SHINE I – DISTRIBUTION OF LED LIGHTBULBS IN EAST INDIA

Document Prepared by

Carbon Check (India) Private Ltd.

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Summary:

A brief description of the validation and the project

Validation: C-Quest Capital SG India LED Private Limited has appointed Carbon Check (India) Pvt. Ltd., to carry out the validation of the project "Shine I - Distribution of LED Lightbulbs in East India", with regards to the relevant requirements of VCS Standard Version 4.4 (dated 17/01/2023).

Project: The project "Shine I - Distribution of LED Lightbulbs in East India", is a grouped project which employs CDM methodology; AMS-II.C version 15.0 /B02/. The project involves distribution of Light Emitting Diodes (LEDs) for domestic lighting in the East Indian states of Jharkhand, West Bengal, Bihar, and Odisha, within respective DISCOM network circles. The project will result in reduction of CO_2 emissions that will real, measurable and give long-term benefits to the mitigation of climate change.

The purpose and scope of validation

Purpose: The purpose of a validation is to have a thorough and independent assessment of the proposed project activity against the applicable VCS requirements, in particular, the project's baseline, monitoring plan and compliance with the relevant VCS and host Party 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 VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reductions. Carbon Check's objective is to perform a thorough, independent assessment of the validation of the project activity.

Scope: Validation scope is defined as an independent and objective review of the Project Description (PD). The PD is reviewed against the relevant criteria and guidance documents provided by VCS which include the following: VCS Program Guide (v4.3, dated 17/01/2023), VCS Standard (v4.4, dated 17/01/2023), Program Definitions (v4.3, dated 17/01/2023), Registration & Issuance Process (v4.3, dated 17/01/2023) VCS Validation and Verification Manual (v3.2, dated 19/10/2016) applicable at the time in order to confirm that the project meets the applicability conditions of the selected baseline and monitoring CDM methodology AMS-II.C (version 15.0) , also assess the claims and assumptions made in the PD without limitation on the information provided by the project participants.

The method and criteria used for validation.

The validation consists of the following four phases:

- A desk review of the project description documents.
    - A review of data and information.
    - Cross checks between information provided in PD and information from sources with all necessary means without limitations to the information provided by the project proponent.

I. On-site interviews with project stakeholders
    - Interviews with relevant stakeholders in host country with personnel having knowledge of the project development via telephone, email or direct on-site visits.
    - Cross checking between information provided by interviewed personnel with all necessary means without limitations to the information provided by the project proponent.

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

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

The number of findings raised during validation.

During the course of validation, a total of 25 findings were raised, which include:

20 Corrective Action Requests (CARs).

04 Clarification Requests (CLs).

01 Forward Action requests (FARs).

All the raised findings have been successfully closed by the Project Proponent.

Any uncertainties associated with the validation.

There are no uncertainties associated with the validation of the project activity. The validation has been done with a reasonable level of assurance.

Summary of the validation conclusion

Carbon Check (India) Private Ltd. concludes the validation with a positive opinion that the VCS Grouped Project “Shine I – Distribution of LED Lightbulbs in East India” as described in the PD (version 3.1, dated 15/10/2023) /01-d/, meets all applicable VCS requirements, including those specified in the VCS Standard (v4.4, dated 17/01/2023), relevant methodology, tools and guidelines.

- The selected baseline and monitoring CDM methodology AMS-II.C (version 15.0) is applicable to the project and correctly applied. Carbon Check (India) Private Limited. therefore, requests the registration of the project as a VCS grouped project.

CONTENTS

1 INTRODUCTION

1.1 Objective

C-Quest Capital SG India LED Private Limited has appointed the VVB, Carbon Check (India) Private Limited to perform a validation of the VCS Grouped Project "Shine I – Distribution of LED Lightbulbs in East Indian states of Jharkhand, West Bengal, Bihar, and Odisha within respective DISCOM network circles. This report summarizes the findings of validation of the project, performed on the basis of the VCS Program Guide (v4.3, dated 17/01/2023), VCS Standard (v4.4, dated 17/01/2023), Program Definitions (v4.3, dated 17/01/2023), Registration & Issuance Process (v4.3, dated 17/01/2023) VCS Validation and Verification Manual (v3.2, dated 19/10/2016). Validation is required for all VCS project activities intending to register a grouped project under the VCS program. This report contains the findings and resolutions from the validation of the grouped project.

The purpose of a validation is to have a thorough and independent assessment of the proposed grouped project against the applicable VCS requirements, in particular, the project's baseline, monitoring plan and the project's compliance with relevant VCS and host Party 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 VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reductions, VCUs.

1.2 Scope and Criteria

The validation scope is defined as an independent and objective review of the Project Description (PD), project design, the project's baseline study and monitoring plan and other relevant documents. The PD is reviewed against the relevant criteria and decisions by the VCS Program, and against the approved baseline and monitoring methodology. Carbon Check has employed a risk-based approach in the validation, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

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

The validation is carried out on the basis of the following requirements, applicable for this grouped project:

- VCS Program Guide v4.3/B01/
- VCS Standard v4.4/B01/
- Program Definitions v4.3/B01/
- Registration & Issuance Process v4.3/B01/

- VCS Validation and Verification Manual v 3.2/B01/
- VCS Methodology: CDM methodology; AMS-II.C version 15.0 /B02/.
- Other relevant rules, including the host country legislation.

1.3 Reasonableness of Assumptions

The validation report is based on the PD /01/, supporting documents /01/-/18/ made available to the verifier and information collected through performing interviews.

The Validation has been planned and organized to achieve a:

☒ Reasonableness of assumptions, limitations, and methods that support a statement about the outcome of future activities as per VCS Standard (v4.4).

1.4 Summary Description of the Project

The project "Shine I – Distribution of LED Lightbulbs in East India", is a grouped project which employs of the CDM methodology; AMS-II.C version 15.0 /B02/. The grouped project involves distribution of distribution of LED Lightbulbs in India" which involves distribution of Light Emitting Diodes (LEDs) for domestic lighting in the households in the East Indian states of Jharkhand, West Bengal, Bihar, and Odisha within respective DISCOM network circles. Under this grouped project 11,365,000 LEDs will be distributed to grid connected households for domestic lighting. PP has considered a number of project devices, i.e., number of LEDs distributed to each grid connected household as a project activity instance under this grouped project. A maximum number of 5 LEDs (7W and 12 W) will be distributed in grid connected household under a single project activity instance which is in line with §48(c) methodology AMS.II.C. v15.0/B02/. The project will result in reduction of CO2 emissions that are real, measurable and will give long-term benefits to the mitigation of climate change. The start date for the grouped project is 23/03/2023 /03/ which is the date of distribution of first LED distributed in the grouped project.

The project proponent for the project activity is C-Quest Capital SG India LED Private Limited, owns the rights to VERs/05//13/.

Maximum emission reductions from a single project activity instance under this grouped project are estimated to be 1.409 tCO2e per year (considering replacement of five 100 W ICLs with five 12 W LEDs in a grid connected household). The project will distribute 11,365,000 LEDs to households under this grouped project in the span of 3 years in 2,273,000 grid connected households (i.e. project activity instance) and the total estimated GHG emission reductions expected from the total number of 2,273,000 project activity instances under this grouped project are estimated to be 2,351,830 tCO2e per year and total emission reductions from this grouped project are estimated to be 23,518,299 tCO2e during the fixed crediting period of 10 years. The maximum energy savings from a single project activity instance are calculated to be 1.548 MWh considering five 12 W LEDs will be replacing five ICLs in a household). Therefore, in line with the VCS standard v4.4 the project size is categorized as a large project as estimated GHG emissions reductions or removals per year are more than 300,000 tonnes CO_2e. It is evident that

the aggregate energy savings by a single project activity instance shall not exceed the equivalent of 60 GWh per year. Hence, the validation team confirms that the per PAI meets the scale limit, and as the grouped project has taken the actual distribution, it fulfils the criteria of the scale of the grouped project.

