INSTALLATION OF HIGH EFFICIENCY WOOD BURNING COOKSTOVES IN ZIMBABWE

Document Prepared by

C-Quest Capital SGS Stoves Private Limited

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1 PROJECT DETAILS

1.1 Summary Description of the Implementation Status of the Project

The project involves distribution and installation of fuel-efficient Improved Cookstoves (ICS) in Zimbabwe. The ICS disseminated through this project replaces the baseline cookstoves. Under this project two stoves (model TLC-CQC Rocket Stoves, each with single pot) are being installed per household in Zimbabwe. Through this project, the distribution and installation of approximately 500,000 ICS will be undertaken for households in Zimbabwe.

The ICS will burn wood more efficiently thereby improving thermal transfer to pots, hence saving fuel. Not only this halt the rapidly progressing deforestation in Zimbabwe but also reduce health hazards from indoor smoke pollution and women and children are able to spend less time collecting firewood.

TLC-CQC Rocket Stove usage substantially reduces fuel consumption and emissions for conducting cooking and water heating tasks in homes. The ICSs are more efficient than traditional firewood stove as they reduce heat loss and improve thermal transfer, resulting in a decrease in fuel use in comparison with traditional firewood stove. It substantially reduces wood fuel consumption compared with a three-stone fire or traditional pot support.

TLC-CQC ROCKET STOVE

The first TLC Stove was installed on 29-November-2020. Till the end of 3rd monitoring period, a total of 191,974 TLC Stoves were installed under the project. The details of instances added for each monitoring period is depicted in the table below.

All the data recorded during stove registration process was captured via handheld digital devices (smart phones and/or tablets). The information collected is then transferred to a centralized online project database. PP has distributed two improved cookstoves in the households as per the requirement of the stove users.

- **The relevant implementation dates (e.g., dates of construction, commissioning, and continued operation periods).**

Monitoring Period

1st Monitoring Period	29-November-2020 to 31-August-2021 (Both dates are included)
2nd Monitoring Period	1-September-2021 to 28-February - 2022 (Both dates are included)
3rd Monitoring Period	1-March-2022 to 15-September-2022 (Both dates are included)

Installation of ICS

Date of first ICS installed	29-November-2020
No. of instances added/ICS installed during 1st MP	72,188
No. of instances added/ICS installed during 2nd MP	119,770
No. of instances added/ICS installed during 3rd MP	16
Total no. of ICS distributed till end of 3rd MP (15-September-2022)	191,974

First Monitoring Survey

Survey dates for parameters $N_{y,i,j}$ and $B_{y=1,new,i,j,survey}$	20-November-2021 to 13-December-2021

Second Monitoring Survey

Survey dates for parameters $N_{y,i,j}$	30-March-2022 to 30-April-2022

Third Monitoring Survey

Survey dates for parameters $N_{y,i,j}$	14-November-2022 to 24-November-2022

- **The total GHG emission reductions or removals generated in this monitoring period.**

  The project results in a total emission reduction of 454,274 tCO_2e over the monitoring period of 1-March-2022 to 15-September-2022 (including both dates).

Audit history of the project

Audit Type	Period	Program	VVB Name	Number of years
Validation	25-February-2022 (date of deed representation)	VCS Validation	Carbon Check (india) Private Ltd.	

Verification	29-November-2020 to 31-August-2021(Both dates are included)	VCS Verification	Carbon Check (India) Private Ltd.	0 years, 9 months, 3 days.
Verification	01-September-2021 to 28-February - 2022(Both dates are included)	VCS Verification	VKU Certification Pvt.Ltd.	0 year, 6 months, 0 day.
Verification	01-March-2022 to 15-September-2022(both dates included)	VCS Verification	VKU Certification Pvt.Ltd.	0 year, 6 months,15 days.
Total				1 year,9 months,18 days.

This is the 3rd monitoring period for this project. The current monitoring period is considered from 01-March-2022 to 15-September-2022(Including both dates). The total GHG emission reductions or removals generated in this monitoring period are 454,274 tCO2e (calculated value referred in the ER spread sheet).

1.2 Sectoral Scope and Project Type

The project is categorised under type/category as below:

a) Sectoral scope: 03 - Energy demand
b) Type: II – Energy efficiency improvement projects

The project is a grouped project activity.

1.3 Project Proponent

Organization name	C-Quest Capital SGS Stoves Private Limited
Contact person	Ken Newcombe
Title	Director

Address	38 Beach Road #29-11, South Beach Tower, Singapore.
Telephone	+1-202 247-7976
Email	cqc-operations@cquestcapital.com

1.4 Other Entities Involved in the Project

Apart from the Project Proponent, there are no other entities involved in the Project.

1.5 Project Start Date

29-November-2020 (date of commissioning of 1st ICS under this grouped project activity)

1.6 Project Crediting Period

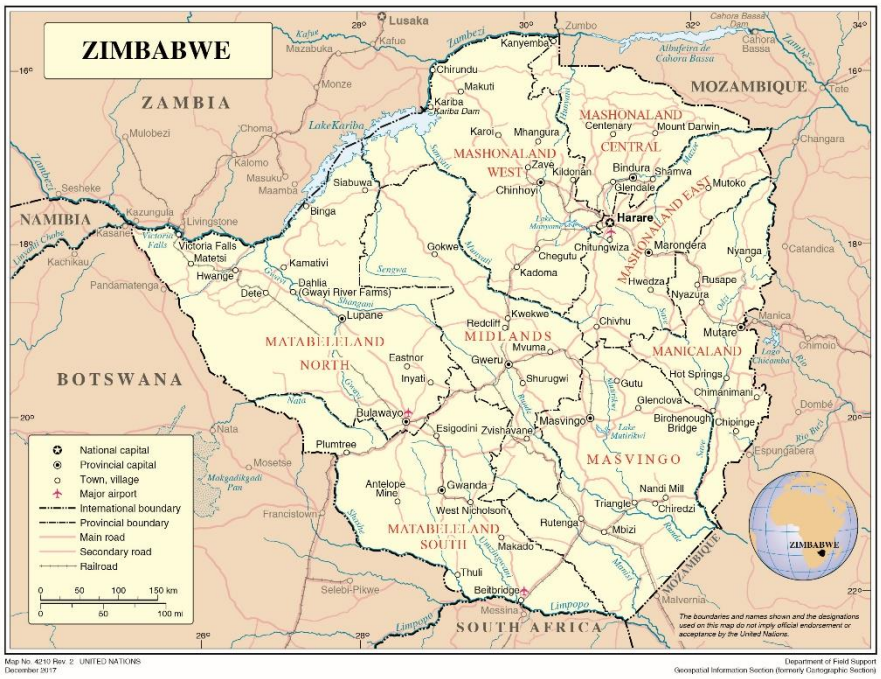
29-November-2020 to 28-November-2030 (both days included), ten years fixed crediting period.

