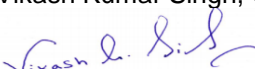




**Verification and certification report form for
CDM programme of activities
(version 02.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the programme of activities (PoA)	Fuel Efficient Stoves in Zambia UNFCCC PoA reference number: 6864	
Version number(s) of the PoA-DD(s) to which this report applies	6.2	
Version number of the verification and certification report	02	
Completion date of the verification and certification report	02/07/2018	
Monitoring period number and duration of this monitoring period	Monitoring period number 03 28/01/2017 to 27/01/2018 (including both the days)	
Number and version number of the monitoring report to which this report applies	Monitoring report number: 1 Version number of the monitoring report: 2.0	
Coordinating/managing entity (CME)	3 Rocks Ltd. (3RL)	
Host Parties	Host Parties of the PoA	Is this a host Party to a CPA covered in this report? (yes/no)
	Zambia	Yes
Applied methodologies and standardized baselines	AMS II.G., version 03	
Mandatory sectoral scopes linked to the applied methodologies	3: Energy demand	
Conditional sectoral scopes linked to the applied methodologies, if applicable	Not applicable	
Estimated amount of GHG emission reductions or GHG removals for this monitoring period in the included CPAs covered in this report	PoA: 122,052 tCO ₂ e 6864-0001 GHG emission reductions: 40,684 tCO ₂ e 6864-0002 GHG emission reductions: 40,684 tCO ₂ e 6864-0003 GHG emission reductions: 40,684 tCO ₂ e	
Certified amount of GHG emission reductions or GHG removals for this monitoring period for the included CPAs covered in this report	6864-0001 GHG emission reductions: 20,211 tCO ₂ e 6864-0002 GHG emission reductions: 19,495 tCO ₂ e 6864-0003 GHG emission reductions: 12,556 tCO ₂ e Total: 52,262 tCO₂e	
Name and UNFCCC reference number of the DOE	Carbon Check (India) Private Ltd. E-0052	
Name, position and signature of the approver of the verification and certification report	Vikash Kumar Singh, Compliance Officer 	

SECTION A. Executive summary

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Introduction:

The Coordinating Managing Entity has commissioned the DOE, Carbon Check (India) Private Ltd. (CCIPL) to perform an independent verification of the CDM Programme of Activities “Fuel Efficient Stoves in Zambia” in Zambia (hereafter referred to as “Programme of Activities” or “PoA”) for the CPAs titled “Fuel Efficient Stoves in Zambia (3RL CPA No.01)”; “Fuel Efficient Stoves in Zambia (3RL CPA No.02)” and “Fuel Efficient Stoves in Zambia (3RL CPA No.03)”. The PoA helps in reducing the emissions of greenhouse gases by distribution of the fuel-efficient cook stoves in individual households of Zambia. The fuel-efficient cook stoves are replacing the traditional three-stone/rock stoves that were being used in the baseline scenario.

During the current monitoring period all the three included CPAs (6864-0001, 6864-0002 and 6864-0003) have been implemented and hence emission reductions for all the three CPAs are being claimed. The CME is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the component project activities.

This report summarises the findings of the verification of the project, performed on the basis of paragraph 62 of the CDM Modalities & Procedures, as well as criteria given to provide for consistent project operations, monitoring and reporting and the subsequent decisions by the CDM Executive Board. Verification is required for all registered CDM project activities intending to confirm their achieved emission reductions and proceed with request for issuance of CERs. This report contains the findings and resolutions from the verification and a certification statement for the certified emission reductions.

Objective:

Verification is the periodic independent review and ex-post determination of both quantitative and qualitative information by a Designated Operational Entity (DOE) of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during a defined monitoring period.

Certification is the written assurance by a DOE that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify emission reductions reported for the “Fuel Efficient Stoves in Zambia” in the host country Zambia for the period 28/01/2017 to 27/01/2018.

The purpose of verification is to review the monitoring results and verify that the monitoring methodology was implemented according to the monitoring plan and monitoring data, and used to confirm the reductions in anthropogenic emissions by sources, is sufficient, definitive and presented in a concise and transparent manner. CCIPL’s objective is to perform a thorough, independent assessment of the registered programme of activities.

In particular, the monitoring plan, monitoring report and the project’s compliance with relevant UNFCCC and host Party criteria are verified in order to confirm that the component projects have been implemented in accordance with the previously registered/included component project design and conservative assumptions, as documented. It is also confirmed if the monitoring plan is in compliance with the registered/included CPA-DDs and approved monitoring methodology.

Scope:

The scope of the verification is:

- To verify the project implementation and operation with respect to the registered/included CPA-DDs

- To verify the implemented monitoring plan with the registered/included CPA-DDs and the applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that the reported emission reductions are complete and accurate in order to be certified.

The verification comprises a review of the monitoring report over the monitoring period from 28/01/2017 to 27/01/2018 and based on the registered/included CPA-DDs in part of the monitoring parameters and monitoring plan, emission reduction calculation spreadsheet, monitoring methodology and all related evidences provided by the CME.

On-site visit and stakeholders' interviews are also performed as part of the verification process.

The verification team assigned by the DOE concludes that the PoA-DD (Version 6.2, dated 07/01/2013) /B04/, Component Project Activities 6864-0001, 6864-0002 and 6864-0003 as described in the registered CPA-DDs (Version 6.2, dated 07/01/2013; Version 2.1, dated 23/10/2013 and Version 2.1, dated 23/10/2013 respectively) /B04/ and monitoring report (version 2.0, dated 27/06/2018) /2/, meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the requirements of CDM VVS for PoAs (version 01.0) /B01-1/.

The component project activities were correctly implemented according to selected monitoring methodology, monitoring plan and the registered/included CPA-DDs. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on site visit the verification team confirms that the PoA has resulted in the 52,262 tCO₂e emission reductions during the third monitoring period.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team members

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader/ Technical Expert	IR	Agarwalla	Sanjay Kumar	CCIPL	X	X	X	X
2.	Local Expert	EI	Msoni	Joyce	CCIPL		X	X	

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Singh	Vikash Kumar	CC IPL
2.	Approver	IR	Singh	Vikash Kumar	CC IPL

SECTION C. Application of materiality in conducting the verification

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human Error: Recording and reporting of the information in the ER spreadsheet.	Medium	All the ER spreadsheet data of the stoves, including sales database, determination of parameter for efficiency testing including data calculation. This includes all the parameters to be monitored ex-post as per the PoA-DD/CPA-DDs /B04/.	The risk has been mitigated by the training of the personnel involved in the data capture, calculation and by following the monitoring responsibilities. The training records have been checked by the verification team /10/ which was also confirmed during the on-site visit interviews.
2.	Information System: Use of spreadsheets without adequate controls related to data changes/updates, version tracking, traceability, security	Medium	The data is recorded in the spreadsheets based on the raw data collected during the field visits. The access to the spreadsheets for calculation of ERs, monitoring and sales database and Stove efficiency testing records.	The identified risk has been mitigated by managing access to the records. It was confirmed through interviews that the raw data is collected by the field agents and then transmitted and stored electronically to the PP's office. The data quality control is maintained by the Assigned Monitoring Officer.
3.	Accuracy of the measuring equipment	Low	Check the calibration records for the measurement equipment used for efficiency test.	The risk due to accuracy of the measuring equipment has been ensured by checking calibration certificates of the measuring equipment used for stove efficiency (water boiling tests) /12/.

C.2. Consideration of materiality in conducting the verification

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The threshold of materiality was evaluated based on §13 of "Guideline: Application of materiality in verifications" Version 02.0 /B08/ and § 307 of CDM VVS for PoAs, version 01.0/B01-1/. It was concluded that the materiality threshold applicable to the project activity based on actual emission reductions achieved is 5% of 52,262 tCO₂e which is equal to 2,613 tCO₂e.

In planning the verification, verification team took cognizance of para 11 and 12 of the "Guideline: Application of materiality in verifications" Version 02.0 /B08/. A materiality threshold of 2,613 tCO₂e is determined in line with para 307 (d) of CDM VVS for PoAs, version 01.0.

Based on the above, activities in which risks were assessed were:

1. Monitoring system including the data input procedure (including relevant personnel and applicable template forms used)
2. Copy of the agreement between household and Project Participant (s) (origin of data)
3. Stove unique ID system
4. ER sheet (application of data)
5. Data flow
6. Data control procedures
7. Stove efficiency test (WBT) records

In conducting the verification, DOE took cognizance of para 13-17 of the “Guideline: Application of materiality in verifications” Version 02.0 /B08/ and based on the input of data from different sources checked through sampling of records during on-site and off-site. Data flow was checked through comparison of data in hand written forms /5/, electronic database and ER sheet /4/. The competence of the personnel involved in conducting the stove efficiency testing, recording of data and calculation of the emission reductions data has been checked by the verification team by means of on-site visit interviews.

The risks identified were mitigated through cross check with all sets of documents. The verification team performed the following checks in order to mitigate the effects of the above-identified sources of error:

Mitigation of Human error risks: The verification team mitigated the risk by checking the training records /10/ of the personnel and during the on-site visit interviews. Further, data was crosschecked with the ER calculation spreadsheet /3/ and the raw data.

