**Validation report form for Project activity**

**(Version 01.0)**

| VALIDATION REPORT | |
|---|---|
| **Title of the project activity** | Biolite Solar Lighting Project in Malawi<br>GS11397 |
| **Version number of the validation report** | 01.1 |
| **Completion date of the validation report** | 23/01/2024 |
| **Version number of PDD to which this report applies** | Version: 05; Dated: 02/01/2024 |
| **Project Developer** | Biolite, Inc |
| **Project Participantsand any communities involved** | Swiss Carbon Value Ltd |
| **Host Party** | Malawi |
| **SDG Impacts:** | 1. SDG 1: No poverty (1.1)<br>2. SDG 7: Clean, Affordable Energy for all (7.1)<br>3. SDG 13: Climate Action (13.3) |
| **Sectoral scope(s) and selected methodology(ies)** | Sectoral Scope: 1<br>CDM Methodology: AMS-I.A. Electricity generation by the user - Version 19.0 |
| **Estimated Sustainable Development Contributions** | SDG 13: Climate Action- 18,630 $tCO_2e$<br>SDG 1: No Poverty- 4,058,041 USD<br>SDG 7: Clean, Affordable Energy for all- 240,000 Households |
| **Name of VVB** | E-0052: Carbon Check (India) Private Limited |
| **Name, position and signature of the approver of the validation report** | Sanjay Agarwalla<br>Sanjay Kumar Agarwalla, Technical Director |

## SECTION A. Executive summary

Purpose and general description:

The Project Developer Biolite Inc. has appointed the VVB, Carbon Check (India) Private Ltd. to perform an independent validation of the Gold Standard Project Activity “Biolite Solar Lighting Project in Malawi” in the host country of Malawi (hereafter referred to as “project activity”) This report summarises the findings of the validation of the registration of new project activity, performed on the basis of Gold Standard criteria Gold standard for gold goals (GS4GG)/ UNFCCC as well as criteria given to provide for consistent project operations, monitoring and reporting. This report contains the findings and resolutions from the validation and a validation opinion.

As per the PDD /01/, the project activity “Biolite Solar Lighting Project in Malawi” involves implementing Solar home lighting distribution system in Malawi. The project activity aims at mitigating the $CO_2$ emissions from kerosene- based lighting technologies that is used as project baseline by providing them with solar lighting systems to individuals. This technology includes a solar flat plate panel, battery, connection box, switch box and LED light bulbs. The project activity will reduce an average of 18,630 $tCO_{2e}$ for the crediting period of 5 years.

The purpose of a validation is to have a thorough and independent assessment of the proposed project activity against the applicable Gold Standard/ UNFCCC requirements, in particular, the project’s baseline, monitoring plan and the project’s compliance with relevant UNFCCC and Gold standard for Global Goals criteria. These are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all Gold Standard for Global Goals Voluntary projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of voluntary emission reductions (VERs).

Location:

The proposed project is located in geographic boundaries of Malawi.

| Latitude | Longitude |
|---|---|
| 13°15' 4.38" S | 34°18' 5.50" E |

Scope of the validation:

The validation scope is defined as the independent and objective review of the project design document (PDD /01/). The PDD /01/ is reviewed against the relevant criteria (see above) and decisions by the Gold standard/ UNFCCC, including the approved baseline and monitoring methodology /B03/. The validation team has, based on the recommendations in the CDM Validation and Verification Standard /B02/ and GS4GG Principles and Requirements, version 1.2 /B01/ employed a rule-based approach, focusing on the identification of significant risks for project implementation and the generation of VERs.

The validation is not meant to provide any consulting towards the project developer. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

While carrying out the validation, CCIPL determines if the Project Activity complies with the requirements of the paragraph 37 of the CDM Modalities & Procedures, the applicability conditions of the selected methodology /B03/, guidance issued by the Gold Standard and also assess the claims and assumptions made in the PDD /01/ without limitation on the information provided by the project developers.

The Validation team confirms the contractual relationship signed between the VVB, Carbon Check (India) Private Ltd. and the Project Developer /20/ on 08/04/2022. The team assigned to the validation meets the Carbon Check (India) Private Ltd.'s internal procedures including the UNFCCC/Gold Standard for Global Goals requirements for the team composition and competence. The projects team has conducted a thorough contract review as per UNFCCC and Carbon Check procedures and requirements.

Validation methodology:

The validation has been performed as described in the CDM Validation and Verification Standard /B02/ and constitutes the following steps:

- Document review of data and information (PDD /01/ and the relevant documents including the reference to information relating to projects or technologies similar to the proposed project activity and review based on the approved methodology /B03/ being applied and of the appropriateness of formulae and accuracy of calculations).
- Cross checks between information provided in the PDD /01/ and information from other sources.
- Follow up actions for cross checking data and on-site visit assessment.
- Reference to available information
- Issuance of Validation Report.

Validation Process:

The validation consists of the following four phases:

i. A desk review of the project design documents;
   - A review of the data and information;
   - Cross checks between information provided in the PDD /01/ and information from sources with all necessary means without limitations to the information provided by the project developer;
   - Submission of Validation work plan to the PD

ii. Follow-up interviews with project stakeholders
   - Interviews with relevant stakeholders in host country with personnel having knowledge of the project development via telephone, email, online etc.;
   - Cross checking between information provided by interviewed personnel with all necessary means without limitations to the information provided by the project developer;

iii. Reference to available information relating to projects or technologies similar projects under validation and review based on the approved methodology /B03/ being applied for the appropriateness of formulae and accuracy of calculations.

iv. The resolution of outstanding issues and the issuance of the final validation report and opinion.

The report is based on the assessment of the PDD /01/ undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews and stakeholder interviews, review of the applicable/applied methodology /B03/ and their underlying formulae and calculations.

This report contains the findings and resolutions of findings, a validation opinion on the proposed Project Activity thus confirming the Project design in the documents is sound and reasonable and meets the stated requirements and identified criteria.

The validation protocol describes a total of 29 findings which include:

- Eighteen (18) Corrective Action Requests (CARs);

- Eleven (11) Clarification Requests (CLs);

No FARs were raised in this validation.

All the findings are closed during the validation process.

Conclusion:

Carbon Check (India) Private Ltd. concludes the validation with a positive opinion that the GS PA "Biolite Solar Lighting Project in Malawi", as described in the PDD /01/, meets all applicable Gold Standard and CDM requirements, including those specified in the relevant methodologies, tools /B03/ and guidelines and article 12 of the Kyoto Protocol, paragraph 37 of CDM modalities and procedures, subsequent decisions by the COP/MOP and CDM Executive Board.

The selected baseline and monitoring methodology /B03/ is applicable to the project and correctly applied. Carbon Check (India) Private Ltd. therefore recommends the project to the Gold Standard for registration.

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

### B.1. Validation team member

| No. | Role | Type of resource | Last name | First name | Affiliation | Involvement in | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Desk review | On-site inspection | Interview(s) | Validation findings |
| 1. | Team Leader / Technical Expert | IR | Raychoudhury | Rishi Kishore | CCIPL | X | X | X | X |
| 2. | Trainee Assessor | IR | Nifiya J | Jeni Miraclin | CCIPL | X | - | - | X |
| 3. | Local Expert | ER | Kumwima | Priscilla | CCIPL | - | X | X | - |

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

| No. | Role | Type of resource | Last name | First name | Affiliation |
|---|---|---|---|---|---|
| 1. | Technical reviewer | IR | C | Indumathi | CCIPL |
| 2. | Approver | IR | Agarwalla | Sanjay Kumar | CCIPL |

## SECTION C. Means of validation

### C.1. Desk review

List of all documents reviewed or referenced during the validation is provided in Appendix-3.

## C.2. On-site inspection

| **Duration of on-site inspection:** 04/07/2023 to 07/07/2023 | | | | |
|---|---|---|---|---|
| **No.** | **Activity performed on-site** | **Site location** | **Date** | **Team member** |
| 1. | • General information about the project.<br>• Barriers faced/overcome in the processes (additionality)<br>• Local Stakeholder consultation processes<br>• Legal/ Statutory Clearances and Agreements Signed<br>• Baseline determination<br>• Application of appropriate Methodology<br>• Operation and maintenance Procedures<br>• Technical details of project<br>• Data monitoring and storage practices<br>• Calibration and maintenance requirement of the equipment Monitoring Methodology | Malawi | 04/07/2023 to 07/07/2023 | Rishi Kishore Raychoudhury<br><br>Priscilla Kumwima |
| 2. | Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD | | 04/07/2023 to 07/07/2023 | |

## C.3. Interviews

| No. | Interviewee | | | Date | Subject | Team member |
|---|---|---|---|---|---|---|
| | Last name | First name | Affiliation | | | |
| 1. | Nkombe | Gracious | Biolite | 04/07/2023, 05/07/2023, 06/07/2023 & 07/07/2023 | • Discussion on Project Design and eligibility criteria<br>• Proposed Technology to be used in the PA<br>• PD Management System Manual<br>• Discussion on project funding and involvement of any ODA<br>• Discussion on the PA PDD and ER sheet<br>• Discussion on the GS preliminary review comments<br>• Sustainability aspects of the PA SDG impacts | Rishi Kishore Raychoudhury<br><br>Priscilla Kumwima |
| 2. | Maya | Tionge | Yellow | 07/07/2023 | • Discussion on Project Design and eligibility criteria<br>• Proposed Technology to be used in the PA<br>• PD Management System Manual<br>• Discussion on project funding and involvement of any ODA<br>• Sustainability aspects of the PA<br>• SDG impacts<br>• Safeguarding principles | |

List of beneficiaries surveyed by VVB:

| Sl. no | Unique ID | Name of interviewee | Date | Subject | Audit team member |
|---|---|---|---|---|---|
| /01/ | SHX-14112927 | Veronica Duke (relative of Samuel Dukes) | 04/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | Rishi Kishore Raychoudhury<br><br>Priscilla Kumwima |
| /02/ | SHX-15383036 | Pauline Mlomo (relative of Stive Mlomo) | 04/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | |
| /03/ | SHX-184183310 | Rusiya Makenga (relative of Hastings Chidyaudzu) | 05/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | |

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| /04/ | SHX-14184329 | Steve Willie | 05/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | |
| /05/ | SHX-15108867 | Andrew Mateyu | 05/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | |
| /06/ | SHX-16715274 | Agnes Nsewere | 05/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | |
| /07/ | SHX-18792100 | Mwaiwawo Ganizani (relative of Chipiliro Ganizani) | 06/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | |
| /08/ | SHX-19891385 | William Chimvumbulutoso | 06/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | |
| /09/ | SHX-18773025 | Patrick Mkolonga | 06/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | |
| /10/ | SHX-17385880 | Emiliya Chifweza | 07/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | |
| /11/ | SHX-10166963 | Lyphod Mphote | 07/07/2023 | Local stakeholder consultation and Baseline survey of the project activity | |

## C.4. Sampling Approach

As the target population is homogeneous, PD has proposed simple random sampling plan using 90/10 as confidence/precision. This is in line with the applied methodology /B03/. The sample size for each parameter is determined following guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities Ver. 4.0 (EB86, Annex 4) /B06/.

In line with paragraph 26 of the “Standard for Sampling and surveys for CDM Project Activities and Programmes of Activities, Version 09.0” /B06/, the validation team has applied acceptance sampling approach on the baseline survey as part of validation. The project Developer had applied sampling approach to determine the baseline, a representative baseline survey /03/ was conducted by the Project Developer. The validation team has chosen acceptance sampling in accordance with paragraph 28 of the “Standard for Sampling and surveys for CDM Project Activities and Programmes of Activities, Version 09.0” /B06/.

Applying paragraph 39 (c) of the “Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 09.0”, /B06/, a sample size of 11 households was chosen (with no discrepant records). A sample size of 11 was determined, based on an AQL of 0.5% and UQL of 20%; producer risk of 10% and consumer risk of 10% each in determining the VVB’s sample size Acceptance number (c) thus determined for the sample is 0. However, VVB interviewed 11 samples from the baseline survey done by project developer.

The information provided in the baseline survey /03/, has been cross checked during the Onsite visit. As a part of acceptance sampling, the Validation team could confirm the baseline survey data /03/ with no discrepant records. Thus, PD’s set of records has been accepted in line with paragraph 33 of the “Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 09.0”, /B06/.

## SECTION D. Validation findings

### D.1. Description of project activity

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| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |
| **Conclusion** | The project activity involves solar home lighting distribution system in the country of Malawi leading to reduction in GHG emissions released into the atmosphere.<br><br>The project activity involves distribution of 80,000 SLS (Solar Lighting System) Kits in Malawi replacing kerosene bases lighting that were used in the baseline. The components included in the kit are Solar lights, connecting wires/ cables, Min distribution box, power switches, battery, and solar PV plate for charging. The common SLS model distributed is Solar Home 620 known as SHS620. Other than this model the project activity also involves distribution of SHS620 and SHS5000. This has validated by the technical specification of the lighting system submitted by PD /04/. The average life span of the project is 7 years /04/. The baseline of the project activity is kerosene, a fossil fuel which leads to GHG emission in the form of $CO_2$. The use of kerosene is the cheapest option and do not require any expert knowledge on their application. The carbon credits have been claimed only for the portion of the users who employed kerosene for lighting purpose in the baseline scenario. The same has been cross checked by VVB /02/. Hence it has validated by VVB that the project bassline is kerosene from the survey records /03/ and on-site assessment /19/. Biolite's Solar Lighting Systems (SLS) are distributed throughout Malawi by Yellow Solar, an external distributor. To ensure effective sales, Yellow Solar deploys trained sales agents to specific points of sale across the country. These agents provide prospective customers with comprehensive information on the products, including the fact that the project is part of a carbon certification framework. By purchasing the device, the end-user agrees to share the carbon rights to Biolite. A carbon waiver, or consent form as part of the warranty card /16/ is signed by the user at the time of sale. VVB has reviewed the warranty card /16/ submitted by PD and confirmed the same. PD has conducted a retroactive baseline survey across the representative sample of users throughout Malawi. The survey revealed that kerosene served as the primary lighting source for 31.54% of the households surveyed. VVB has validated the survey records submitted by PD |

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| | /03/ and also confirmed the same during on-site visit /19/. Therefore, PD has considered a reasonable value. This was further found to be correct as per discussion with households.<br><br>As per the approved methodology "AMS-I.A: Electricity generation by the user" (version 19.0) /B03/ 80,000 SLS kits are expected to result in reduction of average 18,630 $tCO_2$ emission reductions.<br><br>Scenario existing prior to the implementation of the project activity<br><br>The project activity is the green field activity, which involves distribution of SLS kits in the households of Malawi where prior to the implementation of the project activity the households rely on battery operated torched, kerosene lamps, firewood, candles etc. This was validated from on-site interview and from the baseline survey report /03/. The baseline scenario was the project activity is not connected to the grid at any time. Hence, it complies with the applied methodology /B03/.<br><br>Technology of the project activity:<br><br>The project included different models of the SLS to cater the variety of user requirements. The common SLS model is Solar Home 620, SHS620+ and SHS5000. The models are in compliance with the IEC Standard 62257-9-5 and meet the lighting Global Pico PV quality standards. The lifespan of the SLS us expected to be 7 years an the same is validated with the technical specification submitted by PD /04/.<br><br>Location:<br><br>The project activity is located in the LDC Malawi. The physical coordinates of the project activity are 13° 15' 4.38" S, 34° 18' 5.50" E.<br><br>Start Date of the project activity:<br><br>GS4GG clause 4.1.39 Principle and Requirement /B01/ states "The Project start date is the earliest date on which the Project Developer has committed to expenditures related to the implementation of the Project. This does not include the purchase or option to purchase the land upon which a Project is intended to take place". In this case the start date is the earliest date when first SLS kit is distributed to the households. It has been verified that 17/09/2020 is the earliest date of SLS kit distributed under the project activity which represents and justifies the start date of the project activity /07/. It has been noted that the project is a retroactive project which means the start date has occurred prior to the first submission of preliminary review information to GS (clause 4.1.42 (b) under Principle and Requirement /B01/. As per GS preliminary review for the project and listing documents, it is verified the start date to be 17/09/2020. Hence, the start date meets GS requirement and correctly considered for the project activity. Being portable device, it is realistic to consider that on the date of distribution of the SLS kit.<br><br>From the desk review of PDD /01/ and interviews of the PD representatives, it is revealed that this Project does not involve any ODA funding. Thus, the validation team considers no ODA funding has been involved under this Project. This is further confirmed by the undertaking /14/ provided by the PD.<br><br>Based on assessment above, CCIPL confirms that the description of the proposed Project Activity in the PDD /01/ is accurate and complete and it provides an understanding of the Project Activity, and the project is in line with the applied methodology /B03/ and GS4GG requirements /B01/. |

## D.2. Application of selected baseline and monitoring methodology and selected standardized baseline

### D.2.1. Applicability of methodology and standardized baseline

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| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |
| **Conclusion** | The small-scale project activity utilizes the methodology AMS-I.A: "Electricity |

Generation by the User", version 19.0 /B03/.

