERy,i,j
1	3.62	0.0156	0.852	138.23	35,045	221,622
2	3.57	0.0156	0.852	138.23	35,045	218,312
3	3.52	0.0156	0.852	138.23	35,045	215,035
4	3.46	0.0156	0.852	138.23	35,045	211,791
5	3.41	0.0156	0.852	138.23	35,045	208,579
6	3.36	0.0156	0.852	138.23	35,045	205,399
7	3.31	0.0156	0.852	138.23	35,045	202,251
					Total	**14,82,989**
					Annual Average	**211,856**

Through the assessment process validation team confirmed that:

- All the assumptions and data used by the project participants are listed including their references and sources;
- All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PD
- All values used in the PD are considered reasonable in the context of the VCS project activity;
- The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;

All estimates of the emission reductions can be replicated using the data and parameter values provided in the PD

3.4.7 Methodology Deviations

NO deviation envisaged for the present joint validation and verification.

3.4.8 Monitoring Plan

Assessment team checked the monitoring plan as per methodology requirement and the detail analysis is as below:

Parameters determined ex-ante:

1. Non-CO2 emission factor for the use of wood fuel in baseline scenario- Value of 26.23 tCO2e/TJ as per IPCC default values.
2. Efficiency of baseline cookstove- Value of 0.1 as per methodology default value. This is accepted as baseline scenario was a three- stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney.
3. Efficiency of project stove at the start of project activity.- Value of 32.19% as per manufacturer specifications
4. Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass- Value of 0.852 has been calculated as per TOOL30: Calculation of the fraction of non-renewable biomass"
5. CO2 emission factor for the use of wood fuel in baseline scenario - Value of 112 tCO2e/TJ as per IPCC default values.
6. Net calorific value of the non-renewable woody biomass that is substituted or reduced- Value of 0.0156 TJ/tonne as specified by the methodology AMS II.G ver.10 has been used.
7. Discount factor to account for efficiency loss of project cookstove per year of operation (fraction)- Value of 0.99 as per methodology default value.
8. Operating lifetime of project device for projects opting Equation 5 for determining project stove efficiency- 7 years as per manufacturer specification.
9. Number of project devices of type i and batch j operating during year y (Ny,i,j)- Value of 35,045 nos. as installation database
10. Annual quantity of woody biomass used by improved cookstoves in tonnes per device of type i and batch j (By=1,new,i,j,survey)- Value is 4.9 kg/device/day or equal to 1.7885 tonnes/device/year based on the survey result.
11. Date of commissioning of batch j-15/02/2020 (first date of batch of ICS commissioned in the project activity instance) The start date of crediting period is considered from 15/02/2020 onwards.

12. Efficiency of the improved cook stove type i and batch j determined as per equation 5 of methodology during year y – This is calculated as per methodology equation 5.

The above values are checked as per methodology requirement and found to be appropriate.

Parameters determined ex-Post:

The parameters that would be monitored are as follows

Number of project devices of type I and batch j operating during year y

Annual quantity of woody biomass used by improved cook stoves in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey

To establish the date of commissioning, the Project Participant may opt to group the devices in "batches/project activity instances" and the latest date of commissioning of a device within the batch shall be used as the date of commissioning for the entire batch.

Actual date of commissioning of the project device (each ICS)

Measurement/monitoring of few parameters based on a representative sample. As per methodology, minimum sample size determine in which case compliance with 90/10 confidence precision is not obligatory. 100 Sample size is selected being target population is above 1000

The audit team confirms that PP is able to monitor the same during verification

As per the VVB's opinion, the monitoring plan for this parameter stands justified and correct when cross-checked against provisions in the applied methodology VMR0006.