Mitigation due to error in Information system: Verification team by conducting interviews with the personnel responsible for such activities mitigated the risk due to error in information system. It was confirmed through interviews that the raw data is collected by the field agents and then transmitted and stored electronically to the PP’s office. The data quality control is maintained by the Assigned Monitoring Officer from the PP.

Accuracy of the measuring equipment: The risk due to inaccuracy in measurements is mitigated by reviewing calibration certificates of all the project equipment. The verification team has reviewed the dates of calibration and to check whether all equipment is being calibrated at regularly defined intervals.

CC IPL has conducted a review of the PoA-DD /B04/, the monitoring report /2/, emission reduction calculation spread sheet /4/ and the data provided and the assessment carried out above. CC IPL confirms a reasonable level of assurance for the claimed emission reductions or removals are free from material errors, omissions or misstatements.

SECTION D. Means of verification

D.1. Desk/document review

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The verification was performed primarily based on the review of the Monitoring report /1/ /2/ and the supporting documentation. This process included review of data and information presented to verify their completeness and review of the monitoring plan/B04/ and monitoring methodology/B02/. Documents reviewed or referenced during the verification are listed in Appendix 3 below.

D.2. On-site inspection

Duration of on-site inspection: 21/06/2018 to 22/06/2018				
No.	Activity performed on-site	Site location	Date	Team member
1.	An assessment of the implementation and operation of the registered project activity as per the registered PoA-DD/B04/,	Zambia, visit to sample households	21/06/2018 to 22/06/2018	Sanjay Agarwalla Jyoce Msoni

	registered/included CPA-DDs/B04/.			
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters	Zambia, visit to sample households	21/06/2018 to 22/06/2018	Sanjay Agarwalla Jyoce Msoni
3.	Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the CPA-DDs/B04/	Zambia, visit to sample households	21/06/2018 to 22/06/2018	Sanjay Agarwalla Jyoce Msoni
4.	A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources	3 Rock Limited office, Katete	21/06/2018 to 22/06/2018	Sanjay Agarwalla Jyoce Msoni
5.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the CPA-DDs/B04/ and the selected methodology and corresponding tool(s), where applicable	3 Rock Limited office, Katete	21/06/2018 to 22/06/2018	Sanjay Agarwalla Jyoce Msoni
6.	A review of calculations and assumptions made in determining the GHG data and emission reductions	3 Rock Limited office, Katete	21/06/2018 to 22/06/2018	Sanjay Agarwalla Jyoce Msoni
7.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	3 Rock Limited office, Katete	21/06/2018 to 22/06/2018	Sanjay Agarwalla Jyoce Msoni

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			

1.	Chirwa	Robert	3 Rocks Limited	21/06/2018 to 22/06/2018	Data and information flow, Data input device, Roles and responsibility, Project implementation and operation, monitoring procedure, Quality Assurance – Management and operating system, distribution records, Survey records, Qualification and Training	Sanjay Agarwalla Jyoce Msoni
2.	Serenje	Nancy	CEEEZ	21/06/2018 to 22/06/2018	Monitoring procedure, Survey records, WBT procedure and records	Sanjay Agarwalla Jyoce Msoni
3.	Lohia	Rohit	Climate-Secure Services	25/06/2018 Interviewed through skype	Project operation, CER calculation and completeness of monitoring report, Quality Assurance – Management and operating system, compliance of monitoring plan with monitoring methodology and registered CPA-DDs.	Sanjay Kumar Agarwalla

D.4. Sampling approach

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The total population of the stoves under the three CPAs together are 40,437.

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

1. Number of stoves still operation during the monitoring period (NS)
2. Thermal efficiency of the stove (η_{new})
3. Quantity of biomass saved per stove per annum – to adjust the value of B_{old} for the continued usage of baseline 3 Rock Stoves in some of the households (B_{new})

Simple random sampling across all the three CPAs included in the PoA was applied by CME for selection of the monitoring samples with 95/10 confidence/precision for all the three parameters for annual monitoring which is deemed acceptable as per the registered PoA-DD /CPA-DDs. Please refer to the section E.3.4.3 of this report on detailed assessment on sampling plan opted by the CME.

In line with paragraph 25 of the Sampling Standard, the verification team has applied a sampling approach for on-site visits and remote surveys as part of verification. Now as the CME had applied sampling approach, the verification team has chosen acceptance sampling for ASG parameter in accordance with paragraph 27 of the sampling standard /B07/.

DOE used sampling during verification for checking the CME's sample size. Considering that Zambia is a Least Developed Country, applying paragraph 33 (c) of the sampling standard, version 07 /B07/, a sample size of 8 households was chosen (with no discrepant records). A sample size of 8 was required, based on an AQL of 0.5 % and UQL of 20 %, producer risk 10 % and consumer risk 20 %. Acceptance number (c) thus determined for the sample is 0. It was observed that out of the 8 samples, all 8 stoves were found to be operational which matched with the CME's records and hence no discrepant records were observed with the published MR /1/ and ER sheet /3/ and thus c=0. Thus, CME's set of records has been accepted in line with § 32 of the sampling standard, version 07 /B07/. For the ASG parameter a common interview questionnaire /16/ was prepared and was used during the survey by the CME. Verification team has cross verified these sample documents during the on-site visit.

For the SESG parameter, WBT have been performed and this has been checked by the verification team with the related spreadsheets. Interviews were conducted during the on-site visit with the relevant persons from CEEEZ who had conducted the WBT at the sampled households. The verification team found the team to be competent for carrying WBT. Furthermore, the verification team has cross checked all the raw data input records in the WBT calculation spread sheets including the calculation procedure for the sampled households and found them to be correct. All the raw data forms for the WBT carried out for SESG parameter were checked by the verification team and thus no sampling of data is required. In addition, for the SESG parameter, the verification team randomly selected 8 households from the CME's sample list of 13 households for which WBT were done and conducted interviews. Through the interviews, it was confirmed that WBT tests were conducted by the CME.

The sampling plan implemented by the CME is in accordance with the applied approved monitoring methodology /B02/ and the PoA-DD/CPA-DDs /B04/. The CME has appropriately performed Simple Random Sampling procedure in line with the applied methodology and best suited for this type of project. As the registered PoA-DD /B04/ mentions the option for Simple Random Sampling procedure, it is acceptable to the verification team.

The necessary confidence / precision of 95/10 each of the parameters is met. This has been cross verified by the verification team from the supporting documents submitted /12/.

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
General			
Compliance of the monitoring report with the monitoring report form	02	01	00
Remaining forward action requests from validation and/or previous verification	00	00	00
CPA(s) considered for verification and covered in this report	00	00	00
Programme of activities			
Compliance of the programme implementation with the registered PoA-DD	00	00	00
Implementation and operation of the management system	00	00	00
Post-registration changes	00	00	00
<ul style="list-style-type: none"> • Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline 	00	00	00
<ul style="list-style-type: none"> • Corrections 	00	00	00
<ul style="list-style-type: none"> • Inclusion of a monitoring plan 	00	00	00
<ul style="list-style-type: none"> • Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools 	00	00	00

• Changes to the programme design or project design	00	00	00
• Change of coordinating/managing entity	00	00	00
• Changes specific to afforestation and reforestation activities	00	00	00
Component project activities			
Compliance of the CPA implementation with the included CPA design document	01	00	00
Post-registration changes	00	00	00
• Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline	00	00	00
• Corrections	00	00	00
• Changes to the start date of the crediting period of component project activities	00	00	00
• Inclusion of a monitoring plan	00	00	00
• Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools	00	00	00
• Changes to the programme design of project design	00	00	00
• Changes specific to afforestation and reforestation component project activities	00	00	00
Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline	00	00	00
Compliance of monitoring activities with the registered monitoring plan	00	00	00
• Data and parameters fixed ex ante or at renewal of crediting period	00	00	00
• Data and parameters monitored			
• Implementation of sampling plan	01	00	00
Compliance with the calibration frequency requirements for measuring instruments	01	00	00
Assessment of data and calculation of emission reductions or net removals	-	-	-
• Calculation of baseline GHG emissions or baseline net GHG removals by sinks	00	01	00
• Calculation of project GHG emissions or actual net GHG removals by sinks	00	00	00
• Calculation of leakage GHG emissions	00	00	00
• Summary of calculation of GHG emission reductions or net GHG removals by sinks	00	00	00
• Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA	00	00	00
• Remarks on difference from estimated value in included CPA	00	00	00
Assessment of reported sustainable development co-benefits	00	00	00
Global stakeholder consultation	00	00	00
Others (please specify)	00	00	00
Total	05	02	00

SECTION E. Verification findings**E.1. General****E.1.1. Compliance of the monitoring report with the monitoring report form**

Means of verification	Document Review
Findings	CAR 01, CL 01 and CL 02 had been raised and resolved. Please refer to Appendix 4 of this report for further details.
Conclusion	<p>CME has used the Monitoring report form for CDM programme of activities, Version 02.0 /B03/. Verification team confirms that the latest available version of monitoring report /1/ has been used by the CME and the MR is in compliance of the monitoring report form with the relevant form and instructions therein /B03/.</p> <p>CCIPL, had made the version 1.0, dated 17/05/2018 of the monitoring report /1/, covering the monitoring period from 28/01/2017 to 27/01/2018 (both days inclusive) publicly available on 24/05/2018.</p> <p>This confirms compliance with the §337 and §338 of CDM VVS for PoAs, version 01.0 /B01-1/.</p>

E.1.2. Remaining forward action requests from validation and/or previous verifications

>>

There are no forward action requests from validation and/or the previous (second) verification of the PoA.