Under section B.2 of the PDD /01/, project has been assessed for all the applicability conditions of the applied methodology.

| S. N | Applicability Condition of AMS-I. A, version 19.0 | PD Justification | VVB Assessment |
|---|---|---|---|
| 1. | The methodology is applicable to project activities that involve new installations (greenfield) or replace existing onsite fossil-fuel-fired generation. | The project activity involves new installations. | Validation team based on review of the PDD /01/ and the sales records for the SLS installations /07,16/ confirms the project activity involves new addition. Hence satisfies the applicability condition. |
| 2. | The applicability of the methodology is limited to individual households and users that do not have a grid connection except when:<br><br>(a) A group of households or users are supplied with electricity through a standalone mini-grid powered by renewable energy generation unit(s) where the capacity of the generating units does not exceed 15 MW (i.e. the sum of installed capacities of all renewable energy units connected to the mini-grid is less than 15 MW) e.g. a community-based stand-alone off-the-grid renewable electricity systems; or<br><br>(b) For renewable energy-based lighting applications, the emission reductions per system is less than 5 tonnes of CO2e a year and it shall be demonstrated that that fossil fuels would have been used in the absence of the project activity by: | For this specific case. Though most of the target end-users are not connected to the grid, however, applicability condition (b) applies to the project activity, since it is a solar based lighting application. | Validation team based on review of the PDD /01/ and the ER sheet /02/ it is confirmed that the project activity has emission reduction less than 5 tonnes of $CO_2e$ pe system per year and hence satisfies the applicability condition (b). |

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| | | (i) a representative sample survey of target households; or (ii) official statistics from the host country government agencies;<br><br>(c) A group of households or users are connected to a grid prior to the start date of the project activity (or the start date of validation with due justification), however the electricity from the grid is available for the households and users for less than 36 hours in any given calendar month during the crediting period or the grid connected household coverage in the host country is less than 50%. | | |
| | 3. | The methodology is not applicable to project activities that include units that will be connected to the grid at any time during the crediting period. | The project SLS will not be connected to the grid at any point during the crediting period. | Validation team based on review of the PDD /01/ and the methodology /B03/ confirms that the project activity is not relevant to this applicability criteria provided in the methodology as in the project activity Case A was applied. |
| | 4. | Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:<br><br>(a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir;<br>(b) The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of | N/A, since this is not a hydro powered activity. | Validation team based on review of the PDD /01/ and the methodology /B03/ confirms that the project activity is not a hydro powered activity and hence the applicability is not applicable. |

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| | the project activity is greater than 4 W/m2;<br><br>(c) The project activity results in new reservoirs and the power density of the power plant, is greater than 4 W/m2. | | |
| 5. | Combined heat and power (cogeneration) systems are not eligible under this category. | N/A, since this is not a cogeneration activity. | Validation team based on review of the PDD /01/ and the methodology /B03/ confirms that the project activity is not a cogeneration activity and hence the applicability is not applicable. |
| 6. | If the electricity generation unit added has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW. | N/A, since only renewable energy is used to provide energy supply to the project technology. | Validation team based on review of the PDD /01/ and the methodology /B03/ confirms that the project activity is only renewable energy used to supply energy and hence the applicability is not applicable. |
| 7. | Project activities that involve retrofit or replacement of an existing renewable electricity generation unit are included in this category. To qualify as a small-scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW. | N/A, as the project technology does not involve any retrofit or replacement of an existing RE generation unit. | Validation team based on review of the PDD /01/ and the methodology /B03/ confirms that the project activity does not involve any retrofit or replacement of the existing Renewable Energy generation unit and hence the applicability is not applicable. |
| 8. | In the case of project activities that involve the addition of renewable electricity generation units to an existing renewable electricity generation facility, | N/A, since the project activity is a new activity, with installation of solar lighting applications, making SLS reach resource deprived households. | Validation team based on review of the PDD /01/ and the methodology /B03/ confirms that the project activity is a new activity with installation of |

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| | | the total capacity of the units added by the project should be lower than 15 MW and should be physically distinct1 from the existing units. | | solar lighting applications and hence the applicability is not applicable. |
| | 9. | In cases where the project activity utilizes biomass, the applicability conditions of "TOOL16: Project and leakage emissions from biomass" shall apply. | N/A, as it is not a biomass-based project activity. | Validation team based on review of the PDD /01/ and the methodology /B03/ confirms that the project activity does not use any biomass activity and hence the applicability is not applicable. |
| | CCIPL hereby confirms that the selected baseline and monitoring methodology has been approved by Gold standard, and is applicable to the Project, which complies with all the applicability conditions therein and the selected version is valid at the time of submission of the proposed project activity. | | | |

### D.2.2. Deviation from methodology

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| **Means of validation** | Document Review, Interview |
| **Findings** | Not Applicable |
| **Conclusion** | Not Applicable. |

### D.2.3. Clarification on applicability of methodology, tool and/or standardized baseline

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| **Means of validation** | Desk Review & Interviews |
| **Findings** | No findings were raised |
| **Conclusion** | The VVB confirms that no clarification is needed. |

### D.2.4. Project boundary

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| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |
| **Conclusion** | According to paragraph 18 of the applied methodology AMS-I.A, version 19.0 /B03/, "The spatial extent of the project boundary included the physical, geographical site of the renewable electricity generating unit(s) and the equipment that uses the electricity produced."<br><br>The information was validated during the On-site visit conducted by the validation team and same has been demonstrated in section B.3 of the PDD /01/.<br><br>The project boundary confirmed during the on-site visit along with the documentary evidence was found in conformance with the applied baseline methodology /B03/. All sources of GHG emissions required by the methodology have been included in the project boundary and are justified in reference to the project activity. There are no project emissions/leakage emissions of any sort which are not addressed by the applied methodology occurring because of the project activity. Validation team confirms that the justification provided by the PD is reasonable and evidenced in the PDD /01/. |

### D.2.5. Establishment and description of baseline scenario

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| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |

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| **Conclusion** | As per paragraph 5.2 of the applied methodology AMS-I. A, version 19.0, the baseline is defined as "The baseline emissions are calculated based on the fuel consumption of the technology in use or that would have been used to generate the equivalent quantity of energy in the absence of the project activity,".<br><br>PD has been able to demonstrate that kerosene is the baseline fuel used for lighting needs of the household. From the baseline survey, it is confirmed that 31.54% of households were using Kerosene as the primary lighting source as it is the cheapest options and do not require any expert knowledge on their application of lighting and the same has been cross checked by the survey records submitted by PD /03/. The validation team during on-site visit interview found that users are dependent Kerosene, wood, electricity, battery (rechargeable and non-rechargeable), candles and other portable solar bulbs. Also, during on-site visit, VVB has found that during the survey approximately 40% of the households rely on Kerosene as the primary lighting source and during the interview with the households it was found that Kerosene is the cheapest options. Therefore, baseline scenario identified by the project developer is credible for the project activity as the same is taken into consideration for the emission reduction calculation.<br><br>Validation team confirms that the baseline scenario is identified as per the applied methodology and assumes confirms that each SLS in the project activity will replace equivalently kerosene lamps. All data parameters are used correctly while estimating the baseline emissions. The baseline scenario represents the most possible scenario in absence of the project activity. The same is also justified in section B.4 of PDD /01/. This is in conformance with paragraph 12.1.5 (b) of GS4GG Project Activity requirements version 1.2 /B01/. |

### D.2.6. Proof of Project Eligibility

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| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |
| **Conclusion** | GENERAL ELIGIBILITY CRITERIA:<br>**Eligible Project Types**: As per section 4.1.3 of the GS4GG Principles and Requirements, version 1.2, /B01/ document states following for automatic eligibility for a project "A Project type is automatically eligible for Gold Standard Certification if there are Gold Standard approved Activity Requirements and/or Impact Quantification Methodologies associated with it or it's referenced in the Gold Standard Product Requirements." The Gold Standard has published Community Services Activity Requirements. The project replaces kerosene – based lighting technologies with solar- based lighting technology. The project type is installation solar lighting technologies, which is eligible under community service activity requirements, version 1.2 paragraph 3.1.1 (b) /B01/. Therefore, the project is automatically eligible for GS certification under the lighting end-use energy efficiency category.<br><br>**Location of the Project:** The project's host Party is Malawi, and eligible/ accordance as per Gold Standard Principles & Requirements, version 1.2 /B01/.<br><br>**Project Area, Project Boundary and Scale:** Project boundary geographical area is defined as the physical boundary of the project activity i.e distribution of Solar Home Lighting System within the geographic boundaries of Malawi. Project activity falls under small scale project activity as the emission reduction for the project activity is less than 5 tonnes of $CO_2e$ a year. Hence, the project qualifies for small scale projects.<br><br>**Host Country Requirements:** The project's host Party is Malawi and eligible as per Gold Standard requirements. The project does not have any negative environmental impact. Moreover, the project activity is in compliance with the host country's environmental, ecological and social regulation. The proposed project activity is deemed to be eligible under gold standard as per Gold Standard Principles and Requirements, version 1.2 /B01/. |

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| | **Contact Details:** Project contact details has been given in Appendix 2 of the PDD /01/.<br><br>**Legal Ownership**: Legal ownership of the GS carbon credit generated from the project activity is transferred to the PD. Each end user included into the project signs a wavier form for the transfer of credits to Biolite Inc /09/. And it is confirmed that the project developer has full and uncontested legal ownership of the project that are eligible under this project as per the GS Principles and Requirements, version 1.2 /B01/.<br><br>**Other Rights:** Not applicable. The project is implementation as per individual users choice and hence no other rights are required.<br><br>**Official Development Assistance (ODA) Declaration:** The project does not involve any ODA /14/. This has been also supported with declaration of ODA as per GS Principles and Requirement version 1.2 /B01/.<br><br>Therefore, the proposed project activity is deemed to be eligible under gold standard GS4GG. |

### D.2.7. Demonstration of additionality

| | |
|---|---|
| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |
| **Conclusion** | As per paragraph 4.1.9 of GS4GG Community services activity requirements, version 1.2 /B01/, Projects that meet any of the following criteria are considered as deemed additional and therefore are not required to prove Financial Additionality at the time of design certification:<br>(a) Positive list (Annex B of this document)<br>(b) Projects located in LDC, SIDS, LLDC<br>(c) Microscale projects<br><br>PD has demonstrated additionality as per paragraph 4.1.9 (b) of GS4GG Community services activity requirements, version 1.2 /B01/, the project activity is located in Malawi which is a least developed country as defined by the United Nations. As per clause 3.5.1.5 of GS4GG Principles and Requirements, version 1.2 /B01/ a retroactive project must submit project documents within one year of the project start date. PD has submitted initial project documents on 15/09/2021 to GS and the project activity started the sale of first SLS device on 17/09/2020 which has been cross verified by the sales records /07/ submitted by PD. Therefore, the prior consideration is met for the project activity as per GS4GG rules. As per clause 3.5.2.2 of GS4GG Principles and Requirements, version 1.2 /B01/, the proposed project activity falls under the 'Projects located in LDC' and hence under Principle 5 – Financial Additionality & Ongoing Financial Need, the project is considered deemed additional and therefore not required to prove Financial Additionality at the time of Design Certification.<br><br>This is in conformance with the requirements of the CDM Project Standard for Project Activities (version 03.0) /B02/ and CDM Validation and Verification Standard for Project Activities (version 03.0) /B02/ and GS4GG requirements/B01/. |

### D.2.8. Eligibility criteria for inclusion of VPAs

| | |
|---|---|
| **Means of validation** | Not Applicable |
| **Findings** | -- |
| **Conclusion** | This is a project activity not a program of activities. Thus, this section is not applicable. |

## D.2.9. Emission reductions

| | |
|---|---|
| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |
| **Conclusion** | As per "AMS-I.A: Electricity Generation by user," version 19.0 /B03/ the emission reduction is calculated as follows:<br><br>**Baseline Emission:**<br>The establishment of baseline equation follows 3 mains steps as elaborated in the PDD /01/. The retained calculation method for baseline emission is Option 3: based on trend adjusted projection of historical fuel consumption as per the methodology /B03/.<br><br>$BE_y = \sum_j FC_{j,y} \times NCV_j \times EF_{CO2,j}$ |

| Parameter | Unit | Type | Value |
|---|---|---|---|
| $BE_y$ | $tCO_2$ | Calculated | Baseline emissions in year y |
| $FC_{j,y}$ | Mass or volume unit | Calculated | Projected fuel consumption of fuel type j in year y (mass or volume unit) |
| $NCV_j$ | GJ per mass or lighting service unit | Default | Net calorific value of fuel type j. For renewable energy lighting application, equivalent level of lighting service must be used instead of energy. |
| $EF_{CO2,j}$ | t CO2/GJ | Default | CO2 emission factor of fuel type j |
| j | N.A. | N.A. | Fuel type used for combustion |

The term FC*NCV of the above formula represents the net calorific value of the fuel consumed in the baseline, which is the energy content of the fuel consumed in the baseline, which can be re-expressed by :

$$FC_{j,y} \times NCV_j = l_i * d_v * h * \frac{1}{LE_{ker}} * 3600 * 10^{-9}$$

The equation is transformed according to the following :

- $p_{ker}$ – representing the fraction of rural households – is directly integrated in $N_{i,a,1}$:
  - $p_{ker} \times N_{i,a,tot} = N_{i,a}$
- The present project deals with devices (each of them having two lamps), and not with individual lamps, therefore the Lamp Failure Rate (LFR) becomes the Device Failure Rate (DFR):
  - $CF_{i,y,LFR} = CF_{i,y,DFR}$
- It has to be noted that the share of lights found operational is related to the failure rate through the following equation :
  - $CF_{i,v,DFR} = 1 - DFR_{i,v}$

According to the above, ex post baseline emission for each lamp type *i* can be calculated with the following equation:

$$BE_y = \sum_{a=1}^{n} (N_{i,a} \times d_{i,a,y}) \times l_i \times h \times \frac{1}{LE_{ker}} \times EF_{ker} \times 10^{-6} \times 3.6 \times CF_{i,y,DFR}$$

| Parameter | Unit | Type | Description |
|---|---|---|---|
| $N_{i,a}$ | Number | Monitored | The number of solar lamps of type *i* deployed in period *a* for which user used kerosene as fuel for lighting prior to the acquisition of the device. |
| $d_{i,a,y}$ | Days | Monitored/ calculated | Average number of days lamps of type *i* that have been deployed in period *a* were operating in period *y* |
| $l_i$ | Lumen | Monitored (once per lamp type) | Capped (by $RC_{HH}$) lumen output of solar lamps of the type *I* deployed as part of the project activity (see above) |
| h | Hours/day | Fixed | Average operating hours of kerosene lamps in the baseline |
| $LE_{ker}$ | Lumen/W | Fixed | The specific light output of kerosene when burnt in a kerosene lantern |
| $EF_{ker}$ | $t_{CO2}$/GJ | Fixed | The specific CO2-emissions of kerosene |
| $CF_{i,y,DFR}$ | - | Monitored/ Calculated | This factor corrects the BE to calculate for total number of device of type *i* that were found to be operational, by accounting the Device Failure rate. |

Therefore, the baseline emission for the SLS model Solar home for Year 1 is calculated as below:

$BE_{SH620,y1}$ = (50,464*365)*42.02449*3.5*(1/0.1)*0.0708*($10^{-6}$)*3.6*0.95) $tCO_{2e}$
= 6,560 $tCO_{2e}$
Hence the baseline emission for the SLS model Solar home for year 1 is 6,560 $tCO_{2e}$.