1.7 Project Location

The project location is the geographical boundary of Republic of Zimbabwe with coordinates- 19°0'55.6"S latitude and 29°09'17.5"E longitude.[1]

Map of project area

[1] Zimbabwe | Geospatial, location data for a better world (un.org)



1.8 Title and Reference of Methodology

1. VMR0006: "Methodology for Installation of High Efficiency Firewood Cookstoves" (Version 1.1[2])
2. Tool 30 version 3.0 – "calculation of the fraction of non-renewable biomass." (Version 3.0[3])
3. Standard – "Sampling and Surveys for CDM project activities and programmes of activities" (Version 09.0[4])

1.9 Participation under other GHG Programs

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

1.10 Other Forms of Credit and Supply Chain (Scope 3) Emissions

The project activity and the GHG emission reductions are not included in any emission trading program or any other mechanism that includes GHG allowance trading and include details

[2]https://verra.org/methodology/vmr0006-methodology-for-installation-of-high-efficiency-firewood-cookstoves/

[3]https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-30-v4.0.pdf/history_view

[4]https://cdm.unfccc.int/sunsetcms/storage/contents/stored-file-20210531160756223/Meth_Stan05.pdf

about any such programs or mechanisms. The project has not sought or received another form of GHG-related environmental credit.

As per Section 3.23.9 of the VCS Standard, v4.4, the "producer(s) or retailer(s) of the impacted good or service are known but not involved in the project or do not have a website the project proponent shall notify them of the project and potential risk of Scope 3 emissions double claiming via email."

The Project Proponent has informed the manufacturer of the TLC-CQC Rocket Stoves parts as well as the implementing partner in Zimbabwe at the time of signing agreement for the goods and services provided by them, that ICS will be distributed in Zimbabwe under this project. Also, intimated them about the project registration under VERRA for the generation of VCUs. Evidence of the emails and public statement[5] has been submitted to the VVB during verification. Please refer Appendix A for the details.

1.11 Sustainable Development Contributions

The project contributes to sustainable development in a number of ways:

a) Environmental Sustainability

- The project helped significantly reduce greenhouse gas emissions over the monitoring period.
- The project helped reduce the use of non-renewable biomass from forests, thus assist in conserving existing forest stock and the protection of natural forest eco-systems and wildlife habitats.

b) Social Sustainability

- Considerably less time need to be spent collecting wood fuel for the family home thereby reducing the work burden on rural families and presenting alternative opportunities for economic development.
- The amount of indoor pollutants from the burning of biomass in the family home reduced. Less carbon dioxide, carbon monoxide and particulates emitted due to the decrease in total biomass burned and an increase in the temperature of combustion.
- The stove provides a safer method for combusting biomass for cooking, helping to reduce burn injuries, especially for children, in the family home.

c) Economic Sustainability

- The project helped develop a section of the local economy, in the distribution, local assembly, maintenance and monitoring activities.
- Household expenditures on cooking fuel reduced through the use of the ICS.
- Saved household labour can be diverted to more productive economic activities.

The project created local employment opportunities in operational and management roles, as well as future assembly and/or manufacturing initiatives.

Status of project under SD VISta; The project is listed and is under validation.

[5] https://cquestcapital.com/latest/public-notices/

Table 1: Sustainable Development Contributions

The project lead to the achievement of the following SDGs due to the implementation of project activities:

Row	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
1	4.3	Project specific indicator: Number of individuals who received any informal training	Increase	Vocational training and project related training with respect to successful implementation of a programme, appropriate methods of conducting surveys, carrying out maintenance activities etc. in addition to issues related to climate change was provided to 05 individuals associated with the project.	Contribute to increasing vocational and relevant skills of at least 50 local individuals (with a focus on targeting women and youth) by providing non-formal education and training on issues related to climate change, with specific skill building in operations and surveying activities related to stove distribution and its monitoring under VCS
2	7.1	7.1.2 Proportion of population with primary reliance on clean fuels and technology	Increase	Increasing access to clean cooking technology by distributing a set of project stoves in 95,987 households.	Increase access to clean cooking technology with project stoves installations in approximately 0.25 million households under the project lifecycle
3	8.3	8.3.1 Proportion of informal employment in non-agriculture employment, by sex	Increase	A total of at least 05 individuals were directly and indirectly employed under the project activity during the current monitoring period in Country for various activities related to project implementation, maintenance, and monitoring.	Contribute to generation of employment in informal sector (total economy, agriculture, and non-agriculture) by contracting locals with a target employment of 50 employees for varying lengths of time over the project lifetime with a focus on hiring females. Employment comprises all persons of working age who, during a short reference period (minimum one week), or full time

					will be engaged in any activity to produce goods or provide services for pay or profit
4	13.0	Project Specific indicator: Reduction in emissions as compared to baseline scenario (open fire)	Increase	Total emission reduction in the current monitoring period is 454,274 tCO2 eq.	Contribute to GHG reduction through an estimated reduction of 37 tCO2e per stove for the ten-year period owing to the replacement of baseline stoves with project stoves.
5	15.3	15.2.1 Progress towards sustainable forest management by increasing above ground biomass in forests	Implemented activities to increase	The project has resulted in saving 501,484 tons of non-renewable biomass in 95,987 HHs.	Contribute an estimated reduction of deforestation of tons of woody biomass, per stove, per year, from forests surrounding the communities and reducing pressure on forest reserves