E.1.3. CPAs considered for verification and covered in this report

Title and UNFCCC reference number of the CPA included in the PoA as of the end of this monitoring period	Is the CPA considered for this verification? (yes/no)	The date when the CPA was included	Version of the PoA-DD	Confirmation that a request for issuance including the CPA has been published for the previous monitoring period (Y/N)
CPA 6864-0001: Fuel Efficient Stoves in Zambia (3RL CPA No.01)	Yes	28/01/2013	Version 6.2	Y
CPA 6864-0002: Fuel Efficient Stoves in Zambia (3RL CPA No.02)	Yes	25/10/2013	Version 6.2	Y
CPA 6864-0003: Fuel Efficient Stoves in Zambia (3RL CPA No.03)	Yes	01/11/2013	Version 6.2	Y

E.2. Programme of activities**E.2.1. Compliance of the programme implementation with the registered programme design document**

Means of verification	Document Review, Interview
Findings	-
Conclusion	CCIPL by means of an on-site inspection and document review, assessed that all

	<p>physical features (technology, project equipment, and monitoring and metering equipment) of the included CPAs in the registered PoA-DD are in place and that the coordinating/managing entity has operated the PoA and the CPAs as per the registered PoA-DD and the CPA-DDs.</p> <p>There are no deviations or proposed or actual changes in the implementation or operation of the PoA and the included CPAs.</p> <p>The verification team confirms actual operation of the CPAs and PoA implementation and operation in compliance with the registered PoA-DD / CPA-DDs in order to confirm the compliance of § 339, § 340 and § 341 of CDM VVS for PoAs, Version 01.0 /B01-1/.</p>
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E.2.2. Implementation and operation of the management system

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The PoA management system including the record-keeping system has been explained in the registered PoA-DD /B04/. During the course of verification, verification team based on review of provided documents and OSV interview/observation has assessed this management system. Verification team evaluated that the management systems is in place to implement the monitoring plan as stated in the registered PoA-DD and the included CPA-DDs. This included the roles and responsibilities, data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system.</p> <p>As outlined in section B.6.1 of CPA-DDs /B02/ and section B.1 of the MR, monitoring is be done by the CME i.e., 3 Rocks Ltd. (3RL) by means of monitoring database. The data is further periodically checked by the CME to ensure there is no double counting.</p> <p>It was confirmed during the OSV and by checking the monitoring system that the representatives of CME fulfil all the roles and responsibilities related to the monitoring.</p> <p>The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan /B04/.</p> <p>The details about monitoring system have been provided in Section B.1 of the monitoring report /2/. The data flow and management and reporting structure was also checked during the site visit.</p> <p>The roles and responsibilities of data collection, transfer and aggregation procedures, data storage and archiving for the monitoring system have been provided in section B.1 of the MR /2/.</p> <p>The verification team confirms that the monitoring management system of the CDM PoA is in place; with the responsibilities properly identified and in place. This confirms the compliance of § 339 (a), § 346 (b) (iv) and § 346 of CDM VVS PoAs. Version 01.0 /B01-1/.</p>

E.2.3. Post-registration changes

E.2.3.1. Temporary deviations from the registered monitoring plan, applied methodology or applied standardized baseline

>>

There are no temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline during the monitoring period.

E.2.3.2. Corrections

>>

There are no corrections applicable to the monitoring period that have been approved by the Board during this monitoring period or to be submitted with the request for issuance.

E.2.3.3. Inclusion of a monitoring plan

>>

There are no inclusions of monitoring plan to the registered programme of activities has been approved by the Board during this monitoring period

E.2.3.4. Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline or other applied standards or tools

>>

There are no permanent changes to the registered monitoring plan or permanent deviation of the monitoring from the applied methodology during the current monitoring period.

E.2.3.5. Changes to the programme design or project design

>>

There are no changes to the programme design of the registered PoA-DD (including corresponding changes to project design of the generic CPA-DD(s)) and updates to the eligibility criteria for inclusion of specific-case CPAs in the PoA.

E.2.3.6. Change of coordination/managing entity

>>

Not applicable

E.2.3.7. Changes specific to afforestation and reforestation activities

>>

Not applicable to the type of the programme of activity.

E.3. Component project activities

E.3.1. Compliance of the CPA implementation with the included CPA design document

Means of verification	Document Review, Interview	
Findings	CL 03 had been raised and resolved. Please refer to Appendix 4 of this report for further details.	
Conclusion	The implementation status of the PoA and the component project activities is:	
	Co-ordinating and Managing entity/Project Participants:	3 Rocks Ltd.
	Title of the PoA:	Fuel Efficient Stoves in Zambia
	UNFCCC registration No:	6864
	Applied Baseline and monitoring methodology:	AMS-II.G (version 03)
	Title of the CPA:	Fuel Efficient Stoves in Zambia (3RL CPA No.01)
	CPA reference number:	6864-0001
	Date of inclusion:	28/01/2013
	CPA implementer	3 Rocks Ltd.
	Project Scale:	Small scale
	Location of the CPAs:	Zambia
	CPA crediting period:	28/01/2013 to 27/01/2020
	Reported monitoring Period verified in this verification:	28/01/2017 to 27/01/2018
	Title of the CPA:	Fuel Efficient Stoves in Zambia (3RL CPA No.02)
	CPA reference number:	6864-0002

Date of inclusion:	25/10/2013
CPA implementer	3 Rocks Ltd.
Project Scale:	Small scale
Location of the CPAs:	Zambia
CPA crediting period:	25/10/2013 to 23/10/2020
Reported monitoring Period verified in this verification:	28/01/2017 to 27/01/2018

Title of the CPA:	Fuel Efficient Stoves in Zambia (3RL CPA No.03)
CPA reference number:	6864-0003
Date of inclusion:	01/11/2013
CPA implementer	3 Rocks Ltd.
Project Scale:	Small scale
Location of the CPAs:	Zambia
CPA crediting period:	01/11/2013 to 31/10/2020
Reported monitoring Period verified in this verification:	28/01/2017 to 27/01/2018

As part of the site visit, the verification team was able to confirm that the implementation of the CPAs is in accordance with the project description contained in the included CPA-DDs /B04/.

The three (03) implemented CPAs involve distribution of fuel-efficient stoves individual households of Zambia and these CPAs have been implemented by 3 Rocks Ltd. The stove design is based on 'rocket stove' design. The stove (model Z3000) consists of a durable metal alloy liner, with an insulating layer surrounding it. The liner and insulation are encased in a metal outer container, which is further attached to brick enclosure for protection and security. The liner is tapered at the top, where a galvanized cooking surface provides a rest for the cooking pot. The flame is directed onto the pot speeding up the flow of gases from the combustion chamber and the biomass fuel is supported using a metal grate to ensure adequate airflow to the fire. The technology details were confirmed during the on-site visit. There were no changes observed during OSV from the technology stated in the PoA-DD / CPA-DDs /B04/.

The three CPAs involve installation of a maximum of 15,938 stoves each. It was confirmed through the monitoring database /6/ that during the monitoring period, the CPAs involved distribution and installation of only 15,638, 15,084 and 9,715 stoves for CPA 6864-0001, 6864-0002 and 6864-0003 respectively and thus do not exceed the limit of stoves as stated in the CPA-DDs. The stove model in all three (03) CPAs is Z3000. The total population size of the stoves, for the three CPAs together is 40,437. The percentage of operational stoves in the activity sample group is 87.25% /2/ /4/. Accordingly, the numbers of stoves used for calculation of ERs (after deducting the non-operational stoves, have been used as 13,645, 13,162 and 8,477 for CPA 6864-0001, 6864-0002 and 6864-0003 respectively (amounting to 35,283 stoves for the three CPAs together). Consequently, the number of stove operating days has been adjusted by the same factors to 4,980,396, 4,803,958 and 3,094,037 for CPA 6864-0001, 6864-0002 and 6864-0003 respectively /2/ /4/.

The annual energy savings were as follows:

CPA	GWh _{th}
6864- 001	86
6864- 002	83
6864- 003	54

Hence in all the cases the energy savings was within the threshold of 180 GWh_{th} for both the annual monitoring campaigns and thus the CPAs remain under the small-scale limit /B02/.

The stoves in the CPAs have been distributed across different locations in Zambia. As confirmed through the monitoring database provided in the ER spread sheet, first stove for the CPAs was distributed on 06/06/2011 and last stove on 16/05/2013 /6/.