2 VALIDATION PROCESS

2.1 Method and Criteria

C-Quest Capital SG India LED Private Limited has appointed the VVB, Carbon Check (India) Private Limited, to carry out the validation of the project "Shine I – Distribution of LED Lightbulbs in East India", with regards to the relevant requirements of VCS Standard Version 4.4 (dated 17/01/2023) /B01-a/.

The validation includes a thorough and independent assessment of the proposed grouped project against the applicable VCS requirements, in particular, the project's baseline, additionality, monitoring plan and the project's compliance with relevant VCS and host party criteria. The validation involves assessment of the project and to confirm that the project meets the applicability conditions of the selected methodology, AMS.II-C version 15.0 /B02/ and also assess the claims and assumptions made in the PD /01/ without limitation on the information provided by the project participants. The overall validation was conducted using Carbon Check's internal procedures.

2.2 Document Review

During the document review, CCIPL has applied standard auditing techniques including but not limited to document reviews and on-site interviews, review of the applicable/applied methodology and its underlying formulae and calculations to assess the quality of information provided.

This report contains the findings and resolutions from the validation and a validation opinion on the proposed grouped project thus confirming the project design as document is sound and reasonable and meets the stated requirements and identified criteria.

The VCS project description, emission reduction calculation spread sheet and supporting documents related to the project design and baseline were reviewed as per VCS standard version 4.4 /B01/ requirements. The desk review included:

- A review of the data and information presented to verify completeness and consistency in accordance with VCS standard version 4.4 requirements.
- A review of the project description and monitoring methodology, paying particular attention to the applicability conditions of the methodology and baseline and additionality related requirements.
- A review of the monitoring plan and the project's compliance with relevant VCS criteria.

Furthermore, the validation team used additional documentation by third parties like host-party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The VCS PD version 1.0 dated 28/10/2022 /01-a/ was initially reviewed and CCIPL requested the PP to present the supporting information and documents. The documents reviewed by CCIPL are listed below in Appendix 1. Through the process of validation, the revised VCS PD and the supporting documents were evaluated to confirm the actions taken by the PP to the CARs and CLs issued by the validation team.

The table in Appendix 1 outlines the documentation reviewed during the validation.

2.3 Interviews

The table below describes the on-site interview process and further identifies personnel, including their roles, who were interviewed and/or provided information additional to that provided in the project description /01/ and any supporting documents.

Sr. No.	Date	Name	Organization	Topic	Persons Interviewed
/1/	09-Aug-23	Vijay Machcha	C-Quest Capital (CQC)	• Project Design • Project Implementation status • Project start date and Project Location • Baseline Scenario • Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance – • Management and operating system • Social and Environmental Impacts • Local Stakeholders meeting process. • Compliance with relevant laws • Roles and responsibility	Siddhant Bankar
/2/	09-Aug-23	Madhujya Gogoi	C-Quest Capital (CQC)	• Project Design • Project Implementation status • Project start date and Project Location • Baseline Scenario • Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance – • Management and operating system	Siddhant Bankar

Sr. No.	Date	Name	Organization	Topic	Persons Interviewed
				• Social and Environmental Impacts • Local Stakeholders meeting process. • Compliance with relevant laws • Roles and responsibility	
/3/	09-Aug-23	Himanka Deka	C-Quest Capital (CQC)	• Project Design • Project Implementation status • Project start date and Project Location • Baseline Scenario • Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance – • Management and operating system • Social and Environmental Impacts • Local Stakeholders meeting process. • Compliance with relevant laws • Roles and responsibility	Siddhant Bankar
/4/	09-Aug-23	Sanjib Das	M.B Enterprises (IP)	• Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance –Management and operating system	Siddhant Bankar
/5/	09-Aug-23	Bikroo Par	M.B Enterprises (IP)	• Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance – Management and operating system	Siddhant Bankar
/6/	09-Aug-23	Soma Paul	M.B Enterprises (IP)	• Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance –Management and operating system	Siddhant Bankar

Sr. No.	Date	Name	Organization	Topic	Persons Interviewed
/7/	09-Aug-23	Kaushik Manjur	WBSRLM	• Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance –Management and operating system • Meeting Details • Information given about Carbon credits. • Price of Cookstove being distributed. • Location of Meet • Invitation Method • LSC feedback	Siddhant Bankar
/8/	09-Aug-23	Victor Majumdar	WBSRLM	• Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance –Management and operating system • Meeting Details • Information given about Carbon credits. • Price of Cookstove being distributed. • Location of Meet • Invitation Method • LSC feedback	Siddhant Bankar
/9/	09-Aug-23	Jaya Ghar	M.B Enterprises (IP)	• Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance –Management and operating system	Siddhant Bankar
/10/	09-Aug-23	Prasenjit Sakar	M.B Enterprises (IP)	• Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance –Management and operating system	Siddhant Bankar

Sr. No.	Date	Name	Organization	Topic	Persons Interviewed
/11/	09-Aug-23	P Pal	M.B Enterprises (IP)	• Baseline Identification and Additionality • Qualification and Training • Monitoring and reporting documentation • Quality Assurance –Management and operating system	Siddhant Bankar
/12/	09-Aug-23	Aparna Gayen	Local stake holder	• Meeting Details • Information given about Carbon credits. • Price of Cookstove being distributed. • Location of Meet • Invitation Method • LSC feedback	Siddhant Bankar
/13/	09-Aug-23	Santosh Sarkar	Local stake holder	• Meeting Details • Information given about Carbon credits. • Price of Cookstove being distributed. • Location of Meet • Invitation Method • LSC feedback	Siddhant Bankar
/14/	09-Aug-23	Sushama Halder	Local stake holder	• Meeting Details • Information given about Carbon credits. • Price of Cookstove being distributed. • Location of Meet • Invitation Method • LSC feedback	Siddhant Bankar
/15/	09-Aug-23	Debjani Majumdar	Local stake holder	• Meeting Details • Information given about Carbon credits. • Price of Cookstove being distributed. • Location of Meet • Invitation Method • LSC feedback	Siddhant Bankar
/16/	09-Aug-23	Tumpa Mondal	Local stake holder	• Meeting Details • Information given about Carbon credits. • Price of Cookstove being distributed. • Location of Meet • Invitation Method • LSC feedback	Siddhant Bankar

Sr. No.	Date	Name	Organization	Topic	Persons Interviewed
/17/	09-Aug-23	Aparna De	Local stake holder	• Meeting Details • Information given about Carbon credits. • Price of Cookstove being distributed. • Location of Meet • Invitation Method • LSC feedback	Siddhant Bankar

The validation team has carried out on-site interviews on date 09/08/2023 in order to assess the information included in the PD. During the desk review, the relevant records such as the registration certificate has been checked to confirm the start date of the project activity /03/ technical specification has checked to check the life span of the LEDs /04/ and other records/ documents was used to cross check consistency of information.

