



# Verified Carbon Standard

## UPENERGY-SOCIAL AND CLIMATE IMPACT PROGRAMME- NIGERIA-1



Document Prepared by Earthood Services Private Limited

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## Summary:

Provide a brief summary of the following:

- A description of the project

The project activity “Up Energy - Social and Climate Impact Programme- Nigeria-1” involves dissemination of fuel efficient improved cookstoves (ICS) to households in Nigeria at subsidized prices by the UpEnergy group as the project proponent. The Grouped project activity is a voluntary initiative that undertakes installation of the ICS designed for improvised combustion efficiency to reduce fuel consumption thereby leading to lesser GHG emission and resulting socio-economic benefits like monetary savings, employment creation, women empowerment and promoting public health by improving the indoor air quality as co-benefits.

- A description of the validation and verification

Earthood Services Private Limited (Earthood) has performed a joint validation & verification of the grouped project activity “UpEnergy - Social and Climate Impact Programme- Nigeria-1” by “UpEnergy Group” in Nigeria. This assignment was performed based on rules and requirements defined by VCS for the grouped project activities.

The review of the joint PD & MR, supporting documentation and subsequent follow-up actions (onsite visit and interviews with end-users) have provided Earthood with sufficient evidence to determine the fulfilment of stated criteria. The project correctly applies the approved baseline and monitoring methodology VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, version 1.1/5/.

The grouped project activity results in reductions of CO<sub>2e</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario and the emission reductions attributable to the project are, hence, additional to any that would occur in the absence of the VCS project activity.

The average annual and total GHG emission reduction from the grouped project activity is expected to be 1,633,731 tCO<sub>2e</sub> and 11,436,117 tCO<sub>2e</sub> respectively, over the first 7-year crediting period from 07/05/2022 to 06/05/2029. The monitoring report identified for the first verification period is from 07/05/2022 to 31/10/2022, and the achieved emission reductions during this monitoring period is 1,459 tCO<sub>2e</sub>.

- The purpose and scope of validation and verification

The purpose of the services provided by the Earthood Services Private Limited is to perform joint validation & verification of the grouped project activity “UpEnergy - Social and Climate Impact Programme- Nigeria-1”. The scope is to assess the claims and assumptions made in joint project description & monitoring report /1/ against the VCS criteria, including but not limited to the VCS Standard /3/, VCS Validation and Verification Manual /4/ and other relevant rules and requirements established for Verra.

- The method and criteria used for validation and verification

This assignment is an independent and objective review for determination of the monitored reductions in GHG emissions. The joint validation & verification includes the assessment of implementation and operation of the project as reported in the project description & monitoring report/1/. The validation & verification process is undertaken by VVB that involves the following:

- The desk review of documents and evidence submitted by the project participant in context of the VCS criteria.
  - Undertaking physical site visit, interviews, or interactions with the representative of the project participant.
  - Reporting audit findings with respect to clarification and non-conformities and the closure of the findings as appropriate.
  - Preparing a draft joint validation & verification report of VCS program complying with the VCS requirements
  - Technical review of the draft validation & verification opinion along with other documents as appropriate by an independent competent technical review team for finalization of the joint validation & verification opinion (this report)
  - An independent technical review team reviews this report made by the assessment team. After the final report is accepted by the Technical Reviewer it is then approved by Earthood Services Private Limited which is processed further according to the VCS procedures.
- The number of findings raised during validation and verification

During joint validation and verification of the project, a total of 03 CLs, 02 CAR and 01 FAR were raised. These have been successfully resolved as provided in Appendix IV of this report.

- Any uncertainties associated with the validation and verification

VVB has undertaken an elaborate audit trail for validation of assumptions and claims contained in final PD & MR Version 6.0, dated 19/03/2024. Each detail has been checked during onsite audit and document review which is not only confined to information provided by PP but also by undertaking an independent evaluation of relevant publicly available information by making use of technical expertise of the assessment team. Thus, there are no evident uncertainties associated with the assessment.

- Summary of the validation and verification conclusions

The review of the project description & monitoring report, supporting documentation and subsequent follow-up actions have provided ESPL with sufficient evidence to determine the fulfilment of stated criteria. Earthood is of the opinion that the project activity “UpEnergy - Social and Climate Impact Programme- Nigeria-1” (VCS ID: 2673) meets all the VCS requirements and has correctly applied the VCS approved monitoring methodology VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, version 1.1 /5/. The GHG emission reductions were calculated correctly based on the approved methodology.

Earthood Services Private Limited can certify that the emission reductions achieved in the project description & monitoring report for the monitoring period 07/05/2022 to 31/10/2022 by VCS project activity “UpEnergy - Social and Climate Impact Programme- Nigeria-1” amount to 1,459 tCO<sub>2e</sub>. Therefore, this is being submitted for request for issuance, as per VCS procedures.

In summary, it is Earthood's opinion that the grouped project activity "UpEnergy - Social and Climate Impact Programme- Nigeria-1" as described in the PD & MR, version 6.0, dated 19/03/2024 meets all the relevant baseline and monitoring methodology. The monitoring plan adequately provides for the ex-post monitoring of the project's emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is Earthood's opinion that the UpEnergy Group shall be able to implement the monitoring plan and requirements of VCS standard.

Therefore, Earthood requests the registration of the project as a VCS grouped project activity and issuance of VCUs under the first monitoring period.

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# 1 INTRODUCTION

## 1.1 Objective

UpEnergy Group (PP) has contracted Earthood Services Private Limited (VVB) to jointly carry out the joint validation and verification of the grouped project activity “UpEnergy - Social and Climate Impact Programme- Nigeria-1” (VCS ID:2673) located in Nigeria against the requirements of VCS Program.

The objective of the joint validation and verification assessment is to determine the-

- The project complies with all the applicable VCS requirements of the current version of the VCS Standard v4.4/3/ and program guide v4.3/2/.
- Project conformity with the applied methodology, VMR0006: Methodology for Installation of High Efficiency Firewood Cookstoves, version 1.1/5/, including the procedure for the demonstration of additionality specified in the applied methodology.
- Likelihood that methods and procedures set out in the project description will generate verifiable GHG data and information when implemented; and
- The data/information reported is accurate, complete, consistent, transparent, and free of material error or omission.

In order to fulfil the above objectives, the VVB assigned the task of assessment to validation team that is collectively qualified as per Annex A.2.3.3 of ISO 14064-3 and other internal requirements.

The validation/ verification is an independent assessment of the project by a validation/verification body that determines whether the project complies with the VCS rules.

## 1.2 Scope and Criteria

The joint validation and verification scope of this assignment is defined as an independent and objective review of the VCS Project Description & Monitoring Report (VCS PD & MR)/1/ and supporting annexures, which is reviewed by the assessment team against the relevant criteria and decisions by the VCS Board, including but not limited to, the approved baseline and monitoring methodology, applicable tools, VCS standards and guidance. The assessment team has, employed a risk-based approach as per recommendations prescribed in the latest version of VCS Validation and Verification Manual focusing on the identification of significant risks for project implementation and the generation of VCU.

The scope of this assignment is to:

- Jointly conduct validation and verification in accordance with Earthood’s own QMS that is based on the VCS VVM along with the guidance provided by the VCS board to determine if the project

meets all applicable VCS requirements, including those specified in the VCS standard, relevant methodology, tools, and guidelines and processing the same with VCS Program Guide.

- Assess the accuracy, conservativeness, relevance, completeness, consistency, and transparency of the information provided by the project proponents.
- Determine whether information provided by the project proponents is reliable and credible.
- Present information in the form of joint validation & verification report in a factual, neutral, coherent manner and referencing the sources and assumptions, and other forms of validation means employed.
- Report the findings and conclusions in an objective manner and conduct all validation & verification in accordance with VCS rules and procedures.
- Apply consistent validation and verification criteria in providing expert judgments to the requirements of applicable approved methodology, tools, and cross check the same.
- Safeguard the confidentiality of all information obtained during validation and verification; and
- Adhere to the principles of independence, ethical conduct, fair presentation, and due professional care in assessment process.

### 1.3 Reasonableness of Assumptions and Level of Assurance

Limited level of assurance

Reasonable level of assurance

Earthood's validation approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. Earthood planned and performed the validation by obtaining evidence and other information and explanations that Earthood considers necessary to give reasonable level of assurance that reported estimated GHG emission reductions are fairly stated.

In our opinion the estimated and actual GHG emissions reductions were calculated correctly based on the approved baseline and monitoring methodology VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves, version 1.1 /5/.

The assessment result has a reasonable level of assurance in validation & verification that GHG assertions are free of material errors, omissions, and misrepresentations. The documents and evidence reviewed are included under Appendix I of this report.

### 1.4 Summary Description of the Project

Summary description of grouped project activity has been illustrated in section 1.1 of Joint PD&MR appropriately. As per the given details in PD, information was assessed on-site and found to be consistent.

The project activity “UpEnergy - Social and Climate Impact Programme- Nigeria-1” undertakes dissemination of fuel efficient improved cookstoves (ICS) to households in Nigeria at a subsidized price. The grouped project activity is a voluntary initiative as host country laws do not mandate the distribution of ICS to the households. This ICS technology is designed to reduce GHG emission by improving the thermal efficiency of the cookstove thereby reducing the fuel consumed by households for domestic purposes and alongside promoting public health to tackle several health challenges such as indoor air pollution caused due to using less efficient stoves.

The baseline and project scenarios are well described and consistent with the data that was verified during the VVB onsite audit. The average annual and total GHG emission reduction from the group project activity is expected to be 1,633,731 and 11,436,117 tCO<sub>2</sub>e, respectively, over the first 7-year renewable crediting period. The monitoring report identified for the first verification period is from 07/05/2022 to 31/10/2022, and the achieved emission reductions during this monitoring period are 1,459 tCO<sub>2</sub>e.

## 2 VALIDATION AND VERIFICATION PROCESS

### 2.1 Method and Criteria

The validation and verification of the project consists of following steps:

#### **Desk review-**

- Review of data and information provided in the VCS joint PD & MR/1/ and corresponding annexures.
- Cross check the information with the sources without limitations to the information provided by the project proponent.

#### **Follow up actions-**

- On-site inspection to physically inspect the project design including, but not limited to, implementation status and monitoring mechanism.
- Interview with relevant personnel and end-users responsible for information given in the VCS PD & MR

#### **Reporting of findings-**

- Resolution of findings
- Draft joint validation & verification report

#### **Independent technical review-**

The project documentation is reviewed by internal technical reviewer to independently confirm whether the applicable GHG program requirements were objectively met or not, in addition to whether internal

procedures were followed while arriving at the validation and verification opinion. The technical reviewer may accept or reject the validation and verification opinion prepared by the assessment team and gives the reasons. The resolved findings may be opened at this stage or new findings may be identified that are required to be addressed by assessment team and/or project proponents, as appropriate. The technical reviewer is the decision maker on behalf of the Earthood Services Private Limited. A positive opinion is issued if all the findings have been satisfactorily resolved and in all other cases a negative opinion is issued unless the contract is terminated by either party before reaching the final opinion.

Earthood keeps all documents and records in a secure and retrievable manner for at least two years after the end of the project crediting period.

## 2.2 Document Review

This joint validation & verification of the grouped project activity is performed primarily as a document review of the VCS Joint PD & MR /1/ and associated documents as stated in detail in appendix I of this document. The assessment is performed by a validation & verification team as per the defined protocol. The cross checks between information provided in the VCS Joint PD & MR and information from sources other than those used, if available, the team's sectoral or local expertise and, wherever necessary, independent background investigations.

The joint validation and verification are performed primarily as a document review of the documents submitted at various stages of assessments. The review is performed by assessment team using dedicated protocols. The assessment team cross checks the information provided in the documents (Joint Project Description & Monitoring Report/1/) and information from sources other than those used by the PP if available and conducts independent background investigations. Earthood conducted a desk review as under.

- a. A review of the data and information presented to verify their completeness.
- b. A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of project technology including efficiency of the project stove, and the quality assurance and quality control procedures
- c. An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions

## 2.3 Interviews

The VVB conducted an on-site audit from 20/05/2023 to 22/05/2023. The physical site visit was conducted for validation of the project design and to verify the implementation and monitoring procedures followed in the project. The following points were discussed as the part of the interviews:

- a. Introduction, scope and objective of work, roles and responsibilities of audit team, resources required, and timetable of the onsite audit including venue for closing meeting and any concerns from PP.

- b. All the details about the project activity mentioned in the Joint PD-MR were cross checked by discussion with the PP.
- c. Compliance of monitoring procedures followed at project site with registered PDD and monitoring methodology.
- d. Conducting the Site visit by interviewing the end-users and physical inspection of the households.
- e. And finally, submission of the audit findings to the client and agreement on the issues raised and agreement on timelines.