3.5 Non-Permanence Risk Analysis

Not applicable

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project is implemented as mentioned in the PD. The ICS deployed under this project is energy efficient which substantially reduces fuel consumption and emissions for conducting cooking and water heating tasks in homes. The ICS improve the efficiency of combustion and thermal transfer to the pot compared with a traditional pot support or three-stone fire by incorporating energy efficient technology which provides a conducive environment for clean and efficient combustion of wood. It substantially reduces wood fuel consumption compared with a less efficient or three-stone fire or traditional pot support. The boundary of the grouped project is in India and there are 35,045 project activity instances in the state of Assam with a total number of 35,045 ICS distributed across the boundary which is mentioned in the PD. Therefore is no change observed in the technical specification as mentioned in the PD and the ICS distributed is as per the requirement of the PD. Therefore assessment team confirm that the project is implemented as per the requirement of the PD.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

The VVB had telephonic/Teams interviews with concerned onsite persons, households and has reviewed documents & photographs submitted by PP; assessment team concluded that the project activity is implemented and operated in-line with the VCS PD & MR. A total number of 35,045 ICS distributed across the boundary which is mentioned in the PD. There is no change in the project design or operation and monitoring practices at site which can alter the applicability or additionality of the project activity. In addition to the interviews with PP, assessment team have checked the all

the documentation and found that the project activity is implemented as per the VCS PD and Monitoring report submitted by the PP for current monitoring period.

Parameters fixed ex ante

<table>
<tr><td>Means of verification</td><td>The data and parameters fixed ex ante have been checked from the CPA-DD, approved methodology and IPCC.

1. Non-CO2 emission factor for the use of wood fuel in baseline scenario- Value of 26.23 tCO_2e/TJ as per IPCC default values
2. Efficiency of baseline cookstove- Value of 0.1 as per methodology default value. This is accepted as baseline scenario was a three- stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney.
3. Efficiency of project stove at the start of project activity.- Value of 32.19 as per manufacturer specifications
4. Fraction of woody biomass saved by the project activity during year y that can be established as non-renewable biomass- Value of 0.852 has been calculated as per TOOL30: Calculation of the fraction of non-renewable biomass”
5. CO2 emission factor for the use of wood fuel in baseline scenario - Value of 112 tCO_2e/TJ as per IPCC default values.
6. Net calorific value of the non-renewable woody biomass that is substituted or reduced- Value of 0.0156 TJ/tonne as specified by the methodology AMS II.G ver.10 has been used.
7. Discount factor to account for efficiency loss of project cookstove per year of operation (fraction)- Value of 0.99 as per methodology default value.
8. Operating lifetime of project device for projects opting Equation 5 for determining project stove efficiency- 7 years as per manufacturer specification.
9. f_{NRB} = Fraction of woody biomass that can be established as non-renewable biomass (f_{NRB} value= 0.852)
10. $\eta_{new,y,i,j}$ = Efficiency of the improved cook stove type i and batch j determined as per equation 5 of methodology during year y
<table>
<tr><th>Year (y)</th><th>$\eta_{new,y,i,j}$</th></tr>
<tr><td>1</td><td>30.26%</td></tr>
<tr><td>2</td><td>29.96%</td></tr>
<tr><td>3</td><td>29.66%</td></tr>
<tr><td>4</td><td>29.36%</td></tr>
<tr><td>5</td><td>29.07%</td></tr>
<tr><td>6</td><td>28.78%</td></tr>
<tr><td>7</td><td>28.49%</td></tr>
</table>
</td></tr>
<tr><td>Findings</td><td>CL03 has been raised since the f_{NRB} calculation provided by the CME is not clear on the method to calculate DRB. The same is not in line with Tool 30.</td></tr>
</table>

	CME has demonstrated the calculation based on the step wise approach as per Tool 30 and relevant references and calculations have been provided.
Conclusion	TÜV SÜD confirms that the values fixed exante are in line with the requirements of VCS v4.2

Parameters monitored

Means of verification	The verification of the parameters required by the monitoring plan is provided as follows:

