




**Validation report form for post-registration changes for  
CDM project activities  
(Version 02.0)**

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

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the project activity</b>	Improved Cook Stove Project 2, Nkhata Bay District, Malawi; UNFCCC ref.: 9935
<b>Process track</b>	<input type="checkbox"/> Prior approval <input checked="" type="checkbox"/> Issuance <input type="checkbox"/> Renewal of crediting period
<b>Version number of the validation report on PRCs</b>	01
<b>Completion date of the validation report on PRCs</b>	28/06/2018
<b>Type(s) of PRCs</b>	<input type="checkbox"/> Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines <input checked="" type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of a monitoring plan <input checked="" type="checkbox"/> Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools <input type="checkbox"/> Changes to the project design <input type="checkbox"/> Changes specific to afforestation and reforestation project activities
<b>Version number of PDD to which this report applies</b>	1.6
<b>Project participants</b>	The Sigma Global Company Pty Ltd. Vimiti Limited
<b>Host Party</b>	Malawi
<b>Applied methodologies and standardized baselines</b>	AMS-II.G, Energy efficiency measures in thermal applications of non-renewable biomass, version 5.0
<b>Mandatory sectoral scopes linked to the applied methodology</b>	3: Energy Demand.
<b>Conditional sectoral scopes linked to the applied methodologies</b>	NA
<b>Name and UNFCCC reference number of</b>	Earthood Services Private Limited; UNFCCC ref.: E-0066

the DOE	
Name, position and signature of the approver of the validation report on PRCs	 Dr. Kaviraj Singh Managing Director

## SECTION A. Executive summary

>> The project involves dissemination of the Changu Changu Moto high efficiency biomass cook stoves to approximately 22,000 households in Nkhata Bay District, Malawi. The project is being developed under the small scale CDM methodology AMS- II.G. Energy efficiency measures in thermal applications of non-renewable biomass, version 5.

The Changu Changu Moto is a low cost, high efficiency biomass fired cook stove developed through extensive trials with the local communities and is specifically designed for local Malawian conditions. The stove is constructed from locally available materials and does not require specialist construction skills or equipment. The stove design is a brick rocket stove, constructed using 26 mud bricks and a mud mortar mix. The Chichewan name Changu Changu Moto translates to "Fast Fast Fire" and reflects one of the main benefits of the improved cook stove in reducing cooking time and saving wood fuel.

The Changu Changu Moto improved cook stove will replace the low efficiency 3-stone fire stove, which is the dominant firewood end-use system for cooking within Malawi. Emission reductions are achieved through improving household energy efficiency and thus reducing the consumption of non-renewable woody biomass.

### Scope of Validation

The scope of the services provided by Earthood Services Private Limited for the project is to perform validation of the post registration changes for the project activity. The scope of validation is to assess the claims and assumptions made in the revised project design document (PDD) against the UNFCCC criteria, including but not limited to, CDM PS version 1.0 for PA, CDM VVS version 1.0 for PA, applied methodology and other relevant rules and requirements established for CDM project activities.

### Validation Process

The validation process is undertaken by validation team that involves the following:

- the desk review of documents and evidences submitted by the project participant in context of the reference CDM rules and guidelines issued by CDM EB,
- undertaking site visit, interview or interactions with the representative of the project participant,
- reporting audit findings with respect to clarifications and non-conformities and the closure of the findings, as appropriate and
- preparing a draft validation report for renewable of crediting period complying with the CDM requirements

An independent Technical Review team reviews the validation report prepared by validation team. The final validation report that is accepted by Technical Reviewer is then approved on behalf of Earthood Services Private Limited and processed further as per CDM procedures.

### Conclusion

The review of the PDD, supporting documentation and subsequent follow-up actions (onsite visit and interviews) has provided Earthood with sufficient evidence to determine the fulfilment of stated criteria.

Earthood is of the opinion that the project activity "Improved Cook Stove Project 2, Nkhata Bay District, Malawi" as described in the final PDD version 1.6 dated 27/05/2018 meets all relevant requirements of CDM, meets host country criteria and has correctly applied the methodology AMS-II.G, Energy efficiency measures in thermal applications of non-renewable biomass, version 5.0. Therefore, the project is being recommended to CDM EB for request for approval of Post registration changes.

## SECTION B. Validation team, technical reviewer and approver

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### B.1. Validation team member

No.	Role	Last name	First name	Affiliation	Involvement in
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					(e.g. name of central or other office of DOE or outsourced entity)	Desk/document review	On-site inspection	Interviews	Validation findings
1.	Team Leader (from 01/08/2018 onwards)	IR	Mandal	Amit Ranjan	Central office	Y	Y	Y	Y
2.	Technical Expert (TA 3.1) (from 01/08/2018 onwards)	IR	Mandal	Amit Ranjan	Central office	Y	Y	Y	Y
3.	Methodological Expert (AMS-II.G) (from 01/08/2018 onwards)	IR	Mandal	Amit Ranjan	Central office	Y	Y	Y	Y
4.	Team Leader	EI	Agarwal	Nikunj	Central office	Y	Y	Y	Y
5.	Validator	EI	Agarwal	Nikunj	Central office	Y	Y	Y	Y
6.	Technical Expert (TA 3.1)	EI	Agarwal	Nikunj	Central office	Y	Y	Y	Y
7.	Methodological Expert (AMS-II.G)	EI	Agarwal	Nikunj	Central office	Y	Y	Y	Y
8.	Local Expert	EI	Agarwal	Nikunj	Central office	Y	Y	Y	Y

## B.2. Technical reviewer and approver of the validation report on PRCs

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	Garg	Shreya	Central office
2.	Technical Expert (TA3.1)	IR	Garg	Shreya	Central office
3.	Approver	IR	Singh	Kaviraj	Central office

## SECTION C. Means of validation

### C.1. Desk/document review

>> The validation for the post registration changes is performed primarily as a document review of the project design document version 01.6 dated 27/05/2018 /6/. The cross checks between information provided in the PDD and information from sources other than those used, if available, the validation team's sectoral or local expertise and, if necessary, independent background investigations.