The list of PP representatives interviewed by the VVB team is as follows:

S. No	Name	Role	Affiliation	Date	Subject	Assessment team members
1.	Murugesh Sudalairaja	Project Officer - Carbon Technical	UpEnergy Group (India)	20/05/2023	- Project design	Anjali Chaudhary, Shifali Guleria and Kumden Nanbal Luka
2.	Kumarswamy CK	Senior Program Officer - Carbon			-Project Implementation status	
3.	Toyin Oshaniwa	Regional Carbon Operations Manager	UpEnergy Group (Nigeria)		-Project start date and Project Location	
4.	Tosin Olorunmaiye	Carbon Officer			-Choice of applied methodology	
5.	Matilda Owohu	Nigeria Operation Manager	Climate Catalyst Ltd		-Baseline Identification and Additionality of project	
6.	Shehu Abdul-Hafiz	Finance Manager			-Investment analysis	
7.	Ngozika Vivien Ikenna	Accountant			-Grouped project eligibility criteria	
8.	Ahmed Yero	Data Officer			-Monitoring and reporting procedure	
9.	Benevolence Buoye	Data Associate			-Quality Assurance	
10.	Chidiadi Arigbonu	Data Associate			-Management and operating systems	
11.	Muhammed T. Abdulwahab	Warehouse Manager				
12.	Bimbola Agboola	Community Engagement Officer				

					-local stakeholder consultation process -Compliance with relevant laws	
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The list of LSC participants interviewed by the VVB are as follows:

Name	Affiliation	Date	Subject	Assessment team members
Elder Zaccheaus Kadiri	Stakeholder (Community Leader-Karu Community)	20/05/2023	-Participation in the LSC	Anjali Chaudhary, Shifali Guleria and Kumden Nanbal Luka
Stella Oneli U.	Stakeholder (Government Stakeholder-National Orientation Agency)		- Feedback about the project -Ongoing Grievance Mechanism	
Olanike Olugboji	Stakeholder (MD Local NGO-WISE)			

The list of households physically inspected and interviewed by the assessment team to verify the baseline scenario during the onsite visit is as follows:

S. No	Name	Location	Fuel type	Date	Subject	Assessment team members
1.	Salma Saifullah	Kano (Rural)	Charcoal	21/05/2023 to 22/05/2023	VVB field survey	Anjali Chaudhary, Shifali Guleria and Kumden Nanbal Luka
2.	Hajiya Halima	Kano (Rural)	Charcoal		-Baseline stove type	
3.	Hajara Abubakar	Kano (Rural)	Charcoal		-Baseline fuel type	
4.	Amina Auwal Nasidi	Kano (Rural)	Charcoal		-Fuel consumption and procurement patterns	
5.	Saudat Iliyasu	Kano (Rural)	Charcoal		-Stove usage and meal patterns	
6.	Mariya Lawan	Kano (Rural)	Charcoal		-KPT conducted at household	
7.	Aisha Ibrahim	Kano (Urban)	Charcoal			
8.	Hajia Hafsat Abdullahi	Kano (Urban)	Charcoal			
9.	Tabawalo Suleman	Kano (Urban)	Charcoal			

10.	Aisha Liman	Kano (Urban)	Charcoal			
11.	Binta Ahmad Garko	Kano (Rural)				

The Validation team covered a total of 11 samples to confirm baseline scenario and verify the baseline KPT results. The 11 samples are spread across the urban and rural areas All the households interviewed were found to have locally made unimproved metal tripod charcoal stoves and confirmed that KPTs were conducted at their household. Therefore, no discrepancies were observed.

The list of households physically inspected and interviewed by the assessment team to verify the implementation during the onsite is as follows:

S. No	Name	Stove UID	Affiliation	Date	Subject	Assessment team members
1.	Mr.Yakubu	VSP02940	Monitoring survey	21/05/2023 to 22/05/2023	VVB field survey	Anjali Chaudhary, Kumden Nanbal Luka
2.	SK. Photographer	VSP04406			-ICS installation details	
3.	Mrs favour jonah	VSP03925			-ICS usage patterns	
4.	Dorcas innocent	VSP11110			-fuel consumption and procurement patterns	
5.	Jummai Bawa	VSP06137			-Reduction in time spent on cooking	
6.	Mrs Patience Mailili	VSP04790			-Reduction in fuel consumption	
7.	Mrs Ekundayo Felicia	VSP00113			-Grievance mechanism	
8.	Florence Michael	VSP00668			-Training on ICS usage	
9.	Iormumba nguyawen	VSP04834			-WBT stove replacement	
10.	Agbenusi Chinyere	VSP00260				
11.	Beatrice Eje	VSP02639				

The verification team covered a total of 11 samples to confirm monitoring survey results. Only charcoal stoves have been distributed during the current monitoring period therefore the VVB sample consists of

only charcoal stoves. All the households interviewed were found to have operation project stove and confirmed reduction in fuel consumption as compared to the baseline stove. Therefore, no discrepancies were observed by the verification team.

## 2.4 Site Visits

The VVB carried out an on-site audit from 20/05/2023 to 22/05/2023 and physically inspected the project technical design and implementation as specified in the VCS PD & MR /1/.

The site visit was conducted to validate the accuracy and completeness of the project description. The validation and verification team members who visited the site collectively had competence for the relevant technical area to which the project relates. The views obtained during site observation were considered while concluding the validation and verification opinion.

The sampling plan adopted by the VVB for carrying out the joint validation and verification assessment is as follows.

- **Sampling plan for validation of the project:**

The Sampling and surveys for CDM project activities and programmes of activities (Version 9.0)/7/ states under paragraph 28 that “When the project participants or the coordinating/managing entity have applied a sampling approach, the VVB may apply acceptance sampling as described in the steps indicated in paragraphs 29–38 as part of validation/verification activities”.

Since the PP has determined the value of ex-ante parameter  $B_{old}$ , efficiency of baseline stove and type of fuel consumed through sampling of 165 baseline households, the validation team conducted acceptance sampling in line with paragraph 30 and 31 of the sampling standard version 9.0/7/.

The validation team randomly selected samples from PP’s baseline survey records to check the acceptability (or otherwise) of the data for each such record with PP’s sample records and determined if the PP’s sample records meet the requirements.

Sample Size:

AQL	UQL	Producer Risk	Consumer Risk	Sample Size; Min	Acceptance No.
0.5%	20%	10%	10%	11	0

The Validation team covered a total of 11 samples to confirm baseline scenario and verify the baseline KPT results.

- **Sampling plan for verification of the project:**

The CDM Standard – Sampling and surveys for CDM project activities and programme of activities (Version 9.0)/7/ states under paragraph 28 that “When the project participants or the coordinating/managing entity have applied a sampling approach, the VVB may apply acceptance sampling as described in the steps indicated in paragraphs 29–38 below as part of validation/verification activities”.

Since the PP has monitored parameters ( $N_{y,i,j}$ ,  $\eta_{new,y,i}$ , and  $\mu_y$ ) through sampling based surveys, verification team conducted acceptance sampling in line with paragraph 30 and 31 of the sampling standard version 9.0.

The verification team selected a random sample from PP’s monitoring survey records to check the acceptability (or otherwise) of the data for each such record with PP’s sample records and determined if the PP’s sample records meet the requirements.

Sample Size:

AQL	UQL	Producer Risk	Consumer Risk	Sample Size; Min	Acceptance No.
0.5%	20%	10%	10%	11	0

The verification team covered a total of 11 samples to confirm monitoring survey results. All the households interviewed were found to have operation project stove and confirmed reduction in fuel consumption(charcoal) as compared to the baseline stove.

The details of the interviews conducted are mentioned in section 2.4 above.

## 2.5 Resolution of Findings

The validation and verification protocols used for the assessment are designed in accordance with the latest version of latest VCS Program Documents. The validation and verification protocols are an internal document in Excel and available on request.

As an outcome of the joint validation and verification process, the assessment team can raise different types of findings. Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable VCS/CDM requirements have been met. Where a non-conformance arises the validator/verifier raises a Corrective Action Request (CAR). A CAR is issued, where:

- The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions.
- The CDM/VCS requirements have not been met.
- There is a risk that emission reductions cannot be monitored or calculated.

Forward Action Request (FAR) is raised during validation/verification to highlight issues related to project implementation that require review during the first verification of the project activity. FARs do not relate to the VCS/CDM requirements for registration.

Irrespective of the nature of findings, all of these are given to PP in a separate finding document. In this document, the project proponent(s) is/are given the opportunity to respond to the findings. Based on the responses by PP along with relevant supporting documents/evidence the validation team determines whether the findings are resolved or not. The findings may also be raised at a later stage e.g., during internal technical review process and these are also communicated/dealt in the same manner as

described above. The draft joint validation & verification report is also prepared during this period reflecting the status of the findings, if any, as appropriate.

In summary, the type and total number of findings that were raised are indicated below.

Type of Finding	CAR	CL	FAR
Total Findings	02	03	01

All the findings raised during this joint validation & verification of the project are included under Appendix IV of this report.

### 2.5.1 Forward Action Requests

Forward Action Request, FAR 01 was raised during this assessment. Please refer Appendix IV.

## 3 VALIDATION FINDINGS

### 3.1 Project Details

#### **Project type, technologies and measures implemented, and eligibility of the project**

The Grouped project “UpEnergy – Social and Climate Impact Programme- Nigeria-1” falls under sectoral scope 03 and is appropriately selected in the VCS PD & MR. The host country for project activity implementation is Nigeria. The project category and type are correctly indicated in the VCS PD & MR/01/.

The project activity undertakes dissemination of improved cookstoves to households of Nigeria with focus on the demand from urban and rural areas. Each cookstove is considered as a project activity instance under this grouped project. The project is a voluntary initiative as host country laws do not mandate the subsidized distribution of ICS to the local communities.

This project includes technologies designed to reduce GHG emission by improving the thermal efficiency of the cookstoves. The initial project instances included under the GP are Smart Home Pro Cook Stoves model of charcoal ICS. The project activity envisages inclusion of other models of charcoal based cookstoves in the future subjected to conformance with the inclusion criteria.

The description of the ICS models is given in PD & MR/1/ and was confirmed from manufacturer’s specification/11/. The confirmed details are as follows:

#### **Model-1:**

Name of the stove – Smart Home Pro

Stove type- Domestic

Stove height – 26 cm

Stove diameter – 28 cm

Fuel type- Charcoal

Thermal efficiency – 37.9 %

Stove lifetime –7 years

The VCS PD & MR/1/ includes sufficient information regarding the project activity, project stoves description and distribution plan. Further description on application and information on the ICS technology is provided under section 1.11 of the PD & MR/1/.

**Project design, including eligibility criteria for grouped projects**

The project activity is identified as a grouped project activity under section 1.4 of the VCS PD&MR.

The Project proponent UpEnergy Group is correctly listed in the VCS PD. The other entity involved in the project activity is Climate Catalyst, Nigeria Ltd which a Subsidiary of UpEnergy Group. The ownership of the carbon rights remains with the UpEnergy Group.

The start date of the Grouped project activity is 07/05/2022 which is the date of installation of first ICS under the grouped project/10/. The start date of the Grouped project activity is thus identified in accordance VCS standard/3/.

The project crediting period is correctly defined in VCS PD, which is chosen as 7 years renewable twice, for a maximum total of 21 years. The selected crediting period is consistent with the project start date and the first crediting period spans from 07/05/2022 to 06/05/2029 (both days included).

The project is correctly classified as a large project as per VCS Standard /3/ as the estimated average annual emission reductions are more than 300,000 tCO<sub>2e</sub>. The estimated annual average emission reductions are estimated as 1,633,731 tCO<sub>2e</sub> and the total emission reductions over the crediting period of 7 years are estimated as 11,436,117 tCO<sub>2e</sub>. The ex-ante emission reductions are consistent with the corresponding ER spreadsheet /8/.

**Project eligibility under VCS is assessed below**

**A. Eligibility conditions**

Scope	Applicability	VVB Assessment
The seven Kyoto Protocol greenhouse gases.	The GP reduces GHG emissions associated with the combustion of cooking fuels. Gases included are CO <sub>2</sub> , CH <sub>4</sub> , N <sub>2</sub> O.	PP has considered the GHG gases within the scope of Kyoto protocol which are reduced using improved cookstove under the grouped PA.
Ozone-depleting substances (ODS).	The GP does not involve any ODS.	The grouped project does not involve any Ozone-depleting

		substances as it involves only dissemination of ICS.
Project activities supported by a methodology approved under the VCS Program through the methodology approval process.	The ICS to be distributed) in the GP uses the methodology “VMR0006 “Methodology for Installation of High Efficiency Firewood Cookstoves”, version 1.1.” which is a VCS approved methodology.	The grouped project applies, VMR0006 “Methodology for Installation of High Efficiency Firewood Cookstoves”, version 1.1/5/, applicability of the methodology is assessed in detail under section 3.4 of this report.
Project activities supported by a methodology approved under a VCS approved GHG program, unless explicitly excluded under the terms of Verra approval.	Not applicable.	Not applicable

c. **Excluded project activities under the VCS Program**

<b>Excluded Activity</b>	<b>Applicability</b>	<b>VVB Assessment</b>
Grid-connected electricity generation using hydro-power plants/units	N/A. The GP reduces GHG emissions associated with the combustion of cooking fuels.	The grouped project installs ICS which is not related to hydro-power plants. Thus, exclusion condition is not applicable.
Grid-connected electricity generation using wind, geothermal, or solar photovoltaic (PV) power plants.	N/A. The GP activities are energy efficiency measures and do not generate electricity from wind, geothermal, or photovoltaic (PV) power plants.	The grouped project disseminates ICS which is not related to wind, geothermal, or photovoltaic (PV) power plants. Thus, exclusion condition is not applicable.
Activities recovering waste heat for combined cycle electricity generation, or to heat/cool via cogeneration or trigeneration.	N/A The GP activities are energy efficiency measures and do not utilize recovered waste heat for any purposes.	The project does not involve any component of electricity generation or heating/cooling via cogeneration or trigeneration. Thus, exclusion condition is not applicable.
Activities generating electricity and/or thermal energy for industrial use from the combustion of non-renewable biomass, agro-residue biomass, or forest residue biomass.	N/A. The GP activities are energy efficiency measures and do not generate electricity using biomass. The GP includes energy efficiency improvements in	The project does not involve any component of electricity generation. Thus, exclusion condition is not applicable.

	thermal applications, i.e., cookstoves.	
Activities generating electricity and/or thermal energy using fossil fuels, and activities that involve switching from a higher to a lower carbon content fossil fuel.	N/A. The GP activities do not include the generation of electricity and/or thermal energy using fossil fuels, including activities that involve switching from a higher carbon content fuel to a lower carbon content fuel.	The project does not involve any component of electricity generation. Thus, exclusion condition is not applicable.
Activities replacing electric lighting with more energy-efficient electric lighting, such as the replacement of incandescent electrical bulbs with compact fluorescent lights (CFLs) or light emitting diodes (LEDs).	N/A The GP activities do not include the replacement of electric lighting.	The project does not include any replacement of electric lighting. Thus, exclusion condition is not applicable.
Activities installing and/or replacing electricity transmission lines and/or energy-efficient transformers.	N/A. The GP activities do not include the installation and/or replacement of electricity transmission lines and/or energy efficient transformers.	The project does not involve any component of electricity generation. Thus, exclusion condition is not applicable.
Activities that reduce hydrofluorocarbon-23 (HFC-23) emissions	N/A. The GP reduces GHG emissions associated with the combustion of cooking fuels	The grouped project disseminates ICS which does not involve HFC-23. Thus, exclusion condition is not applicable.