Row	SDG Target	SDG Indicator	Net Impact on SDG Indicator	Current Project Contributions	Contributions Over Project Lifetime
6	3.9	Project specific indicator: Reduction in PM2.5 emissions	Implemented activities to decrease	Annual emission of PM2.5 is reduced by 47% in project households. For the 95,987 households which have received double stoves. The same is evidenced from survey results which show that 100 % of the respondents felt reduction in smoke and soot levels near the cooking area and 97% of respondents experienced reduced levels of itchiness of eye associated with cooking on open fire.	Contribute to improved health and well-being brought about by reduced levels of fine particulate matter (PM2.5) emissions within 0.25 million households by approximately 47% below baseline emission level of 3.9 g/kg fuel.
7	5.4	5.4.1 Proportion of time spent on unpaid domestic and care work, by sex, age, and location.	Implemented activities to decrease	The project survey results augment the above claim as 72% of the respondents reported to having experienced fewer trips for wood collection freeing up their time for other activities.	Contribute to reducing drudgery and gender inequality in 0.25 million households, especially for women and children by saving time spent in collecting fuel wood below the baseline fuelwood collection time considered at an average of 1.9 hour/day/household for rural areas using an open fire or similar traditional cookstove. The project will lead to time savings by approximately one hour every day. The women can use the time saved for doing more productive activities or personal care.

2 SAFEGUARDS

2.1 No Net Harm

There are no potential negative environmental or socio-economic impacts for this project activity based on the following facts:

- The project does not coerce the population into any practice or habit which they are not willing to take up as the cooking practice or habit on the project stove is similar to what was practiced before implementing this project activity, i.e., on the baseline stove.
- The project activity promotes gender equality as it intends to reduce the burden on women in the most vulnerable communities by reducing the fuel wood consumption. The amount of time spent collecting fuel wood and cooking is reduced. Women have more time for other pursuits. The risk of being exposed to gender-based violence is also reduce.
- The project is neither involved in any activity that would bring environmental deterioration nor lead to any emission of toxic substances. The project stoves rather reduce emissions due to the increased thermal efficiency compared to the baseline stoves.
- There are no threats anticipated in terms of negative effects on the local economy. Moreover, the locals are also be employed as a result of this project activity. Thereby improving the economic growth in the region where the project activity has been implemented.

2.2 Local Stakeholder Consultation

Stakeholders were invited to provide feedback via multiple methods including, an announcement posted on C-Quest Capital's website on 26-October-2020 also, e-mail invitations were sent from C-Quest Capital on 04-November-2020 to 48 people from organizations around the country including government, NGOs, stove manufacturers, project developers, academia and private and public-sector entities involved with cookstoves and/or sustainable energy. The email included a link to the CQC website announcement and feedback form which resulted in electronic commentary from two additional stakeholders.
The outcomes from the local stakeholder consultation are available in Section 2.2 of the registered PD.

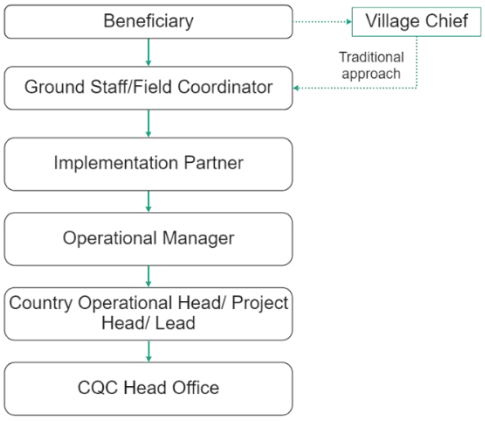
On-going Communication Mechanism.

The Stove owner can contact the local implementation partner in case any support or replacement of any stove part is required. The contact details of the local implementation partner/project proponent have been shared with the end users during the stove installation. PP provide each household a guidebook to stove manufacturing. the guidebook printed with the project proponent's address and phone number. The end user call to the number and, if necessary.
The local support staff address the end users' query by providing the necessary support. In case of replacement of stove part is needed, local staff coordinates with the management team to arrange the replacement of the part. At the time of monitoring survey also, field staff takes

feedback from the local stakeholders. All stakeholders' concerns (positive or negative) during implementation of the project activity have been compiled in the survey results spreadsheet. Necessary action has been taken by the PP (if required) to address the concerns raised by stakeholders during ongoing communication.

Grievance Redressal mechanism.

PP follows a proper Feedback and Grievance Redress Policy and Procedure, which ensures that project-affected communities and individual stakeholders' grievances are properly prioritized and addressed. These measures are taken to enhance PP's accountability and transparency and to support the project initiatives that can help the communities to identify adverse effects to them, or their environment which had not previously been identified and mitigated by PP.



Flow of information/complaint/grievances from stakeholder to PP

The Grievance Policy and Procedure is accessible as a phone number of the PP/implementing partner office in Zimbabwe is available on the brochure provided to each household, which is the most accessible manner to provide feedback. PP policy and procedure outline the process to evaluate and respond to complaints; the procedure details when a serious level complaint should be communicated to PP country teams and when it would be best addressed by the implementing partner.

Grievance received for the monitoring period

Grievance Received	Action Taken
Too much heat.	End user was using excess amount of firewood to prepare their food. Field officer visited the household and sensitized to use less firewood especially small twigs and branches.

Project Stove is too smoky.	End user was using bigger logs to prepare their food, choking the flow of oxygen level in the combustion chamber leading to increased smoke. Field officer visited the household and sensitized to use small twigs and branches instead of bigger logs as well as to avoid using wet wood for the preparation of food.
stove was cracked	End user received new training on how to maintain the stove and repair cracks.

2.3 AFOLU-Specific Safeguards

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

3 IMPLEMENTATION STATUS

3.1 Implementation Status of the Project Activity

Till the end of the monitoring period, the project installed 191,974 stoves. Only one stove model (TLC-CQC Rocket Stove) was distributed in the project.

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

Technical Specifications	
Stove Size	Depth: 34.5cm Width: 34.5cm Height: 28 cm
Efficiency	34.5%
Average Life	10 years

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

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

Under this project two stoves (model TLC-CQC Rocket Stoves, each with single pot) are being installed per household in Zimbabwe.

Life span of ICS- CQC Rocket Stove

The life of TLC stove is at least 10 years owing to it being a clay and brick stove which can be easily repaired using a mixture of local clay, cow dung, sand, and water on a regular basis. The metal parts used in the stoves are under extended warranty from PP/manufacturer side throughout the projected life span and will be replaced in case of request received from the stove owner for replacement. PP has confirmed the life span of 10 years through the above measures.