The complete list of documents/evidences assessed by validation team is included under Appendix 3.

**C.2. On-site inspection**

Duration of on-site inspection: 02/12/2016 to 03/12/2016				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening Session- Introduction to audit- Overview of Monitoring process	Project Office	02/12/2016	Nikunj Agarwal
2	Implementation and operation of the project Activity, Data collection system, Regulatory data: Discussion and Document review. Any change in the project from Registered PDD.	Project Office	02/12/2016	Nikunj Agarwal
3	Audit trail which contains the evidence and records, Cross-check the monitoring report against other sources such as comparable information like raw data, plant records, etc.	Project Office	02/12/2016	Nikunj Agarwal
4	Visiting to House Holds in the project boundary to cross check the Operating Households.	House Holds/ Villages	02/12/2016	Nikunj Agarwal
5	Calibration performance and observations of monitoring practices against the requirements of the PDD and the selected methodology and corresponding tool: Discussion and document review	Project Office	03/12/2016	Nikunj Agarwal
6	Evaluation of data management and the quality assurance and quality control system, review of information flows for generating, aggregating and reporting.	Project Office	03/12/2016	Nikunj Agarwal
7	To verify the actual status, project equipment and monitoring procedures, discussions with the responsible monitoring team. Verifying the reported emission reductions, check of each monitoring parameter.	Project Office & Villages	03/12/2016	Nikunj Agarwal
8	Meeting with Community Volunteers, Responsible Monitoring Staff, Manager and Coordinators involved in the KPT Process.	House Holds/ Villages	03/12/2016	Nikunj Agarwal
9	Visiting to House Holds in the project boundary to cross check the Operating Households including the Households participating in KPT from July to August 2016.	House Holds/ Villages	03/12/2016	Nikunj Agarwal
10	Summary and Closing session of Audit.	Project Office	03/12/2016	Nikunj Agarwal

**C.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Furber	Geoffrey	CEO	02/12/2016 & 03/12/2016	Distribution of Stoves	Nikunj Agarwal
2.	Luxford	Nikki	Project Information Coordinator	02/12/2016 & 03/12/2016	Distribution of Stoves, sampling Plan	Nikunj Agarwal
3.	Furber	Elizabeth	Trustee	02/12/2016	Distribution of Stoves	Nikunj Agarwal
4.	Ngwira	Force	Programme Manager	02/12/2016 & 03/12/2016	Sampling, KPT and Surveys, Monitoring plan	Nikunj Agarwal
5.	Chinunda	Evance	General Manager CCM	02/12/2016 & 03/12/2016	Distribution of Stoves	Nikunj Agarwal
6.	Nyirenda	Hope	Data Entry Assistant	02/12/2016	Sampling, KPT and Surveys	Nikunj Agarwal
7.	Kaunda	Jessie	CCM Manager	02/12/2016 & 03/12/2016	Emission Reduction Calculation	Nikunj Agarwal
8.	Kachali	Hannah	Office Administrator	02/12/2016	Data Entry and Log Books	Nikunj Agarwal
9.	Banda	John	Coordinator	02/12/2016	Sampling, KPT and Surveys	Nikunj Agarwal
10.	Msowoya	Israel	Project Manager	02/12/2016 & 03/12/2016	Sampling, KPT and Surveys, Monitoring Plan	Nikunj Agarwal
11.	Soldier	Amon	Coordinator	02/12/2016 & 03/12/2016	Sampling, KPT and Surveys	Nikunj Agarwal
12.	Phillimon	Harawa	Lead Community Volunteer	03/12/2016	Sampling, KPT and Surveys	Nikunj Agarwal
13.	Nyirenda	Lifa	Lead Community Volunteer	03/12/2016	Sampling, KPT and	Nikunj Agarwal

					Surveys	
14	Mzumala	Ann Saulosi	Independent Household representative	02/12/2016	DOE Field Survey	Nikunj Agarwal
15	Muthali	Kate Fransisco	Independent Household representative	02/12/2016	DOE Field Survey	Nikunj Agarwal
16	Phiri	Jane Nation	Independent Household representative	02/12/2016	DOE Field Survey	Nikunj Agarwal
17	Ngambi	Dotothy Lughano	Independent Household representative	02/12/2016	DOE Field Survey	Nikunj Agarwal
18	Mayo	Elines Musterd	Independent Household representative	02/12/2016	DOE Field Survey	Nikunj Agarwal
19	Bande	Lameck Militi	Independent Household representative	02/12/2016	DOE Field Survey	Nikunj Agarwal
20	Banda	Liliyan Ziyoka	Independent Household representative	02/12/2016	DOE Field Survey	Nikunj Agarwal
21	Nyivenda	Cecilia Chimombo	Independent Household representative	02/12/2016	DOE Field Survey	Nikunj Agarwal
22	Ngando	Mary Justin	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
23	Longwe	Jiwalange Hellings	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
24	Kaunda	Marget Plaston	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
25	Longwe	Andriss Simon	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
26	Mhone	Lackel Mazondi	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
27	Saka	Mery Luben	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
28	Saka	Mackray Wadison	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
29	Phiri	Matalida Chicago	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
30	Banda	Gertrude Henderson	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
31	Mbewere	Anne Kalao	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
32	Kaira	Ellena Allan	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
33	Mponda	Mary Enoseti	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal

34	Ngamba	Patricia Jelly	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
35	Muwisa	Pitison Joel	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
36	Mwenda	Samson Mujuma	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
37	Mwenda	Esau Musoti	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
38	Mwenda	Phonex Nico	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
39	Mwenda	Godfrey Lusungu	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
40	Nyirenda	Visuzgo Kavinyinda	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
41	Kaunda	Coster Kanamaya ni	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
42	Kamanga	Wiliyard Chilundi	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal
43	Sisha	Lazaroh Vumdumu	Independent Household representative	03/12/2016	DOE Field Survey	Nikunj Agarwal

#### C.4. Sampling approach

>> The sampling plan has been designed in accordance with Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0 and Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0.

It follows the recommended outline for a sampling plan in Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0.

Practices for sample design and administering of the surveys and field measurements are based on *Household Sample Surveys in Developing and Transition Countries* as recommended in Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0.

#### Sampling Design:

##### Objectives and Reliability Requirements

The objective of this sampling plan is to determine an estimate of By,new,KPT, the quantity of woody biomass used per device during the project activity in period y. By,new,KPT will be measured as per the Kitchen Performance Test (KPT) protocol, with a 90% confidence interval and a 10% margin of error. The KPTs will be carried out in accordance with procedures specified by the Partnership for Clean Indoor Air (PCIA).

#### Target Population

The target population includes all households participating in the project and is transparently described in section **Error! Reference source not found.** and **Error! Reference source not found.** of the PDD. The target population is all individual households within each chief area in the Traditional Authorities within the project area. Each household has a chief. The total number of eligible households in the project area is estimated at 22,000.

#### Sampling Method

The sampling method to be used is multi-stage sampling using a self weighting sampling procedure as per section II.E of Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities



version 3.0. Nkhata Bay District covers an area of 4,071 km<sup>2</sup>. Transport infrastructure is limited, access to liquid fuels in Malawi is limited, and times and costs to travel within the district can be high. Multi-stage sampling is selected to significantly improve the efficiency and reduce the costs of the sampling compared to a simple random sample. The main objective is to determine the average daily quantity of woody biomass used per household during the project activity across the whole project area, so explicit stratification is not required.

The primary sampling unit (PSU) includes all eligible households in the project area and is defined as each village under a chief (chief area) in the Traditional Authorities within the project area. The ultimate sampling units are defined as individual households within each chief area and include all households in the target population.

Each PSU will be checked to ensure it is sufficiently large enough to select the required number of households if required (i.e. as 15 households are to be selected from each PSU, as described below, each PSU must contain at least 15 households). Any PSUs below the minimum size will be combined with other adjacent PSUs.

The 12 PSUs in the first stage will be selected using a probability proportional to size (PPS) without replacement procedure, the size being the number of households in each unit. The number of households participating in the project in each chief area will be determined from implementation data in the project database.

The assessment team has checked and reviewed the revised PDD and the details are transparently mentioned as discussed above.

#### C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	-	CAR#01	-
Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines	-	-	-
Corrections	-	-	-
Changes to the start date of the crediting period	-	-	-
Inclusion of a monitoring plan	-	-	-
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools	-	CAR#02	-
Changes to the project design	-	-	-
Changes specific to afforestation and reforestation project activities	-	-	-
Others (for monitoring activities)	CL#01, 02, 03, 04	CAR#03	-
<b>Total</b>	<b>04</b>	<b>03</b>	<b>00</b>

### SECTION D. Validation findings

#### D.1. Compliance with PDD form

<b>Means of validation</b>	The project participants used the latest version of the PDD form version 10.1. The revised PDD (both in track change and clean version) provided is in compliance with the guidelines to fill PDD form. The information contained in the revised PDD is materially same as the information in the registered PDD except the content of PRC, which is assessed in further sections of this report. The updated PDD was found in conformance to the latest guidelines and is a part of the current submission.
<b>Findings</b>	CAR#01 was raised and resolved.
<b>Conclusion</b>	a) The revised PDD provided to include the change is in compliance to CDM-PDD-FORM version 10.1. b) The information from the registered PDD has been appropriately transferred to the revised PDD. The changes in the revised PDD were then done in track

	change mode.
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## D.2. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

Means of validation	N.A.
Findings	N.A.
Conclusion	N.A.

## D.3. Corrections

Means of validation	<p>Corrections made in the PDD are:</p> <ul style="list-style-type: none"> <li>Section E.1 was updated according to the updated template with additional information on Stakeholder Consultation.</li> <li>Section F was updated to add the date the Letter of Approval was issued.</li> </ul> <p>The assessment team has checked the revised PDD and it is observed that the changes are correct.</p>
Findings	No findings raised.
Conclusion	<p>In view of the above assessment, the validation team able to confirm that: The proposed change in project design comply with the –</p> <p>(a) The applicability and application of the applied methodology under which the project activity has been registered; (b) The additionality of the project activity; (c) The scale of the project activity.</p> <p>The changes will be submitted along with the request for issuance.</p> <p>The assessment team able to confirm that the actual changes does not adversely affect the conclusions of the validation report of the registered, PDD with regard to: (a) Additionality of the registered CDM project activity; (b) Scale of the registered CDM project activity; (c) Applicability and application of the approved methodologies and, where applicable, the approved standardized baselines under which the CDM project activity has been registered; (d) The compliance of the monitoring plan with the applied methodologies and, where applicable, the applied standardized baselines.</p>