According to section 3.6.16, “Grouped projects shall include one or more sets of eligibility criteria for the inclusion of new project activity instances. The eligibility criteria have been incorporated under section 1.4 of the PD. The assessment of eligibility criteria is as follows.

**Eligibility criteria to include PAIs to the Grouped project activity:**

S No	Criterion	How the new project activity instances comply	VVB Assessment
1	Project Activity Instances (PAIs) must meet the	The project activity instances (ICS) will meet the applicability	The ICS included under grouped project activity is suitable only for

	applicability conditions set out in the applied methodology.	conditions set out in Section 3.2, where the target end-users are households and the thermal efficiency of the stoves deployed is at least 25%.	domestic usage as checked from Manufacturer's specifications/11/. Project ICS distribution database/8/ containing unique household and end user information was cross-checked through visit to the households during the onsite audit to confirm the end users targeted. The assessment of conformance of PAI with respect to the requirements of the applied methodology is included under section 3.4.2 of this document.  Thus, the eligibility criterion is met.
2	Use the technologies or measures specified in the project description.	The project activity instances added to this grouped project will use efficient improved cookstoves (ICS) to be distributed within the project's pre-defined geographical boundary.	The ICS model distributed as initial project activity instance under the Grouped project activity is Smart Home Pro, the efficiency of the stove is verified as 37.9% from the technical description as per the Manufacturer's specifications/11/. The design efficiency of stoves is thus verified as higher than 25%.  Thus, the eligibility criterion is met.
3	Apply the technologies or measures in the same manner as specified in the project description.	The project activity instances, and the new project added to this grouped project will use Improved Cookstove to be distributed in the project and it will replace traditional cookstoves in households. All the project technologies distributed under the project will have a unique serial number and ID to curb	The Instances included under the grouped project activity consists of a Unique ID as verified from the Installation database and cross-verified during the physical site visit to the households/12, 22/.  Thus, the eligibility criterion is met.

		double counting of the stoves under the project.	
4	Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	The project activity instances, and new projects added to this group will take place within Nigeria only and subject to the same baseline scenario determined in Section 3.4.	<p>The PP records the location of stove ID at the time of installation sale through the sales receipt/17/ and maintain the records in ICS installation database for each stove sold/12/. These records were verified during the site visit, and it is confirmed that the stoves are distributed within the project boundary i.e., the host country of Nigeria. It is confirmed through the interviews with the end users that traditional charcoal stove has been replaced by the project stove.</p> <p>Thus, the eligibility criterion is met.</p>
5	Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.	This project activity new projects added to this group will distribute the project technology at subsidized value and more details on additionality and NPV have been added in the section 3.5 below.	<p>An analysis of Nigerian government programmes or policy for cookstoves as shown under Section 1.14 of Joint PD and MR/1/ was carried out and it is confirmed that there is no mandate for the subsidised distribution of ICS to the households in Nigeria/35/.</p> <p>The assessment team has confirmed that initial PAIs under the project activity were provided to end-user at 12.6 (approx. 6000 Naira) however a declaration is provided by the PP that the cost will be further reduced up to \$5 for future PAIs/37/</p>

			Thus, the eligibility criterion is met.
<b>Eligibility conditions specific to inclusion of New PAIs</b>			
7	The new PAI must occur within one of the designated geographic areas specified in the project description.	The new project instances to be added to this grouped project will be only within Nigeria	Project stove will be distributed only in the host country, Nigeria. Project ICS installation database/12/ will record the household locations. The condition has been set correctly in line VCS standard v4.4/3/.
8	The new PAI must 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.	The new project activity instances (ICS) added to this grouped project will comply with all the eligibility criteria as outlined in the previous table	the new PAIs will demonstrate conformation with eligibility criteria in the MR. The condition has been set correctly in line VCS standard v4.4/3/.
9	The new PAI must 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.	The monitoring report for this grouped project activity includes details of the new project activity instances added i.e., new ICS added to this grouped project. This includes Name of ICS user, Address/Village/ Geographical coordinates of ICS household, Contact Details, Stove model Distributed, Date of distribution/installation, Unique ICS serial, technical specification etc. Further the monitoring report demonstrates conformance of the new project instances to the applicable set eligibility criteria such as applied technology, ICS minimum efficiency level, geography of implementation, baseline scenario and additionality criteria, thus	The new PAIs will demonstrate conformation with eligibility criteria in the MR in line with Joint PD and MR. The condition has been set correctly in line VCS standard v4.4/3/.

		providing requisite evidence to VVB	
10	The new PAI must be validated at the time of verification against the applicable set of eligibility criteria.	The new project instances to be added to this grouped project will be only within Nigeria as highlighted in section 1.12. Further the geographical coordinates of new project instances will be furnished in the project database.	The new PAIs will record the geo-coordinates for each PAI, and the records will be maintained in the installation database. The condition has been set correctly in line VCS standard v4.4/3/.
11	The new PAI must 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).	The distribution receipts for the new project activity instances will be made available for verification wherein the project ownership (carbon waiver) and start date of crediting period (ICS distribution / installation date) are recorded	The start date and ownership details of the new PAIs will be determined through the sales cum warranty receipts consisting of carbon rights waiver declaration by the end-user. The start date will be determined by maintaining the due gap of 1 day between sale and GHG accounting. The records will be maintained in the installation database. The condition has been set correctly in line VCS standard v4.4/3/.
12	The new PAI must have a start date that is the same as or later than the grouped project start date.	The new project activity instances will either start on the start date of this grouped project i.e., 07-05-2022 or later	The start date of the new PAIs will be determined through the sales cum warranty receipt of the stove which shall be after the start date of the grouped project. The condition has been set correctly in line VCS standard v4.4/3/.
13	The new PAI must be eligible for crediting from the start date of the project activity instance through to the end of the project crediting period.	The crediting period for the new project activity instances will only be eligible to start on 07-05-2022 and end till 06-05-2029 in the first crediting cycle. (Crediting period will be renewed maximum	The start date of the new PAIs will be determined through the sales cum warranty receipt. The end date of the crediting period will be cross checked with the end date published on VCS registry. The

		for 2 times) – Please refer section 1.9 for further details	condition has been set correctly in line VCS standard v4.4/3/.
14.	Only eligible for crediting from the start of the verification period in which they were added to the grouped project.	The VER crediting for the added new project instances will be only on or after the start date of verification period depending on the date of distribution	The start date of the new PAIs will be determined through the sales/warranty receipts maintain the gap of 1 day between sale and GHG accounting. The records will be maintained in the installation database. The condition has been set correctly in line VCS standard v4.4/3/.
15.	The new PAI shall not leave one VCS project and subsequently enroll in another VCS project.	The new project instances added to this grouped project will have unique identification serial number and shall not be enrolled in any VCS or other Carbon Standards, thus avoiding double counting of credits generated.  No double counting declaration has been duly provided by the project proponent	PP has shared a signed declaration confirming that the PAI under VCS GP 2673 will not be enrolled under another VCS project. The stoves consist of UID, and the database will be maintained to avoid double counting within the GP. The validation team has verified that the GP has not been registered, or rejected under any other GHG program through independent cross-check and the declaration from the PP is provided /24/.
17	Where a capacity limit applies to a project activity included in the project, no project activity instance shall exceed such limit. Further, no single cluster of project activity instances shall exceed the capacity limit, determined as follows:  1) Each project activity instance that exceeds one	Not applicable, since it is a large-scale project.	The applied methodology does not specify capacity limits/5/.

	<p>percent of the capacity limit shall be identified.</p> <p>2) 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.</p> <p>3) 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.</p>		
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**Project proponent and other entities involved in the project**

UpEnergy Group is the project proponent of the project. The other entity involved in this grouped project activity is Climate Catalyst, Nigeria Ltd which is a subsidiary of UpEnergy Group.

**Ownership**

UpEnergy Group is the sole owner of the carbon credits generated from the VCS grouped project activity title-d “UpEnergy - Social and Climate Impact Programme- Nigeria-1”. This has been clearly mentioned in the VCS PD & MR section 1.7 /1/ and was confirmed by reviewing the signed carbon waiver declaration with stakeholders involved/24/. Also, end-user agreement/warranty card provided to each end-user receiving project technology (ICS) to confirm the ownership of rights are only held by PP and end-users have voluntarily waived their rights on carbon credits generating from the use of project stove. VVB confirms that all the evidence demonstrating the ownership of the project or right to use were found to be acceptable. It was found to be in compliance with section 3.7.1 of VCS standard/3/. Independent research was conducted to confirm that the project is not listed under any emission trading program or other binding limits.

**Project start date**

The start date of the grouped project activity, as identified by the PP is 07/05/2022, which is also the date of installation of first ICS under the Grouped project activity/10/. It was found to be in compliance with section 3.8 of VCS standard/3/.

#### **Project crediting period**

The project crediting period will be seven years, twice renewable, for a maximum total of 21 years. The first crediting period will be 07/05/2022 to 06/05/2029 (both days included).

#### **Project scale and estimated GHG emission reductions or removals**

The project activity is identified as a large-scale project, as the estimated average annual GHG emission reductions are 1,633,731 tCO<sub>2</sub>e. The total emission reductions over the crediting period of 7 years are 11,436,117 tCO<sub>2</sub>e. The estimated emission reductions are consistent with the corresponding ER spreadsheet /8/.

#### **Project location**

The project activity instances will be implemented within the geographical boundaries of the host country i.e., Nigeria. The geographical coordinates of the PAI were confirmed through the Get-geocoordinates mobile application during the VVB on-site audit. The information made available by the PP, the distribution database consisting of stove location within Nigeria/12/ and the geo-coordinates obtained by VVB/22/ have been verified during the site visit and found to be consistently defining the project location as the geographical boundaries of the host country, Nigeria. Therefore, this was found to be acceptable by the VVB.

#### **Conditions prior to project initiation**

The baseline scenario of the project consists of the use of non-renewable biomass (charcoal) and locally sourced inefficient metal charcoal stoves are in use for cooking purposed as verified through interviews with end-user households.

#### **Project compliance with applicable laws, statutes, and other regulatory frameworks**

As this grouped project is a distribution of ICS technologies, this does not come under purview of Environment Impact Assessment (EIA) as per Nigerian laws and regulatory framework. This was verified through General Guidelines and Procedure for Environmental Impact Assessment, Federal Republic of Nigeria /34/.

#### **Participation under other GHG programs**

##### **○ Projects registered (or seeking registration) under other GHG program(s):**

The validation team has verified that the grouped project activity has not been registered, and it has no plans to register under any other GHG program by reviewing the declaration from the PP that the project has not claimed or will not claim carbon credits under any other scheme after registration of the proposes project under VCS/24/.

- **Rejection by other GHG programs:**

The project has not been rejected by any other GHG programs/24/.

**Other forms of credit and supply chain (Scope 3) emissions**

- **Emissions trading programs and other binding limits:**

The PP confirms in section 1.16.1 of the joint PD & MR /1/ that this grouped project does not reduce GHG emissions from activities that are included in an emissions trading program. Nigeria does not have its own ETS. Also, it does not seek or receive another form of GHG-related environmental credit.

- **Other forms of environmental credit sought or received and eligible to be sought or received:**

The grouped project activity did not seek or receive another form of GHG-related environmental credit.

- **Issuance of public statement(s) to help prevent Scope 3 emissions double claiming:**

The grouped project activity which aims at distribution of ICS to households does not result in any Scope 3 emissions in its supply chain.