3.2 Deviations

3.2.1 Methodology Deviations

This project did not apply any methodology deviations.

3.2.2 Project Description Deviations

Since 11-January-2023, project ownership rights transferred to C-Quest Capital SGS Stoves Private Limited. The relevant document (Deed of accession and Deed of Partial Release in respect of VCS registration deed of representation both dated 11-January-2023 and communications agreement dated 03-November-2022 for transferring the ownership to VCS has been provided. Verra has approved this deviation, and it has been published on the project page[6] .

3.3 Grouped Projects

New project activity instances included under this grouped project ensure that it meets the eligibility criteria below.

No.	Criterion	How the new project activity instances to comply
1	Meet the applicability conditions set out in the methodology applied to the project	All new project activity instances (TLC-CQC Rocket Stoves) meet the applicability conditions set out in Section 3.2 of the PD, where the end-user is household and the ICS deployed is having 34.5% thermal efficiency, which is higher than 25%. Same can be verified from the Efficiency report provided to VVB.
2	Use the technologies or measures specified in the project description.	Only single pot fixed TLC-CQC Rocket stoves have been adopted in the project.

[6] https://registry.verra.org/app/projectDetail/VCS/2341

3	Apply the technologies or measures in the same manner as specified in the project description.	Only TLC-CQC Rocket stoves have been adopted in the project and it replace traditional cookstoves in household.
4	Are subject to the baseline scenario determined in the project description for the specified project activity and geographic area.	The new project activity instances were installed within Zimbabwe only and subject to the same baseline scenario determined in Section 3.4 of PD. Baseline scenario and geographical boundary can be confirmed from registration records /consent deeds of individual ICS which contains geographical coordinates, address of households as well as signed declaration from household stating that they were using traditional 3 stone fire or traditional pot support before the installation of project stove.
5	Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area.	All new project activity instances use the activity method for demonstration of additionality. **Step 1: Regulatory Surplus-** There is no mandated government programme or policy in host country of this project ensuring the distribution of new project activity instances. **Step 2: Positive List-** The inclusion of new project activity instances complies with positive list as it satisfies criterion 1 where it meets all the applicability conditions of the methodology. Same can be confirmed from the registration cum consent deed signed by each household, where they confirm to voluntarily shifting from traditional three stone fire stove to project stove provided by PP.
6	Where a capacity limit applies to a project activity included in the project, no project activity instance shall exceed such limit. Further, no single cluster of project activity instances shall exceed the capacity limit, determined as follows: 1) Each project activity instance that exceeds one percent of the	No project activity instance exceeds the applicable limit, which is 180 GWh_{th}/y. The expected annual energy saving for each project activity instance is approximately 0.0104 GWh_{th}/y or 0.01% of the limit. As the annual energy saving is below 1% of the limit, therefore no project activity instance is identified and divided into clusters.

	capacity limit shall be identified. 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. 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.	

4 DATA AND PARAMETERS

4.1 Data and Parameters Available at Validation

Data / Parameter	$f_{NRB,y}$
Data unit	Fraction
Description	Fraction of woody biomass saved by the project activity during year *y* that can be established as non-renewable biomass
Source of data	IPCC 2019 refinement[7], UNData[8] & FAO reports[9]
Value applied	0.88
Justification of choice of data or description of measurement methods and procedures applied	This parameter has determined ex-ante. C4 EcoSolutions (Pty) Ltd was appointed as third party to study and derive the f_{NRB} value for Zimbabwe. The value has been calculated in accordance with Tool 30 version 3; using latest available versions of Food and Agriculture Organization (FAO) report, UN Data and other publicly available data that have been published by reliable sources.
Purpose of Data	Calculation of emission reductions

[7]https://www.ipcc-nggip.iges.or.jp/public/2019rf/pdf/4_Volume4/19R_V4_Ch04_Forest%20Land.pdf
[8]Rural population - Zimbabwe | Data (worldbank.org)
[9]Country reports | Global Forest Resources Assessments | Food and Agriculture Organization of the United Nations (fao.org).

Comments	The report of f_{NRB} was made available to VVB during the validation.

Data / Parameter	$NCV_{woodfuel}$
Data unit	TJ/tonne
Description	Net calorific value of the non-renewable woody biomass that is substituted or reduced
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 1 Introduction
Value applied	0.0156
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value
Purpose of Data	Calculation of emission reductions
Comments	No comments

Data / Parameter	$EF_{wf,CO2}$
Data unit	tCO_2/TJ
Description	CO_2 emission factor for the use of wood fuel in baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion[10]
Value applied	112
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value
Purpose of Data	Calculation of emission reductions
Comments	No comments

Data / Parameter	$EF_{wf,nonCO2}$
Data unit	tCO_2/TJ

[10] https://www.ipcc-nggip.iges.or.jp/public/2006gl/vol2.html

Description	Non-CO_2 emission factor for the use of wood fuel in baseline scenario
Source of data	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion
Value applied	26.23
Justification of choice of data or description of measurement methods and procedures applied	IPCC default value
Purpose of Data	Calculation of emission reductions
Comments	No comments

Data / Parameter	η_{old}
Data unit	Fraction
Description	Efficiency of baseline cookstove
Source of data	Methodological default value
Value applied	0.1
Justification of choice of data or description of measurement methods and procedures applied	A default value of 0.1 is used, as baseline device is a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation, that is without a grate or a chimney
Purpose of Data	Calculation of emission reductions
Comments	No comments

Data / Parameter	η_p
Data unit	Fraction
Description	Efficiency of project stove at the start of project activity.
Source of data	Manufacturer's specification
Value applied	0.345
Justification of choice of data or description of measurement methods and procedures applied	This parameter has determined ex-ante
Purpose of Data	Calculation of $\eta_{new,y,i,j}$
Comments	No comments