## D.4. Changes to the start date of the crediting period

Means of validation	NA
Findings	NA
Conclusion	NA

## D.5. Inclusion of a monitoring plan

Means of validation	NA
Findings	NA
Conclusion	NA

### D.6. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

<b>Means of validation</b>	<p>Following changes are made in the PDD:</p> <ol style="list-style-type: none"> <li>1. Section B.3 was updated according to the updated template with the GHG source table. PP has revised the section and included the GHG sources as required by the template. The assessment team has checked and reviewed the revised PDD and found it correct and consistent with the requirements.</li> <li>2. Section B.7.1 was updated to correct an error made in the Values Applied in the <math>N_{y,CCM}</math> table. Estimated stove usage rate was incorrectly included as 90%. It has been corrected to 80%. The value was wrongly mentioned in the registered PDD. The PP has revise the value in line with the actual estimated value of the parameter. The assessment team has checked and reviewed the value and found correct and accepted.</li> <li>3. The <math>f_{NRB}</math> table was updated according to the updated template to include QA/QC procedures and also Purpose of the Data information. The table was updated in line with the new template version. The assessment team has checked and reviewed the revised PDD and found correct.</li> </ol>
<b>Findings</b>	No Findings raised.
<b>Conclusion</b>	<p>In view of the above assessment, the validation team able to confirm that: The proposed change in project design comply with the –</p> <ol style="list-style-type: none"> <li>(a) The applicability and application of the applied methodology under which the project activity has been registered;</li> <li>(b) The additionality of the project activity;</li> <li>(c) The scale of the project activity.</li> </ol> <p>The changes will be submitted along with the request for issuance.</p> <p>The assessment team able to confirm that the actual changes does not adversely affect the conclusions of the validation report of the registered, PDD with regard to:</p> <ol style="list-style-type: none"> <li>(a) Additionality of the registered CDM project activity;</li> <li>(b) Scale of the registered CDM project activity;</li> <li>(c) Applicability and application of the approved methodologies and, where applicable, the approved standardized baselines under which the CDM project activity has been registered;</li> <li>(d) The compliance of the monitoring plan with the applied methodologies and, where applicable, the applied standardized baselines.</li> </ol>

### D.7. Changes to the project design

<b>Means of validation</b>	
<b>Findings</b>	
<b>Conclusion</b>	

### D.8. Changes specific to afforestation and reforestation project activities

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

## SECTION E. Internal quality control

>> The draft validation report for post registration changes prepared by the validation team was reviewed by an independent technical review team to confirm if the internal procedures established and implemented by ESPL were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess

the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team were independent of the validation team.

The technical review process may accept or reject the validation opinion or raise additional findings in which case these must be resolved before requesting for registration. The technical review process is recorded in the internal documents of ESPL and the additional findings gets included in the report.

The final report approved by the technical reviewer is authorized by Managing Director and issued to PP and/or submitted for request for post registration changes along with request for issuance for monitoring period 06/08/2015 to 11/08/2016 (first and last days included), as appropriate on behalf of ESPL.

## **SECTION F. Validation opinion**

>> ESPL has completed the validation of post registration changes for “Improved Cook Stove Project 2, Nkhata Bay District, Malawi”.

The validation for post registration changes was performed on the basis of rules and requirements defined by UNFCCC for the CDM project activities.

The project involves dissemination of the Changu Changu Moto high efficiency biomass cook stoves to approximately 22,000 households in Nkhata Bay District, Malawi. The project is being developed under the small scale CDM methodology AMS- II.G. Energy efficiency measures in thermal applications of non-renewable biomass, version 5.

The Changu Changu Moto is a low cost, high efficiency biomass fired cook stove developed through extensive trials with the local communities and is specifically designed for local Malawian conditions. The stove is constructed from locally available materials and does not require specialist construction skills or equipment. The stove design is a brick rocket stove, constructed using 26 mud bricks and a mud mortar mix. The Chichewan name Changu Changu Moto translates to “Fast Fast Fire” and reflects one of the main benefits of the improved cook stove in reducing cooking time and saving wood fuel.

The Changu Changu Moto improved cook stove will replace the low efficiency 3-stone fire stove, which is the dominant firewood end-use system for cooking within Malawi. Emission reductions are achieved through improving household energy efficiency and thus reducing the consumption of non-renewable woody biomass

It is demonstrated that the project is not a likely baseline scenario and the emission reductions attributable to the project are, hence, additional to any that would occur in the absence of the proposed CDM project activity. The project correctly applies the approved AMS-II.G, Energy efficiency measures in thermal applications of non-renewable biomass, version 5.0 and is assessed against latest valid CDM PS, VVS and PS and/or other applicable CDM Decisions/Tools/Guidance/Forms.

The proposed CDM project activity is likely to achieve the anticipated emission reductions stated in the PDD provided the underlying assumptions do not change. The expected emission reductions (annual average) from the project activity are estimated to be 37,830 tCO<sub>2</sub>e per year over the selected crediting period. The proposed CDM project activity is likely to achieve the anticipated emission reductions stated in the PDD provided the underlying assumptions do not change.

ESPL has informed the project participants of the validation outcome through the draft validation report and final validation report. In case of negative validation outcome, the final validation report is only submitted to PP. The final validation report contains the information with regard to fulfilment of the requirements for validation, as appropriate.