**Project Emission:**

In line to paragraph 28 of the applied methodology AMS-I.A, version 19.0 /B03/:

$PE_y$= 0 (Renewable energy project activities).

**Leakage Emission:**

In line to paragraph 30 of the applied methodology AMS-I.A, version 19.0 /B03/:

$LE_y$= 0

**Emission Reduction:**

$ER_y$= $BE_y$+$PE_y$+$LE_y$
= 6,560+0+0
= 6,560 $tCO_2e$

| | |
|---|---|
| | The emission reduction for the SLS model Solar home for year 1 is 6,560 $tCO_2$ and the annual average emission reduction over the crediting period is 18,630 $tCO_2$. The calculation of the emission reductions has been ensured by the validation team based on the ER calculation sheet /02/. |

## D.2.10. Monitoring plan

| | |
|---|---|
| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |
| **Conclusion** | **Data and parameters fixed ex-ante:** |

| | Data/parameter | Unit | Value applied | Assessment |
|---|---|---|---|---|
| 1 | The specific luminous efficiency of kerosene when burnt in a kerosene lantern ($LE_{ker}$) | Lumen/ W | 0.1 | Validation team through reviewal of the documents PDD and Table – 1, comparison of non-electric lamps with standard lamp; Working paper, titled "Domestic Lighting" by Robert van der Plas, Industry and Energy Department, World Bank, 1988 [1] sourced from the World Bank Study and confirmed the same. Hence it is acceptable. |
| 2 | The specific CO2 emissions of kerosene ($EF_{ker}$) | $tCO_2/GJ$ | 0.0708 | Default value as per option (d) the TOOL 05: Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation, version 3.0 /B03/ under *IPCC default values at the upper or lower limit – whatever is more conservative – of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories* is used for the project activity. Hence it is acceptable. |
| 3 | Number of hours baseline lighting technology was used in a day (h) | Hours/ day | 3.5 | Default value as given in the applied methodology /B03/ is used for the project activity. Hence it is acceptable. |

**Assessment on Sampling plan:** -

PD has proposed simple random sampling plan using 90/10 as confidence/precision. This is in line with the applied methodology /B03/. The sample size for each parameter is determined following guidelines for Sampling and Surveys for CDM Project activities and

[1] https://documents1.worldbank.org/curated/en/274831468739224368/pdf/multi-page.pdf

Programme of Activities Version 4.0 (EB86, Annex 4) /B06/ and the same has also been stated under section B.7.2 of the PDD/01/.

The validation team determined the sample size for acceptance sampling approach by using its own professional judgement and guidance in the In line with paragraph 26 of the "Standard for Sampling and surveys for CDM Project Activities and Programmes of Activities, Version 09.0" /B06/. A sample size of 11 households was chosen (with no discrepant records). A sample size of 11 was determined, based on an AQL of 0.5% and UQL of 20%; producer risk of 10% and consumer risk of 10% each in determining the VVB's sample size Acceptance number (c) thus determined for the sample is 0. However, VVB interviewed 11 samples from the baseline survey done by project developer. VVB hence confirms that the sampling size and the method opted in on-site assessment was in line with the requirements of the paragraph 33 of the "Standard for Sampling and surveys for CDM project activities and programmes of activities, Version 09.0", /B06/.

**Data and parameters to be monitored:**

**SDG 13:**

| | Data/parameter | Unit | Value applied | Assessment |
|---|---|---|---|---|
| 1 | Total number of solar lamps of type I that have been deployed in period a ($N_{ia}$) | Number | Year 1: 160,000<br>Year 2: 320,000<br>Year 3: 480,000<br>Year 4: 640,000<br>Year 5: 800,000 | Validation team has reviewed the PDD /01/ and found the monitoring frequency of the parameter is Annual. PD has submitted sales records /06/ which contains the unique serial number, date of installation, model name, ownership information etc, which has been used in the calculation of the baseline emission. The parameter is evaluated by computing the number of technology days for lamps from the eligible devices, divided by 365 for the yearly equivalence. The same has been validated by VVB and found to be appropriate. |
| 2 | Lumen output of each solar LED lightbulb I deployed as part of project activity, capped by the equivalent level of service ($L_i$) | Lumens | Nominal lamp value (150 lumens)<br><br>$RC_{HH}$= 42.02449 | Validation team has reviewed the PDD /01/ and found the monitoring frequency of the parameter is Annual. PD has submitted manufacturer specification of SLS models /04/ in which each individual lamp's actual lumen is checked via models sold which has been used in the calculation of the baseline emission. The same has been validated |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | by VVB and found to be appropriate. | |
| | 3 | Average number of days lamps of type i that have been deployed in period a were operating in period y ($D_{i,a,y}$) | Number | 365 | Validation team has reviewed the PDD /01/ and found the monitoring frequency of the parameter is Annual. PD has submitted sales database /06/ in which the value applied will be average of number of days in the monitoring period from the day the solar lighting technology is installed and this is has been used in the calculation of the baseline emission. The same has been validated by VVB and found to be appropriate. | |
| | 4 | Device failure rate: share of SLS type i in a checked sample group not operational in period v ($DFR_{i,y}$) | % | Year 1= 5%<br>Year 2= 10%<br>Year 3= 13%<br>Year 4= 15%<br>Year 5= 17% | Validation team has reviewed the PDD /01/ and found the monitoring frequency of the parameter is Annual. PD has submitted survey report /03/ in which representative sample of SLS users per age-group is visited and the proportion of non-functional SLS will be discounted which has been used in the calculation of the baseline emission. The parameter is tracked with the survey using the formula Device failure rate = Number of non-functional SLS divided by Total number of SLS checked. The same has been validated by VVB and found to be appropriate. | |
| | 5 | Device working rate ($CF_{i,y,DFR}$) | % | Year 1= 95%<br>Year 2= 90%<br>Year 3= 87%<br>Year 4= 85%<br>Year 5= 83% | Validation team has reviewed the PDD /01/ and found the monitoring frequency of the parameter is Annual. PD has submitted survey report /03/ in which representative sample of SLS users per age-group is visited and the proportion of non-functional SLS will be discounted which has | |

| | | | | |
|---|---|---|---|---|
| | | | | been used in the calculation of the baseline emission. The parameter is tracked during the survey and also with visual inspection of the device. The same has been validated by VVB and found to be appropriate. |
| 6 | Kerosene usage in the baseline | Percentage | 31.54% | Validation team has reviewed the PDD /01/ and found the monitoring frequency of the parameter is Annual. PD has submitted survey report conducted among the representatives of sample of end-users /03/ in which the proportion of end-users who rely on kerosene for lighting purposes is included in the ER sheet /02/ which has been used in the calculation of the baseline emission. The parameter is evaluated based on the representative sample of end users relying in kerosene for the lighting purpose. The same has been validated by VVB and found to be appropriate. |

The parameters Grid availability, Emission factor in year y ($EF_{CO2y}$), Electricity generation by the project activity unit(s) type i in year y ($EG_{CO2y}$), Electricity generation by the project activity unit(s) type i in year y ($EG_{c,i,y}$), Net quantity of biomass consumed in year y ($B_{biomass,\ y}$), Moisture content of the biomass (wet basis), Net calorific value of fossil fuel type i ($NCV_{i,y}$), Net calorific value of fossil fuel type k ($NCV_{i,k}$), Average technical transmission and distribution losses (TDL) as per the methodology are **not applicable** for the project activity as per the footnote 2 of the methodology AMS-I.A, version 19.0 /B03/: Renewable energy lighting applications shall consider the equivalent level of lighting services instead of energy and the project device (Solar lighting system) is a standalone device operating solely on renewable solar energy. The same is found acceptable by VVB.

**SDG 1:**

| | Data/parameter | Unit | Value applied | Assessment |
|---|---|---|---|---|
| 1 | SDG 1: No poverty Indicator: Expenditure savings per year by user households on lighting | USD | 4,058,041 | Validation team has reviewed the PDD /01/ and found the monitoring frequency of the parameter is Annual. PD has submitted survey records /03/ and SDG impact sheet /15/ which contains the survey results prior to the SLS kit is 31.54% of |

| | | | | |
|---|---|---|---|---|
| | | | | households uses kerosene for lighting, and the annual expenditure of kerosene for lighting is equivalent to USD 53.61 and also it is estimated that the household annual savings on kerosene for lighting purpose in Malawi is 16.9 [2]which has been used in the calculation of the baseline emission. The parameter is evaluated measured during monitoring and retroactive baseline survey. The same has been validated by VVB and found to be appropriate. |

**SDG 7:**

| | Data/parameter | Unit | Value applied | Assessment |
|---|---|---|---|---|
| 1 | SDG 7: Clean, affordable energy for all<br>Indicator: Population with access to clen and affordable solar lights | Number | 80,000 per year | Validation team has reviewed the PDD /01/ and found the monitoring frequency of the parameter is Annual. PD has submitted sales records /06/ which contains the information which has been used in the calculation of the baseline emission. The parameter is evaluated measured during monitoring and retroactive baseline survey. The same has been validated by VVB and found to be appropriate. |

CCIPL confirms that the monitoring plan mentioned in the PDD is in accordance with the requirements mentioned in the monitoring methodology and the local regulatory requirements, as well the monitoring arrangements described in the monitoring plan are feasible within the project design. CCIPL is of the opinion that the monitoring plan will give opportunity for real measurement of achieved emissions reductions for the crediting period.

## D.3. Duration and crediting period

| | |
|---|---|
| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |
| **Conclusion** | The start date of the crediting period for the project activity is 17/09/2020 /01/. |

[2] This is conservative compared to a study published in 2009 which evaluated the expenditure on Kerosene for lighting purpose in Malawi to USD 47 USD. Source: Section 3.4; https://www.sciencedirect.com/science/article/abs/pii/S0301421509008209

| | |
|---|---|
| | GS4GG clause 4.1.39 Principle and Requirement /B01/ states 'The Project start date is the earliest date on which the Project Developer has committed to expenditures related to the implementation of the Project. This does not include the purchase or option to purchase the land upon which a Project is intended to take place' . In this case the start date is the earliest date when first SLS device was distributed. It has been verified that 17/09/2020 is the earliest date of SLS distributed under the project activity which represents and justifies the start date of the project activity. It has been noted that the project is a retroactive project which means the start date has occurred prior to the first submission of preliminary review information to GS (clause 4.1.42 (b) under Principle and Requirement) /B01/. As per GS preliminary review for the project and listing documents, it is verified the start date to be 17/09/2020 /07/. Hence, the start date meets GS requirement and correctly considered for the project activity. Being portable device, it is realistic to consider that on the date of distribution of first SLS.<br><br>Start date of the crediting, expected operational lifetime and duration of the crediting period, have been provided in the PDD version 05 dated 02/01/2024 /01/; checked and found appropriate to the validation team. |

## D.4. Safeguarding Principle

| | |
|---|---|
| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |
| **Conclusion** | PD has done the safeguarding principles assessment analysis and presented assessment in the GS PDD /01/. The assessment has been performed in accordance with requirements prescribed in the GS4GG Principles & Requirements, Version 1.2 & Safeguarding Principles & Requirements, Version 1.2 /B01/.<br><br>Validation team has carried out on site interviews to cross check the safeguarding principal assessment conducted by the PD. GS VVB has also reviewed the initial GS local stakeholder consultation report /12/, safeguarding principles assessment by Local expert /18/ and GS4GG PDD /01/ and found that the PD has assessed all the required critical safeguarding principle in project activity. It has been found that the Project Activity is the distribution of clean energy based technology and there is no safeguarding principles that are to be monitored and there is no net harm or negative impacts that may be foreseen by the implementation of the project activity. Validation assessment has been provided in the below Appendix 5. |

## D.5. Local stakeholder consultation

| | |
|---|---|
| **Means of validation** | Document Review, Interview |
| **Findings** | Please refer to Appendix 4 for further information. |
| **Conclusion** | The local stakeholder consultation is found conducted following guideline as outlined in GS4GG 'Stakeholder Consultation & Engagement Procedure, Requirement and Guidelines', version 1.2 /B01/ and a stakeholder consultation report is prepared /12/. VVB cross checked the information provided in the stakeholder report during document review.<br><br>The local stakeholder consultation meeting was successfully held on 31/05/2022 (physical) and 01/06/2022 (virtual) and has been postponed from the initial date due to COVID-19 pandemic situation started in 2020.<br><br>The stakeholders were invited via local newspaper advertisement, notice in public places and personal invitations and the documents were made available to the VVB. The same also confirmed from stakeholders during site visit. All the steps found performed as per the guideline. No negative comment or grievance found recorded during the stakeholder meeting. VVB also noted during site visit that no negative comments from stakeholders from the project activity. It is also noted that a continuous grievance mechanism as detailed during stakeholder meeting is found in practice at site. Stakeholders are found aware of continuous grievance mechanism system. It is also noted from PD, the feedback round as required |

| | |
|---|---|
| | under the GS started immediately after the end of the stakeholder meeting and stakeholders were asked to provide feedback to the concerned personnel within 2 months after the stakeholder report is circulated. Email to relevant stakeholders along with the project documents are circulated on 17/01/2022 for feedback. However, until March 2022 no comment received. VVB has cross checked the feedback forms submitted by PD /11/ and confirmed that no negative feedback is received. Since, a continuous grievance mechanism is in place the feedback round meets the GS4GG requirements.<br><br>Validation team has checked the supportive document i.e., Minutes of LSC meeting, public invitation, personal invitations, Email to stakeholders, Attendance sheet, LSC evaluation forms and photos /12/ to confirm the LSC and found inline with the GS4GG stakeholder Consultation and Engagement Requirements, version 1.2 /B01/.<br><br>Since the project is a retroactive project (Start date of the project is 17/09/2020), PD has conducted integrated stakeholder consultation and stakeholder feedback round as per the requirement of para 6.1.4 of GS4GG Stakeholder Consultation and Engagement Requirements, version 1.2 /B01/ which is found acceptable. An email and form invitation were sent to the stakeholders on 17/01/2022 along with the project documents. Stakeholders feedback Round (SFR) was from 17/01/2022 to 17/03/2022. As discussed with PD, no comments have been received. |

## SECTION E. Internal quality control

The final validation report has undergone a technical review and quality review before being submitted to the project developer and Gold Standard. A technical reviewer qualified in accordance with CCIPL's qualification scheme for CDM/GS validation and verification performed the technical review.