Data / Parameter:	$N_{y,i,j}$
Data unit:	Number
Description:	Number of project devices of type I and batch j operating during year y
Source of data used:	ICS installation database
Value	35,045
Details of monitoring equipment:	Value obtained from monitoring survey of samples and installation data base.
Means of verification/Comments:	The number of stoves installed have been verified from the ICS installation database which provides the complete list of the stoves installed during each year. The type of stoves is defined as per the VCS PD. The project implementer is maintaining database of all the ICS installed in the PD. Measured directly or based on a representative sample as per methodology and 100 samples have been taken by the CME. **Survey Procedure** - Since the population is homogeneous in nature considering the selection of end users based on specific criteria "simple random sample" is considered for selection of end users from each instance. However, care has been taken to select end users from the entire geographic outreach covered under each instance. PP has selected more than 100 samples for survey and average value of biomass consumption per cook stove is considered for ER calculations. The survey

	result indicates that biomass consumption per cook stove is above 4.9Kg/Cook stove per day, however PP considered it as 4.9 kg for ER calculations. Every individual project stove in the project covered under this MR (observed to be uniquely identifiable by its ID number) was allocated a sample number. CME has submitted sample size calculation spreadsheet and random number generator where it was demonstrated that samples are drawn randomly using stratified random sampling approach. VVB further has cross-checked the sampling approach by the project proponent as per MR against related PD. Additionally, the related population size has been checked with corresponding supporting documents (e.g. Total ICS database, ER worksheet). Input parameters for the sampling calculations have been checked for consistency with the stated approach and against PD and the methodology requirement. Further, verification team has re-calculated the sample size according to the required confidence/precision and found the sample size correctly calculated. Also, the achieved precision for every parameter was recalculated by the verification team and was found to meet the minimum desired confidence and precision levels. The survey procedures are in line with Standard for sampling and surveys for project activities and programme of activities
Cross-check	This has been cross-checked with the contract agreements with the beneficiaries

Data / Parameter:	$B_{y=1,new,i,j,survey}$

Data unit:	Tonnes
Description:	Annual quantity of woody biomass used by improved cook stoves in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey
Source of data used:	Monitoring Survey results
Value	For ex-ante calculation, the value is assumed as 4.9 kg/device/day or equal to 1.7885 tonnes/device/year. This value is based on survey results.
Details of monitoring equipment:	Value obtained from monitoring survey of samples
Means of verification/Comments:	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 survey. Sample surveys to estimate this parameter, that are solely based on questionnaires or interviews (i.e. that do not implement measurement campaigns) may only be used if the following conditions are satisfied. (i) Baseline cookstoves have been completely decommissioned and only improved cookstoves are exclusively used in the project households; (ii) If multiple devices are used in the project, it is possible from the results of the survey questions to clearly differentiate the quantity of firewood being used by each device. In other words, if more than one device, or another device that consumes firewood, are in use in project households, then the

	sample survey needs to distinguish the quantity of firewood used by the project device and the other devices that use firewood.
Cross-check	--

Data / Parameter:	**Date of commissioning of project device i**
Data unit:	Date
Description:	Actual date of commissioning of the project device
Source of data used:	ICS installation database
Value	15/02/2020 (first date of batch of ICS commissioned in the project activity instance) and same date considered for start date
Details of monitoring equipment:	ICS installation database
Means of verification/Comments:	The date of commissioning has been verified from the ICS installation database. Date of installation of each of the stove has been provided in the database. The audit team confirms that the total number of installed stoves is consistent with the database.
Cross-check	--

Data / Parameter:	**Life Span**
Data unit:	Years
Description:	Operating lifetime of project device for projects opting Equation 5 for determining project stove efficiency
Source of data used:	Manufacture Declaration