The information (including data and variables) provided in the MR /2/ is in line with the details provided in the included CPA-DDs /B04/.

Based on above assessment, verification team confirms that the component project activity was implemented and equipment installed as described in the included CPA-DDs.

The actual operation of the CDM project activity

The first distribution of stoves took place on 06/06/2011 /6/. A total of 40,437 stoves were distributed in the three CPAs during the monitoring period /6/ and have been considered for emission reduction calculations. The CME has got the recipient household's consent for carbon rights during the distribution of the ICS for the exclusive rights of the CERs for CME /8/. Operation of the devices is confirmed during the site visit by the verification team. Followings were verified at the project site:

1. Stoves numbering system
2. Electronic monitoring system including input procedure
3. Actual distribution / implementation of the stoves
4. Household-representatives were interviewed regarding the usage of stove
5. Whether or not baseline technology was still in use
6. Process of data collection during installation of stove
7. Agreements between households and the CPA implementer

In accordance with § 341 of CDM VVS for PoA, version 01 /B01-1/, the verification team confirms that there is no information (data and variables) in the current monitoring period that are different from that stated in the registered CPA-DDs which has caused an increase in the estimates of GHG emission reductions.

Verification team has assessed the project in order to check any proposed or actual changes to the project design in accordance with § 269 of CDM VVS for PoAs, Version 01.0. In the opinion of CCIPL, there is no change to the project design. CCIPL's verification team confirms that the CPAs are implemented within the boundary of the PoA as described in the registered PoA-DD.

In accordance with § 341 (c) of CDM VVS for PoAs, Version 01.0 /B01-1/, information (data and variables) provided in the monitoring report that are different from that stated in the registered CPA-DDs /B04/, have been assessed. The assessment is summarized below:

Parameter	Ex-ante value in the CPA-DDs	Actual operation for the reported monitoring period	Assessment by the verification team
Number of stoves still operational during the monitoring period (NS)	15,938 for each of the three CPAs	<ul style="list-style-type: none"> • 6864-0001: 13,645 • 6864-0002: 13,162 • 6864-0003: 8,477 	The number of operational stoves is less than the ex-ante estimated value in the CPA-DD.
Total stove operating days in monitoring period (OD)	5,817,370 days/annum for each CPAs (365 days * 15,938 stoves)	<ul style="list-style-type: none"> • 6864-0001: 4,980,396 • 6864-0002: 4,803,958 	OD is less than the estimated values in all the cases.

		<p>• 6864-0003: 3,094,037</p>	
Thermal efficiency of the stove (η_{new})	29.5%	23.23 %	The weighted average efficiency of the cook-stoves (η_{new}) monitored ex-post for the current monitoring period is less than the estimated ex-ante value in the CPA-DDs. Verification team based on its sectoral expertise confirms that decrease in efficiency in actual project condition is a realistic phenomenon and thus this issue does not require further assessment, as it does not lead to increase in emission reductions.
Quantity of biomass saved per stove per annum (B_{old} / B_{new})	4.1 tonnes / annum / stove	2.76 tonnes / annum / stove	The value of B_{new} is calculated after adjusting the operation of the baseline stoves during the monitoring period and the calculated values are less than the ex-ante estimated value of 4.1. The verification team has checked the survey sheets and the calculation of B_{new} and found it to be correct and conservative for the calculation of ERs.
Emission reductions per stove/year	2.5526 tCO ₂ /Stove/year for each of the three CPAs	1.2924 tCO ₂ /Stove/year	The ERs per stove is less than the ex-ante estimated values in the CPA-DDs. The verification team also noted that the emission reductions per stove in the previous monitoring period was 1.3115 tCO ₂ .
<p>In the opinion of CCIPL, there is no change to the project design. CCIPL's verification team confirms that the CPAs are implemented within the boundary of the PoA as described in the registered PoA-DD and the implementation and operation of the project activity has been conducted in accordance with the description contained in the registered PoA-DD and registered/included CPA-DDs.</p> <p>The verification team took cognizance of § 339, § 340 and § 341 of the CDM VVS for PoA, version 01 /B01-1/ to conduct the verification and conducted a site visit in accordance with the § 320 and 321 of the CDM VVS for PoA, version 01 /B01-1/. The compliance to the requirements shall be reassessed once the responses to the findings in Appendix 4 are provided by the PP/CME.</p>			

E.3.2. Post-registration changes**E.3.2.1. Temporary deviations from registered monitoring plan, applied methodology or applied standardized baseline**

>> There are not temporary deviations from the registered monitoring plan or the applied methodology.

E.3.2.2. Corrections

>>

There are no corrections applicable to the monitoring period that have been approved by the Board during this monitoring period or to be submitted with the request for issuance.

E.3.2.3. Changes to the start date of the crediting period of component project activities

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There are no changes to the start date of the crediting period for the CPAs.

E.3.2.4. Inclusion of a monitoring plan

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There are no inclusions of monitoring plan to included CPA-DDs.

E.3.2.5. Permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology, standardized baseline, or other applied standards or tools

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There are no permanent changes to the registered monitoring plan or permanent deviation of monitoring from the applied methodology.

E.3.2.6. Changes to the programme design or project design

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There are no changes to the programme design of the included CPA-DDs.

E.3.2.7. Changes specific to afforestation and reforestation component project activities

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Not applicable to the type of the programme of activity.

E.3.3. Compliance of the registered monitoring plan with the methodology including applicable tool(s) and standardized baseline

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The verification team is able to confirm that the monitoring plan contained in the registered CPA-DDs is in accordance with the approved methodology applied by the project activity, i.e. AMS-II.G (version 03) /B02/.</p> <p>The monitoring plan is in accordance with the approved methodology, AMS-II.G version 03 /B02/, applied by the component project activity and as provided in the CPA-DDs /B04/.The monitoring plan is in accordance with the approved methodology, AMS-II.G, Version 03 /B02/, applied by the component project activities and as provided in the CPA-DDs /B04/.</p> <p>The verification took cognizance of § 342 to § 344 of CDM VVS for PoAs, Version 01.0 /B01-1/.</p>

E.3.4. Compliance of monitoring activities with the registered monitoring plan

The monitoring has been carried out in accordance with the monitoring plan contained in the registered CPA-DDs. This conclusion has been made based on assessment below in section E.3.4.1, E.3.4.2 and E.3.4.3 below.

E.3.4.1. Data and parameters fixed ex ante or at renewal of crediting period

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>Verification team confirms that the Data and parameters fixed ex ante are in compliance with the registered CPA-DDs /B04/ and the monitoring plan. Please refer Appendix 5 for detailed analysis of the ex-ante parameters.</p> <p>The verification took cognizance of § 345 of CDM VVS for PoAs, Version 01.0 /B01-1/.</p>

E.3.4.2. Data and parameters monitored

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>The Verification team will be able to confirm that the Data and parameters monitored are in compliance with the registered CPA-DDs/B04/ and the monitoring plan/B04/. A complete assessment of each of the monitored parameters has been provided in Appendix 6 of the verification report.</p> <p>The verification took cognizance of § 345, § 346(c), §357 and §358 of CDM VVS for PoAs, Version 01.0 /B01-1/.</p>

E.3.4.3. Implementation of sampling plan

Means of verification	Document Review, Interview
Findings	CL 04 had been raised and resolved. Please refer to Appendix 4 of this report for further details.
Conclusion	<p>A single sampling plan has been applied for all the three CPAs together and this is deemed acceptable as per the registered PoA-DD /B04/. The CPAs are homogeneous considering that the stoves distributed across the three CPAs are of common technology (stove model Z3000), have common usage pattern and same geographical coverage (Zambia). The homogeneity of the population has been demonstrated by the CME during the 1st periodic verification. Furthermore, verification team checked and confirmed that the population remains the same as that in 1st monitoring and no new stoves have been added to the CPAs. The total population of the stoves under the three CPAs are 40,437 (15,638, 15,084 and 9,715 stoves for CPA 6864-0001, 6864-0002 and 6864-0003 respectively).</p> <p>The monitoring parameters to be monitored through the sampling plan are:</p> <ol style="list-style-type: none"> 1. Number of Stoves still operating during the monitoring period (NS) 2. Quantity of biomass saved per annum – to determine the average deduction per stove from the baseline parameter Bold due to continues usage of the baseline stoves in some of the households (Bnew) 3. Thermal efficiency of the stoves (%) (η_{new}) <p>Simple random sampling was applied for selection of the monitoring samples with 95/10 confidence/precision for all the parameters which is deemed acceptable as per the registered PoA-DD /CPA-DDs and the applied methodology considering annual sampling survey applied for the current monitoring period.</p> <p>A single sampling frame was applied for determining the parameters “NS” and “Bnew” as because stoves type distributed under the three CPAs were same</p>

including the end users that are domestic households.

For the thermal efficiency of the stoves (η_{new}), one sampling frame was chosen considering that the homogeneity of the population.