- **Email notification of the potential risk of Scope 3 emissions double claiming:**

The grouped project activity does not result in any Scope 3 emissions, hence not applicable.

**Additional information relevant to the project, including**

- **Leakage management:**

As the Grouped project activity adopts a net gross adjustment factor of 95% to account for leakage, this is not applicable.

- **Commercially sensitive information:**

The VCS PD&MR/1/ does not indicate any information that is commercially sensitive in nature as confirmed by PP under section 1.18 of joint PD&MR/1/.

- **Sustainable development contributions:**

The Grouped project activity is contributing to 7 SDGs:

**SDG 1 No Poverty**

- Indicator 1.1: Proportion of population below the international poverty line. In the current monitoring period, the usage of improved cooking stove has led to reduced expenditure in cooking fuel, thereby reducing household expenditure by \$0.23 per HH/day as confirmed through interviews with households during onsite audit and monitoring survey database.
- Indicator 1.4: Proportion of population living in households with access to basic services. In the current monitoring period, 100% of PAI users i.e., 1,566 households (considering 95% usage rate out of 1,648 households with ICS installed as per applied methodology) have access to

basic cooking services as confirmed from the monitoring survey when compared with the baseline.

### **SDG 5 Gender Equality**

- Indicator 5.1: Proportion of women in employment, to promote, enforce and monitor equality and non-discrimination based on sex. The women employee constitutes 28% of total people employee in all roles for the implementation of Grouped project activity as verified from the employment records.
- Indicator 5.4: Proportion of time spent on unpaid domestic and care work, by sex, age and location. In the current monitoring period, 100% of PAI users did experience less time spent in cooking by 49 min/HH/day as compared to cooking on the baseline stoves as verified through interviews during onsite audit.
- Indicator 5.5: Proportion of women in managerial/leadership roles, 60% of the top positions in the implementing organizations are held by women.

### **SDG 7 Affordable and Clean Energy –**

- Indicator 7.1.2 Proportion of population with primary reliance on clean fuels and technology. In the current monitoring period, 1,566 households received ICS and this was confirmed from the distribution database, and the operationality was cross verified during the onsite audit.

### **SDG 8 Decent Work and Economic Growth –**

- Indicator 8.1: Proportion of training provided, during the current MP, 3 training was provided to people employed as enumerators and other staff.
- Indicator 8.5: Proportion of youth not in employment, education or training. In the current monitoring period, the project activity generated employment for around 69 people.

### **SDG 12 Ensure sustainable consumption and production patterns-**

- Indicator 12.2: Proportion of decrease in specific fuel consumption, during the current monitoring period a yearly reduction of 2.75 tons of nonrenewable biomass per household has been verified and confirmed through interviews with end-users onsite.

**SDG 13 Climate Action** – Indicator 13 Take urgent action to combat climate change and its impacts. During the current monitoring period, the GHG emission reductions resulted in 1,459 tCO<sub>2</sub>e and this was confirmed from the ER calculation sheet.

**SDG 15 Life on Land** – Indicator 15.1. In the current monitoring period, 792 tons of woody biomass was saved while implementing the grouped project activity under its first monitoring period.

All the SDGs listed in the PD/MR have been assessed by the VVB thoroughly by desk review and cross checked during the on-site visit done by VVB.

PP also mentioned in the PD & MR that this grouped project also seeks certification under SD Vista and the monitoring and reporting of these SDGs will be demonstrated as per the requirements of SD Vista.

No further information is included in the VCS Joint PD & MR/1/. This is to confirm that the information in the project description is accurate, complete, and provides an understanding of the nature of the project.

## 3.2 Participation under Other GHG Programs

The grouped project activity has not been registered, and it has no plans to register under any other GHG program. The validation team has verified by reviewing the declaration from the PP that the project has not claimed or will not claim carbon credits under any other scheme after registration of the project under VCS/24/. Therefore, the grouped project activity is in line with section 3.22.1 of VCS standard/3/ and is eligible to participate under the VCS Program.

## 3.3 Safeguards

### 3.3.1 No Net Harm

As this grouped project is a distribution of ICS technologies, this does not come under purview of Environment Impact Assessment (EIA) as per Nigerian laws and regulatory framework. This was verified through General Guidelines and Procedure for Environmental Impact Assessment, Republic of Nigeria /34/. That this project of distribution of ICS to households in Nigeria does not require EIA. VVB accepted this justification that since project does not need environmental assessments, supports that project does not cause environmental harm.

### 3.3.2 Local Stakeholder Consultation

The local stakeholder consultation process has been described under Section 2.2 of the VCS PD& MR/1/. The Project Participant correctly identified the relevant stakeholders such as local NGOs, representatives of local authorities, target project ICS users. The local stakeholder meeting was conducted on 23/06/2022. The participants across the host country (Nigeria) were invited and informed about the meeting through email invite, newspaper advertisement and LinkedIn/social media announcement notifying the date, time and location of the event. The attendance sheet, photos and videos of the local stakeholder meetings were submitted as evidence by the PP/29/.

All questions raised by stakeholders were answered and documented by the PP and their representatives. Stakeholders had no comments/complaints/grievances by the end of the meeting which could have any significant modification in the project description or its design. The date and mode of invitation were confirmed from telephonic interviews of the LSC participants conducted by validation team. VVB validation team was also able to confirm through the interviewed stakeholders that they were part of the LSC meetings conducted by the PP and were found to be aware about the proceedings of the meeting including benefits of the improved cookstove, including lesser smoke, lesser time in fuel collection, lesser fuel consumption, etc. 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.

The PP has a continuous grievance mechanism in place for the local stakeholders. The beneficiaries of the project ICS have been provided with the following means to contact the PP:

- Directly registering complaints at the nearest cell office or reaching out to retail partners.

A toll-free helpline on which the end users can seek assistance.

- [E-mail at technical@upenergygroup.com](mailto:technical@upenergygroup.com)

Evidence on the collection of grievance feedback from the end-users is provided by PP (photographs of the grievance/feedback notes), thus the requirement is identified as being fulfilled/29/.

### 3.3.3 Environmental Impact

No environmental impact assessment has been done for this project as the project type is exempted from EIA as per Nigerian laws and regulations. Please see section 3.3.1 of this report for further clarification.

### 3.3.4 Public Comments

This project was open for public comment from 29/03/2023 to 28/04/2023. No comments were received by the project during the public comment period as confirmed from the project registry webpage /25/.

### 3.3.5 AFOLU-Specific Safeguards

This project is a non-AFOLU project type; therefore this section is not required.

## 3.4 Application of Methodology

### 3.4.1 Title and Reference

The project, as given in section 3.1 of VCS Joint PD & MR /1/, has applied VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves, version 1.1/5/ and relevant tools prescribed therein. The reference to the versions of the tools and methodology were found to be valid for use. The validity of the versions of the applied methodology and tools were checked from Verra and CDM websites.

Tools applied in this project are listed below:

CDM TOOL01 “Tool for the demonstration and assessment of additionality” Version 07

CDM TOOL30 “Calculation of the fraction of non-renewable biomass” Version 4.0

CDM Guideline “Sampling and surveys of CDM project activities and programmes of activities” version 4.0

CDM Standard “Sampling and surveys for CDM project activities and programmes of activities” version 9.0

### 3.4.2 Applicability

The project “Upenergy-social and climate impact programme- Nigeria-1” applies a valid version of the methodology/5/ and complies with each applicability condition of the identified methodology /5/. The same has been justified in the following table.

Applicability criteria of applied methodology, VMR0006 for PAIs to be included are listed in the table below:

No.	Applicability Condition	Justification of applicability	Means of assessment
1	Project activities shall be implemented in domestic premises or in community-based kitchens.	The project activity involves distribution of ICS in residential sector	<p>The purpose of the project is to provide improved cookstoves to households in Nigeria with focus on urban and rural areas.</p> <p>The technical specifications of the stove model being disseminated are reviewed to confirm that the Smart Pro ICS distributed under the GP is only suitable for domestic purposes/11/.</p> <p>It was verified from the ICS installation database/12/ and cross-checked by the VVB during onsite visit that project stoves were distributed only to household within the project boundary i.e., Nigeria/22/.</p> <p>Thus, the criterion is found applicable.</p>
2	The project stove shall have specified high-power thermal efficiency of at least 25% per the manufacturer’s specifications and shall exclusively use woody biomass and can be single pot or multi-pot; in case of project stove	Improved Cookstoves planned to be distributed under this project is SmartHome Pro stove that have an efficiency of 37.9% as per the manufacturer’s specifications. This project does not involve replacement of fossil fuel-based stoves.	<p>Thermal efficiency of all the ICS will be more than 25%, which shall be demonstrated at the time of PAI inclusion.</p> <p>The ICSs distributed till now SmartHome Pro stove with the design efficiency of 37.9% as per manufacturer’s specification/11/. Thus, the</p>

	replacing fossil fuel baseline stove, it shall exclusively use renewable biomass.		efficiency is found higher than 25%.  Thus, the criterion is found applicable.
3	Both 'Projects' and 'Large Projects' can use the methodology	The project is a large-scale project	The GP is defined as a "Large Project" in Joint PD and MR in line with para 3.10.1 of VCS Standard /3/. The scale of the project was confirmed through review of estimated ER sheet/8/.  Thus, the criterion is found applicable.
4	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.	According to the U.N. FAO, 9.9% or about 9,041,000 ha of Nigeria is forested during 2010 and between 1990 and 2010 Nigeria lost an average of 409,650 ha or 2.38% per year. In total, between 1990 and 2010, Nigeria lost 47.5% of its forest cover, or around 8,193,000 ha <sup>1</sup> . This can be attributed to dependency of non-renewable biomass for cooking needs by a large amount of its population. Hence the use of non-renewable biomass in the region is very much evident	The use of Non-renewable biomass since 1989 was confirmed through published reports including the Nigeria Demographic and health survey report/39/ and Nigeria living standard survey /38/. It will be demonstrated through the fraction of non-renewable biomass assessment sheet.  Therefore, the criterion is found applicable.
5	For the specific case of biomass residues processed as a fuel (e.g., briquettes, wood chips), it shall be demonstrated that:	A unique numbering or identification system for the ICS installed is applied in the project instance. This shall ensure no double counting of stoves within the Project and ensure that stoves can be identified as	The project involves distribution of ICS products and does not involve biomass residues. Therefore, this criterion is found to be non-applicable.

<sup>1</sup> <https://rainforests.mongabay.com/deforestation/2000/Nigeria.htm> (last accessed on 07/05/2023)

	<p>(a) It is produced using exclusively renewable biomass (more than one type of biomass may be used).</p> <p>(b) The consumption of the fuel should be monitored during the crediting period and</p> <p>(c) Energy use for renewable biomass processing (e.g., shredding and compacting in the case of briquetting) may be considered as equivalent to the upstream emissions associated with the processing of the displaced fossil fuel and hence disregarded.</p>	<p>belonging to this Project and not to a project managed by any other PP. Each ICS distributed under the project instance will have the UpE logo or Brand name (Smart Home Pro or similar) and unique serial number on the product. The unique serial number along with the customer details (name, address, etc.) is also stored in the sales database along with the unique serial number assigned to each product.</p>	
6	<p>The Project Design Document 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)</p>	<p>A unique numbering or identification system for the ICS installed is applied in the project instance. This shall ensure no double counting of stoves within the Project and ensure that stoves can be identified as belonging to this Project and not to a project managed by any other PP. Each ICS distributed under the project instance will have the UpE logo or Brand name (Smart Home Pro or similar) and unique serial number on the product. The unique serial number along with the customer details (name,</p>	<p>Each PAI will be recorded under a distribution database consisting of date of distribution and UID of the product as a mechanism to avoid double counting along with associated user details/12/.</p> <p>The unique ID associated with each ICS product distributed to end-users was checked during site visit and were found correct and consistent with the monitoring survey records/15/ and the distribution database/12/.</p> <p>Therefore, the criterion is found applicable.</p>

		address, etc.) is also stored in the sales database along with the unique serial number assigned to each product.	
7	The CDM-PDD or CDM-PoA-DD/CPA-DD shall also explain how the proposed procedures prevent double counting of emission reductions, for example to avoid that project stove manufacturers, wholesale providers or others claim credit for emission reductions from the project devices.	To prevent the double accounting of emission reductions by the key stakeholders involved in this grouped project viz., ICS manufacturer and end users, the carbon waiver agreements have been signed. This will prevent the other involved parties from claiming the carbon credits generated by this project activity. The carbon waiver agreements will be shared with VVB during validation & verification.	End user agreements signed by end-users transparently show the transfer of GHG rights.  It was cross checked by the VVB during the onsite interviews with the end-users that they had signed sales cum warranty receipt with carbon waiver declaration which confirms that the ownership of the resultant carbon credits belongs solely to the PP.  Therefore, the criterion is found applicable.

### 3.4.3 Project Boundary

The project boundary and identified GHG sources, sinks and reservoirs for the project and baseline scenarios are appropriately defined in the VCS PD & MR /1/. All the project activity instances (PAIs) that will be added within the project boundary i.e., Nigeria. The selection and justification for inclusion or exclusion is appropriate and duly supported in the VCS PD & MR/1/.

The PP has considered CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O as major GHG in the baseline scenario and project scenario. Emission from burning of non-renewable biomass has been considered in both scenarios. The approach was found to be in line with the applied methodology/5/.