ESPL applied the following validation process and methodology using a competent validation team;

- the desk review of documents and evidences submitted by the project participant in context of the reference CDM rules and guidelines issued by CDM EB,
- undertaking/conducting site visit, interview or interactions with the representative of the project participant,
- reporting audit findings with respect to clarifications and non-conformities and the closure of the findings, as appropriate and
- preparing a draft validation opinion based on the auditing findings and conclusions
- technical review of the draft validation opinion along with other documents as appropriate by an independent competent technical review team
- finalization of the validation opinion (this report)

The review of the PDD, supporting documentation and subsequent follow-up actions (onsite visit and interviews) have provided ESPL with sufficient evidence to determine the fulfilment of stated criteria.

ESPL is of the opinion that the project activity “Improved Cook Stove Project 2, Nkhata Bay District, Malawi” as described in the final PDD version 1.6 dated 27/05/2018 meets all relevant requirements of CDM, meets host country criteria and has correctly applied the methodology AMS-II.G, Energy efficiency measures in thermal applications of non-renewable biomass, version 5.0. Therefore, the project is being recommended to CDM EB for request for post registration changes.

## Appendix 1. Abbreviations

Abbreviations	Full texts
SSC	Small Scale
BM	Build Margin
CAR	Corrective Action Request
CCM	Changu Changu Moto
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board
CER	Certified Emission Reduction
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CO <sub>2</sub> e	Carbon dioxide equivalent
CR / CL	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
EIA / EA	Environmental Impact Assessment / Environmental Assessment
ER	Emission Reduction
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
FSR	Feasibility Study Report
GHG	Greenhouse Gas(es)
GWP	Global Warming Potential
IRL	Information Reference List
KP	Kyoto Protocol
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-Governmental Organisation
OM	Operational Margin
PCP	Project Cycle Procedure
PDD	Project Design Document
PP	Project Participant
PS	Project Standard
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Clean Development Mechanism Validation And Verification Standard

## Appendix 2. Competence of team members and technical reviewers

Competence Statement			
<b>Name</b>	Amit Ranjan Mandal		
<b>Country</b>	India		
<b>Education</b>	Master of Science (Energy Management)		
<b>Experience</b>	9.5 yrs		
<b>Field</b>	Environmental, Energy, CDM		
Approved Roles			
<b>Team Leader</b>	YES		
<b>Validator</b>	YES		
<b>Verifier</b>	YES		
<b>Methodology Expert</b>	ACM0002, AMS.I.D, AMS.II.G		
<b>Local expert</b>	YES (India)		
<b>Financial Expert</b>	NO		
<b>Technical Reviewer</b>	YES		
<b>TA Expert</b>	YES (TA 1.2, TA 3.1)		
<b>Reviewed by</b>	Abhishek Mahawar	<b>Date</b>	01/03/2018
<b>Approved by</b>	Ashok Kumar Gautam	<b>Date</b>	01/03/2018

Competence Statement			
<b>Name</b>	Nikunj Agarwal		
<b>Country</b>	India		
<b>Education</b>	B.Tech. (Chemical Engineering) M. Tech. (Energy Management)		
<b>Experience</b>	11.5 Years +		
<b>Field</b>	CDM, Energy, Climate Change, Energy Efficiency		
Approved Roles			
<b>Team Leader</b>	Yes		
<b>Validator</b>	Yes		
<b>Verifier</b>	Yes		
<b>Methodology Expert</b>	Yes (AMS-I.D, AMS.I.C., ACM0001, ACM0002, ACM0006, ACM0009, ACM0012, AMS.II.B, AMS.III.H, AMS.II.J, AMS.II.D., AMS.II.G.)		
<b>Local expert</b>	Yes (India, Malawi)		
<b>Financial Expert</b>	No		
<b>Technical Reviewer</b>	No		
<b>TA Expert</b>	Yes (TA 3.1)		
<b>Reviewed by</b>	Abhishek Mahawar	<b>Date</b>	01/03/2018
<b>Approved by</b>	Ashok Kumar Gautam	<b>Date</b>	01/03/2018

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	6 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Gautam	Date	01/03/2018

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	Earthood Services Private Limited	Onsite interviews and Audit carried out by ESPL: <b>Verification Team on site:</b> Nikunj Agarwal	Site Visit	Others
2.	UNFCCC	AMS II G "Energy efficiency measures in thermal applications of non-renewable biomass" version 05	Version 05	Others
3.	Environmental Affairs Department	Ministry of Natural Resources, Energy and Environment, Malawi Government. 2010. Malawi State of Environment and Outlook Report. s.l.: Environmental Affairs Department,	2010	Others
4.	PP	Monitoring report. version 1 Monitoring report. Final version	Dated 28.10.2016 Dated 19.08.2018	PP
5.	UNFCCC	Guidelines On Assessment Of Debundling For SSC Project Activities, Version 03	Last Accessed on 22/07/2017	Others
6.	UNFCCC	Guidelines For Objective Demonstration And Assessment Of Barriers, Version 01	Last Accessed on 22/07/2017	Others
7.	UNFCCC	Indicative Simplified Baseline And Monitoring Methodologies For Selected Small-Scale CDM Project Activity Categories, Version 03	Last Accessed on 22/07/2017	Others
8.	UNFCCC	Standard For Sampling And Surveys For CDM Project Activities And Programme Of Activities, Version 03	Last Accessed on 22/07/2017	Others
9.	UNFCCC	Guidelines for completing CDM-PDD and CDM-NM	MR	Others