PP has chosen to monitor the operating hours of the project LEDs continuously for a period of 90 days with the help of run time meters installed on a sample of project LEDs. The data thus measured will be used for calculating average annual operating hours, VVB has witnessed the end users with Data meter just to ensure that for relevant parameter is being calculated in line with methodology AMS.II.C v.15.0, no random sampling was carried out to select the end users with data meter[1].

Therefore, VVB can achieve a reasonableness of assumptions, limitations, and methods that support a statement about the outcome of future activities by conducting a site visit, or through a on-site site visit, this is in conformance with the VCS rules, and no request for an exemption or pre-approval from Verra is required. However, where a validation has been conducted a site visit,

2.4 Site Visits

Carbon Check conducted an on-site inspection on 09/08/2023 to understand the implementation and operation of the VCS project. A reasonableness of assumptions, limitations, and methods that support a statement about the outcome of future activities has been maintained throughout the on-site visit for the purpose of validation as follows:

- An assessment of the implementation method and operation of the VCS project in line with VCS standard and methodology AMS.II.C v15.0, through on-site interviews with the representatives of project proponent and relevant stakeholders.
- Confirmation of the pre-project scenario.
- Confirmation of the applicability of the methodology and monitoring and controlling instruments and operational arrangements.

[1]Result for operating hours will be checked during 1st verification, FAR #1 is raised for same.

- Confirm the data collection procedures are implemented in accordance with the MP
- Assessment of the project boundaries
- Assessment of the monitoring provisions by checking the monitoring arrangement.
- A review of information aggregating and reporting of the monitoring parameters
- A check of the observations of monitoring practices against the requirements of the VCS PD and the applied monitoring methodologies
- A review of calculations and assumptions made in determining the GHG data and ERs, and
- An identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters.

2.5 Resolution of Findings

This section summarizes the findings from the validation of the project activity. In this section the findings from the document review, assessments and on-site interviews are provided.

Material discrepancies identified in the course of the validation are addressed either as CARs, CLs or FARs.

Corrective action requests (CAR) are issued, where:

a) Inconsistencies have been made with VCS standard and applied methodology which is making a direct impact on project implementation in PD.

b) Applicable methodological specific & VCS requirements have not been met.

A Clarification request (CL) may be used where additional information is needed to fully clarify an issue or where the information is not transparent enough to establish whether a requirement is met.

A total of 20 CAR, 04 CLs & 01 FAR have been raised and successfully resolved. Please refer to Appendix 4 below for the details of the CARs/CLs and their closure.

2.5.1 Forward Action Requests

FAR 01 has been raised for the first monitoring period.

3 VALIDATION FINDINGS

3.1 Project Details

The project “Shine I – Distribution of LED Lightbulbs in East India”, is a large size grouped project which employs baseline and monitoring methodology; AMS.II-C “Demand-side energy efficiency activities for specific technologies” version 15.0 /B02/which is the small-scale methodology. The grouped project involves distribution of LEDs in East Indian states of Jharkhand, West Bengal, Bihar, and Odisha, within

the respective DISCOM network circles. This grouped project will be distributing around 11,365,000 LEDs to households for domestic lighting usage. The project will result in reduction of CO_2 emissions that are real, measurable and give long-term benefits to the mitigation of climate change. Section 1.1. of the VCS PD contains a clear summary description of the project activity. The completeness and accuracy of the project description was validated through on-site interviews.

The project proponent for the project activity C-Quest Capital SG India LED Private Limited, owns the rights to VERs /5/.

The start date for the grouped project is 23/03/2023 /03/ which is the date of distribution of first LED under this project activity.

The crediting period starts on 23/03/2023 /03/, which coincides with the starting date of the project activity, and lasts for 10 years, fixed. This is in accordance with paragraph 3.8.1 of the VCS standard version 4.4 /B01-a/ for non-AFOLU projects. The total estimated GHG emission reductions expected under the grouped project is 23,518,299 tCO_2e for the ten years crediting period and the annual average emission reductions under the grouped project are estimated to be 2,351,830 tCO_2e per year. The indication of the project activity, instance location and the geographic boundaries is provided in section 1.12. of the VCS PD. They are in accordance with paragraph 3.10.1 of the VCS Standard and can confirm that the project activity boundary is uniquely defined. The grouped project location and geographic boundaries of the project are those of East Indian states of Jharkhand, West Bengal, Bihar, and Odisha within respective DISCOM network circles. This is in accordance with paragraph 3.5.8 of the VCS standard version 4.4 /B01-a/, which requires grouped projects to have one or more clearly defined geographic areas within which new project activity instances may be developed.

The VCS PD clearly indicates the project scope, which is scope 3: Energy demand, and more specifically demand -side energy efficiency project. The project is a large size grouped project; this is indicated in section 1.2. of the VCS PD.

Baseline scenario derived from the applied methodology has been applied correctly and is transparently and sufficiently documented in section 1.13 of the PD /01/. The replaced LED would be energy efficient in comparison to the conventional incandescent lamp (ICL)and reduces the need for electricity. The electricity is supplied by the grid which is pre-dominantly fossil fuel based. In the absence of the project activity, the equivalent amount of electricity would have been supplied by the Indian grid, which is fed majorly based on fossil fuel fired plants. The baseline scenario is as per the requirements paragraph 51 of applied methodology AMS.II-C version 15.0/B02/.

The validation team further confirms that the project activity does not fall in the list of projects or activities requiring environmental impact assessment. The project type/category is not included in the “List of projects or activities requiring prior environmental clearance” included in the Environmental Impact Assessment (EIA) notification of the Ministry of Environment and Forest (MOEF), Government of India, 2006. Hence the project complies with relevant local, regional and national laws, statutes and regulatory frameworks. The proposed large size grouped project has not been rejected under any other GHG programs. There is no Commercially Sensitive Information excluded from the VCS-PD. PP has also clearly stated the additional information related to the project under section 1.18 of the VCS-PD /01-d/.

The proposed grouped project is an energy efficiency project activity and is located in a non-Annex I country. Therefore, the ER generated would not be part of an emission trading program, nor it is located in a jurisdiction or sector with binding limits. The project proponent intends to claim carbon credits under the VCS programme only for the emission reductions achieved. The PP states in the VCS PD that the emission reductions generated by this project will not be used for compliance with an emission-trading program or to fulfil binding commitments. In fact, at the time of validation, no binding targets have been set by India under the Kyoto protocol, as indicated in the UNFCCC website /B05/.

The proposed project activity instances do not generate another form of environmental credit. The project proponent indicates in the VCS PD that the project does not intend to generate any other form of GHG related environmental credit other than those claimed under this VCS project.

Additional Information:

In the proposed grouped project, LEDs that will be distributed to the consumers are not transferred from another activity; hence leakage emissions are not applicable. Also, project activity instances implemented under this grouped project activity will monitor the scrapping of replaced ICLs /fluorescent tubes in line with footnote 10 of the applied methodology.

Eligibility criteria of the grouped project activity

The eligibility criteria have been provided clearly in section 1.4 of the PD /01/ and then justification provided for inclusion of project activity instances as per VCS standard version 4.5.