## SECTION F. Validation opinion

The VVB (Carbon Check (India) Private Ltd.) hereafter referred to as CCIPL, has been appointed by Swiss Carbon Value Ltd (the PP) to perform validation of the Project Activity "Biolite Solar Lighting Project in Malawi". The validation was performed on the basis of the UNFCCC criteria for the Clean Development Mechanism and GS4GG requirements. The scope of the validation is defined as an independent and objective review of the project design document (PDD) /01/, meets all applicable GS requirements, including those specified in the CDM Project Standard for Project Activity /B02/, GS4GG Principles and requirements version 1.2 and other relevant GS4GG applicable rules /B01/, relevant methodology /B03/, tools and guidelines and article 12 of the Kyoto Protocol, paragraph 37 of CDM modalities and procedures, subsequent decisions by the COP/MOP and CDM Executive Board. The project's baseline establishment and monitoring plan and other relevant documents. The information in these documents is reviewed against CDM Validation and Verification Standard for Project Activities, Version 03.0 /B02/, Kyoto Protocol requirements, CDM Modalities & Procedures and subsequent decisions and guidance by the COP/MOP and CDM Executive Board and GS4GG requirements.

The report is based on the assessment of the PDD /01/ undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews, stakeholder interviews, review of the applicable/applied methodology /B03/ and their underlying formulae and calculations.

The Validation team confirms the contractual relationship signed between the VVB (CCIPL) and PD (Biolite Inc) on 08/04/2022 /20/. The team assigned to the validation meets the CCIPL internal procedures including the UNFCCC requirements for the team composition and competence. The

validation team has conducted a thorough contract review as per UNFCCC and CCIPL's procedures and requirements.

Validation methodology and process

The validation has been performed as per the requirements described in the Gold Standard for the Global Goals Principles & Requirements (version 1.2); /B01/ and CDM Validation and Verification Standard for Project Activities (version 03.0) /B02/ and constitutes the review and completion of the following steps:

- Desk review of the PDD /01/ , and ER spread sheet /02/
- Review of the applied monitoring methodology AMS-I.A version 12" /B03/
- On site visit interview (04/05/2022 to 05/05/2022)
- Issuance of Draft Validation Report
- Resolution of CARs and CLs raised during validation
- Issuance of Final Validation Report.

The Project Activity will result in emissions reductions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the PA is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the PA.

The validation did not reveal any information that indicates that the PA can be seen as a diversion of ODA funding /14/.

The PDD /01/ contains monitoring plan for the monitoring of the emission reductions from the PA. The monitoring arrangement described in the monitoring plan is feasible within the project design and its CCIPL's opinion that the project developers are able to implement the monitoring plan.

| Sustainable Development Goals Targeted | SDG Impact | Estimated Annual Average | Units or Products |
|---|---|---|---|
| SDG 13- Climate Action | GHG Emission Reductions | 18,630 | $tCO_{2e}$ |
| SDG 1- No Poverty | Expenditure savings per year by user households on lighting | 4,058,041 | USD |
| SDG 7- Clean, Affordable Energy for all | Population with access to clean and affordable solar lights | 240,000 | Households |

Carbon Check (India) Private Ltd. concludes the validation with a positive opinion that the GS Project Activity "Biolite Solar Lighting Project in Malawi", as described in the PDD /01/, meets all applicable CDM/GS requirements, including those specified in the CDM Project Standard for Project Activity /B02/, GS4GG requirement /B01/ relevant methodology /B03/ and article 12 of the Kyoto Protocol, paragraph 37 of the CDM modalities and procedures and the subsequent decisions by the COP/MOP and CDM Executive Board.

Carbon Check (India) Private Ltd., therefore, requests the registration of the project activity as a GS Project Activity with Gold Standard.

# Appendix 1. Abbreviations

| Abbreviations | Full Texts |
|---|---|
| ASP | Acceptance Sampling Plan |
| AQL | Acceptable Quality Level |
| BE | Baseline Emission |
| CAR | Corrective Action Request |
| CCIPL | Carbon Check (India) Private Ltd. |
| CDM | Clean Development Mechanism |
| CDM EB | CDM Executive Board |
| CER | Certified Emission Reduction |
| CER | Certified Emission Reduction |
| CL | Clarification Request |
| $CO_2$ | Carbon Dioxide |
| $CO_2e$ | Carbon Dioxide Equivalent |
| COP/MOP | Conference of Parties/ Meeting of Parties |
| DNA | Designated National Authority |
| DR | Document Review |
| DVR | Draft Verification Board |
| EB | Executive Board |
| ER | Emission Reduction |
| FAR | Forward Action Request |
| FVR | Final Validation Report |
| GHG | Greenhouse Gas |
| GS | Gold Standard |
| GS4GG | Gold Standard for global goals |
| I | Interview |
| IPCC | Intergovernmental Panel on Climate Change |
| LDC | Least Developed Country |
| LE | Leakage Emission |
| LSC | Local Stakeholder Consultation |
| MoV | Means of Validation |
| MOC | Modalities of Communications |
| NA | Not applicable |
| NGO | Non-Government Organisation |
| ODA | Official Development Assistance |
| OSV | On Site Visit |
| PE | Project Emission |
| PA | Project Activity |
| PD | Project Developer |
| PDD | Project Design Document |
| PS | Project Standard |
| PV | PhotoVoltaic |
| SDG | Sustainable Development Goals |
| SLS | Solar Lighting System |
| T | Tonne |
| TR | Technical Review |
| UNFCCC | United Nations Framework Convention on Climate Change |
| UQL | Unacceptable Quality Level |
| VER | Verified Emission Reduction |
| VVS | Validation and Verification Standard |
| VVB | Validation and Verification Body |

# Appendix 2. Competence of team members and technical reviewer

## Carbon Check (India) Private Limited

## Certificate of Competency

**Mr. Rishi K Raychoudhury**

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

*for the following functions and requirements:*

| | | | |
|---|---|---|---|
| ☒ Validator | ☒ Verifier | ☒ Team Leader | ☒ Technical Expert |
| ☐ Technical Reviewer | ☐ Health Expert | ☐ Gender Expert | ☐ Plastic Waste Expert |
| ☐ CCB Expert | ☐ Legal Expert | ☒ Financial Expert | ☐ Environmental, Health and Safety financial matters |
| ☒ SDG+ | ☒ Social no-harm(S+) | ☒ Environment no-harm(E+) | |
| ☒ Local Expert for India | | | |

*in the following Technical Areas:*

| | | | | |
|---|---|---|---|---|
| ☐ TA 1.1 | ☒ TA 1.2 | ☐ TA 2.1 | ☒ TA 3.1 | ☐ TA 4.1 |
| ☐ TA 4. n | ☐ TA 5.1 | ☐ TA 5.2 | ☐ TA 7.1 | ☐ TA 8.1 |
| ☐ TA 9.1 | ☐ TA 9.2 | ☐ TA 10.1 | ☐ TA 13.1 | ☐ TA 13.2 |
| ☐ TA 14.1 | ☐ TA 15.1 | ☐ TA 16.1 | | |

**Issue Date**

5th December 2023

**Expiry Date**

31st December 2024

Ms. Priya Suman
Compliance Officer

Mr. Sanjay Kumar Agarwalla
Technical Director

**Revision History of the document:**

| Revision date | Summary of changes |
|---|---|
| 2022 | Initial Adoption |
| Jan 2023 | Annual revision |
| Dec 2023 | Change in the template due to revision in TA and function |

CCIPL_FM 7.9 Certificate of Competency_V4.0_112023

[1] Please refer to previous version of FM 7.9 for the revision history

Carbon CHECK

# Carbon Check (India) Private Limited

## Certificate of Competency

## Priscilla Kumwima

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

*for the following functions and requirements:*

| | | | |
|---|---|---|---|
| ☐ Validator | ☐ Verifier | ☐ Team Leader | ☐ Technical Expert |
| ☐ Technical Reviewer | ☐ Health Expert | ☐ Gender Expert | ☐ Plastic Waste Expert |
| ☐ SDG+ | ☐ Social no-harm(S+) | ☐ Environment no-harm(E+) | ☐ CCB Expert |
| ☐ Financial Expert | ☒ Local Expert for Malawi | | |

*in the following Technical Areas:*

| | | | | |
|---|---|---|---|---|
| ☐ TA 1.1 | ☐ TA 1.2 | ☐ TA 2.1 | ☐ TA 3.1 | ☐ TA 4.1 |
| ☐ TA 4. n | ☐ TA 5.1 | ☐ TA 5.2 | ☐ TA 7.1 | ☐ TA 8.1 |
| ☐ TA 9.1 | ☐ TA 9.2 | ☐ TA 10.1 | ☐ TA 13.1 | ☐ TA 13.2 |
| ☐ TA 14.1 | ☐ TA 15.1 | | | |

**Issue Date**
03rd May 2023

**Expiry Date**
02nd May 2024

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

CCIPL_FM 7.9 Certificate of Competency_V2.1_012023

# Carbon Check (India) Private Limited

## Certificate of Competency

### Ms. Indumathi C

has been qualified as per CCIPL's internal qualification procedures in accordance with the requirements of CDM AS (V7.0), ISO/IEC14065:2020, ISO/IEC 17029:2019 and other applicable GHG programs:

*for the following functions and requirements:*

| | | | |
|---|---|---|---|
| ☒ Validator | ☒ Verifier | ☒ Team Leader | ☒ Technical Expert |
| ☐ Technical Reviewer | ☐ Health Expert | ☐ Gender Expert | ☐ Plastic Waste Expert |
| ☐ CCB Expert | ☐ Legal Expert | ☐ Financial Expert | ☐ Environmental, Health and Safety financial matters |
| ☐ SDG+ | ☐ Social no-harm(S+) | ☐ Environment no-harm(E+) | |
| ☒ Local Expert for India | | | |

*in the following Technical Areas:*

| | | | | |
|---|---|---|---|---|
| ☐ TA 1.1 | ☒ TA 1.2 | ☐ TA 2.1 | ☒ TA 3.1 | ☐ TA 4.1 |
| ☐ TA 4. n | ☐ TA 5.1 | ☐ TA 5.2 | ☐ TA 7.1 | ☐ TA 8.1 |
| ☐ TA 9.1 | ☐ TA 9.2 | ☐ TA 10.1 | ☒ TA 13.1 | ☐ TA 13.2 |
| ☐ TA 14.1 | ☐ TA 15.1 | ☐ TA 16.1 | | |

**Issue Date**

**5th December 2023**

**Expiry Date**

**31st December 2024**

Mr. Sanjay Kumar Agarwalla
**Technical Director**

**Revision History of the document:**

| Revision date | Summary of changes |
|---|---|
| 2022[1] | Annual revision |
| Jan 2023 | Annual revision |
| Dec 2023 | Change in the template due to revision in TA and function |

CCIPL_FM 7.9 Certificate of Competency_V4.0_112023

[1] Please refer to previous version of FM 7.9 for the revision history

# Appendix 3. Documents reviewed or referenced

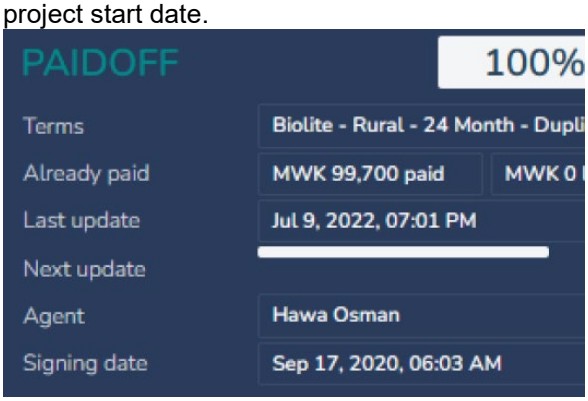
| Ref no. | Reference Document |
|---|---|
| /01/ | a. GS PDD- Biolite Solar Lighting Project in Malawi, Version 2.0, dated 30/05/2023.<br>b. GS PDD- Biolite Solar Lighting Project in Malawi, Version 3.0, dated 18/08/2023.<br>c. GS PDD- Biolite Solar Lighting Project in Malawi, Version 4.0, dated 25/10/2023.<br>d. GS PDD- Biolite Solar Lighting Project in Malawi, Version 5.0, dated 02/01/2024. |
| /02/ | a. Emission Reduction Calculation Spreadsheet, version 2.0<br>b. Emission Reduction Calculation Spreadsheet, version 3.0<br>c. Emission Reduction Calculation Spreadsheet, version 4.0<br>d. Emission Reduction Calculation Spreadsheet, version 5.0 |
| /03/ | a. Biolite SLS Malawi BS and MSU, version 1.0<br>b. Biolite SLS Malawi BS and MSU, version 2.0<br>c. Biolite SLS Malawi BS and MSU, version 3.0 |
| /04/ | Technical specification of the lighting system (SH620, SH620+, SH5000) and SHS Life cycle Assessment |
| /05/ | GS4GG Preliminary Review- 31/01/2022 |
| /06/ | Project activity database |
| /07/ | Evidence for start date of the project activity- 17/09/2020 |
| /08/ | Cover Letter from PD- 24/08/2021 |
| /09/ | Proof of right for VERs |
| /10/ | Training records- Surveyor Training- 17/03/2023 |
| /11/ | LSC records<br>- Feedback forms<br>- Presentation |
| /12/ | Stakeholder consultation report- 31/05/2022 (Physical) and 01/06/2022 (Virtual) |
| /13/ | Grievance Register |
| /14/ | ODA for the project activity- 24/08/2021 |
| /15/ | Records of SDG impacts- Excel |
| /16/ | Warranty card |
| /17/ | Evidence for random sequences |
| /18/ | Safeguarding Principles Assessment by Local Expert |
| /19/ | On-Site Audit Records (04/07/2023 to 07/07/2023) |
| /20/ | Contract- CCIPL and PD (08/04/2022) |

**Background documents**

| Ref no. | Reference Document |
|---|---|
| /B01/ | • GS4GG Principles & requirements version 1.2<br>• GS4GG Safeguarding principles & requirements version 1.2<br>• GS4GG Stakeholder-Consultation requirements version 1.2<br>• GS4GG Gender-Equality-Requirements-Guidelines version 1.1<br>• GS4GG Community Services Activity Requirements version 1.2 |
| /B02/ | • CDM Validation and Verification Standard for Project Activities (version 03.0)<br>• CDM Project Standard for Project Activities (version 03.0) |
| /B03/ | Applied baseline and monitoring methodologies and Tools<br><br>• AMS-I.A. Electricity generation by the user - Version 19.0<br>• Tool 05: Baseline, project and/ or leakage emissions from electricity consumption and monitoring of electricity generation, version 3.0<br>• Tool 16: Project and leakage emission from biomass, version 04.0<br>• Tool 21: Demonstration of additionality of small- scale project activities, version 13.1<br>• Tool 22: Leakage in biomass small- scale project activities, version 04.0 |
| /B04/ | Site Visit And Remote Audit Requirements And Procedures |
| /B05/ | • Template Key Project Information & Project Design Document (PDD), version 1.2 dated 14/10/2020.<br><br>• TEMPLATE GUIDE Key Project Information & Project Design Document v.1.2 |
| /B06/ | • “Standard for sampling and surveys for CDM project activities and programme of activities” (version 09.0)<br><br>• Guidelines for sampling and surveys for CDM project activities and Programme of Activities (version 04) |