10.	IPCCC	Revised 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual	IPCC Data	Others																																								
11.	PP	Kitchen performance Test Result	MR																																									
12.	UNFCCC	Validation and Verification Standard,	version 1.0	Others																																								
13.	Nakhata Bay District Assembly, Ministry of Local Government & Rural Development	Baseline Survey and KPT Report approved by District Forestry Officer	For entire Monitoring Period	PP																																								
14.	PP	sample size calculation Excel Sheet	For entire Monitoring Period	PP																																								
15.	UNFCCC	CDM SSC WG meeting 40 annex 05 ▪ <a href="http://cdm.unfccc.int/Panels/ssc_wg/meetings/040/ssc_040_an05.pdf">http://cdm.unfccc.int/Panels/ssc_wg/meetings/040/ssc_040_an05.pdf</a>	----	Others																																								
16.	PP	KPT Coordinator Guide	For entire Monitoring Period	PP																																								
17	PP	KPT Household Checklists	For entire Monitoring Period	PP																																								
18	Ansari, H. Joint UNDP/World Bank Energy Sector Management Program	Energy Assessment Status Report – Malawi		PP																																								
19	HST Scales	Calibration Records – Weighing Scales <table border="1"> <thead> <tr> <th></th><th>Serial No</th><th>Certificate no</th><th>Test Date</th><th>Test next due</th></tr> </thead> <tbody> <tr> <td>1</td><td>12402141</td><td>13555</td><td>12-April-16</td><td>11-April -17</td></tr> <tr> <td>2</td><td>12402142</td><td>13551</td><td>12-April-16</td><td>11-April -17</td></tr> <tr> <td>3</td><td>12402143</td><td>13552</td><td>12-April-16</td><td>11-April -17</td></tr> <tr> <td>4</td><td>12402145</td><td>13553</td><td>12-April-16</td><td>11-April -17</td></tr> <tr> <td>5</td><td>12402146</td><td>13556</td><td>12-April-16</td><td>11-April -17</td></tr> <tr> <td>6</td><td>12402147</td><td>13550</td><td>12-April-16</td><td>11-April -17</td></tr> <tr> <td>7</td><td>12402148</td><td>13554</td><td>12-April-16</td><td>11-April -17</td></tr> </tbody> </table>		Serial No	Certificate no	Test Date	Test next due	1	12402141	13555	12-April-16	11-April -17	2	12402142	13551	12-April-16	11-April -17	3	12402143	13552	12-April-16	11-April -17	4	12402145	13553	12-April-16	11-April -17	5	12402146	13556	12-April-16	11-April -17	6	12402147	13550	12-April-16	11-April -17	7	12402148	13554	12-April-16	11-April -17	For entire Monitoring Period	PP
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20	Delmhorst	Calibration Records – Moisture Meter <table border="1"> <thead> <tr> <th></th><th>Serial No</th><th>Report no 1</th><th>Report no 2</th><th>Certification Date</th></tr> </thead> <tbody> <tr> <td>1</td><td>40709</td><td>59368-01</td><td>59368-02</td><td>21-Jan-15</td></tr> </tbody> </table>		Serial No	Report no 1	Report no 2	Certification Date	1	40709	59368-01	59368-02	21-Jan-15	For entire Monitoring Period	PP																														
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		2	40710	59368-01	59368-02	21-Jan-15		
		3	40711	59368-01	59368-02	21-Jan-15		
		4	40712	59368-01	59368-02	21-Jan-15		
		5	40713	59368-01	59368-02	21-Jan-15		
		6	40714	59368-01	59368-02	21-Jan-15		
21	PP	sample size calculation					For entire Monitoring Period	PP
22	PP	Emission Reduction Calculations Sheet					For entire Monitoring Period	PP
23	PP	RIPPLE Africa Improved Cook Stove Project 1 and 2 planning v16					For entire Monitoring Period	PP
24	PP	KPT Equipment Instructions (Weighing scale etc.)					For entire Monitoring Period	PP
25	PP	CCM Training Instructions					For entire Monitoring Period	
26	Forestry Department, FAO, UN	Global forest resources assessment 2010 - Country Reports - Malawi –FAO						Others
27	Department of Energy Affairs, Government of Malawi	National Energy Policy. Lilongwe : s.n., 2003						Others
28	Department of Environment	Malawi Environmental Protection Act						Others
29	PP	Log Book (Form, Form 2 & Form 3)					For entire Monitoring Period	
30	Department of Economic and Social Affairs, Statistics Division, United Nations	Household Sample Surveys in Developing and Transition Countries. New York						Others
31	Environmental Protection Department	<a href="http://www.sdn.org.mw/enviro/eia/appendixB.html">http://www.sdn.org.mw/enviro/eia/appendixB.html</a>						Others
32	PP	Screen Shot for the Data Base					For entire Monitoring Period	PP
33	Ripple Africa	Manufacturer Specification regarding the Stoves					For entire Monitoring Period	PP
34	PP	Validation Report					Dated 19/10/2014	PP
35	PP	Registered PDD					Version 1.5 dated 15/08/2014	PP

36	PP	Changu changu moto project launch ceremony report Internal MoM against the implementation of the project activity commenced with moulding of bricks to construct stoves	-	PP
37	UNFCCC	EB67, Annex 22 - information note: Default values of fraction of non-renewable biomass for least developed countries and small island developing States (version 01.0)	-	Others
38	UNFCCC	<a href="http://cdm.unfccc.int/DNA/fNRB/docs/malawi.pdf">http://cdm.unfccc.int/DNA/fNRB/docs/malawi.pdf</a>	Last Accessed on 22/07/2017	Others
39	PP	Multiple Environment Training Record Sheet	For entire monitoring period	
40	PP	Document regarding the monthly Audit	-	PP
41	PP	Summary of KPT Results 2015.xlsx	For entire Monitoring Period	PP
42	Delmhorst	Delmhorst Ripple Africa Letter Received 271016	Calibration of MCS	Others
43	PP	Revised PDD version 1.6 dated 27/05/2018	Revised PDD	Others