The number of samples for each of the parameters covered during the monitoring activity is as given below:

Parameter	Sample Size (n) required	Samples covered during monitoring
ASG	96	102
SESG	7	13

For the monitoring parameters NS and Bnew, data were collected following a specially designed survey form. For thermal efficiency of the stoves WBTs were conducted.

It was found that for all the parameters the confidence/precision of 95/10 was met.

DOE used sampling during verification for checking the CME's sample size. Considering that Zambia is a Least Developed Country, applying paragraph 33 (c) of the sampling standard, version 07 /B07/, a sample size of 8 households was chosen (with no discrepant records). A sample size of 8 was required, based on an AQL of 0.5 % and UQL of 20 %, producer risk 10 % and consumer risk 20 %. Acceptance number (c) thus determined for the sample is 0. It was observed that out of the 8 samples, all 8 stoves were found to be operational which matched with the CME's records and hence no discrepant records were observed with the published MR /1/ and ER sheet /3/ and thus $c=0$. Thus, CME's set of records has been accepted in line with § 32 of the sampling standard, version 07 /B07/. For the ASG parameter a common interview questionnaire /16/ was prepared and was used during the survey by the CME. Verification team has cross verified these sample documents during the on-site visit.

For the SESG parameter, WBT have been performed and this has been checked by the verification team with the related spreadsheets. Interviews were conducted during the on-site visit with the relevant persons from CEEEZ who had conducted the WBT at the sampled households. The verification team found the team to be competent for carrying WBT. Furthermore, the verification team has cross checked all the raw data input records in the WBT calculation spread sheets including the calculation procedure for the sampled households and found them to be correct. All the raw data forms for the WBT carried out for SESG parameter were checked by the verification team and thus no sampling of data is required. In addition, for the SESG parameter, the verification team randomly selected 8 households from the CME's sample list of 13 households for which WBT were done and conducted interviews. Through the interviews, it was confirmed that WBT tests were conducted by the CME.

The sampling plan implemented by the CME is in accordance with the applied approved

monitoring methodology /B02/ and the PoA-DD/CPA-DDs /B04/. The CME has appropriately performed Simple Random Sampling procedure in line with the applied methodology and best suited for this type of project. As the registered PoA-DD /B04/ mentions the option for Simple Random Sampling procedure, it is acceptable to the verification team.

	<p>The necessary confidence / precision of 95/10 each of the parameters is met. This has been cross verified by the verification team from the supporting documents submitted /12/.</p> <p>The verification took cognizance of § 347 of CDM VVS for PoAs, Version 01.0 /B01-1/.</p>
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E.3.4.4. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	Document Review, Interview
Findings	CL 05 had been raised and resolved. Please refer to Appendix 4 of this report for further details.
Conclusion	<p>Stoves distribution database has been used to record the stoves details by the CME through a survey of the installed stoves based on sampling basis. The stove efficiency also needs to be checked. The stove efficiency testing has been done by WBTs conducted in line with the guidance provided by the CME in the CPA-DDs /B04/ /14/. The key monitoring equipment used for conducting the stove efficiencies by WBTs are thermometer, moisture meter and weighing machines. Verification team confirms that the digital weighing machine, moisture meter and thermometers were newly purchased /12/. The appropriate QA/QC procedures have been followed for the monitoring parameters.</p> <p>The verification took cognizance of section 10.2.6 of CDM VVS for PoAs, version 01 /B01-1/.</p>

E.3.5. Assessment of data and calculation of emission reductions or net removals

In line with the requirement of § 357 and 358 of CDM VVS for PoAs, Version 01.0/B01-1/, the verification team has reviewed the Monitoring report /2/ and ER spread sheets /4/ to check the arithmetic calculation of the emission reductions. The equation used for the calculation is compared with those provided in the registered CPA-DDs /B04/ and the methodology AMS-II.G, Version 03 /B02/.

E.3.5.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	CAR 02 had been raised and resolved. Please refer to Appendix 4 of this report for further details.
Conclusion	<p>The verification team confirms that the calculation of baseline emissions as set out in the emission reduction calculation spreadsheet /4/ has been based on appropriate methods and formulae and that the calculation of baseline emissions during the monitoring period is accurate and in line with the monitoring plan and methodology. It has confirmed that all assumptions, emission factors and default factors that have been applied have been appropriately justified and applied.</p> <p>It is being confirmed that data were available throughout the monitoring period in accordance with the monitoring plan and methodology. Sales data are monitored and recorded continuously, and other parameters are monitored by surveys and tests conducted once annually.</p> <p>The equations for baseline emissions as provided in the monitoring report /2/ were confirmed with the registered CPA-DDs /B04/ and the applied methodology AMS-II.G, version 03 /B02/ and found to be correct.</p> <p>Emission reductions are calculated using the below equation:</p> $ER_y = B_{y,savings} \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel}$ <p>Where:</p> <p>ER_y = Emission reductions during the year y in tCO₂e B_{y,savings} = Quantity of biomass that is saved in tonnes</p>

	<p>$f_{NRB,y}$ = Fraction of biomass saved by the project activity in year y that can be established as non-renewable biomass using survey results, national or local statistics or other sources of information (fixed ex ante as 81%)</p> <p>$NCV_{biomass}$ = Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)</p> <p>$EF_{projected_fossilfuel}$ = Emission factor for the substitution of non-renewable biomass by similar consumer (Default value of 81.6 tCO₂/TJ).</p> <p>$B_{y,savings} = B_{new} * (1 - \eta_{old} / \eta_{new})$</p> <p>$B_{old}$ = Quantity of biomass used in the absence of the project activity in tonnes/year; B_{new} was calculated considering a deduction for the proportionate usage of baseline stove during the monitoring period in the sampling survey.</p> <p>η_{old} = Efficiency of the system being replaced (fixed 10% ex ante)</p> <p>η_{new} = Efficiency of the system being deployed as part of the project activity (23.23% monitored ex post during the monitoring period)</p> <p>LAF = Net to gross Adjustment factor (0.95) applied in accordance with paragraph 13 and 23 of AMS-II.G v. 03</p> <p>The verification took cognizance of § 357 of CDM VVS for PoAs, version 01.0 /B01-1/.</p>
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E.3.5.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	-
Conclusion	There are no project emissions identified in the monitoring methodology /B02/ and the CPA-DDs /B04/.

E.3.5.3. Calculation of leakage GHG emissions

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>Net-to-gross adjustment factors for leakage (fixed default values of 0.95 as per AMS II.G. version 03) /B02/ was applied to the project activity to calculate Emission Reductions of this Monitoring Period.</p> <p>Verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from registered CPA-DDs /B04/.</p>

E.3.5.4. Summary of calculation of GHG emission reductions or net GHG removals by sinks

Means of verification	Document Review, Interview
Findings	-
Conclusion	<p>Verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the pre-defined formulae from registered CPA-DDs. The total number of CERs achieved during the monitoring period is 52,262 tCO₂e.</p> <p>In summary, verification team confirms that actual emission reduction is lower than the estimate of the registered (included)/approved CPA-DDs /B04/ for the current monitoring period.</p> <p>The verification took cognizance of § 357 of CDM VVS PoAs, version 01 /B01-1/.</p>

Title and UNFCCC reference number of the CPA	Baseline emissions or baseline net GHG removals by sinks (tCO ₂ e)	Project emissions or actual net GHG removals by sinks (tCO ₂ e)	Leakage (tCO ₂ e)	GHG emission reductions or net GHG removals by sinks (tCO ₂ e)		
				Amount achieved before 1 January 2013	Amount achieved from 1 January 2013	Amount achieved in the entire monitoring period
9769-0001	20,211	0	0	0	20,211	20,211
9769-0002	19,495	0	0	0	19,495	19,495
9769-0003	12,556	0	0	0	12,556	12,556
Total	52,262	0	0	0	52,262	52,262

E.3.5.5. Comparison of actual GHG emission reductions or net GHG removals by sinks with estimates in included CPA

Means of verification	Document Review
Findings	-
Conclusion	Comparison of the actual GHG emission reductions with the estimates in the included specific CPAs is given in the below table. The verification team took cognizance of § 357 of CDM VVS for PoAs, version 01 /B01-1/.

Title and UNFCCC reference number of the CPA	Value estimated in ex ante calculation in the included CPA-DD(s)	Actual values achieved by the CPAs during this monitoring period
9769-0001	40,684	20,211
9769-0002	40,684	19,495
9769-0003	40,684	12,556
Total	122,052	52,262

E.3.5.6. Remarks on difference from estimated value in included CPA

Means of verification	Document review
Findings	-
Conclusion	Verification team confirms that actual emission reduction is lower than the estimate of the registered (included)/approved CPA-DDs /B04/ for the current monitoring period. However, this is subject to closure all the CARs/ CLs raised in the DVR findings and review of the revised documents.

E.3.6. Assessment of reported sustainable development co-benefits

Means of verification	Not applicable (as there are no sustainable development co-benefits required as per the registered CDM PoA-DD)
Findings	-
Conclusion	Not applicable The verification took cognizance of § 360 of CDM VVS PoAs, version 01 /B01-1/.