In line with the VCS Standard v4.4 the project size is categorized as a large project as estimated GHG emissions reductions or removals per year are more than 300,000 tonnes CO_2e. The maximum energy savings from a single project activity instance are calculated to be 1.548 MWh (considering five 12 W LEDs have replaced five ICLs in a household). Therefore, it is evident that the aggregate energy savings by a single project activity instance shall not exceed the equivalent of 60 GWh per year. Thus, each project activity instance under this grouped project meets the applicability criteria of the applied small-scale methodology and therefore it is deemed accepted that this grouped project does not fall under the excluded list of projects.

S.No.	Criteria	Compliance Requirement	Compliance of Project Activity Instances
1	Methodology	Meet the applicability conditions set out in the methodology applied to the project: The project activity instance shall use AMS-II.C- Demand-side energy efficiency activities for specific technologies, Version 15.0. and shall meet all the applicability conditions.	*Details of how each project activity instance meets the requirements of the methodology can be* confirmed from the section 3.2 of this VCS-PD.
2	Technology	Use the technologies or measures specified in the project description: New LEDs will replace existing incandescent lamp (ICL). The lumen	New LEDs under grouped project activity will replace existing incandescent lamp (ICL) e.g., 60 W and 100 W

S.No.	Criteria	Compliance Requirement	Compliance of Project Activity Instances
		output of the project LEDs would be between 90%-150% of the lumen output of the baseline incandescent lamps.	with similar output LED lamps e.g., 7W and 12 W LED respectively. As shown below the Service level is between 90% and 150%. Manufacturer Specifications of the LEDs provided to the VVB.
3	Baseline Scenario	Section 6.1 of the applied methodology (AMS-II.C.,version 15.0) pertains to this grouped project activity and offers specific guidance on monitoring requirements for projects involving the installation of lighting equipment. New project activity instances are subject to the baseline scenario determined in the project description for the specified project activity and geographic area: The baseline is "continued use of existing luminaries in the households". i.e., ICLS. This also conforms to paragraph 51 of section 6.1 of applied methodology AMS-II.C according to which, "assumed baseline scenario is that lighting by the project lamps would have been provided by the lamps collected and replaced by the project activity".".	The baseline scenario of this project activity is use of existing luminaries i.e., ICLs of 60 watts and 100 watts in households.
4	Additionality	Have characteristics with respect to additionality that are consistent with the initial instances for the specified project activity and geographic area: The financial indicator against which the Project activity instances will demonstrate investment barrier, shall be Net present value (NPV).	The project is additional and additionality described in section 3.5 of this document. Project Activity Instance NPV calculation spreadsheet. Same has been provided to the VVB.
5	Defined geographic area	Occur within one of the designated geographic areas specified in the project description (only rural and peri urban households): East Indian states of Jharkhand, West Bengal, Bihar, and Odisha.	Project Activity Instance Database of each consumer to which LEDs are distributed. Same shall be provided to the VVB.

S.No.	Criteria	Compliance Requirement	Compliance of Project Activity Instances
		LEDs are planned to be distributed outside the municipal corporation boundary of respective districts covered under this grouped project. Refer to section 1.12.	
6	Ownership	Have evidence of project ownership, in respect of each project activity instance, held by the project proponent from the respective start date of each project activity instance: A default Beneficiary Agreement for end users including the provision that emission reductions generated by the project activity are owned by the Project Proponent will be provided for project activity instance	Copy of Consent letter / record of consent given from End User to Project Proponent regarding emission reduction claims. Same has been provided to the VVB on sample basis based on request.
7	Start Date	The project activity instance start date will be same as or later date than the grouped project start date.	Copies of signed consent letter/record of consent given by End User to PP for first LED distributed under each project activity instance. Sample end user consent letter/record has been provided to the VVB as evidence of the start date.
8	Capacity limit	Where a capacity limit applies to a project activity included in the project, no project activity instance shall exceed such limit: 1. The aggregate energy savings by a single project activity instance shall not exceed the equivalent of 60 GWh per year as mentioned in applicable methodology AMS II-C: Demand-side energy efficiency activities for specific technologies, Version 15.0. Each project activity instance that exceeds one percent of the capacity limit (i.e., 0.6 GWh) shall be identified. 2. Such instances shall be divided into clusters, whereby each cluster is comprised of any system of instances such that each instance	1. Project Activity Instance ER Spreadsheet containing estimation of annual energy saving from each project activity instance. Same will be provided to the VVB for reference. 2. No project activity instance will exceed the 1 percent limit (i.e., 0.6 GWh). The maximum number of LEDs that can be distributed in a single Household will be 5 LEDs and will not exceed the one percent of capacity limit. Therefore, project activity instances under this grouped project activity shall not be

S.No.	Criteria	Compliance Requirement	Compliance of Project Activity Instances
		is within one kilometre of at least one other instance in the cluster. Instances that are not within one kilometre of any other instance shall not be assigned to clusters.	assigned to clusters. Same shall be verified from each project activity instance database. Same shall be provided to the verifying VVB.
9	Double counting	The LED distributed in any project activity instance shall be uniquely identifiable based on the distribution records. Each LED distributed will have corresponding end user details (i.e., name, address, Unique Identification number etc.). Also, each LED has a unique logo, which will distinguish it from any other similar project devices distributed/ installed in the same region.	Project Activity Instance Database containing name, consumer/service no, of consumer to which LEDs are distributed.

3.2 Safeguards

3.2.1 No Net Harm

As identified by PP project has no negative impact. The potential negative environmental and socio-economic impacts identified by the project proponent and have been listed in section 2.1 of the PD.

Every additional project activity instance to be added to this Grouped Project will summarize any potential negative environmental and socio-economic impacts and the steps taken to mitigate them.

The validation team confirms that for the project does not pose any potential negative environmental and socio-economic impacts. A local stakeholders meeting was conducted for the project and there was no negative feedback.

3.2.2 Local Stakeholder Consultation

The local stakeholders' consultation (LSC) meeting for the Grouped Project Activity- was conducted on 14-March-2023 between 10:30 A.M to 12:00 P.M (Indian Standard Time).

The mechanism for on-going communication with local stakeholders:

PP follows the following two methods for continuous feedback and ongoing communications with stakeholders during project implementation. These are –

Call over helpline number - End Users/beneficiaries can report their grievances and complaints regarding project device or any other issues via calling on the helpline number which has been

engraved on the LED. The CQC ground team/implementing partner takes immediate actions to address the grievances.

Spot check visit – The CQC ground team makes visits to registered households on a sample basis. One of the main objectives of this visit is to ensure that the implementation partner is addressing the concerns from the beneficiaries in adequate way and the end-users are trained on operation and maintenance of LED's including make the end-users aware about the benefits associated with the project devices.

The outcome of the LSC meeting was encouraging. By the end of the webinar several stakeholders expressed their desire to connect with this program as they truly felt that it could be a catalyst in bringing about household energy efficiency improvements in the rural and financially backward sections of society as well as preserve our environment. The stakeholders were requested to register their response through evaluation form (sample attached in appendix of the PD) or given with option they could send their comments at the mail ID provided or on the link made available at the project proponent's website.

The validation team confirms that the project proponent has taken due account of all input (no negative comments were received for the project) listed under section 2.2 of PD. The validation team was attended the of LSC meeting virtually and confirms that the method for engagement, method for documenting the outcomes of local stakeholders' consultation and account of all inputs received was followed in line with VCS requirement.

3.2.3 Environmental Impact

As per the need for an EIA, Environmental Impact Assessments in India are regulated through No environmental impacts have been identified by the project proponent.