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

Table 1. CLs from this validation

CL ID	01	Section no.	A, D, E	Date : 06/12/2016
<b>Description of CL</b>				
When completing a monitoring report form, as per the instructions for filling out the monitoring report form (CDM-MR-FORM) attached to the CDM-MR-FORM, PP shall use the same font and font size, however there are different fonts and font size in some sections of the MR. PP shall clarify.				
<b>Project participant response</b>				<b>Date : 15/02/2017</b>
<i>PP has edited to meet requirements.</i>				
<b>Documentation provided by project participant</b>				
Revised Monitoring Report				
<b>DOE assessment</b>				<b>Date: 04/03/2017</b>
PP has submitted the revised monitoring report, however there are still the different font size exists in the Monitoring Report (page 1 of MR, section D etc.). PP shall check and clarify.				
<b>Project participant response</b>				<b>Date : 29/03/2017</b>
<i>PP has edited the MR to meet requirements</i>				
<b>Documentation provided by project participant</b>				
Revised Monitoring Report				
<b>DOE assessment</b>				<b>Date: 18/05/2017</b>
PP has submitted the revised Monitoring report with the consistency of the Font size; hence this CL is closed out.				

<b>CL ID</b>	02	<b>Section no.</b>	C	<b>Date</b> : 06/12/2016
<b>Description of CL</b>				
As per the registered PDD & Monitoring Report, there is the procedure for the Internal Audit and Training in each monitoring period, however the details of the same is missing in MR. PP shall elaborate the details of Internal Audit and Trainings along with the supporting documents.				
<b>Project participant response</b>				<b>Date</b> : 15/02/2017
PP has added details in Section C of the MR and has provided supporting documents containing information on when the internal audit and training occurred.				
<b>Documentation provided by project participant</b>				
Actual Data records from the once per month audit. Several documents including staff training document, guides, instructions and checklists for KPTs.				
<b>DOE assessment</b>				<b>Date</b> : 04/03/2017
PP has submitted the following documents: <ul style="list-style-type: none"> <li>• staff training documents</li> <li>• Checklists for KPT</li> <li>• Actual Data records from the once per month audit</li> <li>• Guides, instructions for KPTs.</li> </ul> However the details of "Internal Audit" and "training" are still missing in the revised Monitoring Report.				
<b>Project participant response</b>				<b>Date</b> : 29/03/17
Page 7 of the MR contains information on the once per month audit and training.				
<b>Documentation provided by project participant</b>				
Revised Monitoring Report				
<b>DOE assessment</b>				<b>Date</b> : 18/05/2017
PP has updated the details of the Audit and Training in Section C of the revised Monitoring Report. Hence this CL is closed out.				

<b>CL ID</b>	03	<b>Section no.</b>	D.2	<b>Date</b> : 06/12/2016
<b>Description of CL</b>				
<ul style="list-style-type: none"> <li>• Calibration Certificates number for the weighing scale mentioned in section D.2 of the MR doesn't match with the same mentioned in the calibration certificates submitted to DOE.</li> <li>• PP had mentioned the 8 Weighing scales in section D.2 of MR, however PP has submitted the calibration certificates for 7 scales only. Calibration certificate for scale having serial number 12402144 is missing, PP shall submit the same.</li> </ul>				
<b>Project participant response</b>				<b>Date</b> : 15/02/2017
PP has removed the weighing scale serial number 12402144 as it was not used in the 2016 KPTs.				
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date</b> : 04/03/2017
<ul style="list-style-type: none"> <li>• Calibration Certificates number for the weighing scale mentioned in section D.2 of the MR doesn't match with the same mentioned in the calibration certificates submitted to DoE.</li> <li>• It was validated during on site visit that PP had not used the weighing scale having serial number 12402144, hence PP response is found satisfactory and this point is closed out.</li> </ul>				
<b>Project participant response</b>				<b>Date</b> : 29/03/2017
Section D.2 has been updated with correct information.				
<b>Documentation provided by project participant</b>				
Revised Monitoring report				
<b>DOE assessment</b>				<b>Date</b> : 20/05/2017
PP has updated the calibration certificate in the revised monitoring report, and has submitted the revised monitoring report to the DoE. The same information has been checked with the calibration certificate checked during the onsite visit. Hence this CL is closed out.				

<b>CL ID</b>	04	<b>Section no.</b>	D.3	<b>Date</b> : 06/12/2016
<b>Description of CL</b>				
PP shall submit the Supporting Documents in order to Implement the sampling Plan mention in section D.3 of the monitoring report. PP shall submit the "KPT report Project 1 October 2016" as mentioned in section D.3 of MR.				
PP shall submit the excel sheet used in the sampling calculation.				
<b>Project participant response</b>				<b>Date</b> : 15/02/2017
PP has provided documents as requested above.				