E.3.7. Global stakeholder consultation

Means of verification	Not applicable (as this is not first Monitoring report)
Findings	-
Conclusion	Not applicable (this is not first Monitoring report) The verification took cognizance of § 369 of CDM VVS PoAs, version 01 /B01-1/.

SECTION F. Internal quality control

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The verification report passed a technical review before being submitted to the CME/PP and the Assessment Team of the UNFCCC. A technical reviewer qualified in accordance with the CCIPL's qualification scheme for CDM validation and verification has performed the technical review.

SECTION G. Verification opinion

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Carbon Check (India) Private Ltd. (CC IPL) has performed the third periodic verification of the registered CDM Programme of Activities "Fuel Efficient Stoves in Zambia" having UNFCCC reference number as 6864 for the CPAs titled "Fuel Efficient Stoves in Zambia (3RL CPA No.01)"; "Fuel Efficient Stoves in Zambia (3RL CPA No.02)" and "Fuel Efficient Stoves in Zambia (3RL CPA No.03)" with UNFCCC reference numbers 6864-0001, 6864-0002 and 6864-0003 respectively for the three CPAs.

The verification team assigned by the DOE concludes that the PoA-DD (Version 6.2, dated 07/01/2013), Component Project Activities 6864-0001, 6864-0002 and 6864-0003 as described in the registered CPA-DDs (Version 6.2, dated 07/01/2013; Version 2.1, dated 23/10/2013 and Version 2.1, dated 23/10/2013 respectively) /B04/ and monitoring report (version 2.0, dated 27/06/2018) /2/, meets all relevant requirements of the UNFCCC for CDM project activities including article 12 of the Kyoto Protocol and paragraph 62 of CDM M& P, the modalities and procedures for CDM (Marrakesh Accords) and the subsequent decisions by the COP/MOP and CDM Executive Board. The verification has been conducted in-line with the requirements of CDM VVS for PoAs (version 01.0) /B01-1/.

Verification methodology and process

The Verification team confirms the contractual relationship signed on 07/03/2018 between the DOE, Carbon Check (India) Private Ltd. and the Coordinating Managing Entity, 3 Rocks Ltd. The team assigned to the verification meets the CCIPL's internal procedures including the UNFCCC requirements for the team composition and competence. The verification team has conducted a thorough contract review as per UNFCCC and CCIPL's procedures and requirements.

The verification has been performed as per the requirements described in the CDM VVS for PoAs version 01.0 and constitutes the review and completion of the following steps:

- Reviewing the registered PoA-DD (version 6.2, date 07/01/2013), the registered CPA-DDs for 6864-0001, 6864-0002 and 6864-0003 (Version 6.2, dated 07/01/2013; Version 2.1, dated 23/10/2013 and Version 2.1, dated 23/10/2013 respectively) /B04/ including the monitoring plan and the corresponding validation report/s /B04/;
- Publication of the MR (version 1.0, 17/05/2018) /1/ on the UNFCCC website on 24/05/2018
- Desk review of the validation report, MR and other relevant documents including documents related to the projects activities in emission reductions
- Review of the applied monitoring methodology (AMS-II.G version 03) /B02/;
- Review of any CMP and EB decisions, clarifications and guidance /B05/;
- On-site assessment (21/06/2018 – 22/06/2018)
- Resolution of CARs and CLs raised during verification
- Issuance of Verification Report

The component project activities were correctly implemented according to selected monitoring methodology, monitoring plan and the registered/included CPA-DD/s. The monitoring system was installed, maintained in a proper manner, while collected monitoring data allowed for the verification of the amount of achieved GHG emission reductions. Through the review and on site

visit the verification team confirms that the PoA has resulted in the 52,262 tCO₂e emission reductions during the third monitoring period.

Verified emission reductions for the PoA: 52,262 tCO₂e.

The break-up of emission reduction up-to 31/12/2012 and 01/01/2013 onwards as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO₂e)	0	52,262

Break up of emission reductions CPA wise:

6848-0001: 20,211 tCO₂e

6848-0002: 19,495 tCO₂e

6848-0003: 12,556 tCO₂e

CC IPL as a DOE is therefore pleased to issue a positive verification opinion expressed in the attached Certification statement.

SECTION H. Certification statement

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Carbon Check (India) Private Ltd., the DOE, has performed the verification of the registered Programme of Activities, UNFCCC Registration Number 6864, “Fuel Efficient Stoves in Zambia” in Zambia for the CPAs titled “Fuel Efficient Stoves in Zambia (3RL CPA No. 01)”; “Fuel Efficient Stoves in Zambia (3RL CPA No. 02)” and “Fuel Efficient Stoves in Zambia (3RL CPA No. 03)” with UNFCCC reference numbers 6864-0001, 6864-0002 and 6864-0003 respectively. The component project activities are designed to generate emission reductions by distribution of the fuel-efficient cook stoves in individual households. The fuel-efficient cook stoves are replacing the traditional three stone/rock stoves that were being used in the baseline scenario.

The CME is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the component project activities. It is DOE’s responsibility to express an independent verification statement on the reported GHG emission reductions from the component project/s. The DOE does not express any opinion on the selected baseline scenario or on the validated and registered PoA-DD/CPA-DDs. The verification is carried out in-line with the VVS requirements.

The verification was performed to identify the compliance of the component project activities with implementation and monitoring requirements, and to verify the actual amount of achieved emission reductions, through obtaining evidence and information on-site that included i) checking whether the provisions of the monitoring methodology and the monitoring plan were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.

The verification is based on:

— PoA-DD version 6.2 dated 07/01/2013;

— CPA-DD/s included in the registered PoA and its monitoring plan for the monitoring period 28/01/2017 to 27/01/2018.

— Approved monitoring methodology AMS-II.G “Energy efficiency measures in thermal applications of non-renewable biomass” (version 03);

— Validation report /B04/ for the PoA and CPA/s;

— Monitoring report(s) version(s) 1.0, 17/05/2018; version 2.0, dated 27/06/2018

This statement covers verification period from 28/01/2017 to 27/01/2018.

The DOE has raised 05 clarification and 02 corrective action requests, all of which have been resolved.

The DOE considers necessary to give reasonable assurance that reported GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology and the monitoring plan contained in the registered/included CPA-DDs are fairly stated.

The DOE, hereby certifies that the project activity, achieved emission reductions by sources of GHG equal to 52,262 tCO₂ equivalent and all monitoring requirements have been fulfilled and is substantiated by an audit trail that contains evidence and records. The break-up of emission reduction up-to 31/12/2012 and 01/01/2013 onwards as verified during the course of verification are as below:

Item	Emission reductions up to 31 December 2012	Emission reductions from 1 January 2013 onwards
Emission reductions (t CO ₂ e)	0	52,262

Appendix 1. Abbreviations

Abbreviations	Full texts
3RL	3 Rocks Limited
ASG	Activity Sample Group
AQL	Acceptable Quality Limit
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CER	Certified Emission Reduction
CL	Clarification Request
CME	Coordinating and Managing entity
CPA	Component Project Activity
CPA-DD	Component Project Activity Design Document
CO ₂	Carbon Dioxide
CO _{2e}	Carbon Dioxide Equivalent
DR	Document review
DOE	Designated Operational Entities
DVR	Draft Verification Report
EB	CDM Executive Board
EF	Emission Factor
EI	External individual
FA	Final Approval
FAR	Forward Action Request
FVR	Final verification Report
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
I	Interview
IPCC	Intergovernmental Panel on Climate Change
IR	Internal resource
MWh	Mega Watt Hour
OSV	On Site Visit
PoA	Programme of Activities
PoA-DD	Programme of Activities Design Document
PP	Project Participant
QC/QA	Quality control/Quality assurance
SESG	Stove Efficiency Sample group
TA	Technical Area
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Limit
VVS	Validation and Verification Standard
WBT	Water boiling test

Appendix 2. Competence of team members and technical reviewers



Carbon Check (India) Private Ltd.

Sanjay Agarwalla

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator Team Leader Technical reviewer
 Verifier Technical Expert Local Expert¹

In the following Technical Areas:

TA 1.1 TA 3.1 TA 5.2 TA 9.2 TA 13.2
 TA 1.2 TA 4.1 TA 8.1 TA 10.1 TA 14.1
 TA 2.1 TA 5.1 TA 9.1 TA 13.1

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

Date of Approval
24/12/2017

Valid Till
23/12/2018

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2017	Annual Revision
24/12/2017	Annual Revision

¹India

CARBON CHECK (INDIA) PRIVATE LIMITED

Registered in India: U74930DL2012PTC232495
 Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005
 Corporate off: G 49 & 50, 3rd Floor, Sector - 3, NOIDA (Uttar Pradesh) - 201301
 Tel: +91 120 4373114 | URL: www.carboncheck.co.in
 e-mail: info@carboncheck.co.in



Carbon Check (India) Private Ltd.