3.2.4 Public Comments

The public commenting period for the project was from 31-January-2023 to 02-March-2023. 01 public comments were received for the grouped project.

PCP Comment:

The project lacks credibility and aims only revenue generation through carbon credits. The price of LED has been substantially reduced in India and it is available at very cheap price today at every nook and corners in India including far flung rural areas. The project therefore is just a hog wash. Govt is already proving LED at subsidized price and even without any subsidy, it is available at 30 to 40 US cents today, anywhere in India. This project needs detailed scrutiny to maintain the high standards set forth by Verra.

PP Response:

The grouped project activity and all project activity instances will be implemented within the East Indian states of Jharkhand, West Bengal, Bihar, and Odisha and the targeted is of rural and peri-urban population.

As per the Ujala Scheme the LED bulb of 7W has 852 lumen/Watt, which is equivalent of 595 lumens, whereas the project LEDs 7W has 105 lumen/Watt, which is equivalent to 735 lumens, with higher illumination level as compared to the LEDs distributed under the referred scheme.

According to the Indian market the price is varies from around 150[3] to 250[4] INR (roughly 1.81 to 3.01 USD respectively) pre-LED, according to the wattage rating.

Under the Ujala Yojan scheme by government where in 9W LED bulb priced at Rs. 855 (1.03 USD). The average annual income of a rural Indian is around Rs. 40,92[5], which is around Rs. 112 or 1.35 USD per day[6]. Assuming each households requires a minimum of 4-5 LED lightbulbs for their day-to-day activity, it would be hard on the people living in rural India to fork out around INR 600 (150 INR × 4 LEDs) to 1,000 (150 INR × 5 LEDs) or 7.24 USD to 15 USD for buying the LED bulbs, to meet the lighting needs. According to the National Sample Survey (NSS), an average rural household spends about 0.64% of its monthly budget on electrical and lighting accessories. The number when converted to absolute value is equal to 9.44 INR[7] of Monthly Per Capita Expenditure.

Even with the HH income approach as per below table the LEDs are not affordable as compared with LED prices and average income levels.8 –

Indian State	Average HH Monthly Income (INR/Month)	Average HH daily income (=Monthly income/30days) (INR/Day)	Average HH daily income in USD (USD/Day)
All India	8059	268.63	3.92669
Jharkhand	5854	195.13	2.85231
West Bengal	6860	228.67	3.34258
Odisha	7241	241.37	3.52822
Bihar	6277	209.23	3.05841

The Grouped project activity is voluntary activity which is being implemented by PP and this project will help to reduce the GHG emissions, gap between electricity demand and supply during peak hour, also help the rural people to save electricity and get better illuminous by high quality LED lights.

[2] UJALA - Energy Efficiency Services Limited (eeslindia.org)
[3] Amazon.in : 7w led bulb
[4] Amazon.in : 12w led bulb
[5] Ujala Scheme 2023 - Order Led Bulb / Tubelight / Fan at digitalseva.csc.gov.in (sarkariyojana.com)
[6] India's rural-urban divide: Village worker earns less than half of city peer | The Financial Express
[7] Household expenditure on services and durable goods NSS 72nd round (Page no. 18)

[8] Source: NABARD All India Rural Financial Inclusion Survey (report in Aug 2018)
https://www.nabard.org/auth/writereaddata/tender/1608180417NABARD-Repo-16_Web_P.pdf (page 67/184)

VVB Assessment:

VVB has assessed the public comment received and response to it from PP, Furthermore, VVB has crosschecked the data and through the given links and web searches VVB confirmed the details for the Ujala yojana scheme which is scheme being run by Govt. of India, from different sources VVB has confirmed that LEDs being distributed under the "Shine I project" varies around 150 to 250[9] INR (roughly 1.81 to 3.01 USD respectively) which is being distributed at subsidized price in replacement of ICLs, which is then resulting replacement of inefficient lighting with energy efficient LEDs, however in UJALA no such arrangement was made to remove old lights, the price Shine I project offering is Rs.15/LED as per HH 5 LEDs in replacement of ICLs is being provided which cost around Rs.75/5 LEDs (i.e, 0.90 USD for 5 LEDs). Furthermore, VVB has confirmed the project will not sustain without carbon revenue as the negative Net Present Value is proved from evident proofs.

3.2.5 AFOLU-Specific Safeguards

Not Applicable.

3.3 Application of Methodology

3.3.1 Title and Reference

The Grouped Project has referred one of the CDM approved methodology as mentioned below:

- AMS-II.C- Demand-side energy efficiency activities for specific technologies, Version 15.0.

The associated tools and guideline documents in the Grouped Project include:

- Methodology: AMS-I. D: Grid connected renewable electricity generation; Version 18.0
- Methodological Tool 07: Tool to calculate the emission factor for an electricity system, version 7.0.
- Methodological tool 21: Demonstration of additionality of small-scale project activities Version 13.1
- Guideline: General guidelines for SSC CDM methodologies Version 23.1
- Standard: "Sampling and Surveys for CDM project activities and programmes of activities" (version 09.0)

3.3.2 Applicability

The project applies CDM methodology; AMS.II-C, version 15.0/B02-a/. Applicability criteria for the baseline line methodology are assessed by the validation team as follows. The validation team confirms that the project activity meets the criteria of the applied methodology.

[9] Amazon.in : 12w led bulb

Sr. No.	AMS-II.C requirement	Project Qualification Justification	VVB assessment
/1/	This methodology comprises activities that involve the installation of new, energy-efficient equipment (e.g., lamps, ballasts, refrigerators, motors, fans, air conditioners, pumping systems, and chillers) at one or more project sites. Retrofit as well as new construction (Greenfield) projects are included under this methodology. In the case of new construction projects, a stepwise approach is indicated for determining the baseline under paragraph 19 of version 17.0 of the General guidelines for SSC CDM methodologies.	New LEDs will replace existing incandescent lamp (ICL) 60W and 100W. The project lamps (7W &12W) also carry a unique logo and thus are distinguishable. Project lamp LEDs technical details can be referred from manufacturer specifications.	VVB based on review of PD and documents submitted confirms that the project is in accordance with applicability criteria set out by applied methodology. PP has used energy efficient LEDs, considering the baseline as ICLs which consumes more energy compared to project device. VVB has confirmed from the technical manufacturer specification the project device is giving same output using less input energy.
/2/	This methodology is only applicable if the service level (e.g., rated capacity or output) of the installed, project energy-efficient equipment is between 90% and 150% of the service level of the baseline equipment.	Project LEDs (7W & 12W) will replace the baseline lamps i.e., Incandescent lamps (ICL) (60W & 100W) respectively. Service level for lighting equipment is light output as stated in the applied methodology. The lumen output of the project LEDs would be between 90%-150% of the lumen output of the baseline lamps thus fulfilling this applicability criteria. Project lamp lumens can be evidenced from manufacturer(s) specifications.	PP has used energy efficient LEDs, considering the baseline as ICLs. VVB has confirmed from the technical manufacturer specification the output of the project LEDs is between 90%-150% of the lumen output of the baseline lamps thus fulfilling this applicability criteria.
/3/	Requirements pertaining to the baseline of the retrofit projects and projects involving capacity increase are indicated in paragraphs 20 to 21 in the general guidelines to SSC CDM methodology. If project output in year y is greater than the average historical output	This condition is not applicable for this project as the proposed project does not involve retrofit/capacity addition in the baseline.	Applicability condition not applicable as project involves replacement of old device with new device.