4.2 Data and Parameters Monitored

Data / Parameter	$N_{y,i,j}$
Data unit	Number
Description	Number of project devices of type i and batch j operating during year y
Source of data	Monitoring Survey
Description of measurement methods and procedures to be applied	Measured based on a representative sample. Sampling standard shall be used for determining the sample size to achieve 90/10 confidence precision according to the latest version of Standard for sampling and surveys for CDM project activities and programme of activities.
Frequency of monitoring/recording	At least once every two years
Value monitored	191,974
Monitoring equipment	No equipment was used to monitor this parameter
QA/QC procedures to be applied	The unique reference number of each stove shall be logged in the monitoring database showing the total number of stoves. Data from the sampling plan will be collected in each monitoring period by trained project staff and applied in the emission reduction calculations. Internal cross-checks by the Project Proponent will be undertaken as Quality Check.
Purpose of the data	Calculation of emission reductions
Calculation method	Proportion of operational stoves obtained from the survey is multiplied by the total commissioned stoves to arrive at this value. Proportion of operational stoves: 100% $N_{y,i,j}$ = 100% * 191,974 = 191,974
Comments	Proportion of operational stoves obtained from the survey is multiplied by the total commissioned stoves to arrive at this value

Data / Parameter	$\eta_{new,y,i,j}$

Data unit	Fraction
Description	Efficiency of the improved cookstove type *i* and batch *j* during year *y*
Source of data	Calculation
Description of measurement methods and procedures to be applied	To adopt Option V given in the methodology: "Efficiency of the improved cookstoves to be estimated using equation 5 above where loss in efficiency per year is calculated, and therefore this parameter does not need to be monitored"
Frequency of monitoring/recording	Annually
Value monitored	The value below is applied.

Vintage	Time Period	$\eta_{new,y,i,j}$
1	29-November-2020 to 28-November-2021	32.43%
2	29-November-2021 to 28-November-2022	32.11%

Monitoring equipment	Calculated value
QA/QC procedures to be applied	This parameter has been calculated using equation 5 of the applied methodology.
Purpose of the data	Calculation of emission reductions
Calculation method	Calculation was performed using equation below: For Vintage 1 stoves - $\eta_{new,y,i,j} = \eta_p \times (DF_n)^{y-1} \times 0.94$ $= 0.345 \times (0.99)^{1-1} \times 0.94$ $= 0.3243$ For Vintage 2 stoves: $= 34.5\% \times (0.99)^{2-1} \times 0.94$ $= 0.3211$
Comments	No comments

Data / Parameter	$B_{y=1,new,i,j,survey}$
Data unit	Tonnes per device per year

Description	Annual quantity of woody biomass used by improved cookstoves in tonnes per device of type i and batch j, determined in the first year of the implementation of the project through a sample survey.
Source of data	First Monitoring survey
Description of measurement methods and procedures to be applied	Sampling standard "sampling and surveys for CDM project activities and programme of activities" version 9 was used for determining the sample size This value was determined in the first year of the introduction of the devices through sample surveys.
Frequency of monitoring/recording	In the first year of project implementation
Value monitored	1.0758
Monitoring equipment	Weighing scale
QA/QC procedures to be applied	Calibration of weighing scales used for measuring the fuel wood was done in house before start using on site.
Purpose of the data	Calculation of emission reductions
Calculation method	This is monitored value
Comments	This parameter was validated and verified by VVB during the first verification as per the methodology requirement.

Data / Parameter	Life Span
Data unit	Number of years
Description	The operating lifetime of the project device.
Source of data	Manufacturer's specification
Description of measurement methods and procedures to be applied	TLC cookstoves manufactured under the project activity match the fixed design specification. This has achieved by using brick molds of specified dimensions to make bricks used for stove construction locally. This ensured, that each stove that is built at individual end user household measures exactly same as the dimensions specified by the manufacturer. Post construction, training has been provided to end users on use, care, and upkeep of these stoves. PP conducted periodic audits and surveillance of the stoves distributed under the project activity to ensure their proper functioning throughout the project lifetime. This along with spot audits and after installation maintenance services, ensure that

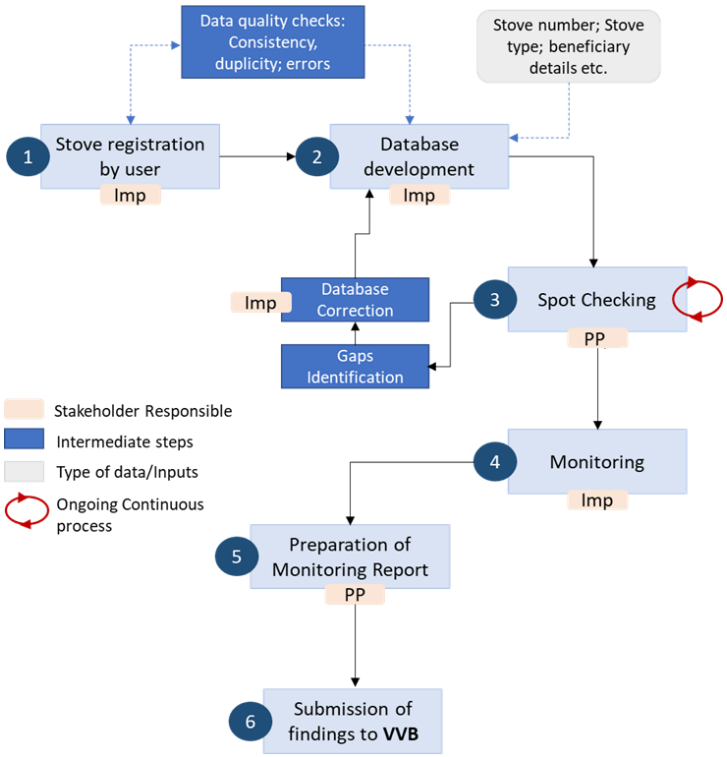
	the project stoves continue to work at efficiencies as specified by the manufacturer.
Frequency of monitoring/recording	Once at the time of project stove installation
Value monitored	10
Monitoring equipment	No equipment was used to monitor this parameter
QA/QC procedures to be applied	This parameter is referred from the Manufacturer's specification
Purpose of the data	Calculation of emission reductions
Calculation method	No calculation used for this parameter
Comments	No comments

4.3 Monitoring Plan

The project's monitoring system follows the monitoring plan described in section 5.3 of the registered VCS-PD.

The monitoring system applied involves a number of key elements to ensure that the PP has high-quality, unbiased and reliable information regarding the performance of the project in terms of implementation and outcomes, and for the purposes of calculating Verified Carbon Units (VCUs) following VCS methodology VMR0006, version 1.1 on the basis of the amount of non-renewable biomass saved by the ICS in the project activity.