Vikash Kumar Singh

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator Team Leader Technical reviewer
 Verifier Technical Expert Local Expert¹

In the following Technical Areas:

TA 1.1 TA 3.1 TA 5.2 TA 9.2 TA 13.2
 TA 1.2 TA 4.1 TA 8.1 TA 10.1 TA 14.1
 TA 2.1 TA 5.1 TA 9.1 TA 13.1

Mr. Amit Anand
CEO

Date of Approval
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¹India, South Africa

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 e-mail: info@carboncheck.co.in

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	3RL	Monitoring report (webhosted)	Version 1.0, dated 17/05/2018	CME
2	3RL	Final Monitoring report	Version 2.0, dated 27/06/2018	CME
3	3RL	Emission reduction calculation spread sheet corresponding to /1/	Version 1.0, dated 17/05/2018	CME
4	3RL	Emission reduction calculation spread sheet, corresponding to /2/	Version 2.0, dated 27/06/2018	CME
5	CEEEZ	Monitoring sampling survey records for the monitoring period	-	CME
6	3RL	CPA distribution records including evidence for the dates of distribution	-	CME
7	3RL	Evidence for the stove specifications installed under the three CPAs including the efficiency	-	CME
8	3RL	Proof of Carbon Credits waiver by End user	-	CME
9	3RL	Sample copies stoves distribution user agreement	-	CME
10	Mechanical Engineering Department of School of Engineering under University of Zambia	Training records for the survey team and WBT team	-	CME
11	CEEEZ	Water boiling test records	-	CME
12	3RL	Technical details including the purchase records of the monitoring equipment (weighing scale, thermometer and moisture meter) used for thermal efficiency measurement	-	CME
13	3RL	Sampling plan along with sample number generator evidence	-	CME
14	3RL	Copy of the protocol for conducting WBT for the cook stoves	-	CME
15	3RL	Evidence for unique identification of each of the project stoves: - GPS references - Name, location and / or ID number - Unique reference numbers	-	CME
16	3RL	Monitoring survey questionnaire template	-	CME
B01	UNFCCC	1. Validation and Verification Standard for PoAs, version 01.0 2. Project Standard for PoAs, version 01.0 3. Project Cycle Procedure for PoAs, version 01.0	http://cdm.unfccc.int/	Others
B02	UNFCCC	Applied baseline and monitoring methodology, AMS-II.G, version 03.0	http://cdm.unfccc.int/	Others
B03	UNFCCC	Instructions for filling out the monitoring report form for CDM programme of activities, version 02.0	http://cdm.unfccc.int/	Others
B04	UNFCCC	Registered PoA-DD (version 6.2 dated 07/01/2013); CPA-DD for 6864-0001: (version 6.2 dated 07/01/2013); CPA-DD for 6864-0002: (version 2.1 dated	http://cdm.unfccc.int/	Others

		23/10/2013) and CPA-DD for 6864-0003: (version 2.1 dated 23/10/2013) and corresponding validation report.		
B05	Web sites	Websites: http://cdm.unfccc.int/	http://cdm.unfccc.int/	Others
B06	UNFCCC	Guidelines: Sampling and surveys for CDM project activities and programmes of activities, Version 04.0	http://cdm.unfccc.int/	Others
B07	UNFCCC	Standard: Standard for sampling and surveys for CDM project activities and Programme of Activities, version 07.0	http://cdm.unfccc.int/	Others
B08	UNFCCC	Guideline: Application of materiality in verifications” Version 02.0	http://cdm.unfccc.int/	Others
B09	Web sites	Profile of institution carried out the WBT- Centre For Energy, Environment and Engineering Zambia Ltd (CEEEZ)	http://www.climatenetwork.org/profile/member/centre-energy-environment-and-engineering-ceeez	others

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FARs from validation and/or previous verification

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of FAR				
-				
CME response				Date: DD/MM/YYYY
-				
Documentation provided by the CME				
-				
DOE assessment				Date: DD/MM/YYYY
-				

Table 2. CLs from this verification

CL ID	CL 01	Section no.	E.1.1	Date: 26/06/2018
Description of CL				
CME is requested to provide CPA wise break up of the ERs on the cover page of the MR.				
CME response				Date: 27/06/2018
The CPA wise breakup of ERs have been specified on cover page of the revised MR				
Documentation provided by the CME				
PoA 6864 MP#3 Monitoring Report v 2.0 27062018				
DOE assessment				Date: 02/07/2018
CME has submitted revised MR stating CPA wise ERs. CL is closed.				

CL ID	CL 02	Section no.	E.1.1	Date: 26/06/2018
Description of CL				
Corrections in the following editorial errors are requested in the MR:				
<ol style="list-style-type: none"> 1. In Section A.1.2 of the MR, titles for CPA 2 and CPA 3 are incorrectly stated. 2. In section C.1 (page 6), the table for number of stoves distributed under each CPA has been repeated twice. 3. In some parts of the MR (like section E.3) it has been stated “two monitoring sessions”. 4. In the revised ER spread sheet, monitoring period has been correctly stated in the sheet “MP#3 Sample Size Cal” and “Monitoring Results”. 5. In the ER spread sheet, in the sheet “MP#3 Survey Summary”, frequency of the meals (daily / weekly) does not match with the survey records. 6. The customer ID number has been incorrectly stated for stove ERA no. Z017482. 				
CME response				Date: 27/06/2018
The following has been rectified in the revised MR / ER calculator:				
<ol style="list-style-type: none"> 1. In Section A.1.2 of the MR, the title of the generic CPA-DD has been revised to be consistent with that in section A.1.1. 2. In section C.1, the repeated table has been removed. 3. The MR has been revised to remove any reference to “two monitoring sessions”. There was only one monitoring event in the concerned monitoring period. 4. In the ER spread sheet, in the sheet “MP#3 Sample Size Cal” and “Monitoring Results”, monitoring period is now correctly stated. 5. In the ER spread sheet, in the sheet “MP#3 Survey Summary”, frequency of the meals (daily) has been revised to match with the survey records. 6. The customer ID number has now been correctly stated for stove ERA no. Z017482 in the ER calculator Survey Summary datasheet. 				
Documentation provided by the CME				
PoA 6864 MP#3 Monitoring Report v 2.0 27062018				
PoA 6864 MP#3 ER calculator version 2.0 27062018				

DOE assessment	Date: 02/07/2018
<ol style="list-style-type: none"> 1. Generic CPA title has been corrected in the revised MR. This part of the CL is closed. 2. Repeated table has been removed in the MR. This part of the CL is closed. 3. MR has been corrected by deleting two monitoring sessions which is not relevant for this monitoring period. This part of the CL is closed. 4. CME has submitted revised ER spread sheet with correct monitoring period. This part of the CL is closed, 5. CME has submitted revised ER spread sheet correcting the frequency of as daily (in line with the survey records). This does not affect the final result. This part of the CL is closed. 6. CME has submitted revised sheet with correct customer ID. This part of the CL is closed. <p>CL is closed.</p>	

CL ID	CL 03	Section no.	E.3.1	Date: 26/06/2018
Description of CL				
In section E.3 of the monitoring report it has been stated that the survey and tests were conducted during 01 February 2018 – 30 April 2018. But during the on-site visit and by document review it was found that the surveys were conducted in February 2018 and WBTs were conducted in March 2018. Clarification is requested.				
CME response				Date: 27/06/2018
The monitoring report has been revised to mention the exact duration of the monitoring exercise.				
Documentation provided by the CME				
PoA 6864 MP#3 Monitoring Report v 2.0 27062018				
DOE assessment				Date: 02/07/2018
Actual monitoring dates have been stated in the revised MR (10 February 2018 – 30 March 2018). The CL is closed.				

CL ID	CL 04	Section no.	E.3.4.3	Date: 26/06/2018
Description of CL				
In section E.3 of the monitoring report it has been stated "In the event that the precision target was not met, based on the Standard: <i>Sampling and surveys for CDM project activities and programme of activities version 05.0 paragraph 17 (b) (i) b.</i> , the parameter values were discounted to the lower bound of the confidence interval". CME needs to confirm the applicability of this for this PoA under the applied version of the methodology and as per the sampling standard.				
CME response				Date: 27/06/2018
The MR has been revised to remove reference to Standard: <i>Sampling and surveys for CDM project activities and programme of activities version 05.0 paragraph 17 (b) (i) b</i> as that is not deemed applicable to the PoA. The same has been corrected to refer to paragraph 22 of the applied methodology.				
PoA 6864 MP#3 Monitoring Report v 2.0 27062018				
Documentation provided by the CME				Date: 02/07/2018
MR has been revised in line with the applied methodology. During the current monitoring period, lower bound value was not applied for any of the parameter as the precision level was met in all the cases. The CL is closed.				

CL ID	CL 05	Section no.	E.3.4.4	Date: 26/06/2018
Description of CL				
CME has not provided the details of the monitoring equipment used for WBT during the current monitoring period.				
CME response				Date: 27/06/2018
The monitoring equipment details have been added to the revised monitoring report				
Documentation provided by the CME				
PoA 6864 MP#3 Monitoring Report v 2.0 27062018				
DOE assessment				Date: 02/07/2018
Details of the monitoring equipment have been provided in the revised MR and also the evidence were provided. The CL is closed.				