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

**Table 1. CL from this validation**

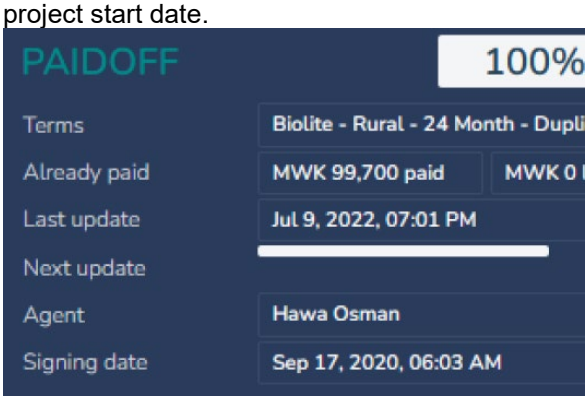
| **CL ID** | 01 | **Section no.** | PDD | **Date:** 27/06/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PD to provide credible evidence during the validation stage check the start date. | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| Evidence of the project start date, hence sale of the first Solar Lighting System (SLS) is found in end-user registration form in document : "SHX-11066102- Registration 20200917".<br>In this document, it appears that the contract signature between end-user and PD is 17/09/2020, defined as project start date.<br>  <br> | | | | |
| **Documentation provided by PD** | | | | |
| 1st sale registration form in document : "SHX-11066102- Registration 20200917" | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD has submitted the 1st sale registration form to VVB. VVB has cross checked and found that the start date mentioned in the PDD is inline to the supporting document provided by the PP. Hence the CL is closed. | | | | |

| **CL ID** | 02 | **Section no.** | PDD | **Date:** 27/06/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PD to provide baseline survey report to confirm the baseline scenario during the validation | | | | |
| **PD response** | | | | **Date: 09/08/2023** |
| As defined in Section B.4. Establishment and description of baseline scenario of PDD, a retroactive baseline survey (see document: 'Biolite SLS Malawi_BS and MSU') was conducted across a representative sample of users throughout Malawi. A total of 62 registered users were visited in order to evaluate their lighting habits prior to receiving the device. The survey revealed that various lighting sources were being used to fulfill the households' lighting requirements. The study revealed that kerosene served as the primary lighting source for 61% of the households surveyed. On average, these households relied on kerosene for approximately 30.8 hours per week (equivalent to 4.4 hours per day) for lighting purposes. The average consumption was estimated to be 1.1 liters per week, resulting in annual fuel expenses amounting to 57,463 Malawian Kwatcha or 56 USD.<br>More details are found in survey results report in document: 'Biolite SLS Malawi_BS and MSU'. | | | | |
| **Documentation provided by PD** | | | | |
| Survey results report in document : 'Biolite SLS Malawi_BS and MSU'. | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD has submitted the baseline survey report "Biolite SLS Malawi_BS and MSU" which has been cross checked by the VVB to confirm the baseline scenario. Hence the CL is closed. | | | | |

| **CL ID** | 03 | **Section no.** | PDD | **Date:** 27/06/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PD to provide all the credible evidence in detail the SDG Impacts and their contribution during validation. | | | | |

| PD response | Date: 09/08/2023 |
|---|---|
| SDG impacts and contribution are thoroughly described in PDD Sections B.6. Sustainable Development Goals (SDG) outcomes. | |
| **Documentation provided by PD** | |
| NA | |
| **VVB assessment** | **Date:** 22/08/2023 |
| PD has provided credible evidence for the SDG 13. However, PD has submitted the project database in which the baseline is considered as 61%. Please clarify. CL is open.<br><br>PD is requested to provide sales database to cross check the value 80,000 SLS kits applied for SDG 7. CL is open.<br><br>Also for SDG 1, PD is requested to provide appropriate reference for the annual expenditure on kerosen 54,700 Malawian kwatcha per year. CL is open. | |
| **PD response** | **Date: 25/10/2023** |
| 1) The project database provided as part of the validation ("*Project Database-Biolite Solar Project-Malawi-Ver 2.0 - Sampling 20230228_vfinal.xlsx"*) does not contain reference to the percentage of kerosene users in the baseline.<br><br>Reviewed files provided as part of round 0 already properly refer to the baseline kerosene use of 56% ("*Biolite SLS Malawi_BS and MSU_v2.0.xlsx*" and "*Biolite Solar ER estimation sheet_Malawi v3.0.xlsx*")<br><br>Therefore it is understood that the project database referred to in the CL is the verification project database, which is now updated to reflect 56% rather than 61% (see "*CL_03_GS11397_ER MP1-Biolite Solar Project-Malawi_v1.1.xlsx*"). The monitoring report is updated as well to reflect the same.<br><br>2) The value of 80'000 SLS is taken as indicative to compute the ex-ante figures for SDG7 in the PDD. The actual database shows a number of SLS of 61,856 devices for the first year of the project, and is used only for the ex-post calculations in the MR.<br><br>3) The annual expenditure of 54'700 MK can be found in the baseline survey in cell C129 of the file "*Biolite SLS Malawi_BS and MSU_v2.0.xlsx*" | |
| **Documentation provided by PD** | |
| CL_03_GS11397_ER MP1-Biolite Solar Project-Malawi_v1.1.xlsx | |
| **VVB assessment** | **Date:** 17/11/2023 |
| 1. PD has revised the baseline consideration from 61% to 56% and has submitted the revised documents which has been cross checked by the VVB. Hence the CL is closed.<br>2. Since the value 80.000 SLD is ex-ante figures for SDG7, the response provided by PD is appropriate. Hence the CL is closed.<br>3. PD has provided reference for the annual expenditure in the cell 129 of the "*Biolite SLS Malawi_BS and MSU_v2.0.xlsx"* file submitted by PD. Hence the CL is closed. | |

| CL ID | 04 | Section no. | PDD | Date: 27/06/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PD to provide in detail the application of methodology during the validation. | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| Please refer to Section B.2. Applicability of methodology of the PDD and the associated table listing all the applicability requirements and justification for the same. | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD has provided the all the applicability condition of the methodology in the revised PDD section B.2. Hence the CL is closed. | | | | |

| CL ID | 05 | Section no. | PDD | Date: 27/06/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| PD to provide the final carbon transfer form to confirm the start date of the project | | | | |
| **PD response** | | | | **Date:** |
| As described in Section B.7.3. of the PDD:<br>"Biolite's Solar Lighting Systems (SLS) are distributed throughout Malawi by Yellow Solar, an external distributor. To ensure effective sales, Yellow Solar deploys trained sales agents to specific points of sale across the country. These agents provide prospective customers with comprehensive information on the products, including the fact that the project is part of a carbon certification framework. By purchasing the device, the end-user agrees to cede the carbon rights to Biolite. A carbon waiver, or consent form as part of the warranty (se document : 'Biolite SHS Warranty Card'), is signed by the user at the time of sale."<br><br>Evidence of the project start date, hence sale of the first Solar Lighting System (SLS) is found in end-user registration form in document : "SHX-11066102- Registration 20200917".<br>In this document, it appears that the contract signature between end-user and PD is 17/09/2020, defined as project start date.<br>  <br> | | | | |
| **Documentation provided by PD** | | | | |
| Carbon waiver example: 'Biolite SHS Warranty Card'<br>1st sale registration form in document : "SHX-11066102- Registration 20200917" | | | | |
| **VVB assessment** | | | | **Date:** |
| PD has submitted 1st sale registration form to confirm the start date of the project. Hence the CL is closed. | | | | |

| CL ID | 06 | Section no. | PDD | Date: 27/06/2023 |
|---|---|---|---|---|
| **Description of CL** | | | | |
| In the section A.1.1 of the PDD:<br>• PD to provide clarification for considering only Kerosene as baseline fuel.<br>• PD to provide the eligibility criteria for Community service activity requirement as the project activity falls under this category. | | | | |
| **PD response** | | | | **Date:** |
| | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD to provide response. Hence the CL is open. | | | | |
| **PD response** | | | | **Date:** 25/10/2023 |
| 1) The project only credits on the portion of users using kerosene as a baseline (see "*CL_03_GS11397_ER MP1-Biolite Solar Project-Malawi_v1.1.xlsx*"). Therefore section A.1.1 only refers to kerosene users as a baseline.<br><br>2) The eligibility of the project towards the Community Services Activity Requirements is already detailed in section A1.1 in S. No. i) : "The project activity is eligible under the "End-use energy efficiency" category, as provided in the Community Services Activity requirements, ver. 1.2. Para 3.1.1 (b) states the category as follows: "End-use energy efficiency: Project activities that reduce energy requirements as compared to baseline scenario without affecting the level and quality of services or products, where the end-user of the products and services are clearly identified and when | | | | |

| |
|---|
| the physical intervention is required at the user end. For example, efficient cooking, heating, lighting, etc.” |
| **Documentation provided by PD** |
| |
| **VVB assessment** **Date:** 21/11/2023 |
| 1. The clarification provided by PD on consideration of only kerosene as baseline fuel is acceptable<br>2. PD has provided the eligibility criteria for Community service activity requirement in the section A.1.1 of the PDD<br>Hence the CL is closed. |

| | | | | |
|---|---|---|---|---|
| **CL ID** | 07 | **Section no.** | PDD | **Date:** 27/06/2023 |
| **Description of CL** | | | | |
| In the section B.2 of the PDD, PD is requested to provide few samples for sales invoices. | | | | |
| **PD response** | | | | **Date:** |
| | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD to provide response. Hence the CL is open. | | | | |
| **PD response** | | | | **Date:** 25/10/2023 |
| Sales invoices are provided in attachment | | | | |
| **Documentation provided by PD** | | | | |
| CL07_SHX-11426650.pdf<br>CL07_SHX-19492148.pdf<br>CL07_SHX-19268005.pdf<br>CL07_SHX-16115549.pdf | | | | |
| **VVB assessment** | | | | **Date:** 17/11/2023 |
| PD has submitted few sales invoices which has been cross checked by the VVB. Hence the CL is closed. | | | | |

| | | | | |
|---|---|---|---|---|
| **CL ID** | 08 | **Section no.** | PDD | **Date:** 27/06/2023 |
| **Description of CL** | | | | |
| In the section B.4 of the PDD:<br>● PD to clarify why only baseline as kerosene and it satisfies the condition of the methodology since the contribution of battery is higher than the use of kerosene.<br>● The Link 7 provided in the section is not traceable | | | | |
| **PD response** | | | | **Date:** |
| | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD to provide response. Hence the CL is open. | | | | |
| **PD response** | | | | **Date: 25/10/2023** |
| 1) As stated in CDM booklet for methodology AMS-I.A., the baseline scenario is described as “*Services (e.g. lighting, refrigeration) are provided using fossil-fuel-based technologies (e.g. kerosene lamps and diesel generators)”*. Therefore the use of battery is not taken into account and the baseline consists solely on fossil-fuel-based technologies.<br><br>2) Reference to link 7 is removed. | | | | |
| **Documentation provided by PD** | | | | |
| | | | | |
| **VVB assessment** | | | | **Date:** 17/11/2023 |

| |
|---|
| In the section B.4 of the revised PDD:<br>1. PD has provided appropriate justification of the consideration of kerosene as the baseline fuel in line with the methodology AMS-I.A. Hence the CL is closed.<br>2. PD has removed the reference 7, but however PD to maintain the sequence of numbering for the footnote provided. Hence the CL is open. |
| **PD response** **Date: 24/11/2023** |
| The sequence of numbering is correct in the clean version of the PDD.<br><br>The sequence is not maintained in the track changes version since it still shows text that has been deleted, to which PD cannot do anything since this is a built in function of Microsoft Word. |
| **Documentation provided by PD** |
| None |
| **VVB assessment** **Date:** 01/12/2023 |
| PD has maintained the sequence of numbering throughout the PDD. Hence the CL is closed. |

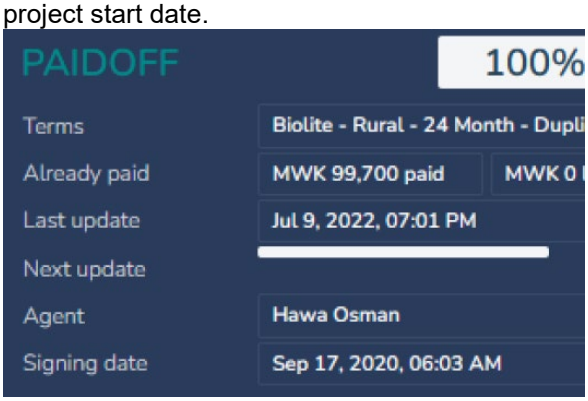
| | | | | |
|---|---|---|---|---|
| **CL ID** | 09 | **Section no.** | PDD | **Date:** 27/06/2023 |
| **Description of CL** | | | | |
| In the section B.5 of the PDD, PD to demonstrate why financial need is mentioned as NA. | | | | |
| **PD response** | | | | **Date: 25/10/2023** |
| As per GS Guide to Completing the PDD : “This information need only be included at Design Certification Renewal and only for those projects that are required to demonstrate financial additionality.” Therefore, such section has been left as NA.<br><br>The PDD is updated in this sense. | | | | |
| **Documentation provided by PD** | | | | |
| PDD v4.0 | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| In the section B.5 of the revised PDD, PD has demonstrated why the financial needs is mentioned as NA as per GS guide. Hence the CL is closed. | | | | |

| | | | | |
|---|---|---|---|---|
| **CL ID** | 10 | **Section no.** | PDD | **Date:** 27/06/2023 |
| **Description of CL** | | | | |
| In the section B.7.3 of the PDD, PD is requested to provide the training records, grievance register, evidence for lifetime as 15 years. | | | | |
| **PD response** | | | | **Date:** |
| | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date: 22/08/2023** |
| PD to provide response. Hence the CL is open. | | | | |
| **PD response** | | | | **Date: 25/10/2023** |
| Requested documents are provided in attachment | | | | |
| | | | | |
| CL10_Lilongwe Grievance-Feedback Register.jpg<br><br>CL10_Surveyor Training Report - Biolite Solar Lighting Project in Malawi.pdf | | | | |
| **VVB assessment** | | | | **Date:** 17/11/2023 |
| PD has submitted the life cycle assessment as the evidence for useful lifetime of devices of at least 7 years. | | | | |

| |
|---|
| However, PD shall explain why the crediting period is considered for 5 years and not for 7 years. Hence the CL is open. |
| **PD response** **Date: 24/11/2023** |
| As explained in CAR10 for Validation, the crediting period is defined as per Community Service Activity Requirements version 1.2 paragraph 4.1.7 which is 5 years. As per GS requirements, the device lifetime is not connected in any way to the length of the crediting period. |
| **Documentation provided by PD** |
| None |
| **VVB assessment** **Date:** 01/12/2023 |
| As per the Community Service Requirements version 1.2, paragraph 4.1.7 the crediting period is mandatory for every 5 years. PD has submitted the life cycle assessment of the SHS as 7 years which is higher than crediting period considered. Hence the CL is closed. |

| | | | | |
|---|---|---|---|---|
| **CL ID** | 11 | **Section no.** | PDD | **Date:** 27/06/2023 |
| **Description of CL** | | | | |
| PD has claimed in the baseline survey, the share of kerosene is 61% as the baseline fuel. However, during the on-site acceptance sampling VVB has found only 50% of the samples are using kerosene as a part of baseline fuel. PD is requested to explain, how the 61% share of kerosene as baseline is valid. | | | | |
| **PD response** | | | | **Date: 18/08/2023** |
| After revision of acceptance sample responses, it appears that the following households :<br><br>HASTINGS CHIDYAUDZU - SHX-18418310 - AG 1-2<br>ANDREW MATEYU - SHX-15108867 - AG 2-3<br>PATRICIA MKORONGO - SHE-18773025 - AG 2-3<br><br>Declared not to use the kerosene for lighting purposes in the baseline. To remain conservative, PD chose to reconsider their answers of the baseline survey, ultimately not considering them as part of the baseline scenario (i.e. use of kerosene for lighting purposes).This is transparently reported with comments in the revised BS report in document: 'Biolite SLS Malawi_BS and MSU_v2.0'.<br>The impact of the change is a revision of the parameter "Kerosene usage in the baseline" from 61% to 56%. The PDD, ER estimates were revised accordingly. | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| During on-site assessment survey, VVB has observed 50% of the selected samples were using kerosene in the baseline scenario. Since the on-site samples selected is the representative of the sampling as per the CDM sampling guidelines, PD shall consider and apportion the ER calculation as per the on-site visit assessment. CL is open. | | | | |
| **PD response** | | | | **Date: 02/01/2024** |
| The rationale of the baseline scenario is detailed in the updated file "*Biolite SLS Malawi_BS and MSU_v3.0.xlsx*" and reviewed at 31.54%. Details of calculation of the 31.54% baseline are available in cell B378. | | | | |
| **Documentation provided by PD** | | | | |
| None | | | | |
| **VVB assessment** | | | | **Date:** 03/01/2024 |
| PD has revised the share of baseline fuel (Kerosene to 31.54%), which is found to be inline to the baseline survey submitted by PD. Hence, the value is acceptable by VVB based on-site visit. Hence the CL is closed. | | | | |