The below flow-chart illustrates the roles and responsibilities of the parties during the implementation of the monitoring plan for the project activity. In the below flowchart, the project implementer is abbreviated to "Imp", and can be the project proponent by the PP.



Roles and Responsibilities

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1. **Implementer: User registers stove:** Project implementer has been collected/received the necessary information required for the Registration process from the user. The Means of collecting this information were through the use of ICTs. Both project Implementers' staff and project proponent's staff double checks the accuracy of information provided, and requests for field staffs' additional clarifications if needed.

2. **Implementer: Data logged into database:** The data of the project registered by the implementer's staff gets uploaded automatically since ICTs is used. Project proponent double checks the information included in the database and checks for duplications. Any duplicate information is found, it is investigated, checked for the errors, gets corrected or is excluded from the database if it is found to be a true duplicate entry.

3. **Project Proponent: Spot- checking (ongoing):** Project Proponent has a procedure for internal auditing called spot-checking, where field staff randomly selects households to ensure proper functioning of the project stoves throughout the project lifetime and to ensure that the project stoves continue to work as efficient as specified by the manufacturer. Field staff of project proponent randomly select units included in the database and visit or contact the stove owners to cross-check the information on the database with the factual evidence in

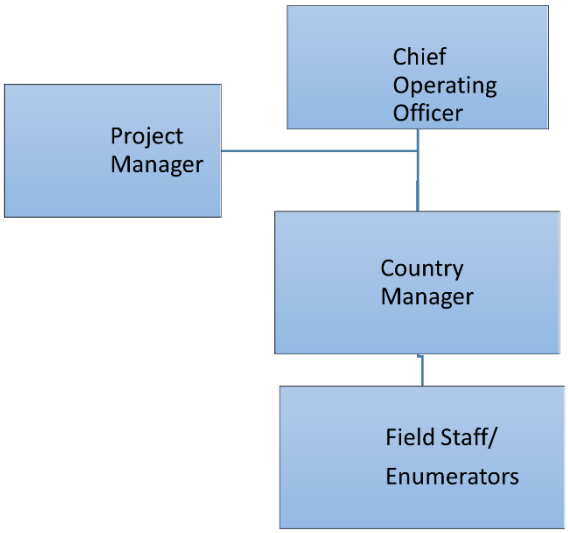
the field. Any inconsistencies found (e.g., change in the address of a user) gets updated on the database, and in case, ICS are found to be no longer in use, they get clearly marked as such and is excluded from emission reductions calculations.

During the spot check, if any of the project stoves was found to be in poor working condition like cracked/damaged or with missing metal parts, the stove owner repairs the stove as they have been trained during installation. If the stove owners are unsuccessful in repairing, the field staff informs the implementer to provide the necessary assistance and the missing metal parts are reported to the management of implementer who then either provides the parts from their existing stocks or request the same to project proponent who procured those from their suppliers. Implementing partner then provides those parts to the stove owners. This is a continuous process.

4. **Implementer: Monitoring:** Project implementer follows the requirements as per VCS-PD to collect the necessary information for a monitoring report.

5. **Project Proponent: Preparation of monitoring report:** The project proponent prepares the final monitoring report to be provided to the VVB for verification of emission reductions.

The PP is comprised of Project Manager, Chief Operating officer, Country manager and field staffs/enumerators to support the Team. The organizational chart can show as below:



Roles and responsibilities

Project Manager

- Ensures compliance of the technology with project requirements.
- Follows up of registration of any project and issuance of VCUs.
- Oversees the proper implementation of project.
- Communicate with Verra and VVB.

Chief Operating Officer

- Maintain record of issued serial numbers.
- Authenticates any changes/replacements of serial numbers during the life span of the ICS.

Country managers

- oversees the execution of training, which includes all aspects of stove design, construction, use & maintenance, of the field staff of project proponent and project implementer.
- Periodically checks and confirms that the installed ICS conform to the standards detailed in the project description.
- Procurement and delivery of stove parts, posters, brochures, and stove ID cards (QR cards).
- Checks and keeps control of all issued serial numbers.

Field staff/Enumerator

- Execute installation and registration of stoves with the implementation partner in the selected households.
- Assist the team in conducting the monitoring survey.
- Conducts spot checking of the installed stoves.

The PP coordinates and manages the implementation of each element of the monitoring plan.

Data measuring, recording Method and Implementation of Sampling Approaches

Steps 1, 2 and 3 – Involves capture end user information and populated the database, as well as provided database quality control.

Step 4 -Involves creating sampling surveys to capture data on number of project devices operating during year y ($N_{y,j,j}$) .

Parameter	Description of Parameter	Sampling approach (outcome in brackets)
$N_{y,j,j}$	Number of project devices operating during year y	Visual inspection of the premises to see if ICS is operational and in use. Interview with end user if required to verify that ICS is still in use [Yes/No]

Due to the large number of ICS envisioned to be distributed in the project activity, it is not economically feasible to monitor each individual ICS unit distributed. Therefore, representative sampling was undertaken that is designed in line with the requirements of the Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities version 09.0. Using simple random sampling formula,

Sample size calculation:

(i) Parameter $N_{y,i,j}$:

To estimate the sample size for the parameter $N_{y,i,j}$ the following equation is used:

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

Where:

n = Sample size

N = Population size (Total number of households/ICS)

p = Expected proportion

1.645 = Represents the 90% confidence required

0.1 = Represents the 10% relative precision

The sampling size is calculated as follows.

PP is responsible for sample size calculation. The calculation of the required sample size for $N_{y,i,j}$ parameter in this monitoring period is illustrated below.

The calculation of the required sample size for $N_{y,i,j}$ parameter in this monitoring period is illustrated below. During 1st and 2nd monitoring surevy , 100% of ICS were found to be in operation. So for this monitoring period also, PP has conservatively considered the same value of expected proportion (p) as 0.85.

Definition	Value	Justification
The population size N is	191,974	Number of stoves registered in database
The expected proportion p for ny,i is	0.85	A conservative assumption of 85% is applied for sample size calculation.
Sample size	47.74	Calculated
Sample size (rounded up)	48	Calculated
Total samples selected short listed	69	Including 30% non-response

$$n \geq \frac{1.645^2 \times 191{,}974 \times 0.85(1-0.85)}{(191{,}974-1) \times 0.1^2 \times 0.85^2 + 1.645^2 \times 0.85(1-0.85)} = 47.74$$

48 ICS were calculated to be surveyed, to compensate for any attrition, outliers or non-response associated with the sample, 30% extra samples have been additionally selected. Therefore the sample size for parameters $N_{y,i,j}$ calculated for the monitoring survey is 69.