Sr. No.	AMS-II.C requirement	Project Qualification Justification	VVB assessment
	(average of the three most recent years prior to the project implementation1) and the demonstration of the baseline for the incremental capacity is not undertaken, the value of the output in year y is capped at the value of the historical average output level.		
/4/	If the energy-efficient equipment contains refrigerants, then the refrigerant used in the project case shall have no ozone depleting potential (ODP).	The project does not involve equipment that contains refrigerants.	Condition not applicable.
/5/	This methodology credits emission reductions only due to the reduction in electricity and/or fossil fuel consumption from use of more efficient equipment. However, the calculation of project emissions shall include any incremental emissions, as compared to the baseline, associated with refrigerants used in the project equipment.	The project will claim emission reductions only due to the reduction in energy savings from use of more efficient lighting equipment by replacement of ICLs with LED. As there are no refrigerants involved in the LED bulbs, incremental emissions associated with refrigerants is not applicable.	VVB through review of PD and documents confirms that project will be claiming the emission reduction only from the reduction I electricity consumption from use of more efficient lighting equipment (LED). Furthermore, VVB has confirmed that in project scenario no refrigerants are being used.
/6/	The aggregate energy savings by a single project may not exceed the equivalent of 60 GWh per year for electrical end-use energy efficiency technologies. For fossil fuel end-use energy efficient technologies, the limit is 180 GWh thermal per year in fuel input.	Electrical energy savings by the project Instances under this grouped project activity are below 60 GWh/yr. Each grid connected household (project activity instance) if receiving five 12W LEDs, the maximum energy saving will be 1.548 MWh, which is less than the capacity limit (i.e., 0.6 GWh).	VVB has confirmed from ER spreadsheet /02/ Electrical energy savings by the single project Instance *i.e five 12 W LEDs will be replacing five ICLs in a household* under this grouped project activity is below 60 GWh/yr. Furthermore, VVB has confirmed in line with VCS standard v 4.4 para 3.6.9 each project activity instance has max energy saving of 1.48 MWh (considering five 12 W LEDs will be replacing five ICLs in a household) which is less

Sr. No.	AMS-II.C requirement	Project Qualification Justification	VVB assessment
			than 1% of 60 GWh limit.

3.3.3 Project Boundary

The Grouped Project boundary is defined as per AMS.II-C version 15.0. "Demand-side energy efficiency activities for specific technologies, (Version 15.0)". The sources of greenhouse gas identified in the PD/01/ are deemed to be appropriate and assessed below:

Source		Gas	Included?	Justification/Explanation
Baseline	Power Plants serving the electricity grid	CO_2	Yes	Major source of emission
		CH_4	No	Minor source. Its exclusion is conservative.
		N_2O	No	Minor source. Its exclusion is conservative.
		Other	Not Applicable	Not Applicable
Project	Power Plants serving the electricity grid	CO_2	Yes	Major source of emission.
		CH_4	No	Minor source of emission has been excluded.
		N_2O	No	Minor source of emission has been excluded.
		Other	Not Applicable	Not Applicable.

the greenhouse gas sources indicated in the VCS PD section 3.3 /01/ are transparently stated and deemed appropriate and consistent with the technology used within the project boundary.

The project boundary for the grouped project consists of LEDs distributed to grid connected households for domestic lighting usage. The physical, geographical locations of the distributed LEDs are within East Indian states of Jharkhand, West Bengal, Bihar, and Odisha.

3.3.4 Baseline Scenario

The project activity will use methodology AMS.II.C version 15.0 which gives pre-defined the baseline scenario i.e continued use of existing luminaries in the household" in line with § 51 of applied methodology AMS II.C Version 15.0. In this project scenario existing luminaries are incandescent lamps (ICLs) which will be replaced by project equipment i.e. LEDs which is more efficient than ICLs/04/.

For instance criteria, under the grouped project, thus satisfying all the relevant applicability criteria of the methodology AMS II.C. (version 15.0) /B02/ and VCS Standard (Version 4,4). This was verified by sample End user declaration/undertaking template /13/, the technical specification of LEDs/04/for the instances under the grouped project. The baseline described in the PD complies with the requirements of the methodology. Validation team confirms that the baseline scenario opted by the project activity is in accordance with the requirements of the applied methodology/B02-a/ and is justified.

3.3.5 Additionality

The additionality of the grouped project has been demonstrated by the PP as per the methodology section 7 /B02/. PP has calculated NPV of the instances under the grouped project and provided detailed investment analysis sheets/08/. The validation team checked all the input values (cash inflow and cash outflow) opted for NPV calculation with their respective evidence/08/ and found it appropriate.

Key cash inflow assumptions have been assessed as follows:

One time cash collected from households: Validation team has checked the opted value ₹15/ICL from the agreement between PP and EWI on 15/02/2023.

Key cash outflow assumptions are as follows:

- **Procurement cost of LED:** Average cost of LED is ₹89.56/LED (for 7 W is ₹ 67.26, and 12 W is ₹ 99.12, sourced from Purchase Order issued to SYSKA LED dated 03-Jan-2023)
- **Disposal of ICLs:** Validation team has checked the calculation for disposal of ICLs and found appropriate conformance with Annexure E of referred ICL collection and disposal agreement /16/.
- **Replacement cost for fused LEDs:** Validation team has checked the calculation and found that PP has not added the replacement cost. The validation team confirms that the assumption, calculation found reliable and appropriate.
- **Distribution cost of LED:** PP has opted distribution cost of LED as ₹4.09/LED for counter-based distribution. The validation team checked the investment analysis calculation and found that the considered distribution cost of LED is in conformance with the referred source i.e. from Agreement with distribution agencies for Kiosk based distribution; dated 17/02/2021.
- **Validation cost:** ₹15,20,000 referred from the contract between CCIPL and C-Quest Capital SG India LED Private Limited
- **Verification cost:** ₹15,20,000 referred from the contract between CCIPL and C-Quest Capital SG India LED Private Limited
- **Monitoring Survey Cost:** PP has not considered monitoring cost.
- **Software development cost:** ₹ 3,00,000 sourced from the document service agreement dated 20/03/2023.

Assessment of discount rate considered:

Discount rate: Validation team has verified the opted India 10-Year Bond Historical Data discount rate of 9.77% from Methodological tool Investment Analysis Version 12, Appendix-: Group 1 default value for India and found appropriate.

The financial calculations have been checked and verified and deemed appropriate. It is clearly established that projects have negative NPV without CDM revenues.

Furthermore, the validation team has checked that even if the cash outflows corresponding to Distribution cost of LEDs; ICL Transport, Scrap Handling, and Disposal; LED Collection, Transportation, and Disposal; are excluded still the NPV remains negative.

Therefore, the validation team confirms that the grouped project is additional and all the project activity instances that will be included in the grouped project will meet the eligibility criteria. Thus, the grouped project is additional – the emission reductions achieved by the project would be below those that would have occurred without the implementation of the project.

3.3.6 Quantification of GHG Emission Reductions and Removals

The equations and choices provided in the methodology and all other methodological tools are correctly quoted in the PD/01-d/. The emission reductions of the project instances of the grouped project would be calculated using the formulae mentioned in the applied methodology; AMS-II.C (version 15.0)/B02-a/.