### 3.4.4 Baseline Scenario

The baseline scenario for ICS has been identified using the methodology VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves, version 1.1 /5/. As per section 6 of applied methodology, the baseline scenario is the continued use of non-renewable wood fuel (charcoal) by the target population to meet similar thermal energy needs as provided by project cookstoves in absence of project activity as confirmed by the VVB during the onsite visit to the households.

The project activity involves distribution of improved cookstoves to the households in Nigeria. In the absence of project activity, the cookstoves used in the households are of unimproved conventional stoves, locally made charcoal based metal stoves with less efficient combustion system. As informed in

the PD section 1.1/1/, the energy and mass flows, and the type and level of service provided through improved cookstoves in project scenario will remain same as of baseline scenario. The baseline scenario has been determined by PP through a baseline assessment survey of 165 households spread across rural, semi-urban and urban areas in Nigeria and targeting all the key geographical areas of Nigeria, i.e., Northern Region, Southwest Region and Southeast Region. Out of the 165 households assessed, 47% are in urban areas, and 53% are located in rural areas/13/.

The procedures for identifying the baseline scenario have been correctly followed and the identified scenario reasonably represents what would have occurred in the absence of the project. VVB confirms that the applied methodology, tools, and documentary evidence/13,14/ are correctly quoted and interpreted. The assumption and data can be deemed reasonable. The VCS PD & MR/1/ considers the national and sectoral policies in effect. The selected methodology /5/ has been correctly applied to identify the baseline scenario as what would happen in the absence of the project and in compliance with the prescription given therein.

### 3.4.5 Additionality

PP has demonstrated additionality according to the applied methodology /5/ as given below:

The Project method is used by the PP to demonstrate additionality as prescribed by VMR0006, v1.1 /5/. The project is not mandated by Nigerian laws as demonstrated under section 1.14 of the VCS PD and confirmed by the VVB through independent cross-checks/35/.

The project activity generates revenue from the sale of cookstoves at subsidized prices therefore demonstrates additionality under section 3.5 of the VCS PD as per Step 3: Project Method of the applied methodology.

Under the additionality section of the applied methodology, Step 3: It is stated that for any project activity where stoves are not provided at zero cost to the end-user or has any other source of revenues other than the sale of GHG credits, then the project activity shall apply investment analysis method set out in the *CDM Tool for the Demonstration and Assessment of Additionality* included in AMS-II.G to determine that the proposed project activity is either: 1) not the most economically or financially attractive, or 2) not economically or financially feasible. The PP is selling the cookstove at a subsidized price of \$12.6 for pilot test basis and intends to further reduce the costs of each cookstove up to \$5 for future project activity instances to be included under the grouped project.

The PP has demonstrated through investment analysis that the Net present value of the investments towards the project activity is negative therefore the project activity is not financially viable without VCU's/19/. The investment decision date is verified as 15/04/2022 through investment decision note/47/, which is the date when the PP provided declaration of commitment towards undertaking the project activity. This date is prior to the project activity start date i.e., 07/05/2022.

The assessment of the key financial parameters is as follows:

Parameter	Value	VVB assessment
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Total ICS to be installed	500,000	The Ex-ante estimate as per the project design
ICS cost	8,582,436 USD <sup>2</sup> (4,132,284,000 Naira)	The cost of SmartHome Cookstoves has been verified as 6500 Naira per unit through the purchase invoice/20/. The latest Invoice reviewed by VVB is dated 04/12/2023 for a purchase of 3000 stoves at 7000 Naira per unit cost. Thus, the estimated cost of ICS is found within the comparable range and therefore found acceptable.
Implementation cost	4,018,154 USD (897,857,191 Naira)	The Implementation costs consist of transportation, storage, and distribution costs and. These costs are verified based on the Management report for Q1 of 2023, shared by the PP/36. b/. The project feasibility report vetted by independent auditor is reviewed by the assessment team and the cost estimates are thus found acceptable by the assessment team/36/
O&M cost		
Cost on account of defective stove/breakdown	742,603 USD (357,549,555 Naira)	The O&M costs consist of the costs on account of stove replacements on account of faulty stoves and breakdown. Which is considered as 1% of the total stove implementation cost, as per the project feasibility report/36/ and is found acceptable by the assessment team.
Local Overheads	16,502,287 USD (7,501,039,624 Naira)	The project feasibility report consists of overhead costs incurred as expenses towards local team and project management for effective implementation of the project, since warranty is offered by

<sup>2</sup> the exchange rate applicable at the time of investment decision i.e., in April 2022 (\$1=455NGN) was considered to determine the costs in Niara for the analysis.

		<p>the PP. The project feasibility report vetted by independent auditor/36/ is reviewed by the assessment team and the cost estimates are thus found acceptable by the assessment team. These costs are verified based on the Management report for Q1 of 2023, shared by the PP/36. b/and found comparable to those estimated</p>
Global Overhead cost	<p>17,747,906 USD (0 Naira)</p>	<p>Global overhead costs (project management&amp; software/database maintenance) included in the feasibility report/36/. However, these have been eliminated from the investment assessment modelled in local currency. These costs are realized in USD therefore for the simplification they are considered as zero. Thus, no further justification was sought.</p>
Revenue @ 6000 Naira per unit	<p>3,000,000,000 Naira 6000 Naira/unit</p>	<p>The VVB has verified the cost of initial stoves installed under GP, through interview with the end-users during the onsite audit and observed that the stoves are sold at an average of 6000 Naira each during the pilot test phase of the project/22/. The PP aims to reduce the cost further. The VVB has verified from the declaration submitted by the VVB that 95% of stoves to be installed under the group project will be sold at a further subsidized rate. The same can be reconfirmed during the subsequent verifications. FAR 01 is raised for the same.</p> <p>However, for this analysis the VVB has considered the verified price of 6000 Naira per stove (as confirmed through end-user's interviews).</p> <p>The revenue realized is thus found less than the costs incurred.</p>

The project activity's additionality has been demonstrated through investment analysis method (NPV analysis). The NPV thus obtained applying these values, along with other input data, has been negative, hence demonstrating the need of carbon revenue for the project's implementation on the full scale. The Net present value is calculated as -21,102,545 USD, thus the project faces investment barrier for full scale implementation.

The Net present value determined -4,52,35,18,046 Naira, as per analysis modelled in local currency.

The key input parameters subjected to the sensitivity analysis include:

Parameter / Variation	10%	0%	-10%
Manufacturing Cost (USD)	-21,688,127	-21,102,545	-20,516,963
Inflation Rate	-21,997,188	-21,102,545	-20,248,749
ICS Distribution Cost (USD)	-21,817,003	-21,102,545	-22,177,373

The input costs are also subjected to sensitivity analysis in local currency given the major costs are realised in Naira.

Parameter / Variation	10%	0%	-10%
Manufacturing Cost (Naira)	-4,805,464,931	-4,523,518,046	-4,241,571,161
Inflation Rate	-4,782,894,469	-4,523,518,046	-4,274,876,114
ICS Distribution Cost (Naira)	-4,326,295,824	-4,523,518,046	-4,782,894,469

The PD has also considered the FOREX rate fluctuations in the IRR sheet at three different scenarios during

- 1) April 2022 (Investment decision date)
- 2) June 2023 (FOREX change)
- 3) January 2024 (during validation)

and the resulting project NPV is negative in all three different FOREX rate scenarios, thus it demonstrates that the change is FOREX having a negligible impact on project NPV analysis and the actualised project cost. The VVB conducted an independent assessment and confirmed the inflationary impact of the FOREX change, thus resulting in increased ICS manufacturing cost (COGS) and local operating costs. This was

further confirmed from the latest ICS Purchase Order dated 04 Dec 2023 shared by the PP which reflected a ~15% increase from the earlier invoices.

The manufacturer’s purchase order was reviewed by the VVB to confirm the cost of procurement and is unlikely to be reduced drastically due to minimum cost of manufacturing involved. The distribution costs have been reviewed through the Management reports for quarter 1 of 2023 and are found comparable. The inflation rate is predetermined through the reliable sources and are not likely to vary from the forecasted during the first crediting period, thus the input parameters are not likely to remain within the range of sensitivity in the opinion of the VVB.

Therefore, VVB confirms that the project additionality has been sufficiently established proved by the PP in accordance with the applied methodology VMR0006, v1.1/5/.

### 3.4.6 Quantification of GHG Emission Reductions and Removals

The project applies the VCS methodology VMR0006, v1.1/5/. All the parameters considered for calculation of emission reductions are correctly applied by the PP.

**Data and Parameters fixed ex-ante:**

S.No.	Parameter	Value applied	Means of assessment
1.	B <sub>old</sub>	Charcoal: 5.46 t/yr/HH	The parameter represents the annual quantity of woody biomass that would have been used in the household in the absence of the project activity to generate useful thermal energy equivalent to that provided by the project devices. According to methodology /5/, the value of B <sub>old</sub> can be sourced from historical data or baseline surveys. The source of the value is based on the KPT assessment and was found correct and acceptable upon checking the KPT excel sheet/14/. The description, source, and justification of choice of data is included in accordance with applied methodology /5/. The value is consistent in Joint PD-MR/1/ and ER calculation sheet/8/. The validation team had also conducted a survey to visit the households where KPT was performed to confirm the conduction of activity. A sample size of 45 was considered for conducting Baseline KPT. These households comprised of Charcoal users/14/. The sample size for baseline KPT has been determined using the “Sampling and surveys for CDM project activities and programmes of activities, Version 09.0”. The required sample size was calculated

			<p>to be 27 therefore the actual sample size of 45 considered for KPT is found adequate and in-line with the CDM Sampling requirement; the results thus obtained have met the reliability criteria of 95/10 for large scale project activities, the reliability calculations included under section 3.4 has been reviewed against the KPT sheets and records provided by the PP and are found correct.</p> <p>The project activity aims to replace the baseline traditional / inefficient charcoal stoves with the charcoal ICS, hence the baseline fuel consumption Bold = 5.46 tonnes/year/HH is applicable for project households that displaces charcoal.</p> <p>The results were validated from test results in the presented in the KPT records/14/ and cross checking through the physical site visit with the households which were picked up as samples.</p> <p>Furthermore the assessment team has conducted independent cross-checks with publicly available literature on fuelwood consumption in the host country of Nigeria, For the parameter Bold recent scientific research work by Ibrahim Sufiyan, Muhammad K.D, Umar Musa U (2021)/43/ establishes the per capita charcoal consumption as 224.4 kg/capita/annum, this translates to 6.05 tonnes wood equivalent for charcoal/HH/annum considering the average HH size of Nigeria to be 4.5 capita/HH . /44/.</p> <p>Hence the Bold value of 5.46 tonnes / HH/ annum, determined through the baseline KPT study conducted by the PP is found to be within the comparable range and thus acceptable.</p>
2.	$f_{NRB,y}$	0.90	<p>The parameter represents a fraction of woody biomass that can be established as non-renewable biomass. The value had been calculated using the latest available version of Tool 30 v4.0/31. The VVB has reviewed the FNRB assessment sheet/9/ and the third-party report and found the calculations to be acceptable and in line with requirements of the</p>

		<p>latest applicable version of tool 30/31/. The parameters used to determine this value are demonstrated in the calculation sheet/9/ and were assessed by the assessment team. The following formula was used for fNRB calculation, which is found to be in line with TOOL30/31/.</p> $fNRB = NRB / (NRB + RB)$ <p>Where,  fNRB = Fraction of non-renewable biomass in the country/region or project area (fraction or %)  NRB = Quantity of non-renewable biomass (t/yr) in the country/region or project area.  RB=Quantity of renewable biomass in the country/region or project area.</p> <p>Since NRB is determined on a country specific basis by the CME, the following method was applied in line with paragraph 9 of TOOL30/31/.</p> $NRB = H - RB$ <p>H=Total annual consumption of wood in the absence of the project activity in the country/region/project area (t/yr)</p> <p><b>total consumption of woody biomass (H) is determined using:</b></p> <ol style="list-style-type: none"> <li>i. Woody biomass for Energy Applications in domestic and industrial segments for the 2020 vintage from “Energy Statistics Database” from United Nation’s Database</li> <li>ii. Commercial woody biomass consumption for non-energy applications (e.g., construction, furniture) i.e., Roundwood consumption from FAO Statistics Food &amp; Agriculture Organization of United Nations for the latest available vintage 2019</li> </ol> <p>For calculation of the fNRB value the latest available data for forest resourced is sourced from Global Resources Assessment 2020 for Nigeria/42/ and the data on wood and charcoal consumption is sourced from Energy Statistics Database of UN statistics division/42/.</p> <p><b>Quantity of renewable biomass</b> available in the applicable area (<b>RB</b>) has been calculated.</p>
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			<ul style="list-style-type: none"> <li>i. Mean Annual Increment (MAI) of woody biomass growth Woody biomass values for forest and other areas are sourced from IPCC report i.e., 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories</li> <li>ii. The land area details of forests and other lands with vegetation are sourced from FAO from Food &amp; Agriculture Organization of United Nations for the latest available vintage 2020.</li> <li>iii. The information regarding protected forests and forests with long-term management plan are sourced from Global Forest Resources Assessment, 2020, FAO, Nigeria</li> <li>iv. The “geographically remote area” i.e., forests/other wooded lands that are beyond the average distance travelled to collect fuelwood has been sourced from the peer reviewed literature Maina, Y. B. Umar, N. K. and Egbedimame, A. B. 2020. An Empirical Analysis of the Impact of Household Fuel Wood Consumption on the Environment in Nigeria. Journal of the Environment, Vol. 14, No. 3 September 2020.</li> </ul> <p>The NRB was calculated by the CME in-line to equation 2 of the applied Tool-30 and was found to be acceptable as the fNRB here is calculated for a specific country (i.e., Nigeria) that is being added to expand the project geographical boundary.</p> $\begin{aligned} \text{NRB} &= \text{H} - \text{RB} \\ &= 180,711,667 - 17,549,193 \\ &= 16,31,62,475 \text{ ton/yr} \end{aligned}$ <p>Furthermore, the fNRB value applied is found comparable with other CDM registered projects in the host country/40/</p> <p>The value is consistent in Joint PD-MR/1/ and ER calculation sheet/8/ was determined in line with the applied methodology/5/.</p>
3	$EF_{wf \text{ CO}_2}$	112 tCO <sub>2</sub> /TJ	<p>The parameter represents CO<sub>2</sub> emission factor for woody biomass. The value has been sourced from IPCC/26/ and was found correct and valid. The value</p>