Sample stoves were selected using the random number generator technique. Under this project activity two stoves were distributed in one household. Survey team also surveyed the second stove, if distributed in the sample household. Therefore, during this survey total 96 stoves were surveyed.

Step 5- Involved monitoring analyses and accuracy and precision checks. The project proponent examined the monitoring data to confirm accuracy of results, analyzed the data, and estimated the resulting emissions reductions outlined in this monitoring report.

The following parameter was obtained though sampling:

1. $N_{y,i,j}$: Number of stoves in operation

Simple random sampling was used for all monitoring parameters in accordance with the Sampling Plan of section 5.3 of the VCS-PD. The objective was to obtain reliable and unbiased estimates of the monitoring parameters. Reliability levels were set at 90% confidence and 10% precision as per VMR0006, version 1.1.

A single homogeneous population (Primary Sampling Unit, as per VCS-PD) was considered for the parameter.

The following table summarizes the sample sizes and results. The sampling sheet named "VCS_2341_ZimMP3_Sampling cal." has been submitted to the VVB and it contains all the data analysis.

Monitored Parameter	Sample size	Actual Samples Surveyed (ICS)	Survey Results	Precision achieved
Number of stoves in operation ($N_{y,i,j}$)	48	96	100%	0.00%

Implementation and quality assurance and control and procedures used for handling any internal auditing performed and any non-conformities identified:

Data obtained from the samples were used to estimate proportions and mean values for the parameters described above. The values were then factored into the emissions reduction calculations. Project proponent provides training to monitoring personnel on monitoring procedures, including provisions for maximizing response rates, documenting out-of-population cases, refusals and other sources of non-response. The monitoring survey included several questions to support the information on the key monitoring parameters. These included visual inspections to confirm stove use and presence of baseline stoves, comments by surveyors, check of randomly selected households against actual household information, and refusal tracking. These strategies aimed at minimizing non-response and surveyor's biases.

5 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

5.1 Baseline Emissions

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

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

Where:

i	=	Indices for the situation where more than one type/model of improved cookstove is introduced to replace three-stone fire
J	=	Indices for the situation where there is more than one batch of improved cookstove of type i
ER_y	=	Emission reductions during year y in t CO_2e
$ER_{y,i,j}$	=	Emission reductions by improved cookstove of type i and batch j during year y in t CO_2e

$$ER_{y,i,j} = B_{y,savings,i,j} \times NCV_{wood\ fuel} \times f_{NRB,y} \times \left(EF_{wf,CO2} + EF_{wf,non\ CO2}\right) \times N_{y,i,j} \times 0.95 \qquad \text{Equation (2)}$$

Where:

$B_{y,savings,i,j}$	=	Quantity of woody biomass that is saved in tonnes per improved cookstove of type i and batch j during year y
$f_{NRB,y}$	=	Fraction of woody biomass that can be established as non-renewable biomass (f_{NRB})
$NCV_{wood\ fuel}$	=	Net calorific value of the non-renewable woody biomass that is substituted or reduced (IPCC default for wood fuel, 0.0156 TJ/tonne)[11]
$EF_{wf,CO2}$	=	CO_2 emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 112 tCO_2/TJ)[12]
$EF_{wf,non\ CO2}$	=	Non-CO_2 emission factor for the use of wood fuel in baseline scenario (IPCC default for wood fuel, 26.23 tCO_2/TJ)[13]
$N_{y,i,j}$	=	Number of improved cookstoves of type i and batch j operating during year y
0.95	=	Discount factor to account for leakage

[11] 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 1 Introduction
[12] 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion
[13] 2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 2 Energy, Chapter 2 Stationary Combustion

To calculate $B_{y,savingsi,j}$, we use equation 4 of the applied methodology[14]

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

Where:

$B_{y=1,new,i,survey}$	Annual quantity of woody biomass used by improved cook stoves in tonnes, determined in the first year of the implementation of the project through a sample survey
η_{old}	Efficiency of baseline cookstove. A default value of 0.10 has been used as the replaced system is a three stone fire, or a conventional system with no improved combustion air supply or flue gas ventilation system, i.e., without a grate or a chimney.
$\eta_{new,I,j}$	Efficiency of the improved cook stove determined using Equation 5 of the methodology.

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

Where:

η_p	Efficiency of project stove (fraction) at the start of project activity
$(DF_n)^{y-1}$	Discount factor to account for efficiency loss of project cookstove per year of operation (fraction). default value of 0.99 efficiency loss per year has considered for the project activity
0.94	Adjustment factor to account for uncertainty related to project cookstove efficiency test

The full set of emission reductions calculation for two stoves per HH is provided in emission reduction spread sheets.

5.2 Project Emissions

The methodology does not account for project emissions separately, but instead quantifies net emission reductions achieved by the project.

5.3 Leakage

Leakage is considered as default 0.95 in accordance with methodology.

[14] Equation 4 of methodology VMR0006, version 1.1

5.4 Net GHG Emission Reductions and Removals

Calculation of GHG Emission Reductions

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

Parameter	Description	Unit	Source	Value
$B_{y,savings,1}$	Total biomass that is saved in tonnes during the monitoring period of vintage 1	Tonnes	Calculated from results of sampling survey conducted during 1st Monitoring survey	2.4131
$B_{y,savings,2}$	Total biomass that is saved in tonnes during the monitoring period of vintage 2	Tonnes	Calculated	2.3782
Annual energy savings/ stove	annual energy saving from each project activity instance (i.e., each project ICS).	GWh_{th}/stove /year	Calculated	0.0104
$f_{NRB,y}$	Fraction of woody biomass saved by the project activity in year y that can be established as non-renewable biomass	Fraction	National value obtained from local study	0.88
NCVwood fuel	Net Calorific Value of biomass	TJ/tonne	IPCC default for wood fuel	0.0156
$EF_{wf,CO2}$	CO2 emission factor for the use of wood fuel in baseline scenario	tCO2e/TJ	IPCC default for wood fuel	112
$EF_{wf,non\ CO2}$	Non-CO2 emission factor for the use of wood fuel in baseline scenario	tCO2e/TJ	IPCC default for wood fuel	26.23
0.95	Discount factor to account for leakage	Fraction	Default from VMR0006 version 1.1	0.95
η_{old}	Efficiency of the system being replaced	Fraction	Default from VMR0006 version 1.1	0.10
$\eta_{new,i}$	Efficiency of the system being deployed as part of the project activity.	Fraction	Calculated	Vintage 1: 0.3243 Vintage 2: 0.3211