Validation team based on the review of the PD /01-d/, confirms that the formulae are correctly presented for the determination of emissions reductions at project instance level. The parameters and equations presented in the PD/01-d/, as well as other applicable documents, have been compared with the information and requirements presented in the methodology respectively. An equation comparison has also been made to ensure consistency between all the formulae presented in the PD/01-d/ and ER spreadsheet/02/ and methodology AMS-II.C (version 15.0)/ B02-a/.

According to applied methodology AMS-II.C (version 15.0) /B02-a/ the emission reduction for the total number of instances under the grouped project are calculated as below:

Baseline Emissions:

According to paragraphs 20 and 21 of the applied methodology, Option 1 i.e., 'Constant Load Equipment's' is applicable for the present project. Baseline emission is calculated using the following equations:

$$BE_y = E_{BL,y} \times EF_{CO2,ELEC,y} + Q_{ref,BL} \times GWP_{ref,BL}$$

As the project entails replacement of LED in place of ICLs no refrigerant is involved. The above equation is then modified as:

$$BE_y = E_{BL,y} \times EF_{CO2,ELEC,y}$$

$$EBLy = \sum_i (n_i \times \rho_i \times o_i/(1 - l_y)$$

BEy = Baseline emissions in year y (tCO2e)

$E_{BL,y}$ = Energy consumption for the baseline (ICLs) in year y (kWh)

$EF_{CO2,ELEC,Y}$ = Electricity emissions factor. If electricity displaced is grid, the emission factor in year y shall be calculated in accordance with the provisions in AMS-I.D (tCO2/MWh). If electricity displaced is captive electricity, the emission factor in year y shall be calculated in accordance with the "Tool to calculate baseline, project and/or leakage emission from electricity consumption"

Energy consumption for baseline in year y is calculated as:

$$E_{BL,y} = \sum_i (n_i \times \rho_i \times o_i /(1-l_y)$$

Where,

n_i = Number of pieces of equipment of the group of 'i' baseline equipment (ICLs) replaced.

ρ_i = Electrical power demand (kW) of the group of 'i' baseline equipment (e.g. 60W or 100W incandescent lamps).
In the case of more than one type of ICLs are replaced, electrical power demand is the weighted average of the rated power (kW) of group i baseline equipment (ICLs).

o_i = Average annual operating hours of the group of 'i' baseline equipment (ICLs).
The operating hours of the baseline equipment in year y can be determined using surveys by continuous measurement of usage hours of baseline equipment for a minimum of 90 days. For a large population of baseline equipment: (a) Use a representative sample (sampling determined by a minimum 90% confidence interval and 10% maximum error margin); (b) Apply correction for seasonal variation, if any; and (c) Ensure that sampling is statistically robust and relevant, i.e. the selection of the equipment to be analysed for operating hours has a random distribution and is representative of target population (size, location).

l_y = Average annual technical grid losses (transmission and distribution) during year y for the grid serving the locations where the devices are installed, expressed as a fraction. This value shall not include non-technical losses such as commercial losses (e.g. theft). The average annual technical grid losses will be determined using recent, accurate and reliable data available for the host country. This value can be determined from recent data published either by a national utility or an official governmental body. The reliability of the data used (e.g. appropriateness, accuracy/uncertainty, especially exclusion of non-technical grid losses) will be established and documented by the project participant. A default value of 0.1 shall be used for average annual technical grid losses, if no recent data are available or the data cannot be regarded accurate and reliable

Project Emission:

Project emissions on account of electricity used by the project equipment shall be calculated according to following equations:

$$PE_y = E_{PJ,y} \times EF_{CO2,y} + PE_{ref,y}$$

Where,

PE_y = Project emissions in year y (tCO2e)

$EP_{PJ,y}$ = Energy consumption in project activity in year y. This shall be determined ex post based on monitored values

$EF_{CO2,y}$ = Emission factor for electricity or thermal baseline energy. The emissions associated with grid electricity consumption should be calculated in accordance with the procedures of AMS-I.D. For fossil fuel displaced reliable local or national data for the emission factor shall be used; IPCC default values should be used only when country or project-specific data are not available or difficult to obtain

PEref,y = Project emissions from physical leakage of refrigerant from the project equipment in year y (tCO2e/y)

As the project entails replacement of LED in place of ICLs, hence no refrigerant is involved. The above equation is then modified as:

$$PE_y = E_{PJ,y} \times EF_{CO2,y}$$

Where,

$$E_{PE,y} = \sum_t \sum_i (n_i \, x \, \rho_i \, x \, o_i)/(1 - l_y) \times 0.95$$

Where,

n_i = Number of group 'i' project devices operating during time interval t in year y.

ρ_i = Electrical power demand (kW) of the group 'i' project devices measured during the time interval t in year y.

o_i = Operating hours of group of 'i' project devices in the time interval t in year y

0.95 = Default value for net-to-gross adjustment factor

Parameters Determined ex-ante.

The following parameters are determined ex-ante and mentioned in section 5.1 of the PD/01-d/:

Parameter	Description	Unit	Value	Assessment
$EF_{CO2, ELEC,y}$	Combined margin emission factor for Indian grid calculated according to equation 16 of methodological tool 07- 'Tool to calculate the emission factor for an electricity system'; version 07	tCO_2/MWh	0.9102	-Fixed ex-ante -VVB has crosschecked the value which is taken from publicly available source for emission factor of Indian grid i.e. "CO_2 Baseline Database for the Indian Power Sector, User Guide; Version 18.0 (December 2022)[10]" which deemed to be appropriate.
Ly	Average annual technical grid losses	Fraction	10%	- Fixed ex-ante - Default value as per the applied methodology AMS- II.C. Version 15.0.

[10] Approved_report_emission_2021_22.pdf (cea.nic.in)

Parameter	Description	Unit	Value	Assessment
Net-to-gross adjustment factor	Net to gross adjustment factor is a number that is used to adjust the net savings from an energy efficiency measure to the gross savings.	fractions	0.95	- Fixed ex-ante - Default value as per the applied methodology AMS II.C version 15.
Li $_{12W \& 7 W}$	Rated average operating hours for LED type i	Hours	25,000	- Fixed ex-ante -Value has been applied from Manufacturer 's specification which deemed to be appropriate.

The validation team reviewed the LEDs Manufacturer 's specification /04/. Thus, the eligibility criteria have been met for the new project activity instances under this group project.

This grouped project would achieve a total emission reduction of 23,518,299 tCO_2e in the 10-year fixed crediting period and an average of 2,351,830 tCO_2e per year as indicated in the final VCS PD /01-d/ and also in the ER spread sheet /02-b/.

In conclusion, all values used in the VCS PD to calculate emission reductions are considered reasonable in the context of the proposed grouped project "Shine I – Distribution of LED Lightbulbs in East India" and calculation approach is correct.

3.3.7 Methodology Deviations

No methodological deviations have been applied to the project activity.

3.3.8 Monitoring Plan

The grouped project employs baseline and monitoring methodology namely AMS.II-C, version 15.0/B02-a/According to sections 5.1 and 5.2 of PD/01/, the parameters determined ex-ante and those to be monitoring ex-post as per the requirements of the methodology are given below.

Parameters monitored ex-post.