<b>Documentation provided by project participant</b>	
<i>KPT Report, Excel sheet for KPT Result</i>	
<b>DOE assessment</b>	<b>Date:</b> 04/03/2017
PP has submitted the KPT Report and Excel Sheet for KPT result. The same was checked for Kitchen performance test and the result for the same, KPT Report was found satisfactorily. Excel Sheet for the sampling calculation was checked during on site and found okay.	
CL reopened PP is requested to explain how the KPT results were found acceptable with a 12.6% precision achieved wherein the sampling was carried out at a 90/10 confidence interval. Kindly explain.	
<b>Project participant response</b>	<b>Date :</b> 02/06/2018
The 90/10 confidence interval was carried out intending to achieve it, however the data came in differently this time. As per the applied methodology we will use the 90% confidence interval lower bound on wood saved. PP has recalculated the emission reductions with the revised number and updated the Monitoring Report and Emission Reductions Calculation Sheet.	
<b>Documentation provided by project participant</b>	
<b>DOE assessment</b>	<b>Date:</b> 28/06/2018
PP has explained the values assumed for the calculation of emission reductions. PP has considered 90% confidence interval lower bound for the wood saved. The assessment team has checked the KPT sheet as well as the ER sheet and found accepted. CL04 is closed.	

Table 2. CARs from this validation

<b>CAR ID</b>	01	<b>Section no.</b>	Section C	<b>Date :</b> 06/12/2016
<b>Description of CAR</b>				
As per section C page 12 of Monitoring Report, it is mentioned that "Households make 30 bricks each....", however as per the description mentioned in Section B.1 of MR, cook stoves are made of 26 bricks, PP shall further clarify.				
<b>Project participant response</b>				<b>Date :</b> 15/02/2017
<i>Extra bricks are made in case the householder needs to repair their stove. When training householders they are shown how to repair their stoves.</i>				
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> 04/03/2017
PP response is found satisfactory, the same was checked during the field visit as well and it was observed that 26 Bricks were used in order to construct the stoves. Hence this CAR is closed out.				

<b>CAR ID</b>	02	<b>Section no.</b>	Section C	<b>Date :</b> 22/11/2016
<b>Description of CAR</b>				
As per section D.2 of Monitoring Report, value of By,new,KPT is 1.46, while as per the registered PDD, the same value was 2.62. PP shall further clarify with the supporting documents. As per section D.2 of Monitoring Report, Figure of "12.78%" is being used to calculate the non-operating households; PP shall submit the supporting documents for this value.				
<b>Project participant response</b>				<b>Date :</b> 15/02/2017
<i>The confidential KPT Report has been provided as well as the final results sheets.</i>				
<b>Documentation provided by project participant</b>				
KPT Report & calculation sheet for the KPT Result				
<b>DOE assessment</b>				<b>Date:</b> 04/03/2017

PP has submitted the KPT Report and the final calculation sheet against the KPT Result. The value of 1.46 for By,new,KPT and the value of 12.78% used to calculate the non-operating Households has been verified from both the documents. CAR reopened PP is required to explain how the KPT surveys conducted abide by the national standards or international standards or guidelines. Also, PP is required to explain how a 3 day test is being considered representative for the entire year.	
<b>Project participant response</b>	<b>Date : 02/06/2018</b>
<p>The sampling plan has been designed in accordance with Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0 and Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0.</p> <p>It follows the recommended outline for a sampling plan in Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0.</p> <p>Practices for sample design and administering of the surveys and field measurements are based on <i>Household Sample Surveys in Developing and Transition Countries</i> as recommended in Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0.</p> <p>The KPTS have been conducted using the same method each year since we started the project and as described above are based on <i>Household Sample Surveys in Developing and Transition Countries</i>. The 3 day test with all the additional design components is based on this standard.</p>	
<b>Documentation provided by project participant</b>	
<b>DOE assessment</b>	<b>Date: 28/06/2018</b>
<p>The sampling plan has been designed in accordance with Standard for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0 and Guidelines for Sampling and Surveys for CDM Project Activities and Programme of Activities version 3.0. The sampling details have been checked and found correct.</p> <p>The PP has also provided the KPT sheet and emission reduction calculation sheet. The assessment team has reviewed the calculation sheet and found it correct and consistent with the requirements.</p> <p>CAR#02 is closed.</p>	

<b>CAR ID</b>	03	<b>Section no.</b>	Section E.8.6	<b>Date : 06/12/2016</b>
<b>Description of CAR</b>				
<ul style="list-style-type: none"> <li>There is the higher amount of Emission Reductions achieved during this monitoring period compared to the registered PDD for the same period. PP shall further substantiate with the supporting evidences.</li> <li>PP shall submit the ER calculation sheet.</li> </ul>				
<b>Project participant response</b>				<b>Date : 15/02/2017</b>
<i>The ER sheet has been provided. The confidential KPT Report has been provided.</i>				
<b>Documentation provided by project participant</b>				
ER Calculation Sheet				
<b>DOE assessment</b>				<b>Date: 04/03/2017</b>
Value of Emission Reductions in the ER calculation sheet are not matching with the same in monitoring report.				
<b>Project participant response</b>				<b>Date : 29/03/2017</b>
<i>Please find attached the revised calculation sheet and Monitoring report.</i>				
<b>Documentation provided by project participant</b>				
<i>KPT Report, Revised Excel Sheet</i>				
<b>DOE assessment</b>				<b>Date: 20/05/2017</b>
PP has submitted the revised calculation sheet, value of emission reductions are now matching with the MR and ER sheet. Hence this CAR is closed out.				

Table 3. FARs from this validation

There is no FAR from this validation.

<b>FAR ID</b>	xx	<b>Section no.</b>		<b>Date: DD/MM/YYYY</b>
<b>Description of FAR</b>				

Project participant response	Date: DD/MM/YYYY
Documentation provided by project participant	
DOE assessment	Date: DD/MM/YYYY

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	31 October 2017	Revision to align with the requirements in the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory		
Document Type: Form		
Business Function: Registration		
Keywords: post-registration change, project activities, validation report		