$N_{y,i,j}$	Number of stoves still in operation during the monitoring period	Quantity	Stove registration/Installation database	191,974
$B_{y=1,new,i,survey}$	Quantity of woody biomass used in the absence of the project activity	Tonnes / household/ year	First Monitoring Survey	1.0758

Sample calculations are as follows:

PP has calculated the emission reduction for each ICS installed under the project activity separately. In this section example for ER calculation of one ICS (stove serial number CQCVZW0090778) is provided:

For the year 2022

For year 2022, vintage for the stove: Vintage 1

No. of days in MP: 199 (from 01-March- 2022 to 15-September-2022)

Year fraction: 199/365 = 0.55

$B_{y=1,new,i,survey}$ = 1.0758

$\eta_{new,i,j}$ = 0.3243

$B_{y,savings,i,j}$ = 1.0758 x ((0.3243/0.1) - 1)

= 2.4131

$ER_{y,i,j}$ = 1.0758 x 0.0156 x 0.88 x (112 + 26.23) x 1 x 0.95 x 0.55

= 2.37

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2022 (1-March-2022 to 15-September-2022)	454,274	0	0	454,274
Total	**454,274**	**0**	**0**	**454,274**

Ex-ante GHG emission reductions and removals and the achieved emission reductions and removals for this monitoring period.

Ex-ante emissions reductions/removals (tCO_2e)	Achieved emissions reductions/removals (tCO2e)	Percent difference (%)	Justification for the difference
389,589	454,274	16.60	Actual emission reduction achieved are higher than the value estimated in ex-ante calculation, due to 100% ICS were found operating during the monitoring survey as compared to the 10% annual stove loss rate assumed during validation.

APPENDIX A: EVIDENCE - SCOPE 3 EMISSIONS DOUBLE CLAIMING

Public notice published on website of PP[15].

cquestcapital.com/latest/public-notices/

Public Notice for VCS Project 3850

SHINE- Distribution of LED Lightbulbs in India-1

This is to bring to your kind notice that Brightspark Energy Private Limited is implementing a grouped project titled "SHINE- Distribution of LED Lightbulbs in India-1" (VCS ID 3850). It involves the distribution of energy-efficient Light Emitting Diodes (LEDs) to grid-connected households in the state of Telangana(south). For this purpose, we had procured LEDs from different manufacturers including SYSKA which were further distributed via Kiosk based approach and direct installation in grid-connected households with support of distribution agency-Nirmala Enterprises.

Verified Carbon Units (VCUs) may be issued for the Greenhouse Gas emission reductions and removals for which Brightspark Energy Private Limited (BEPL) will be claiming carbon credits under VERRA. Based on the existing carbon rights transfer agreement signed between the parties, BEPL will be sharing the carbon credits generated from this grouped project with the entities i.e., Convergence Energy Services Limited (CESL) and Korea Impact Carbon Corporation (KICC) and Ecoeye Co., Ltd.

Public Notice for VCS Project 2341

Installation of High Efficiency Wood Burning Cookstoves in Zimbabwe

This is to bring to your kind notice that C-Quest Capital SGS Stoves Private Limited is implementing a grouped project titled, "Installation of High Efficiency Wood Burning Cookstoves in Zimbabwe" (VCS ID 2341). It involves distribution of improved cook stoves (ICS) to households in Republic of Zimbabwe. For this purpose, we are procuring metal parts of TLC-CQC Rocket Stove from Ener-G-Africa Holding Ltd. We have involved various local implementation partner for distribution of project stoves in Zimbabwe.

Verified Carbon Units (VCUs) may be issued for the greenhouse gas emission reductions and removals for which C-Quest Capital SGS Stoves Private Limited will be claiming carbon credits under VERRA.

This notice intends to apprise you about the project, to avoid any potential risk of double claiming of Scope 3 emissions under this grouped project.

[15] https://cquestcapital.com/latest/public-notices/

MAIL SENT TO IP IN ZIMBABWE

Notice: 2341 Scope 3 Zimbabwe - Taonabiz

Sarah Stever
To Tawanda Mutyambizi
Cc Jacquelyn Sagasta

3/1/2023

Dear Tawanda,

This is to bring to your kind notice that C-Quest Capital SGS Stoves Pvt. Ltd. is implementing a grouped project titled, "Installation of High Efficiency Wood Burning Cookstoves in Zimbabwe" (VCS ID 2341). It involves distribution of improved cook stoves (ICS) to households in Republic of Zimbabwe. For this purpose, we have involved your organization for distribution of project stoves in Republic of Zimbabwe.

Verified Carbon Units (VCUs) may be issued for the greenhouse gas emission reductions and removals for which C-Quest Capital SGS Stoves Pvt. Ltd. will be claiming carbon credits under VERRA. The ownership of these credits lies exclusively with C-Quest Capital SGS Stoves Pvt. Ltd.

This mail intends to apprise you about the project, to avoid any potential risk of double claiming of Scope 3 emissions under the grouped project.

Regards,
Sarah

Sarah Stever
Country Director - Tanzania, The Gambia, Zimbabwe
C-Quest Capital LLC
1015 18th Street NW Suite 730
Washington, DC 20036
Phone: +1 415 290 1144
Website: www.cquestcapital.com

CQuestCapital

Environmental Finance Voluntary Carbon Market Rankings 2022 Winner | World's Best Project Developer in Energy Efficiency

APPENDIX B- LIST OF ABBREVIATIONS

CDM: Clean Development Mechanism

CQC: C-Quest Capital SGS Stoves Private Limited

GHG: Green House Gas

ICS: Improved Cookstoves

PP: Project Proponent

SDG: Sustainable Development Goals

SD VISta: Sustainable Development Verified Impact Standard

TLC: Total Land Care

VCS: Voluntary Carbon Standard

VCU: Voluntary Carbon Unit