			is consistent in Joint PD-MR/1/ and ER calculation sheet/8/ and was determined in line with the applied methodology/5/.
4.	$EF_{wf\ non-CO_2}$	26.23 tCO <sub>2</sub> /TJ	The parameter represents the non-CO <sub>2</sub> emission factor for woody biomass. The value has been sourced from IPCC /26/ and was found correct and valid. The value is consistent in Joint PD-MR/1/ and ER calculation sheet/8/ was determined in line with the applied methodology/5/.
5.	NCV <sub>biomass</sub>	0.0156 TJ/tonne	The parameter represents the net calorific value of the non-renewable woody biomass. The value has been sourced from IPCC report /30/ and is found correct and valid. The value is consistent in Joint PD-MR/1/ and ER calculation sheet/8/.
6.	$\eta_p$	Smart Home Pro stove – 37.9%	The parameter represents efficiency of project stove at the start of project activity. The value of the parameter is sourced from manufacturer's specification/11/. The value applied was found valid and correct. The description, source, and justification of choice of data is included in accordance with applied methodology /5/. The value is consistent in PD & MR/1/ and ER calculation sheet/8/.
7.	$\eta_{old}$	Traditional Charcoal Stove – 16.5%	The parameter represents the efficiency of stoves being used in the baseline scenario. The type and efficiency of the stove is sourced from the baseline assessment report which consists of the records of the WBT conducted on baseline stoves/13/. The value determined by the PP is found within the comparable range of efficiency established by independent researches in the host country. the parameter $\eta_{old}$ value of 16.5% evaluated by the PP is found to be comparable and conservative with the value 15% as per the study conducted by Usman, Ojonimi Yusuf /45/. Therefore, the value of this parameter was found acceptable by the assessment team.
8	Life Span	7 years	The parameter represents the lifetime of the ICS technology being installed; the lifespan determined

			ex-ante is confirmed as 7 years as per the technical specification of the cookstove/11/. The stoves beyond their lifetimes will be eliminated from the database automatically.
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**Data and Parameters to be monitored:**

S.No.	Parameter	Monitoring frequency	Means of assessment
1.	$N_{y,i,j}$	At least once every two years	The parameter will be recorded in the database and updated for operational rate through monitoring surveys in-line with the applied methodology/5/.
3.	$\eta_{new,i,j}$	Annually	The parameter represents the efficiency of the device of each type $i$ and batch $j$ . The efficiency of the distributed cookstove will be determined through WBT conducted on the project stoves in accordance with WBT test protocols as per the applied methodology/5/.
4.	$\mu_y$	At least once every two years	This parameter represents the adjustment to account for any continued use of pre-project devices during year $y$ . The data will be monitored at least once every two years.

**Baseline Emissions and Project emissions:**

It was checked with the applied methodology that there are no baseline emissions and are not quantified separately. The emission reductions saved under the project are calculated through one equation which directly evaluates the GHG saving of amount of fuel saved on switching to new ICS as compared to the previous stove.

**Leakage emissions:**

Leakage shall be considered as default 0.95 in accordance with section 8.3 of VMR0006/5/.

The equation stated under section 5.4 of the Joint PD and MR/1/ were compared with the applied methodology/5/ and were found to be same. The same equations have been used in the estimated ER sheet/8/ to calculate the estimated ERs for the entire crediting period.

### 3.4.7 Methodology Deviations

The VMR0006, v.1.1/5/ was adopted for the Group project activity, and the PP adhered to the VCS PDMR/1/ development process. The validation team has confirmed that the Group project activity has not been subjected to any methodological deviations.

### 3.4.8 Monitoring Plan

The monitoring plan covers:

1. Maintenance of installation and monitoring databases:

The database shall include the following:

- Unique project instance identification number
  - Installation date
  - Beneficiary name, Address, Contact details of user (when available)
  - Baseline cooking fuel source
  - Baseline stove type
  - Date of replacement of cook stove
  - Monitored parameters
2. The roles and responsibilities of the parties involved are described in line with the VCS standard.
  3. The PP has various quality control measures in place like training staff to conduct surveys. Trained supervisors conduct spot check on surveyor results, all information related to parameters are collected on phone-based application/forms, surveys results are tagged as valid or invalid based on the duration of surveys, data validation done by PP. Trainings records will be maintained,
  4. Calculation of ERs is done based on latest results by PP's team.
  5. Joint PD & MR/1/ has been reviewed to check that the procedure for data uncertainty, emergency preparedness, roles and responsibility, operational and management structure are mentioned in the Joint PD & MR. The monitoring plan completely describes all measures to be implemented for monitoring all parameters required.
  6. Sampling Plan:

Sampling plan is made according to the CDM Standard 'Sampling and surveys for CDM project activities and programmes of activities'/7/, and CDM Guidelines: Sampling and Survey for CDM project activities and programmes of activities/6/ to estimate monitored parameter values used in the ER calculations.

The target population will consist of the end users listed in the database on which stratified random sampling will be applied.

The sample size equations stated in the Joint PD and MR/1/ were checked and found consistent with CDM Guidelines: Sampling and Survey for CDM project activities and programmes of activities, version 4/6/.

The sampling frames will include individual PAI stratified based on stove model for the parameters Stove Efficiency ( $\eta_{new,y,i}$ ) and Stove Usage rate ( $U_y$ ) and based on installation date for parameter stove usage factor ( $\mu_y$ ). The PP will apply a 95/10 confidence/precision for annual/biennial sampling since this is a large-scale project activity/6/.

The monitoring plan included in section 6.3 of the Joint PD & MR /1/ is based on the VCS methodology /5/ which has been applied to the VCS grouped project activity.

The monitoring arrangements described in the monitoring plan are feasible within the project design.

### 3.5 Non-Permanence Risk Analysis

This is not applicable for the VCS project as it is a Non AFOLU project.

## 4 VERIFICATION FINDINGS

### 4.1 Accuracy of GHG Emission Reduction and Removal Calculations

- A. Data and parameters available at the time of validation are the same as listed above under section 3.4.6. of this report
- B. Data/parameter monitored for PAI 1 under MP1:

S.No.	Parameter	Monitoring frequency	VVB assessment						
1.	$N_{y,i,j}$	At least once every two years	<p>The parameter represents the number of project devices of type i and batch j operating during year y. The data is sourced from database/12/ and monitoring surveys/15/.</p> <table border="1" data-bbox="873 1150 1417 1228"> <thead> <tr> <th></th> <th>Stoves installed</th> <th>Operational rate</th> </tr> </thead> <tbody> <tr> <td><b>PAI-1</b></td> <td>1648</td> <td>95%</td> </tr> </tbody> </table> <p>The total number of charcoal ICS installed under the current monitoring period is 1,648/12/. It was found that 95% of the stoves were operational as checked from the monitoring survey results /15/ carried by the PP for the first monitoring period. The operational stoves during the are calculated as 288 units on adjusting for the equivalent operational year fraction to account only for the duration of the current Monitoring period. The calculations are checked for the operation year fraction calculation from the ER sheet and are found to be correct/15/.</p> <p>The monitored samples checked by VVB during on-site visit/22/ were also questioned</p>		Stoves installed	Operational rate	<b>PAI-1</b>	1648	95%
	Stoves installed	Operational rate							
<b>PAI-1</b>	1648	95%							

			<p>on the operationality of the project stove, and all the responses were checked with the available information in the monitoring surveys/15/ which was found as sufficiently following the requirements.</p>
2.	$\eta_{new,i,j}$	Annually	<p>The parameter represents the efficiency of the device of each type <math>i</math> and batch <math>j</math>. The value of the parameter during the current monitoring period:</p> <p>Smart Home Pro model of charcoal ICS was only distributed as initial project activity instances therefore WBT tests were conducted on 36 stoves from 25/11/2022 to 12/01/2023 for the current Monitoring period. The value of <math>\eta_{new,i,j}</math> value is determined as 35.51% as verified from the WBT test reports/16/. The WBT test are conducted using calibrated instruments as verified from the calibration certificates/23/.</p>
3.	$\mu_y$	Atleast once every two years	<p>This parameter represents the adjustment to account for any continued use of pre-project devices during year <math>y</math>. The value determined for the current MP is 0.06. The values have been sourced from the monitoring surveys/15/ conducted across 115 HHs.</p> <p>As checked from the monitoring survey results/15/ carried out for the first monitoring period, 19 HHs out of 115 HHs surveyed reported parallel usage. These 19 HHs were further questioned on the frequency of usage of the baseline stove which revealed that the end users which report parallel usage were using the pre-project devices in 36% instances of cooking thus the value of usage of baseline stove is calculated as 6.0% of the total cooking events through extrapolation to the entire population.</p>

			During the onsite audit the project stove users were interviewed if the traditional baseline stove or any other secondary stove was in use by the households and no such instances were observed/22/. All the 11 households confirmed that they were using only one stove i.e., project ICS.
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In conclusion, VVB reviewed all the evidence submitted by PP related to GHG emission reduction calculations and confirmed that all the parameters are correctly applied. Default values used in the calculation were identified correctly. The emission reduction calculation has been done in line with the applied methodology /5/.

**Monitoring Plan for PAI 1 for current MP:**

For the current monitoring, PP had calculated the sample size as per the CDM standard requirements/6,7/. 121 samples were randomly selected /21/ from the distribution database in line with applied methodology VMR0006 ver. 1.1/5/, which prescribes the minimum sample size to be 100. The monitoring surveys were conducted between 17/11/2022 to 19/12/2022.

The monitoring plan included under Appendix 1 of the Joint PD & MR /1/ is based on the VCS methodology/5/ which has been applied to the VCS project activity.

The assessment team has verified the ER calculation sheet/15/ with the monitored data, where the actual achieved precision is calculated in line with Guidelines Sampling and surveys of CDM project activities and programmes of activities/6/ and confirms that the calculation of achieved reliability was done correctly.

All the parameters of interest as per applied methodology are included in the ER sheet, these were checked for the input values as well as the formula applied and are found to be consistent. The reliability (demonstration of precision achieved after the survey results) is depicted in the ER calculation sheets /15/ corresponding to final Monitoring Report /1/, which were also found correct.

The following reliability calculation performed by CME has been reviewed by the assessment team and found correct. Sample estimates of all three parameters are within the required reliability precision.

Parameter	Responded Samples	Value of parameter obtained	Precision Achieved
$\eta_{new}$	36	35.5%	Yes
Uy	121	95.04%	Yes
Baseline stove usage	121	0.06	Yes

The verification team has verified the ER sheet and confirms that the actual achieved precision is calculated as per the Guideline: “Sampling and Survey for CDM project activities and programme of activities” version 04/6/ and found out that the calculation of achieved reliability was done correctly.

## 4.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

The assessment team confirms that the calculation and data is authentic. The quality of supporting documents submitted for validation and verification is adequate. The assessment team has checked the quality and maintenance of the supporting documents during the on-site visit to confirm the authenticity of the documents and to check the appropriate calculations. The assessment team confirms that the proper evidence is available for the whole monitoring period and the same is verifiable and the data collection system meets the requirement of the monitoring plan and the applied methodology according to the assessment carried out.

The assessment team confirms the quality of evidence to determine the GHG reductions are satisfactory and the detailed information regarding the roles and responsibilities have been provided in the Joint PD-MR/1/.

# 5 VALIDATION AND VERIFICATION OPINION

Earthood Services Private Limited, contracted by UpEnergy Group (PP), has performed the independent joint validation & verification of the project activity “UpEnergy - Social and Climate Impact Programme-Nigeria-1”. The PP is responsible for the information and disclosures made to substantiate the implementation of the project activity.

ESPL commenced the joint validation & verification based on the baseline and monitoring methodology VMR0006, version 1.1/5/ and VCS-PD & MR and ERs estimation and calculation spreadsheet/8/.

ESPL's validation approach is based on the understanding of the risks associated with reporting the project activity, estimates of GHG emission data and the controls to be implemented to mitigate these. ESPL planned and performed the validation and verification by obtaining evidence, physical site visit, other information, and explanations that ESPL considered necessary to give reasonable assurance that the estimated GHG emission reductions are fairly to be achieved.