	Value	7 years
	Details of monitoring equipment:	stove Installation database
	Means of verification/Comments:	Validation team has been verified life span of the stive year from manufacturer decleration.
	Cross-check	--
Conclusion	The monitoring has been carried out in accordance with the monitoring plan contained in the VCS PD. All parameters were monitored and determined as per the registered monitoring plan. The substantiation of this conformity on information flow for these parameters including the values in the monitoring reports is reported in the above During the verification, all relevant monitoring parameters of the registered monitoring plan have been verified with regard to the appropriateness of the verification method, the correctness of the values applied for ER calculation, the accuracy and applied QA/QC measures. After appropriate corrections, carried out by the project participant, it is confirmed that all monitoring parameters have been measured / determined without material misstatements and are in line with all applicable standards and relevant requirements. The data maintained in hard & electronic records, internal audit ensures correct transfer of data from monitoring survey and reporting of emission reductions and all necessary QA/QC processes are in place. Internal audit of the project activity has been carried out in line with the required frequency mentioned in the VCS PD and it has been verified by the verification team through internal audit report & other supportive records such as sampling survey, training report. All parameters required to be monitored are recorded at the intervals required by the registered monitoring plan and the applied methodology. On the basis of review of source and nature of available evidences and records, the verification team confirms the quality of evidence for emission reduction provided is sufficient as per VCS v4.2.	

Sampling Approach:

The sampling plan implemented by the PP is in accordance with the applied approved monitoring methodology and the VCS PD. The PP has appropriately performed Simple random Sampling procedure, reliability levels were set at 90% confidence and 10% precision in line with the applied methodology VMR 0006 version 1.1. As the VCS PD mentions the option for Simple random Sampling procedure, it is acceptable to the validation team.

The sampling surveys have been carried out by the well-trained personnel. Monitoring parameters Ny,j,j and By=1,new,i,j,survey are monitored through monitoring sample surveys. Monitoring of the

parameters ensures compliance with the applied methodology VMR0006, version 1.1. Verification team has checked the survey records and sample size calculation. Parameter Ny,j,j monitors the number of stove in operation and the parameters By=1,new,i,j,survey are used to calculate Quantity of woody biomass used by improved cookstoves.

PP has applied sampling for the current monitoring period. A confidence/precision level of 90/10 has been used by the PP for all the monitoring parameters determined through applying simple random sampling. Survey has been carried out. This is in accordance with the sampling plan provided in the registered VCS PD.

The project participant has been followed the simple random sampling approach and the minimum sample size should be determined as per the following guidelines:

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

The simplified approach are used for determining minimum sample size of 100 for parameters available at validation and according parameter monitored in which case it is not requisite for the sample compliance with 90/10 confidence precision is not obligatory.

These parameters are as below

- Number of project devices of type i and batch j operating during year y
- Quantity of woody biomass used by project devices in tonnes per device of type i.

Since sampling has been applied in the project activity during current monitoring period as per VCS PD and the applied methodology VMR0006, version 1.1, thus it is acceptable to the verification team.

VVB Sampling:

The verification team decided to draw samples mainly from the project samples selected by CME. Acceptance Sampling approach was employed by verification team, which follows the “Standard for sampling and survey for CDM project activities and programme of activities”, version 9.0.

TUV SUD has taken the paragraph 39 “Table 2 Sample Size and Acceptance Number” of the “Standard for sampling and survey for CDM project activities and programme of activities”, version 9.0. into consideration in order to select a random sample from the PP based on the AQL of 1%, the UQL of 10%, and the producer’s and consumer’s risk both at 5% were selected. Therefore, a sample size (n) of 61 should have been verified at least, and accordingly with 2 as the maximum number of discrepancies (acceptance number) between the verified data and the PP data. Team verified 61 samples of the project activity. The verification team selected random samples from the list of cookstoves installation database.

Team has assessed (by remote verification, & desk review of contract document between PO & user) a total of 61 samples (randomly selected) selected from different district. The presence of project stoves was checked during the remote visit on video call. The stoves details (unique serial number, date of installation, type of ICS, name of user and address) were also checked and found to be consistent with that reported in the installation database. No inconsistency was observed for any of the 61 samples with respect to the observations in the field.