**Table 2. CARs from this validation**

| **CAR ID** | 01 | **Section no.** | PDD | **Date:** 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| During the preliminary review of the PA, CAR#1 was raised by GS as follows:<br>GS VVB/SC Validation team shall check the start date evidence during the validation stage.<br><br>Please refer CL 01 in this regard. | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| Evidence of the project start date, hence sale of the first Solar Lighting System (SLS) is found in end-user registration form in document: "SHX-11066102- Registration 20200917".<br>In this document, it appears that the contract signature between end-user and PD is 17/09/2020, defined as project start date.<br>  <br> | | | | |
| **Documentation provided by PD** | | | | |
| 1st sale registration form in document : "SHX-11066102- Registration 20200917" | | | | |
| **VVB assessment** | | | | **Date:** 21/08/2023 |
| PD has submitted the 1st sale registration form to VVB. VVB has cross checked and found that the start date mentioned in the PDD is inline to the supporting document provided by the PD. Hence the CAR is closed. | | | | |

| **CAR ID** | 02 | **Section no.** | PDD | **Date:** 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| During the preliminary review of the PA, CAR#2 was raised by GS as follows:<br>GS VVB/SC Validation team, shall check the baseline survey report to confirm the baseline scenario during the validation<br><br>Please refer CL 02 in this regard | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| As defined in Section B.4. Establishment and description of baseline scenario of PDD, a retroactive baseline survey (see document: 'Biolite SLS Malawi_BS and MSU') was conducted across a representative sample of users throughout Malawi. A total of 62 registered users were visited in order to evaluate their lighting habits prior to receiving the device. The survey revealed that various lighting sources were being used to fulfill the households' lighting requirements. The study revealed that kerosene served as the primary lighting source for 61% of the households surveyed. On average, these households relied on kerosene for approximately 30.8 hours per week (equivalent to 4.4 hours per day) for lighting purposes. The average consumption was estimated to be 1.1 liters per week, resulting in annual fuel expenses amounting to 57,463 Malawian Kwatcha or 56 USD.<br>More details are found in survey results report in document : 'Biolite SLS Malawi_BS and MSU'. | | | | |
| **Documentation provided by PD** | | | | |
| Survey results report in document : 'Biolite SLS Malawi_BS and MSU'. | | | | |
| **VVB assessment** | | | | **Date:** 21/08/2023 |
| PD has submitted the baseline survey report "Biolite SLS Malawi_BS and MSU" which has been cross checked by the VVB to confirm the baseline scenario. Hence the CAR is closed. | | | | |

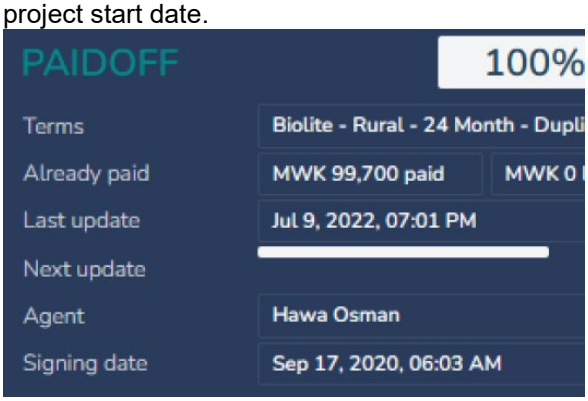
| CAR ID | 03 | Section no. | PDD | Date: 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| During the preliminary review of the PA, CAR#3 was raised by GS as follows:<br>PD shall provide the opinions of an expert stakeholder been provided for the following:<br>Principle 4.1 Sites of Cultural and Historical Heritage<br>Principle 4.2 Forced Eviction and Displacement<br>Principle 4.3 Land Tenure and Other Rights<br>Principle 4.4 Indigenous Peoples<br>Principle 8.1 Impact on Natural Water Patterns/Flows<br>Principle 8.2 - Erosion and/or Water Body Instability<br>Principle 9.10 - High Conservation Value Areas and Critical Habitats<br>Principle 9.11 - Endangered Species | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| Expert opinion on highlighted safeguarding principles are found in document 'SGP assessment local expert SHS Malawi-Gracious' submitted along validation documents. | | | | |
| **Documentation provided by PD** | | | | |
| Document 'SGP assessment local expert SHS Malawi-Gracious' | | | | |
| **VVB assessment** | | | | **Date: 22/08/2023** |
| PD has submitted the 'SGP assessment local expert SHS Malawi-Gracious' to the VVB and found that the expert opinion on highlighted safeguarding principles are found in this document. Hence the CAR is closed. | | | | |

| CAR ID | 04 | Section no. | PDD | Date: 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| During the preliminary review of the PA, FAR#1 was raised by GS as follows:<br>VVB shall assess in detail the SDG Impacts and their contribution during validation.<br><br>Please refer CL 03 in this regard | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| Please refer to CL03. | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD has provided response in CL 03. Hence the CAR is closed. | | | | |

| CAR ID | 05 | Section no. | PDD | Date: 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| During the preliminary review of the PA, FAR#2 was raised by GS as follows:<br>VVB shall check in detail the application of methodology during the validation.<br><br>Please refer CL 04 in this regard. | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| Please refer to Section B.2. Applicability of methodology of the PDD and the associated table listing all the applicability requirements and justification for the same. | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date:** 21/08/2023 |
| PD has provided detailed explanation in the application of the methodology which is clearly mentioned in the section B.2 of the PDD. Hence the CAR is closed. | | | | |

| CAR ID | 06 | Section no. | PDD | Date: 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| During the preliminary review of the PA, FAR#3 was raised by GS as follows:<br>VVB shall check the final carbon transfer form to confirm the start date of the project<br><br>Please refer CL 05 in this regard. | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| As described in Section B.7.3. of the PDD:<br>"Biolite's Solar Lighting Systems (SLS) are distributed throughout Malawi by Yellow Solar, an external distributor. To ensure effective sales, Yellow Solar deploys trained sales agents to specific points of sale across the country. These agents provide prospective customers with comprehensive information on the | | | | |

products, including the fact that the project is part of a carbon certification framework. By purchasing the device, the end-user agrees to cede the carbon rights to Biolite. A carbon waiver, or consent form as part of the warranty (se document : 'Biolite SHS Warranty Card'), is signed by the user at the time of sale."
Evidence of the project start date, hence sale of the first Solar Lighting System (SLS) is found in end-user registration form in document : "SHX-11066102- Registration 20200917".
In this document, it appears that the contract signature between end-user and PD is 17/09/2020, defined as project start date.




**Documentation provided by PD**

Carbon waiver example: 'Biolite SHS Warranty Card'
1st sale registration form in document : "SHX-11066102- Registration 20200917"

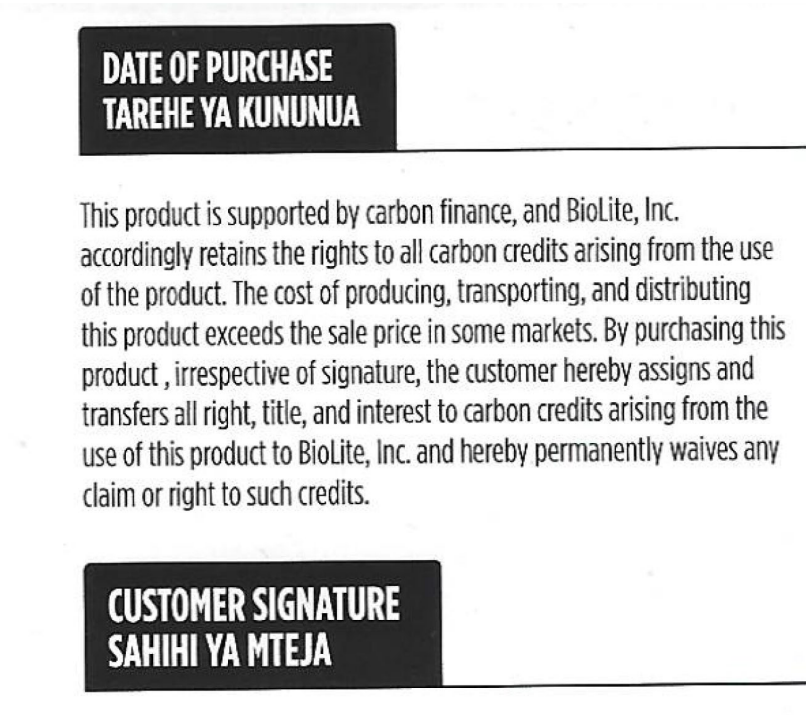
**VVB assessment** | **Date:** 22/08/2023

PD has submitted 1st sale registration form to confirm the start date of the project. Hence the CAR is closed.

But However, PD has mentioned that "A carbon waiver, or consent form as part of the warranty (se document : 'Biolite SHS Warranty Card'), is signed by the user at the time of sale." VVB has referred the document "warranty card" as responded by PD however it is not traceable in the warranty card regarding the carbon waiver. Hence PD is requested to provide the specific document which has been signed by beneficiary. Hence the CAR is open.

**PD response** | **Date: 24/11/2023**

Here is the screenshot of the warranty card provided previously, which details the transfer of carbon rights :




**Documentation provided by PD**

NA

| |
|---|
| None |
| **VVB assessment** **Date:** 01/12/2023 |
| The warranty card submitted by PD explains the rights to carbon credits. Also, PD has submitted the 4 samples of the warranty registration card which is signed by the beneficiary. Hence the CAR is closed. |

| **CAR ID** | 07 | **Section no.** | PDD | **Date:** 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| During the preliminary review of the PA, FAR#4 was raised by GS as follows:<br>All the safeguarding principles assessment shall be supported with evidence/references/expert's opinion. The PD shall provide them for GS VVB validation | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| Expert opinion on highlighted safeguarding principles are found in document 'SGP assessment local expert SHS Malawi-Gracious' submitted along validation documents. | | | | |
| **Documentation provided by PD** | | | | |
| | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD has submitted the 'SGP assessment local expert SHS Malawi-Gracious' containing the expert opinion on safeguarding principle assessment. Hence the CAR is closed. | | | | |

| **CAR ID** | 08 | **Section no.** | PDD | **Date:** 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| During the preliminary review of the PA, FAR#5 was raised by GS as follows:<br>Stakeholders Consultation Report:<br>• The project developer shall invite stakeholders from all categories A to G mentioned in paragraph 3.1.1 in the "Stakeholder Consultation and Engagement Requirements" guidelines.<br>• The invitation for the consultation meeting shall be given at least 30 days before the meeting takes place.<br>• PD shall provide the original versions of evaluation forms and 4-5 representative samples of the evaluation forms in English.<br>• PD shall ensure that the blind sustainable development assessment is conducted in the consultation meeting | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| As suggested in SCR section B.1., the stakeholders from categories A to G were invited to the LSC between the 04/04/2022 and the 25/04/2022, i.e. more than 30 days prior to the physical (31/05/2022) and virtual (01/06/2022) consultations. Evidences of the invites in the form of newspaper announcements & email samples, are found in Section B.1.3. of the same document.<br>Ibid.<br>Samples of evaluation forms in English are found in Section E.3. of the SCR v2.0. Moreover: other samples of 25 original feedback fms are provided in documents : "LSC Malawi 1" to "LSC Malawi 25".<br>During the LSC, the project contributions towards the SDG's were thoroughly discussed. As suggested in the powerpoint presentation material used during the meeting (see document : 'Biolite LSC Malawi_presentation"):<br>The concept of SDG and the 17 indicators were explained to the audience on slide 25<br>The project impacts were described on slide 26<br>A discussion was initiate with the participants for them to associate the project impacts with SDG (in the form of blind exercise)<br>A proposition of potential SDG impacts and associated monitoring parameters was shared with the audience on Slide 27. No objection was formulated by the audience. | | | | |
| **Documentation provided by PD** | | | | |
| powerpoint presentation material used during the meeting. See document : 'Biolite LSC Malawi_presentation" | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD is requested to submit the SCR. CAR is open. | | | | |
| **PD response** | | | | **Date:** 20/10/2023 |
| The SCR was provided in the initial documents package and is resubmitted in attachment. | | | | |
| **Documentation provided by PD** | | | | |

| |
|---|
| CAR_08_GS11397-Biolite SLS Malawi SCR_v2.0.pdf |
| **VVB assessment** **Date:** 16/11/2023 |
| • The project developer has invited LSC from all categories A to G mentioned in paragraph 3.1.1 in the "Stakeholder Consultation and Engagement Requirements" guidelines between 04/04/2022 and 25/04/2022 and the same is been cross checked by VVB from the SCR report submitted by PD. Hence the CAR is closed.<br>• PD to provide response and hence the CAR is open.<br>• In the SCR submitted by PD, VVB has cross checked and found that in the section E.3, PD has included four representative samples of the evaluation forms. Hence the CAR is closed.<br>• PD has discussed the SDG assessment in the consultation meeting and it has confirmed by the LSC presentation records submitted by the PD. Hence the CAR is closed. |
| **PD response** **Date: 24/11/2023** |
| As stated in the SCR provided previously, the LSC was conducted on the 31/05/2022 and invitations were launched on the 25/04/2022 as proven in section B.1.3. |
| **Documentation provided by PD** |
| None |
| **VVB assessment** **Date:** 01/12/2023 |
| PD has submitted the SCR report. VVB has cross checked and found that invitation through newspaper and email was sent on 22/04/2022 and 25/04/2022. The stakeholder consultation and the SFR was conducted on 31/05/2022 which is 30 days after the invitation has been sent. Hence the CAR is closed |