Further, the validation and verification of the GHG statement was conducted in accordance with ISO 14064-3; 2019 by the ESPL assessment team.

Therefore, the VVB confirms that:

- The project activity is in accordance with all relevant host country criteria (Nigeria) and VCS rules and requirements.
- The project activity is in accordance with all conditions of the latest version of applied methodology.
- The environmental assessment is appropriate and sufficient.
- The monitoring plan is transparent and adequate.
- All information has been consistently applied in the VCS Joint PD-MR.
- The implementation of the project has been done as per description in the VCS Joint PD-MR.

Quantity of GHG emission reductions or removals in tCO<sub>2</sub> equivalents are estimated to be 11,436,117 throughout the crediting period and 1,633,731 is the annual average reduced ERs. The validated ex-ante emissions reductions are as follows:

Year	Estimated GHG emission reductions or removals (tCO <sub>2</sub> e)
2022-23	346,553
2023-24	1,114,977
2024-25	2,150,419
2025-26	2,071,765
2026-27	1,994,007
2027-28	1,917,159
2028-29	1,841,236
<b>Total estimated ERs</b>	<b>11,436,117</b>
<b>Total number of crediting years</b>	<b>7</b>
<b>Average annual ERs</b>	<b>1,633,731</b>

Quantity of GHG emission reductions or removals in tCO<sub>2</sub> equivalent achieved by the project during the verification period is as follows:

Verification period: from 07/05/2022 to 31/10/2022

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

Year	Baseline emissions or	Project emissions or	Leakage emissions (tCO <sub>2</sub> e)	Net GHG emission reductions or removals (tCO <sub>2</sub> e)
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	removals (tCO <sub>2</sub> e)	removals (tCO <sub>2</sub> e)		
2022 (07-May-2022 - 31-October - 2022)	1,459	-	-	1,459
Total	1,459	-	-	1,459

Comparison between the estimated ex-ante GHG emission reductions and removals and the achieved emission reductions and removals for the current monitoring period is reported below:

<u>Ex-ante emissions reductions /removals</u>	<u>Achieved emissions reductions /removals</u>	<u>Percent difference</u>	<u>Justification for the difference</u>
169,004	1,459	86.3%	There is a difference of 86.3% in the ex-ante estimates and the actuals obtained for the first monitoring period. Since the scope of this activity is joint registration and issuance of VCUs, this difference is observed due to the difference in the estimated units to be installed and actual installation of ICS, therefore the values obtained are significantly lower than the estimates, and thus lead to a difference in the estimates and actuals for the ERs/VCUs.

Approved by



Dr. Kaviraj Singh

Managing Director

Earthood Services Private Limited

Date: 21/03/2024

Place: Gurgaon, Haryana

## APPENDIX I: LIST OF DOCUMENTS REFERRED

S.No.	Title of document	Version	Provided by
1.	VCS Joint Project Description& Monitoring report	Version 6.0, dated 19/03/2024	PP
2.	VCS Program guide	4.3	VCS
3.	VCS Standard	4.4	VCS
4.	VCS VVB Manual	3.2	VCS
5.	VMR0006 Methodology for Installation of High Efficiency Firewood Cookstoves	1.1	VCS
6.	CDM Guidelines Sampling and surveys of CDM project activities and programmes of activities	Version 4	CDM
7.	CDM Standard Sampling and surveys for CDM project activities and programmes of activities	Version 9	CDM
8.	Ex-Emission Reduction calculation sheet	-	PP
9.	FNRB calculation sheet and third-party assessment report	-	PP
10.	Project activity start date: <ul style="list-style-type: none"> <li>End user signed receipt of sale of first stove unit (UID: VSP00045)</li> </ul>	07/05/2022	PP
11.	UpEnergy group technical specification sheet- Smart Home Pro	-	PP
12.	Installation database	-	
13.	Baseline assessment report conducted by UpEnergy and International Centre for Energy, Environment and Development (ICEED)	January 2022	PP
14.	Baseline KPT records	04/02/2022 to 07/02/2022	PP
15.	a) Monitoring survey database for MP 1 b) ER sheet for MP1	11/12/2022 to 19/12/2022	PP
16.	WBT records for MP 1	25/11/2022 to 12/01/2023	PP
17.	Warranty cards with End-user Carbon Waiver agreement.	-	PP
18.	Carbon waiver agreements with parties involved.	-	PP

	a) Methano Green dated 26/02/2022. b) Roshan Renewables dated 28/02/2022. c) Cookstove supplier dated 06/2/2023		
19.	Financial assessment sheet (IRR sheet) Financial assessment sheet (in local currency)	-	PP
20.	Manufacturer's agreement and Stove purchase invoices	01/02/2023	PP
21.	Screenshot of Random sample generator	-	PP
22.	VVB On-site visit records	-	VVB
23.	Calibration Certificates	2022	PP
24.	Declaration by PP for: a) Non-participation in other GHG programs and b) No double counting c) No ODA	23/05/2023	PP
25.	Project 2673 webpage -: Upenergy-social and climate impact programme- nigeria-1 <a href="https://registry.verra.org/app/projectDetail/VCS/2673">https://registry.verra.org/app/projectDetail/VCS/2673</a>	-	PP
26.	Employment records	-	PP
27.	Training attendance sheet	12/11/2022 and 13/11/2022	PP
28.	Flyers with customer care contact details	-	PP
29.	Stakeholder consultation report and records	23/06/2022	PP
30.	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy	Chapter 1 Introduction Chapter 2 Stationary Combustion	Last accessed on 14/02/2023
31.	Tool 30 Calculation of the fraction of non-renewable biomass	3.0	CDM
32.	Tool 21 Demonstration of additionality of small-scale project activities	13.1	CDM
33.	Tool 1 Tool for the demonstration and assessment of additionality	7.0	CDM
34.	<a href="https://ead.gov.ng/environmental-guidelines-revision/">https://ead.gov.ng/environmental-guidelines-revision/</a>	-	Others

35.	<a href="https://naccnigeria.org/son-approves-national-standards-for-biomass-cookstoves-in-nigeria">https://naccnigeria.org/son-approves-national-standards-for-biomass-cookstoves-in-nigeria</a>	-	Others
36.	a) Project feasibility report vetted by third party independent auditor. b) Management report from Q1 2023	16/06/2023	PP
37.	Declaration by the PP for cap on project stove costs	-	PP
38.	Nigeria - Living Standards Survey 2018-2019 <a href="https://microdata.worldbank.org/index.php/catalog/3827/related-materials">https://microdata.worldbank.org/index.php/catalog/3827/related-materials</a>	January 2021	Others
39.	Nigeria Demographic and health survey <a href="https://dhsprogram.com/publications/publication-fr359-dhs-final-reports.cfm">https://dhsprogram.com/publications/publication-fr359-dhs-final-reports.cfm</a>	2018	Others
40.	CDM registered projects compared: a) <a href="https://cdm.unfccc.int/UserManagement/FileStorage/QU6W5DOY4F97SKHOIRTAMG8P3VL2NC">https://cdm.unfccc.int/UserManagement/FileStorage/QU6W5DOY4F97SKHOIRTAMG8P3VL2NC</a> b) <a href="https://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/ES1A06BIXVORU3FP9HC87DZL5GN2Y4/view">https://cdm.unfccc.int/ProgrammeOfActivities/cpa_db/ES1A06BIXVORU3FP9HC87DZL5GN2Y4/view</a>	-	Others
41.	<a href="#">Global Forest Resources Assessment (FRA) 2020 Nigeria - Report (fao.org)</a>	-	Others
42.	Energy Statistics Database of United Statistics Division <a href="#">UNdata   record view   Fuelwood</a>	-	Others
43.	<a href="https://iwbm.com.my/archives/1iwbm2021/1iwbm2021-22-26.pdf">https://iwbm.com.my/archives/1iwbm2021/1iwbm2021-22-26.pdf</a>	-	
44.	<a href="https://www.africageoportal.com/maps/fbb3c5c5fa9f4429be56af8b11ef4643/about">https://www.africageoportal.com/maps/fbb3c5c5fa9f4429be56af8b11ef4643/about</a>	-	
45.	<a href="https://afribary.com/works/experimental-performance-evaluation-of-charcoal-stove#overview">https://afribary.com/works/experimental-performance-evaluation-of-charcoal-stove#overview</a>	-	
46.	<a href="https://www.exchangerates.org.uk/NGN-USD-exchange-rate-history.html">https://www.exchangerates.org.uk/NGN-USD-exchange-rate-history.html</a>	-	
47.	Investment decision note (MoM)	15/04/2022	

## APPENDIX II: ABBREVIATIONS

Abbreviations	Full texts
BE	Baseline Emission
CAR	Corrective Action Request
CDM	Clean Development Mechanism

CL	Clarification Request
CO <sub>2</sub>	Carbon di oxide
CP	Crediting Period
DR	Desk Review
EB	Executive Board
EF	Emission Factor
ER	External Resource
EIA	Environmental Impact Assessment
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Green House Gas
GP	Grouped Project Activity
ICS	Improved Cook Stoves
MR	Monitoring Report
PAI	Project Activity Instance
PD	Project Description
PP	Project Proponent
tCO <sub>2</sub> e	Tonnes of Carbon di oxide equivalent
TA	Technical Area
TR	Technical Reviewer
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCU	Verified Carbon Units
VVB	Validation and Verification Body

## APPENDIX III: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Competence Statement	
<b>Name</b>	Deepika Mahala
<b>Country</b>	India
<b>Education</b>	M. Sc. (Environment Management), GGSIP University B.Sc. Hons. (Chemistry), Sri Venkateshwar College, DU
<b>Experience</b>	6 Years +
<b>Field</b>	Climate Change
Approved Roles	
<b>Team Leader</b>	YES
<b>Validator</b>	YES

<b>Verifier</b>	YES		
<b>Methodology Expert</b>	ACM0002, AMS.I.D., AMS.I.A, AMS.III.AV, AMS.II.G, AMS-II.C		
<b>Local expert</b>	YES (India, Bangladesh)		
<b>Financial Expert</b>	NO		
<b>Technical Reviewer</b>	YES		
<b>TA Expert</b>	YES (TA 1.2 & TA 3.1)		
<b>Reviewed by</b>	Shifali Guleria (QM)	<b>Date</b>	28/04/2022
<b>Approved by</b>	Kaviraj Singh (MD)	<b>Date</b>	28/04/2022

<b>Competence Statement</b>			
<b>Name</b>	Anjali Chaudhary		
<b>Education</b>	Bachelor of technology in Civil Engineering		
<b>Experience</b>	8 months		
<b>Field</b>	Civil Engineering		
<b>Approved Roles</b>			
<b>Team Leader</b>	Yes (VM)		
<b>Validator</b>	Yes		
<b>Verifier</b>	Yes		
<b>Local expert</b>	Yes (India)		
<b>Financial Expert</b>	No		
<b>Technical Reviewer</b>	No		
<b>TA Expert (X.X)</b>	Yes (VM TA 3.1)		
<b>Reviewed by</b>	Shifali Guleria (Quality Manager)	<b>Date</b>	19/06/2023
<b>Approved by</b>	Deepika Mahala (Technical Manager)	<b>Date</b>	19/06/2023

<b>Competence Statement</b>	
<b>Name</b>	Shifali Guleria
<b>Education</b>	M.Sc. (Environmental Studies and Resource Management), TERI University
<b>Experience</b>	3+ year
<b>Field</b>	Climate Change
<b>Approved Roles</b>	
<b>Team Leader</b>	YES

<b>Validator</b>	YES		
<b>Verifier</b>	YES		
<b>Methodology Expert</b>	YES (AMS-I.A., AMS-II.G., AMS-II.E., AMS-III.A.V., AMS-I.D, ACM0002)		
<b>Local expert</b>	YES		
<b>Financial Expert</b>	NO		
<b>Technical Reviewer</b>	YES		
<b>TA Expert</b>	YES (1.2, 3.1)		
<b>Reviewed by</b>	Deepika Mahala	<b>Date</b>	18/02/2022
<b>Approved by</b>	Ashok Gautam	<b>Date</b>	18/02/2022

<b>Competence Statement</b>			
<b>Name</b>	Kaviraj Singh		
<b>Education</b>	Ph.D. (Environmental Engineering), IIT Delhi Masters (Energy & Environmental), DAVV Indore		
<b>Experience</b>	15 Years +		
<b>Field</b>	Climate Change & Environment		
<b>Approved Roles</b>			
<b>Team Leader</b>	YES		
<b>Validator</b>	YES		
<b>Verifier</b>	YES		
<b>Methodology Expert</b>	AMS-I.D., AMS-II.D., ACM0006, AMS-I.A., AMS-I.C., AMS-II.B., AMS-III.H, ACM0002, ACM0001, AM0080, ACM0018, AM0056, AM0073 VM0042, AMS-III.G, AMS-III.AF., VM0032, VM0018, ACM0010, ACM0022, AMS-III.D, AMS-III.F and AMS-III.A.Q		
<b>Local expert</b>	YES (India)		
<b>Financial Expert</b>	YES		
<b>Technical Reviewer</b>	YES		
<b>TA Expert (X.X)</b>	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1, TA 13.2)		
<b>Reviewed by</b>	Shifali Guleria (Quality Manager)	<b>Date</b>	02/02/2023
<b>Approved by</b>	Deepika Mahala (Technical Manager)	<b>Date</b>	02/02/2023