A total number of 61 samples were validated consisting of the operation of the stoves on random basis.

Duration of remote- sampling: 22-24/01/2022				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	VVB Sampling of the PP samples	Remote	22/01/2022 & 24/01/2022	Shailendra K

The monitoring parameters required to be monitored through the sampling plan are:

1. Number of project devices operating during year y (Ny,j,j)

2. Quantity of woody biomass used by improved cookstoves (By=1,new,i,j,survey)

Simple random sampling was applied by the PP for selection of the monitoring samples with 90/10 confidence/precision for determining the sampling for all the parameters which is deemed acceptable as per the VCS PD.

Remote assessment of Monitoring parameters (namely By=1,new,i,j,survey and N,y,i,j) was conducted based on following two methods:

➢ Confirmation with the household/end user whether or not the PP has performed monitoring/measurement campaign (or parameter By=1,new,i,j,survey) and survey on stove operation (for the parameter N,y,i,j).

➢ Assessment of Competence of personnel involved in conducting standardized tests viz., By=1,new,i,j,survey and surveys: Verification team has reviewed the abilities, qualifications and recognition of involved personnel and institutions of the measuring team involved in the By=1,new,i,j,survey. The verification team based on remote interviews confirms that the team was qualified to carry out the By=1,new,i,j,survey in line with the methodology.

During the remote interviews (video call) with PP's representative, VVB was able to understand the process in line with the methodology VMR 0006 version 1.1 and the PP monitoring procedure in line with the registered VCS PD.

It is worth to note here that PP has selected the households for the both parameters above and for the same reason, VVB's sample for acceptance sampling was the same for both the parameters. VVB could

verify the original survey forms and data/information flow to sampling sheet and ER spread sheet. No discrepancy was found in the data/information flow. As per the section 2.3 above the end users were not interviewed in a single day. Moreover, PP has conducted the monitoring survey during the monitoring period. Hence, the survey process deemed acceptable to the verification team. Furthermore, the installation database and sample agreement copy was also checked/cross verified to confirm the number cookstove for the parameter N,y,i,j.

As per the Sampling Standard, the verification team has to verify whether the project participants entity have implemented the sampling and surveys according to the sampling plan in the registered monitoring plan. The verification includes determining:

(a) Whether the required confidence/precision has been met;

(b) Whether the selected sample was representative of the population. As per the applied methodology VMR0006 version 01.1 section 9.2, and registered VCS PD. The necessary confidence / precision of 90/10 each of the parameters are met. This has been cross verified by the verification team from the supporting documents submitted Emission reductions have been calculated in accordance with the applied methodology VMR0006 version 01.1, and VCS PD. The PP has used monitored data and ex-ante fixed data including default values as mandated/permitted by the applied methodology. The values used for calculation of GHG emission reductions have been thoroughly checked by the verification team and was found appropriate and correct.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

When verifying the report emission reduction, TUV SUD ensured that there was a clear audit trail that contained the evidence and records that validate the stated figures. All source documents that form the basis for assumptions and other information underlying the GHG data are shown above.

When assessing the audit trails, TUV SUD also examined:

1. whether sufficient evidence was available, both in terms of frequency and in covering the full monitoring period

2. the source and nature of the evidence

3. if comparable information was available from sources other than that used in the monitoring report, TUV SUD cross-checked the monitoring report against the other sources to confirm that the stated figures were correct. The sources and the data referenced are shown in section 2.2 above.

TUV SUD also assessed that the data collection system met the requirements of the monitoring plan as per the applied methodology.

Proper data management inclusive of data acquisition and aggregation, data management system is being followed for the project activity.

The monitoring personnel at site are well trained and follow reproducible routines. Thus, they are competent to carry out the relevant tasks with sufficient accuracy.