| | | | | |
|---|---|---|---|---|
| **CAR ID** | 09 | **Section no.** | PDD | **Date:** 27/06/2023 |
| **Description of CAR** | | | | |
| During the preliminary review of the PA, FAR#6 was raised by GS as follows:<br>Design of the Stakeholder Feedback Round:<br>• The PD shall conduct Stakeholder Feedback Round lasting minimum of 2 months and the requested documents shall be public available for global consultation.<br>• All the attendees of LSC meeting shall be invited for further feedback/comment during SFR | | | | |
| **PD response** | | | | **Date: 09/08/2023** |
| As described in Section E.2. of the SCR, All the stakeholders have been invited through via public notice, which was published in local newspaper, also individual email invitation was sent to attend the virtual stakeholders meeting on 01/06/2022 for those who were unable to attend physical meetings on 31/05/2022. Apart from this the project have also invited online comments from the public for mandatory 60 days at:<br>Biolite Inc.: https://global.bioliteenergy.com/pages/carbon-finance-projects<br>South Pole: https://www.southpole.com/en/gold-standard-and-other-stakeholder-consultations<br>However, the documents made publicly available for the period of two months post invitation. Apart from that, a customer care number is provided by the Biolite group to address any comment related to instrument and its technology, also a grievance register is maintained at the plant office in which any stakeholder can mention their comments on the same. | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD has submitted the attendees of LSC meeting along with the feedback form. However PD is requested to provide MoM of LSC, Invitation to stakeholder, Email invitation, attendance, photographs, stakeholder consultation report and grievance mechanism. Hence the CAR is open. | | | | |
| **PD response** | | | | **Date:** 20/10/2023 |
| All the requested information is available in the SCR report. | | | | |
| **Documentation provided by PD** | | | | |
| CAR_08_GS11397-Biolite SLS Malawi SCR_v2.0.pdf | | | | |
| **VVB assessment** | | | | **Date:** 16/11/2023 |
| PD has submitted the stakeholder feedback that has been lasted for a minimum of 2 months and the list of attendees invited. Hence the CAR is closed. | | | | |

| CAR ID | 10 | Section no. | PDD | Date: 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| During the preliminary review of the PA, FAR#7 was raised by GS as follows:<br>Reference for project lifetime of 15 years shall be provided | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| The project cycle is five years renewable twice i.e. 15 years as per CSA requirements v1.2 para 4.1.5: *New Projects may seek Certification and receive Issuance of Gold Standard Certified Impact Statements or Products for a maximum of two Design Certification Renewal Cycles i.e., a total of 15 years issuance.* | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD has mentioned thet CSA requirements, v.1.2 para 4.1.5 *New Projects may seek Certification and receive Issuance of Gold Standard Certified Impact Statements or Products for a maximum of two Design Certification Renewal Cycles i.e., a total of 15 years issuance.* But however as per the link provided by the PD, para 4.1.5 “Project types applying for Gold Standard approval are referred to the Gold Standard Vision and Mission. The Project Developer shall demonstrate how the Project would contribute to these and how the Gold Standard for the Global Goals Requirements would be met in their application for approval”. PD to clarify and provide appropriate reference for the project lifetime. CAR is open. | | | | |
| **PD response** | | | | **Date: 20/10/2023** |
| The attached document provides evidence for a useful lifetime of devices of at least 7 years, which covers the crediting period.<br><br>The monitoring surveys includes the evaluation of the actual usage of the devices, which will therefore be excluded of the ER calculations if they were to fail or not be used during this or future crediting periods.. | | | | |
| **Documentation provided by PD** | | | | |
| CAR_10_SHS Life Cycle Assessment_signed.pdf | | | | |
| **VVB assessment** | | | | **Date:** 21/11/2023 |
| PD has submitted the life cycle assessment as the evidence for useful lifetime of devices of at least 7 years. However, PD shall explain why the crediting period is considered for 5 years and not for 7 years. Hence the CAR is open. | | | | |
| **PD response** | | | | **Date: 24/11/2023** |
| The crediting period is defined as per Community Service Activity Requirements version 1.2 paragraph 4.1.7, which is 5 years. The device useful lifetime is not a criteria for setting up the crediting period. | | | | |
| **Documentation provided by PD** | | | | |
| None | | | | |
| **VVB assessment** | | | | **Date:** 01/12/2023 |
| As per the Community Service Requirements version 1.2, paragraph 4.1.7 the crediting period is mandatory for every 5 years. PD has submitted the life cycle assessment of the SHS as 7 years which is higher than crediting period considered. Hence the CAR is closed. | | | | |

| CAR ID | 11 | Section no. | PDD | Date: 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| During the preliminary review of the PA, FAR#8 was raised by GS as follows:<br>A1.2 - PD shall confirm whether the issue of transfer of product ownership from project beneficiaries to PD was explained and discussed transparently during local stakeholder consultation. | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| PD described the transfer of carbon product ownership during the LSC during the presentation of the concept of carbon credit (i.e. slide 22 and following ones in the presentation material in document : ‘Biolite LSC Malawi_presentation’). | | | | |
| **Documentation provided by PD** | | | | |
| ‘Biolite LSC Malawi_presentation’ | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD has submitted the ‘Biolite LSC Malawi_presentation’ and has described the transfer of carbon product during LSC in the concept of carbon credits. Hence the CAR is closed. | | | | |

| CAR ID | 12 | Section no. | PDD | Date: 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |

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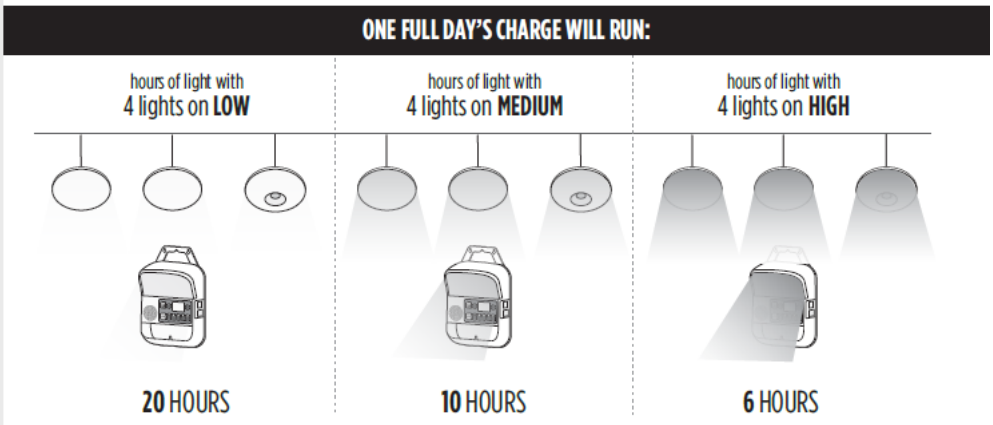
| In the key page information of the PDD:<br>• PD to provide the completion date of PDD.<br>• PD to mention NA if a section is left blank throughout the PDD. |
| **PD response** **Date:** 09/08/2023 |
| Correction were brought in revised version of the PDD v3.0 track & clean. |
| **Documentation provided by PD** |
| "GS 11397_Biolite SLS PDD Malawi v3.0_track"<br>"GS 11397_Biolite SLS PDD Malawi v3.0_clean" |
| **VVB assessment** **Date: 21/08/2023** |
| In the key page information of the revised PDD:<br>• PD has mentioned the completion date of PDD.<br>• PD has mentioned NA for the section left blank in the PDD.<br><br>Hence the CAR is closed. |

| | | | | |
|---|---|---|---|---|
| **CAR ID** | 13 | **Section no.** | PDD | **Date:** 27/06/2023 |
| **Description of CAR** | | | | |
| In the section A.2 of the PDD, the GPS coordinates mentioned by the PD is inconsistent. PD to provide exact location of the project activity. | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| The GPS coordinates of the project location (i.e. the whole Malawi country) are revised based on open-sourced information in the new version of the PDD (v3.0). | | | | |
| **Documentation provided by PD** | | | | |
| https://worldpopulationreview.com/countries/malawi/location | | | | |
| **VVB assessment** | | | | **Date:** 21/08/2023 |
| In the section A.2 of the revised PDD, PD has now mentioned the exact location of the project activity. This has been cross verified by the link provided by PD. Hence the CAR is closed. | | | | |

| | | | | |
|---|---|---|---|---|
| **CAR ID** | 14 | **Section no.** | PDD | **Date:** 27/06/2023 |
| **Description of CAR** | | | | |
| In the section A.3 of the PDD:<br>• The maximum hours of 4 lights on HIGH for the model SHS620+ is inconsistent with the instruction manual provided by the PD.<br>• Is not inline with the template filling form of PDD available in website. PD to include (ii) & (iii) mentioned under the section A.3 of the template filling form. | | | | |
| **PD response** | | | | **Date:** |
| • In the instruction manual of model SHS 620+, it is mentioned that the device can run 6 hours of light with 4 lights on high. The same was presented in section A.3. VVB to clarify the inconsistency.<br>  <br><br>• Section A.3. was amended to include (ii) & (iii) items listed in the PDD guidelines template. | | | | |
| **Documentation provided by PD** | | | | |
| "SH620+ InstructionManual" | | | | |
| **VVB assessment** | | | | **Date:** 21/08/2023 |
| In the section A.3 of the revised PDD: | | | | |

- The maximum hours of 4 lights on HIGH for the model SHS620 is inconsistent with the instruction manual provided by the PD. CAR is open.
- PD to provide response. CAR is open.

| **PD response** | **Date:** 25/10/2023 |
|---|---|
| The maximum hours of light for model SHS620 is updated in the PDD to match the instruction manual. | |
| **Documentation provided by PD** | |
| Updated PDD | |
| **VVB assessment** | **Date:** 16/11/2023 |

In the section A.3 of the revised PDD:

- PD has now made the maximum hours if 4 lights on HIGH for the model SHS620 to be consistent with the instruction manual. The same is cross checked by VVB. Hence the CAR is closed.
- PD has now included (ii) & (iii) mentioned under the section A.3 of the PDD template filling guideline.

Hence the CAR is closed.

| **CAR ID** | 15 | **Section no.** | PDD | **Date:** 27/06/2023 |
|---|---|---|---|---|
| **Description of CAR** | | | | |
| Section B.3 of the PDD, is not inline with (i) of template filling form of PDD. | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| Section B.3. of PDD v3.0 was amended to include a more detailed definition of the project boundary as well as an associated map. | | | | |
| **Documentation provided by PD** | | | | |
| Updated PDD | | | | |
| **VVB assessment** | | | | **Date:** 21/08/2023 |
| In the section B.3 of the revised PDD, PD has provided more detailed information inline to (i) of the PDD template filling guideline. Hence the CAR is closed. | | | | |

| **CAR ID** | 16 | **Section no.** | PDD | **Date:** 27/06/2023 |
|---|---|---|---|---|

**Description of CAR**

In the section B.6.1 of the PDD:

- The formula applied for the baseline is not in line with the methodology.
- PD to explain the project emission and leakage emission for the calculation of emission reduction.
- PD to explain the project scenario and baseline scenario for the SDG1 and SDG7 separately.
- PD is requested to provide the equation number for the formula used in the PDD as per guideline for template filling form of PDD

**PD response** — **Date:** 09/08/2023

- The methodology does not provide guidance on the calculation to use for the Baseline emissions in the specific case of renewable lighting devices. It states that equivalent level of lighting service must be used instead of energy and a daily usage of 3.5 hours per day shall be assumed for the projection of the fuel consumption. Hence, Equation (5) of the methodology is adapted for the specific case of this project. More details were added in Section B.6.1 of the PDD v3.0.
- In line with the methodology, project emissions and leakage emissions are not present for this project, hence not included. More details were added in Section B.6.1 footnotes 10 & 11 of the PDD v3.0.
- Clarification was brought to Section B.6.1 regarding the project/baseline scenarios for SDG 1 & SDG 7 indicators.

**Documentation provided by PD**

NA

**VVB assessment** — **Date:** 22/08/2023

In the section B.6.1 of the revised PDD:

- PD has adopted option 3 of the baseline and provided necessary justification in the section B.6.1 of the PDD. CAR is closed.
- PD has provided footnote to mention that project and leakage emission is zero for the project activity. CAR is closed.
- The response provided by PD is not traceable. PD to provide exact reference for closing of the CAR. CAR is open.
- PD to provided response for the 4$^{th}$ finding raised under the CAR 16. Hence the CAR is open.

**PD response** — **Date:** 25/10/2023

Two paragraphs have been added in section B6.1 to explain the baseline and project scenario's for both SDG's 1 and 7.

The origin of the equation has been thoroughly reviewed in the PDD for better explanation. It also has integrated the cap on the lumen capacity of project lights to reflect the pre-existing baseline level of service. Ex Ante numbers have been reviewed for SDG13, 1 and 7 throughout the PDD and the updated calculation file is provided in attachment.

**Documentation provided by PD**

Updated PDD

CAR_16_Biolite Solar ER estimation sheet_Malawi v4.0.xlsx

| **VVB assessment** | **Date:** 22/11/2023 |
|---|---|

In the revised PDD:

- PD has explained the baseline and project scenario of SDG 1 and SDG 7. Hence the CAR is closed.
- PD has also quoted above "The origin of the equation has been thoroughly reviewed in the PDD for better explanation. It also has integrated the cap on the lumen capacity of project lights to reflect the pre-existing baseline level of service. Ex Ante numbers have been reviewed for SDG13, 1 and 7 throughout the PDD and the updated calculation file is provided in attachment." PD to elaborate the reply. CAR is open.

| **PD response** | **Date: 24/11/2023** |
|---|---|

The above text is a generic explanation of the changes made in the PDD, which is self-explanatory. The changes described are explained in the PDD. Please issue specific questions if anything is unclear.

**Documentation provided by PD**

None

| **VVB assessment** | **Date: 01/12/2023** |
|---|---|

- The para added in the section B.6.3 of the PDD, for baseline and project scenario for SDG 1 seems to be inconsistent with the result of the baseline survey conducted. PD is requested to cross check. CAR is open.
- For SDG 7, the statement provided for baseline and project scenario are generic. PD is requested to reconsider as per project specific. CAR is open.

In the section B.6.3 the explanation provided by PD is not clear regarding cap exceeding rate. Also PD to explain how the $CF_{i,y,ECR}$ value is 1. CAR is open.

| **PD response** | **Date: 02/01/2024** |
|---|---|

- The rationale of the baseline scenario is detailed in the updated file "*Biolite SLS Malawi_BS and MSU_v3.0.xlsx*". The numbers related to SDG1 have been crosschecked and modified according to the updated file.

- The paragraph is further updated as per calculations from file "*Biolite SLS Malawi_BS and MSU_v3.0.xlsx*"

- As per CDM project 2699 (used as an inspiration for the establishment of the ER equation in the PD, the cap exceeding rate "*corrects the amount of emission reductions by the share of the light intensity of D.light lamps* - project lamps - *which exceed the reference cap in a certain household*".

  Since all project devices are capped by the $RC_{HH}$ value of 42.02 lumen (see PDD equation 2), the cap exceeding rate is not required since by definition, no project instance could exceed the reference cap. Therefore, contrarily to the initial proposition where the cap exceeding rate was introduced and set to 1 in order to match the equation of CDM project 2699, the cap exceeding rate is now removed from the ER equation.

**Documentation provided by PD**

*Biolite SLS Malawi_BS and MSU_v3.0.xlsx*

| **VVB assessment** | **Date: 03/01/2024** |
|---|---|

- PD has revised the section B.6.3 of the PDD and it is found to be inline to the baseline survey. Hence the CAR is closed.
- PD has revised the section as per project specific and has included the calculation for the project. Hence the CAR is closed.