<b>Competence Statement</b>
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<b>Name</b>	Kumden Nanbal Luka		
<b>Country</b>	Nigeria		
<b>Education</b>	B.tech. in Urban and Regional Planning		
<b>Experience</b>	1+ years		
<b>Field</b>	Environment; Urban-Rural planning		
<b>Approved Roles</b>			
<b>Team Leader</b>	No		
<b>Validator</b>	No		
<b>Verifier</b>	No		
<b>Methodology Expert</b>	No		
<b>Local expert</b>	Yes (Nigeria)		
<b>Financial Expert</b>	No		
<b>Technical Reviewer</b>	No		
<b>TA Expert</b>	No		
<b>Reviewed by</b>	Shreya Garg	<b>Date</b>	23/11/2018
<b>Approved by</b>	Anshika Gupta	<b>Date</b>	23/11/2018

## APPENDIX IV: LIST OF FINDINGS

Table 1.CL from this validation/verification

<b>CL ID</b>	01	<b>Section no.</b>	1.8	<b>Date</b> : 20/05/2023
<b>Description of CL</b>				
Project Start date and crediting period start date is mentioned as 7/05/2022 under section 1.8 of the VCS PD whereas sales database (refer column I and J) the header description is mentioned as the Start date of stove crediting (considering the start date of monitoring period) and the date is considered as 8/05/2022. PP shall address the inconsistency in the description of the start date of the Project activity and crediting period.				
<b>Project participant response</b>				<b>Date</b> : 01/06/2023
PP has considered the start date of the project as the date of first ICS distribution. However, for the conservative estimation of Emission Reduction (ER) the next day of the distribution has been considered to calculate $N_{y,i,j}$ , this is just to avoid the undue credit on the day of distribution. In this context, PP would like to clarify that the start date of project activity is 7/05/2022, whereas the crediting period of the ICS will be the next day of the distribution for a rational ER claim. It is to be noted that during the next monitoring period onwards the start date and crediting period of the older distributions will remain the same and only for new distributions the crediting period will be considered from the next day onwards.				
<b>Documentation provided by project participant</b>				
Distribution receipt of first ICS				

<b>DOE assessment</b>	<b>Date:</b> 05/06/2023
The project start date is correctly mentioned as 07/05/2022 as verified from the first sales receipt, the same is considered as the crediting period start date which is in line with the VCS requirements. The first monitoring period starts from 07/05/2022, however the emission reductions are not being accounted for the date of sale and a due gap of 1 day is being maintained for calculations. <b>Thus, the finding is closed</b>	

<b>CL ID</b>	02	<b>Section no.</b>	1.8	<b>Date :</b> 20/05/2023
<b>Description of CL</b>				
PP shall clarify what does each project activity instance signify. As per section 7.5 Estimated net GHG emission reductions or removals by Project activity instance 1 (07-05-2022 to 31-10-2022) are described whereas section 1.4 indicates that each ICS is being considered as project activity instance. PP shall mention the reference to instance consistently across the document.				
<b>Project participant response</b>				<b>Date :</b> 01/06/2023
PP would like to clarify that the project activity instance signifies a single ICS. PP has maintained reference of the project instance consistently throughout the revised PDMR v2				
<b>Documentation provided by project participant</b>				
VCS_Nigeria_2673_Joint-PDMR_v2				
<b>DOE assessment</b>				<b>Date:</b> 05/06/2023
The revised PDMR now describes each ICS installed under project activity as the project activity instance consistently. <b>Thus, the finding is closed</b>				

<b>CL ID</b>	03	<b>Section no.</b>	3.5	<b>Date :</b> 05/06/2023
<b>Description of CL</b>				
Additionality: <ol style="list-style-type: none"> <li>1. PP shall clarify why VVB charges (validation +verification costs) are included as an expense for calculating the viability of the project without VCUs.</li> <li>2. During the Onsite audit, VVB interview the households to determine the cost of ICS incurred as an expense by each HHs and it is observed that they have bought the ICS for 6000 Nigerian Naira, which is approximately equal to 12-13 USD, however the IRR sheet considers the cost of cookstoves as 5 USD. PP shall justify reason for the assumption along with supportive for the same.</li> <li>3. PP is requested to clarify what kind of expenses are included within the Project management cost given that cost wise break of expenses (such as Data management, Operation &amp; maintenance etc.) have already been included as. Please requested to provide the supportive which forms the basis of assumption for the PP.</li> <li>4. Please elaborate what constitutes the disposal costs and how the Disposal costs are determined.</li> <li>5. The operation &amp; maintenance cost which is considered for each year of stove operation however the warranty is extended to each stove only for one year as evident from the sales receipt, PP is requested to clarify what expenses constitutes for the O&amp;M cost beyond the warranty cover.</li> </ol>				
<b>Project participant response</b>				<b>Date :</b> 12/06/2023

<ol style="list-style-type: none"> <li>As highlighted by VVB, PP has revised the additionality sheet by excluding the VVB charges for calculating the economic viability of the project without VCUs.</li> <li>PP has considered the sale price of ICS as \$5 for the calculation of the project economics on a long-term basis, however during the pilot term, 5% of projected ICS volume has been planned to be distributed at \$12.6. Hence PP has revised the additionality analysis considering ICS sale cost @ \$12.6 for 5% of initial pilot scale and \$5 for the rest 95% full scale. Project feasibility report has been shared with the VVB. Further, PP would like to state that, even considering the entire ICS distribution at a sale price of \$12.6, the NPV of the project activity works out to be negative.</li> <li>Project management costs include administration expenses at global level, remuneration of UpEnergy Group's top management, global technical and data management team for their involvement in this project activity. This value has been arrived based on Management assumption. Further, PP would like to state that, even with the exclusion of project management cost, the NPV of the project activity works out to be negative.</li> <li>PP has considered a budget for ICS that are defective / damaged during handling, transportation and storing and for their safe / environmentally friendly disposal. PP would like to remove this component from the additionality analysis for the sake of conservativeness. The revised additionality sheet has been shared with the VVB for their review.</li> <li>PP would like to clarify the Operation &amp; Maintenance cost implies the overheads like Salaries for employees at the Nigerian office, office rent, project related travels, other operational expenses etc. incurred in the project activity. PP has renamed this component as "Overheads" for the sake of better clarity and understanding.</li> </ol> <p>Considering the aforementioned changes PP has revised the additionality sheet and some has been shared with VVB for their review and reference.</p>
<b>Documentation provided by project participant</b>
VCS 2673_Additionality Model v1.1
<b>DOE assessment</b>
<b>Date: 12/06/2023</b>
<ol style="list-style-type: none"> <li>The investment analysis sheet is now revised and does not account the expenses occurred towards VVB services for viability assessment.</li> <li>The revenue generated is now demonstrated in a bifurcated manner for both the pilot and full-scale scenario, the declaration by PP is submitted that the future PAIs will be sold at subsidized price of \$5 each and the same is mentioned under section 3.5 of the VCS PD&amp;MR. The NPV is demonstrated as negative, thus was found acceptable.</li> <li>The IRR sheet is revised and now consists of breakup costs. The project feasibility report was reviewed by the assessment team and found acceptable.</li> <li>The component of disposal costs is now omitted.</li> <li>The nomenclature of O&amp;M costs is now revised to clarify the nature of expenses and the same is verified through the project feasibility report.</li> </ol> <p><b>Thus, the finding is closed</b></p>

Table 2.CAR from this validation/verification

<b>CAR ID</b>	01	<b>Section no.</b>	1.4, 3.1	<b>Date :</b> 20/05/2023
<b>Description of CAR</b>				
The following information is found missing within the Joint PD & MR document: <ol style="list-style-type: none"> <li>Section 1.4 of the project description does not include all the information required for the inclusion of project activities as per Sections 3.6.16 and 3.6.17 VCS standard 4.4.</li> <li>Sections 3.1 and 3.2 of the project description do not mention tools applied by the project including the Standard for sampling and surveys for CDM project activities and Programme of activities.</li> </ol>				
<b>Project participant response</b>				<b>Date :</b> 01/06/2023

1) PP has included the eligibility criteria for Inclusion of new project instance as per the Sections 3.6.16 and 3.6.17 of VCS standard 4.4 in the revised PMDR v2. 2) PP has included the following tools that have been applied on this project activity in the revised PMDR v2. <ol style="list-style-type: none"> <li>a. CDM tool 30 for calculation of fNRB – Version 3.0</li> <li>b. CDM tool for Sampling and surveys for CDM project activities and programme of activities – Version 9.0</li> <li>c. CDM Tool for demonstration and assessment of additionality – Version 7.0.0</li> <li>d. Water Boiling Test Protocol – Version 4.2.4</li> </ol>	
<b>Documentation provided by project participant</b>	
VCS_Nigeria_2673_Joint-PDMR_v2	
<b>DOE assessment</b>	<b>Date: 05/06/2023</b>
1. The eligibility criteria for inclusion of new project instances are now added as per section 3.6.16 of the VCS standard. <b>Closed</b> 2. PP shall demonstrate how the project activity meets each of the <b>applicability conditions of the tools</b> applied by the project in line with VCS template guidelines. <b>Open</b> <ol style="list-style-type: none"> <li>a. CDM tool 30 for calculation of fNRB – Version 3.0 applied by the PP is no longer valid, the supportive report provided is dated 2021 there does not include the latest available input values for calculation. PP shall apply the latest tool for FnrRB calculations. <b>Open</b></li> </ol>	
<b>Project participant response</b>	<b>Date : 12/06/2023</b>
2. PP would like to clarify the following regarding VVB's query on fNRB assessment. <ol style="list-style-type: none"> <li>a. For the project activity, the independent party fNRB study was conducted in August 2021 using the CDM TOOL 30 – Version 3.0, which was the latest available version of the TOOL during the study. Further, the only revision between version 4 and version 3 of the TOOL as indicated in page 12 of the TOOL version 4 is the revision to introduce a reference to TOOL33 for using default values i.e., application of default conversion factor for charcoal as per TOOL 33 version. As per the TOOL 33 version 2, the default value for wood-to-charcoal conversion factor is 4.0 kg of fuelwood per kg of charcoal, whereas version 3 of the TOOL 30 allows the PP to use a conversion factor of 6 for Charcoal. PP has analyzed the fNRB study with the revised charcoal conversion factor and found that there has been a de-minimus impact on the final fNRB value (fNRB reduced from 90.63% to 90.20%); however, since the PP applies ROUNDOWN function to the final fNRB value, the value of 90% holds good even with the application of revised conversion factor.</li> <li>b. Further, PP has calculated fNRB value for Nigeria based on version 4 of the TOOL 30, following the same approach as detailed in the independent fNRB study report of 2021, adopting the latest available input values of year 2020. The calculated value thus obtained is also 90% (rounddown value). PP has shared worksheet of both version 4 and version 3 of the TOOL 30 with the VVB.</li> </ol>	
<b>Documentation provided by project participant</b>	
1) Nigeria - fNRB Calculations-Tool 30 v3 2) Nigeria - fNRB Calculations -Tool 30 v4	
<b>DOE assessment</b>	<b>Date: 12/06/2023</b>
1. The FNRB calculations are now found to be in line with the latest version of tool 30 i.e., v4.0. The added clarification with respect to minor impact on calculations is found acceptable upon review of the FNRB assessment sheet. The version of tool is now updated accordingly in the VCS PD&MR. <b>Thus, the finding is closed</b>	

<b>CAR ID</b>	02	<b>Section no.</b>	1.11	<b>Date :</b> 20/05/2023
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<b>Description of CAR</b>	
The type of end-users as per eligibility criteria shall be households, whereas section 1.11 mentions the residential /commercial users. PP shall mention the type of end-users consistently through the document.	
<b>Project participant response</b>	<b>Date : 01/06/2023</b>
PP would like to clarify that the project activity would target only domestic premises in line with the applicability conditions as stated in Section 4 of VMR0006 Methodology-v1.1. PP has maintained the consistency in the target end users throughout the PDMR v2.	
<b>Documentation provided by project participant</b>	
VCS_Nigeria_2673_Joint-PDMR_v2	
<b>DOE assessment</b>	<b>Date: 05/06/2023</b>
The description of the targeted end-users is found to be consistently reported in the revised PDMR. <b>Thus, the finding is closed</b>	

Table 4.FAR from this validation/verification

<b>FAR ID</b>	01	<b>Section No.</b>	3.5	<b>Date : 08/03/2024</b>
<b>Description of FAR</b>				
The ICS distributed revenue demonstration in the IRR sheet considers the sale price as 6000 Naira per unit however the PP declares that the prices will be reduced further. Since only 1,648 stoves were distributed during the current joint validation & verification the sale price of 6000 Naira was confirmed by the VVB, and further subsidy provided by the PP could not be confirmed by the VVB. The verifying VVB shall confirm the sale price of ICS included under the Grouped project activity for monitored samples and for a few instances of non-monitored samples.				
<b>Project participant response</b>				<b>Date : DD/MM/YYYY</b>
NA				
<b>Documentation provided by project participant</b>				
NA				
<b>DOE assessment</b>				<b>Date: DD/MM/YYYY</b>
NA				