Table 3. CARs from this verification

CAR ID	01	Section no.	E.1.1	Date: 26/06/2018
Description of CAR				
As per the MR completing instructions, all the number formats must be stated in the internationally recognized format and this has not been followed in some parts of the MR.				
CME response				Date: 27/06/2018
The number format has been made consistent with the internationally recognized format across the revised MR.				
Documentation provided by the CME				
PoA 6864 MP#3 Monitoring Report v 2.0 27062018				
DOE assessment				Date: 02/07/2018
CME has revised the MR correcting all the number formats appropriately. The CAR is closed,				

CAR ID	02	Section no.	E.3.5.1	Date: 26/06/2018
Description of CAR				
<ol style="list-style-type: none"> 1. Stove usage for the Stove ERA number Z040981 does not match in between the Survey records and the ER spread sheet. 2. The efficiency reported for the stove ERA number Z017531 does not match with the WBT calculation sheet. 				
CME response				Date: 27/06/2018
The following has been corrected:				
<ol style="list-style-type: none"> 1. The stove usage rate for sample (Z040981) has been revised to be consistent with the Survey record. 2. The efficiency of the sample (Z017531) has been revised to be consistent with the WBT observation record and WBT calculation sheet. 				
As a result of these corrections the ER have reduced from 522,370 to 522,262				
Documentation provided by the CME				
PoA 6864 MP#3 Monitoring Report v 2.0 27062018				
DOE assessment				Date: 02/07/2018
<ol style="list-style-type: none"> 1. CME has corrected the stove usage for the stated stove in the ER spread sheet which has been checked and found to be consistent with the survey records. 2. Efficiency of the identified stove has been revised in the ER spread sheet which has been checked and found to be consistent with the WBT records. 				
The CAR is closed. Closure of this CAR has resulted in decrease in ERs from 52,370 tCO ₂ (published MR) to 52,262 tCO ₂ .				

Table 4. FARs from this verification

FAR ID	xx	Section No.		Date: DD/MM/YYYY
Description of FAR				
-				
CME response				Date: DD/MM/YYYY
-				
Documentation provided by the CME				
-				
DOE assessment				Date: DD/MM/YYYY
-				

Appendix 5. Data and parameters fixed ex ante

Parameter	Quantity of biomass used in absence of the project activity (B_{old})
Data unit:	tonnes/year
Default values used:	4.1 * 15938 = 65,345
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Non-renewable biomass usage in Zambia, as a proportion of total biomass usage (f_{NRB,y})
Data unit:	Fraction
Default values used:	0.81
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Efficiency of 3-rock fire cooking method (system being replaced) (η_{old})
Data unit:	Fraction
Default values used:	0.10
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Net calorific value of the non-renewable biomass that is substituted (NCV_{biomass})
Data unit:	TJ/tonne
Default values used:	0.015
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Emission factor: substitution of non-renewable biomass by similar consumers (EF_{projected_fossilfuel})
Data unit:	tCO ₂ /TJ
Default values used:	81.6
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Leakage (Ly)
Data unit:	Fraction
Default values used:	0.95
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Parameter	Demonstrably renewable biomass (DRB)
Data unit:	Tonnes
Default values used:	1,278,025
Purpose of data	Baseline emissions calculation
Source and Verification of the source	The value of this parameter is fixed ex-ante /B04/.

Appendix 6. Data and parameters monitored

Monitoring Parameter Requirement	Assessment/ Observation by the DOE								
Data / Parameter: (as in monitoring plan of CPA-DD):	Number of stoves still operation during the monitoring period (NS)								
Measuring frequency/Time Interval:	Continuous								
Reporting frequency:	Annual								
Reported value:	<table border="1"> <thead> <tr> <th>CPA</th> <th>NS</th> </tr> </thead> <tbody> <tr> <td>CPA 6864-0001</td> <td>13,645</td> </tr> <tr> <td>CPA 6864-0002</td> <td>13,162</td> </tr> <tr> <td>CPA 6864-0003</td> <td>8,477</td> </tr> </tbody> </table>	CPA	NS	CPA 6864-0001	13,645	CPA 6864-0002	13,162	CPA 6864-0003	8,477
CPA	NS								
CPA 6864-0001	13,645								
CPA 6864-0002	13,162								
CPA 6864-0003	8,477								
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes								
Details of monitoring equipment:	Calculated from the stoves distribution database and survey questionnaire								
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not applicable								
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Not applicable								
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not applicable. QA/QC procedures stated in MR comply with CPA-DDs.								
Company performing the calibration (internal or external calibration):	Not applicable								
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not applicable								
Is (are) calibration(s) valid for the whole reporting period?	Not applicable								
If applicable, has the reported data been cross-checked with other available data?	Data have been cross checked with the stove distribution data base								
How were the values in the monitoring report verified?	The values in the monitoring report were verified from the stove distribution data base sheet and the ER calculation spread sheet								
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes								
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable								

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Total stove operating days in monitoring period (OD)
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual

Reported value:	CPA	OD	
	CPA 6864-0001	4,980,396	
	CPA 6864-0002	4,803,958	
	CPA 6864-0003	3,094,037	
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes		
Details of monitoring equipment:	Calculated from the stoves distribution database and survey questionnaire		
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not applicable		
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Not applicable		
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	NA. QA/QC procedures stated in MR comply with CPA-DD.		
Company performing the calibration(internal or external calibration):	Not applicable		
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not applicable		
Is (are) calibration(s) valid for the whole reporting period?	Not applicable		
If applicable, has the reported data been cross-checked with other available data?	Data have been cross checked with the stove distribution data base		
How were the values in the monitoring report verified?	The values in the monitoring report were verified from the stove distribution data base sheet and the ER calculation spread sheet		
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes		
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable		

Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Thermal efficiency of the stove (η_{new})
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	23.23%
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes

Details of monitoring equipment:	Equipment	Use	Details
	Weighing scale	For weighing	Accuracy: ± 1/3000 Make: CAMRY
	Thermometer	Ambient air and water temperature measurements	Accuracy: ± 0.1 °C Make: Liquid in glass lab Thermometer
	Moisture meter (pin and search type)	Moisture content of wood/logs to be used in the test	Accuracy: ± 1.5 % Make: CONTROL Moisture Meter
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	CPA-DD does not specify the accuracy of the monitoring equipment (thermometer, moisture meter and mass balance). Verification team confirms that the accuracy of the monitoring equipment as stated in the MR represent good monitoring practice based on sectoral expertise.		
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Verification team confirms that all the monitoring equipment were newly purchased /12/ and hence did not require calibration.		
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Please see the above comment		
Company performing the calibration(internal or external calibration):	Not applicable		
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not applicable		
Is (are) calibration(s) valid for the whole reporting period?	Not applicable		
If applicable, has the reported data been cross-checked with other available data?	The monitoring equipment purchase records /12/ and manual /12/ were checked.		
How were the values in the monitoring report verified?	Not applicable		
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes. As the monitoring parameter under consideration is determined by standardized test procedures (WBT), the QA/QC and calibrations are at the test conduction by the measuring team for WBT. Accordingly, the verification team has focused on abilities, qualifications and recognition of involved personnel and institutions of the measuring team involved in the WBT. The WBT has been carried out by a third party, CEEEZ ¹ /B09/. The persons involved in conducting the WBTs were duly trained by the Mechanical Engineering Department of School of Engineering under University of Zambia /10/. The concerned institution along with the team is deemed competent to conduct the WBTs by the verification team.		
In case only partial data are available	Not applicable		

¹ Centre for Energy, Environment & Engineering Zambia (CEEEZ) is a non-governmental organisation collaborating with Government and various institutions, that investigates, analyzes and makes useful conclusions and policy recommendations on energy, environment and engineering concerns, and also carries out studies, research and development, consultancy and training in those areas. CEEEZ represents AREED (African Rural Energy Enterprise Development) in Zambia.

<p>because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?</p>	
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Monitoring Parameter Requirement	Assessment/ Observation by the DOE
Data / Parameter: (as in monitoring plan of CPA-DD):	Quantity of biomass saved per stove per annum (This is basically the amount of woody biomass consumption that is consumed through the continued use of old stoves (B_{new}))
Measuring frequency/Time Interval:	Annual
Reporting frequency:	Annual
Reported value:	2.76 tonnes per annum
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Value obtained from monitoring survey of samples
Is accuracy of the monitoring equipment as stated in the CPA-DD? If the CPA-DD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not applicable
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Not applicable
Is the calibration interval in line with the monitoring plan of the CPA-DD? If the CPA-DD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not applicable
Company performing the calibration(internal or external calibration):	Not applicable
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not applicable
Is (are) calibration(s) valid for the whole reporting period?	Not applicable
If applicable, has the reported data been cross-checked with other available data?	The reported data have been cross checked from the monitoring survey sheets and the calculation provided in the ER spread sheet /4/
How were the values in the monitoring report verified?	The values were verified from the ER spread sheet /4/
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0).
01.0	5 June 2015	Initial publication.

Decision Class: Regulatory
Document Type: Form
Business Function: Issuance
Keywords: programme of activities, verifying and certifying