PD has provided appropriate explanation regarding cap exceeding rate and also has removed the use of cap exceeding rate in the ER calculation. Hence the CAR is closed.

| **CAR ID** | 17 | **Section no.** | PDD | **Date:** 27/06/2023 |
|---|---|---|---|---|

**Description of CAR**

In the section B.6.3 of the PDD:

- PD to provide justification for considering the 2009 report as the source as the start date of the project activity is 2020. However, as per the report it is mentioned as $47.66, but PD has considered USD 37. Please clarify.
- PD is requested to provide calculation for the SDG 1.

| **PD response** | **Date:** 09/08/2023 |
|---|---|

As mentioned in the Section B.6.3 of PDD v3.0, the baseline expenses for kerosene lightings are in average $34.16, which is deducted from the baseline expenses for kerosene ($56) times the proportion of households using kerosene in the baseline (61%). The proposed value ($34) is conservative compared to a study published in 2009 which evaluated the expenditure on Kerosene for lighting purpose in Malawi to USD 47 USD. Source: Section 3.4; https://www.sciencedirect.com/science/article/abs/pii/S0301421509008209

**Documentation provided by PD**

NA

| **VVB assessment** | **Date: 22/08/2023** |
|---|---|

In the section B.6.3 of the revised PDD:

- PD to explain how the proposed value $34 is conservative also PD to provide appropriate justification for considering the 2009 report as the source as the start date of the project activity is 2020. However, as per the report it is mentioned as $47.66, but PD has considered USD 30. Please clarify.

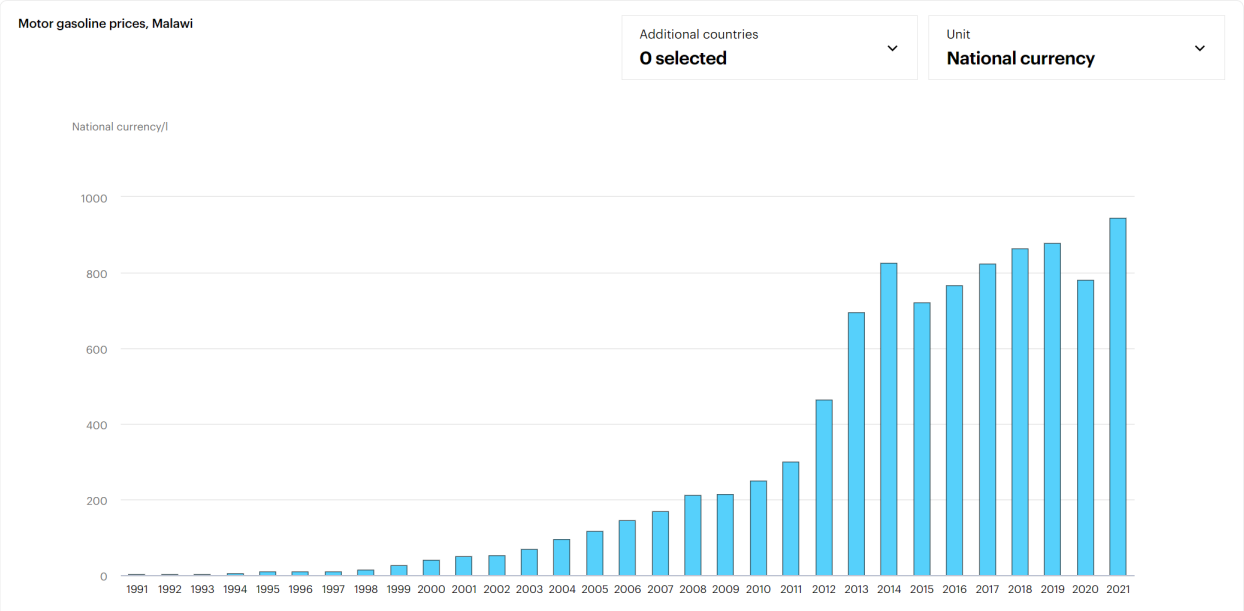
Also in the under the section B.6.3 of the PDD, SDG 1: PD has mentioned that 61% of households used kerosene for lighting. Please clarify. CAR is open.

- PD to provide response. CAR is open.

| **PD response** | **Date: 25/10/2023** |
|---|---|

1) The average yearly savings on lighting per household found by the project is 30 USD/year.hh. This represents the average savings of 54 USD found in the monitoring survey, which is applied to 56% of the population using kerosene in the baseline (54USD*56% = 30USD in average).

   The 2009 survey reports a yearly saving in lighting per household of 47.06USD/year.hh : The reported reductions in weekly fuel expenditures for lighting when annualized were $47.06 average per household". This survey is considered still applicable to this day (i.e. conservative) since fuel prices have largely increased in Malawi since 2010, and the actual figure of 2023 is expected to be much higher than the one of 2010:




Therefore, as explained above, the value of 30USD found in the survey seem very conservative compared to values found in the 2010 study and the values expected for 2021 and 2023.

2) The 61% remained in the clean version v3.0 but was already corrected in the track changes version v3.0. Therefore no changes are made and the correct percentage is reflected.

| **Documentation provided by PD** | |
|---|---|
| None | |
| **VVB assessment** | **Date:** 17/11/2023 |
| PD to provide reference for the above graph and explain. CAR is open | |
| **PD response** | **Date: 24/11/2023** |
| The graph is taken from the International Energy Agency : https://www.iea.org/data-and-statistics/data-tools/end-use-prices-data-explorer?tab=Yearly+prices.<br><br>Accompanying text explaining the use of the graph is self-explanatory. Please issue specific questions if unclear. | |
| **Documentation provided by PD** | |
| None | |
| **VVB assessment** | **Date:** 01/12/2023 |
| The justification provided by PD for consideration of 2009 survey report is found to be conservative by the VVB. Hence the CAR is closed. | |

| **CAR ID** | 18 | **Section no.** | PDD | **Date:** 27/06/2023 |
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| **Description of CAR** | | | | |
| PD to incorporate the monitoring plan inline with the methodology. | | | | |
| **PD response** | | | | **Date:** 09/08/2023 |
| As referred to in Footnote 2 of the methodology AMS-I.A v.19: Renewable energy lighting applications shall consider the equivalent level of lighting service instead of energy. Hence the monitoring plan is adapted according to the discussion and formulas presented in Section B.6. Sustainable Development Goals (SDG) outcomes.<br>Although, section B.7. was amended in PDD v3.0 including monitoring plan included in the methodology. | | | | |
| **Documentation provided by PD** | | | | |
| NA | | | | |
| **VVB assessment** | | | | **Date:** 22/08/2023 |
| PD has incorporated the justification under the section monitoring plan of the revised PDD. Hence the CAR is closed. | | | | |

**Table 3. FARs from this validation**

NA

# Appendix 5. Safeguarding Principles & Requirements

| Assessment Questions/ Requirements | Justification of Relevance (Yes/potentially/no) | How Project will achieve Requirements through design, management or risk mitigation. | Mitigation Measures added to the Monitoring Plan (if required) | VVB Assessment |
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| **Principle 1. Human Rights** | | | | |
| 1. The Project Developer and the Project shall respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Rights<br>2. The Project shall not discriminate with regards to participation and inclusion | No | The project will be implemented in collaboration with local partners and PO will respect internationally proclaimed human rights and shall not be complicit in violence or human rights abuses of any kind as defined in the Universal Declaration of Human Right. The project will not discriminate with regards to participation and inclusion. | N/A | The justification provided by PD was found adequate based on the sectoral expertise of validation team.<br>Further PD representative/employee and stakeholders were interviewed during the onsite visit audit to confirm the same. |
| **Principle 2. Gender Equality** | | | | |
| 1. The Project shall not directly or indirectly lead to/contribute to adverse impacts on gender equality | No | The project activity doesn't endorse any form of discrimination based on gender. Solar Home Systems will be distributed to all willing | | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |

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| and/or the situation of women<br>2. Projects shall apply the principles of nondiscrimination, equal treatment, and equal pay for equal work<br>3. The Project shall refer to the country's national gender strategy or equivalent national commitment to aid in assessing gender risks<br>4. (where required) Summary of opinions and recommendations of an Expert Stakeholder(s) | | customers within the project boundary. Malawi has a National Gender Policy 2015 with the goal to mainstream gender in the national development process to enhance of women and men, girls and boys for sustainable and equitable development for poverty. | | |
| **Principle 3. Community Health, Safety and Working Conditions** | | | | |
| 1. The Project shall avoid community exposure to increased health risks and shall not adversely affect the health of the workers and the community | No | 1. The project doesn't expose the community to increased health risks and is not adversely affecting the health of workers and the community. Use of project solar home systems will contribute in improving the health of users as compared to inefficient lighting sources by reducing | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |

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| | | the indoor air pollution. The workers participating in the project activity are not exposed to unsafe or unhealthy work environments as the sale/distribution of solar lights or the monitoring activities of the project will not include any hazardous chemicals or other hazardous material. | | |
| **Principle 4.1 Sites of Cultural and Historical Heritage** | | | | |
| Does the Project Area include sites, structures, or objects with historical, cultural, artistic, traditional or religious values or intangible forms of culture? | **No** | Since this is a solar home system project, there is no risk of risk to cultural and historic heritage. | **N/A** | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 4.2 Forced Eviction and Displacement** | | | | |
| Does the Project require or cause the physical or economic relocation of peoples (temporary or permanent, full or partial)? | **No** | Since this is a solar home system project, there is no risk of forced eviction and displacement. | **N/A** | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 4.3 Land Tenure and Other Rights** | | | | |

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| a. Does the Project require any change, or have any uncertainties related to land tenure arrangements and/or access rights, usage rights or land ownership?<br>b. For Projects involving land use tenure, are there any uncertainties with regards to land tenure, access rights, usage rights or land ownership? | **No** | Since this is a solar home system project, there is no risk of uncertainty due to land rights/ownership. | **N/A** | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 4.4 - Indigenous people** | | | | |
| Are indigenous peoples present in or within the area of influence of the Project and/or is the Project located on land/territory claimed by indigenous peoples? | No | Since this is a solar home system distribution project, there is no risk to land/territory claimed by indigenous peoples. Solar Home systems will be distributed to all willing customers within the project boundary. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 5. Corruption** | | | | |
| 1. The Project shall not involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects | No | PO will ensure that the project doesn't involve, be complicit in or inadvertently contribute to or reinforce corruption or corrupt Projects. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 6.1 Labour Rights** | | | | |
| 1. The Project Developer shall ensure that all employment is in compliance with | No | The project is implemented on the ground by the PO in collaboration with other project | N/A | Appropriateness for this safeguarding principle was validated and |

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| national labour occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions<br>2. Workers shall be able to establish and join labour organisations<br>3. Working agreements with all individual workers shall be documented and implemented and include:<br>a) Working hours (must not exceed 48 hours per week on a regular basis), AND<br>b) Duties and tasks, AND<br>c) Remuneration (must include provision for payment of overtime), AND<br>d) Modalities on health insurance, AND<br>e) Modalities on termination of the contract with provision for voluntary resignation by employee, AND<br>f) Provision for annual leave of not less than 10 days | | partners. The project employment will be in compliance with national labor occupational health and safety laws and with the principles and standards embodied in the ILO fundamental conventions.<br>2. The workers employed by PO for the project are able to establish and join labor organizations.<br>3. The working agreements with the individual workers will be documented and implemented and the minimum requirements stated will be respected as applicable.<br>4. The minimum age for possible staff hired is 18.<br>5. All the workers will be provided with appropriate equipment, training documentation and reporting of accidents and incidents, and | | confirmed through review of PDD /01/ and on-site visit to confirm the same |

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| per year, not including sick and casual leave.<br>4. No child labour is allowed (Exceptions for children working on their families' property requires an Expert Stakeholder opinion)<br>5. The Project Developer shall ensure the use of appropriate equipment, training of workers, documentation and reporting of accidents and incidents, and emergency preparedness and response measures | | emergency preparedness and response measures. | | |
| **Principle 6.2 Negative Economic Consequences** | | | | |
| 1. Does the project cause negative economic consequences during and after project implementation? | **No** | The project involves sale of solar home systems to willing customers within the project boundary. Carbon revenues are important for creating awareness among the end users and strengthening the local sales and distribution services. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 7.1 Emissions** | | | | |
| Will the Project increase greenhouse gas emissions over the Baseline Scenario? | No | The project will reduce the GHG emissions which will be | N/A | Appropriateness for this safeguarding principle was validated and |

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| | | monitored and verified in line with the applied methodology. | | confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 7.2 Energy Supply** | | | | |
| Will the Project use energy from a local grid or power supply (i.e., not connected to a national or regional grid) or fuel resource (such as wood, biomass) that provides for other local users? | No | The project is a solar home system distribution programme and does not use energy from a local grid or power supply. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 8.1 Impact on Natural Water Patterns/Flows** | | | | |
| Will the Project affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity? | No | The project is a solar home system distribution programme and will not affect the natural or pre-existing pattern of watercourses, ground-water and/or the watershed(s) such as high seasonal flow variability, flooding potential, lack of aquatic connectivity or water scarcity. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 8.2 Erosion and/or Water Body Instability** | | | | |
| a. Could the Project directly or indirectly cause additional erosion and/or water body instability or disrupt the natural pattern of erosion? | No | The project is a solar home system distribution programme and will not directly or indirectly cause additional erosion and/or water body instability or | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |

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| b. Is the Project's area of influence susceptible to excessive erosion and/or water body instability? | | disrupt the natural pattern of erosion. | | |
| **Principle 9.1 Landscape Modification and Soil** | | | | |
| Does the Project involve the use of land and soil for production of crops or other products? | No | The project is a solar home system distribution programme and does not involve the use of land and soil for production of crops or other products. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 9.2 Vulnerability to Natural Disaster** | | | | |
| Will the Project be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions? | No | The project is a solar home system distribution programme and will not be susceptible to or lead to increased vulnerability to wind, earthquakes, subsidence, landslides, erosion, flooding, drought or other extreme climatic conditions. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 9.3 Genetic Resources** | | | | |
| Could the Project be negatively impacted by or involve genetically modified organisms or GMOs (e.g., contamination, collection and/or harvesting, commercial development, or take place in facilities or farms that include | No | The Project is not negatively impacted by the use of genetically modified organisms or GMOs. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |

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| GMOs in their processes and production)? | | | | |
| **Principle 9.4 Release of pollutants** | | | | |
| Could the Project potentially result in the release of pollutants to the environment? | No | As the project includes distribution of solar home systems, there is no risk of releasing pollutants to the environment. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 9.5 Hazardous and Non-hazardous Waste** | | | | |
| Will the Project involve the manufacture, trade, release, and/ or use of hazardous and non-hazardous chemicals and/or materials? | No | The Project does not involve the manufacture, trade, release, and/or use of hazardous chemicals and or materials. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 9.6 Pesticides & Fertilisers** | | | | |
| Will the Project involve the application of pesticides and/or fertilisers? | No | The project does not involve the application of pesticides and/or fertilisers | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 9.7 Harvesting of Forests** | | | | |
| Will the Project involve the harvesting of forests? | No | The project does not involve the harvesting of forests. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review |

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| | | | | of PDD /01/ and on-site visit to confirm the same |
| **Principle 9.8 Food** | | | | |
| Does the Project modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives? | No | The project does not modify the quantity or nutritional quality of food available such as through crop regime alteration or export or economic incentives. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 9.9 Animal husbandry** | | | | |
| Will the Project involve animal husbandry? | No | The project does not involve animal husbandry. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 9.10 High Conservation Value Areas and Critical Habitats** | | | | |
| Does the Project physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified? | No | The project is a solar home system distribution programme and do not physically affect or alter largely intact or High Conservation Value (HCV) ecosystems, critical habitats, landscapes, key biodiversity areas or sites identified. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |
| **Principle 9.11 Endangered Species** | | | | |

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| a. Are there any endangered species identified as potentially being present within the Project boundary (including those that may route through the area)?<br>b. Does the Project potentially impact other areas where endangered species may be present through transboundary affects? | No | The project boundary is geographical sites of solar home systems distribution and there are no endangered species identified as potentially being present within the Project boundary. | N/A | Appropriateness for this safeguarding principle was validated and confirmed through review of PDD /01/ and on-site visit to confirm the same |