Project Activity Instance 1:

The summary for project activity instance 1 is as below

Period from	Period to	Number of Day during period of Y Year	Number of ICS operating during year y	Efficiency of ICS during year y	Quantify of woody biomass saved	Emission reductions by ICS
			Ny,i,j	$\eta_{new,y,i,j}$	$B_{y,savings,i,j}$	
15-02-20	31-12-20	313	1	30.26%	3.63	186,635
01-01-21	31-12-21	365	1	29.96%	3.13	218,312

The Vintage wise summary for project activity instance

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
15/02/2020 - 31/12/202020	186,635	0	0	186,635
01/01/2021 - 31/12/2021	218,312	0	0	218,312
Total	**404,947**	**0**	**0**	**404,947**

5 VALIDATION AND VERIFICATIONCONCLUSION

VALIDATION CONCLUSION:

TUV SUD South Asia has been engaged by **EKI Energy Services Ltd.**to perform the Joint validation and verification of the project activity.

The proposed project activity seeks to increase access of households and communities to improved cookstoves by disseminating high thermal efficiency and low greenhouse gas emitting cooking stoves known as Improved Cook Stoves (ICS). The improved cook stoves through replacement of inefficient traditional cook stove will contribute towards reduction of greenhouse gas emission resulting in the reduction of firewood consumption leading to climate change mitigation in a sustainable manner.

The management of the project participant/owner is responsible for the preparation of the GHG emissions data and the reported/estimated GHG emissions reductions on the basis set out within the project's Monitoring Plan in the Joint VCS PD & MR and the approved VCS Methodology: VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, Version 1.1 dated 22 July 2021, Sectoral scope 3.

Our Validation approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board and VCS board. Our approach is risk-based, drawing on an understanding of the risks associated with estimated GHG emissions data and the controls in place to mitigate these. The validation can confirm that:

- The projects description 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 4.2

- The project fulfils criteria of VCS Standard Version 4.2

- The project is in line with all relevant VCS requirements.

- The project baseline is sufficiently justified in the PD.

- The project's baseline and additionality and monitoring plan are assessed against "VCS Methodology: VMR0006" for grouped project.

- A risk based approach has been followed to perform this validation activity. The review of the project description and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews with Project Owner have provided with sufficient evidence for positive validation opinion as per the requirement of VCS.

- No restrictions or uncertainties were identified related to the validation.

The conclusions of this report demonstrate that the proposed VCS project, as described in the VCS PD, conforms to all applicable validation criteria.

VERIFICATION CONCLUSION:

Our Verification approach was based on the requirements as defined under VCS Standard, the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is operated as planned and described in the project document;
- the monitoring plan is as per the applied methodology;
- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan;
- the installed equipment/devices being essential for generating emission reduction runs reliably as per monitoring plan
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.
- No limitation observed for the present verification

In our opinion the GHG emissions reductions reported for the project activity for the period are fairly stated in the Joint VCS PD & MR Version 02 dated 08/10/2021. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology: VMR0006 version 1.1 and the VCS standard version 4.2.

The verification team is of the opinion that the project has been implemented in accordance with the registered project description, the MP with complies with the approved monitoring methodology, the monitoring complies with the MP and the monitored data and calculation of ERs are assessed and confirmed as correct.

The project complies with the validation and verification criteria for projects and their GHG emission reductions or removals set out in VCS Version 4.2, and include any qualifications or limitations.

Therefore, TUV SUD hereby certifies, and requests the issuance of, the reported ERs during the monitoring period of 15-February-2020 to 31-December-2021 amounting to 404.947 tCO2e to the VCS Registry.

Verification period: From 15- Feb-2020 to 31-Dec-2021

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
15/02/2020 - 31/12/202020	186,635	0	0	186,635
01/01/2021 - 31/12/2021	218,312	0	0	218,312
Total	**404,947**	**0**	**0**	**404,947**