S.N.	Parameters	Methodology/Source of data	Description

1	$n_{i\ baseline\ (60W\ \&\ 100\ W))}$.	Actual collection record as stored in database	**Description**: - Number of pieces of 60 W & 100 W baseline Incandescent Lamps replaced. **Monitoring Method**: - At the time of the exchange of baseline ICL (must be in working condition) a record will be kept of the number of replaced lamps. The data will be recorded through a handheld device that will relay it in real time to a central Database Management System. Industry standard software, databases, infrastructure and backup procedures will be followed ensuring full audit procedures and long-term data integrity and security so that data is not misreported, overwritten or lost. **Frequency of monitoring**: Once at the time of project installation
2	$n_{i\ baseline\ scrapped\ (100\ W\ \&\ 60\ W)}$	Actual collection record as stored in database	**Description**: - Number of pieces of 60 W & 100 W baseline Incandescent Lamps destroyed. **Monitoring Method**: - The project involves one-to-one replacement of baseline lamp with project lamp. At the time of the exchange of baseline lamp (must be in working condition), a record will be kept of the replaced equipment. The collected baseline lamps will be stored in separate boxes according to their wattages at a central facility. Each box will have suitable labels with information about the type, number and wattage of baseline lamps stored in it. At the time of destruction, the contracted entity will ensure recording and independent verification of scrapped baseline lamps on random basis to ensure that only working ICLs have been destroyed. **Frequency of monitoring**: Once at the time of project installation

3	n_i project (7 W & 12 W)	Actual collection record as stored in database	**Description**: - Number of pieces of 7W & 12 W project lamps distributed. **Monitoring Method**: - At the time of the exchange of baseline ICL a record will be kept of the number of replaced lamps. The data will be recorded through a handheld device that will relay it in real time to a central Database Management System. Industry standard software, databases, infrastructure and backup procedures will be followed ensuring full audit procedures and long-term data integrity and security so that data is not misreported, overwritten or lost. **Frequency of monitoring**: Once at the time of project installation
4	n_i operational (12 W & 7 W)	Sample to be calculated from actual distribution records as stored in the database management system (option 1 stated in paragraph 53 of the applied methodology AMS-II.C, Version 15)	**Description**: - Total number of 7 W & 12 W project LEDs that are operational during time interval t. **Monitoring Method**: - Physical observation and recording response in questionnaires of sample of non-metered 12 W & 7W project LEDs. Sample size will be determined in accordance with guidelines for Sampling and Surveys for CDM project activities and programme of activities, version 09. **Frequency of monitoring**: Annually[11]
5	ρ_i (baseline 60 W, 100 W)	Actual collection record as stored in the database management system	**Description**: - Rated power of 60 W and 100 W baseline lamps replaced. **Monitoring Method**: - At the time of the exchange of baseline lamp, nameplate data of wattage will be recorded for each replaced lamp. The data will be recorded through a handheld device that will relay it in real time to a central DMS. Industry

[11] According to the clarification SSC_740, https://cdm.unfccc.int/UserManagement/FileStorage/K7HJFEP9DZOV3RAXQ28YU416SWCNMG

			standard software, databases, infrastructure and backup procedures will be followed ensuring full audit procedures and long-term data integrity and security so that data is not misreported, overwritten or lost. **Frequency of monitoring**: Once at the time of project installation
	ρ_i (project 7W, 12W)	Actual distribution record as stored in the database management system	**Description**: - Rated power of 7 W and 12 W project LEDs (Watts). **Monitoring Method**: - Nameplate data for each project lamp will be recorded at the time of distribution and will be stored in a central DMS. **Frequency of monitoring**: Once at the time of project installation
	o_i baseline (60W) / project (7W)	Assumed based on a similar project in East India State i.e., Bihar (VCS 2695), actual value will be declared during the first verification through ex-post monitoring survey.	**Description**: - Average annual operating hours of 60 W baseline/7W project LED. **Monitoring Method**: - The operating hours will be measured continuously for a period of 90 days with the help of run time meters installed on a sample of lighting points. The data thus measured will be used for calculating average daily operating hours. The value obtained will be multiplied with 365 days to give average annual operating hours of baseline/project lamps (as per SSC_740 "Clarification on frequency of oi (operating hours of project lamps)[12]. Sample size will be determined in accordance to guidelines for Sampling and surveys for CDM project activities and programmes of activities, version 09 **Frequency of monitoring**: once, prior to or concurrent with the first ex-post monitoring survey[13]

[12] K7HJFEP9DZOV3RAXQ28YU416SWCNMG (unfccc.int)

[13] According to the clarification SSC_740, https://cdm.unfccc.int/UserManagement/FileStorage/K7HJFEP9DZOV3RAXQ28YU416SWCNMG

	o_i baseline (100W) / project (12 W)	Assumed based on a similar project in East India State i.e., Bihar (VCS 2695), actual value will be declared during the first verification through ex-post monitoring survey.	**Description**: - Average annual operating hours of 100 W baseline/12W project LED. **Monitoring Method**: - The operating hours will be measured continuously for a period of 90 days with the help of run time meters installed on a sample of lighting points. The data thus measured will be used for calculating average daily operating hours. The value obtained will be multiplied with 365 days to give average annual operating hours of baseline/project lamps (as per SSC_740 "Clarification on frequency of oi (operating hours of project lamps)[14]. Sample size will be determined in accordance with guidelines for Sampling and surveys for CDM project activities and programmes of activities, version 09. **Frequency of monitoring**: once, prior to or concurrent with the first ex-post monitoring survey[15]

In accordance with the AMS.II.C V15.0 /B01/ all documents and records will be kept in a secure and retrievable manner for at least two years after the end of the project crediting period. The data collecting and management methods as provided in section 5.3 of the VCS PD/01/ are acceptable to the validation team. The validation team interviewed representatives of PP and it was established that the database of all the project equipment distributed by PP is created and maintained. The entire database will be kept protected by PP for a period of more than two years.

The validation team considers that the means of implementation of the monitoring plan, including the data management, monitoring equipment, and quality assurance and quality control procedures, are sufficient to ensure that the emission reductions achieved by/resulting from the proposed grouped project therein can be reported ex-post and verified. In addition, the sampling plan meets the requirements of the monitoring methodology AMS.II.C V15.0 /B02/ and the Standard of Sampling and Surveys of CDM project activities and Programme of Activities (version 09.0) /B04/ and Guidelines for sampling and surveys for CDM project activities and Programme of Activities (version 4) /B04/.

The validation team confirms that the overall monitoring plan complies with the requirements in line with section 6.1 of the applied methodology AMS.II.C V15.0 /B02/ for project activities installing a lighting equipment has been applied appropriately, the monitoring arrangements describes in the monitoring

[14] K7HJFEP9DZOV3RAXQ28YU416SWCNMG (unfccc.int)

[15] According to the clarification SSC_740, https://cdm.unfccc.int/UserManagement/FileStorage/K7HJFEP9DZOV3RAXQ28YU416SWCNMG

plan are feasible within the project design and the project proponents will be able to implement the described monitoring plan.

3.4 Non-Permanence Risk Analysis

This is not applicable to the project activity as the Project is not an AFOLU (Agriculture, Forestry and Other Land Use) project.

4 VALIDATION OPINION

The Project Participant C-Quest Capital SG India LED Private Limited, has commissioned the VVB, Carbon Check (India) Private Ltd. to perform an independent validation of the VCS grouped project "Shine I – Distribution of LED Lightbulbs in East India". This report summarizes the findings of the validation of the project, performed on the basis of VCS criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation process was performed on the basis of all guidance and criteria as provided in VCS Standard version 4.4 /B01-a/, VCS Program Guide version 4.3/B01-b/, VCS Validation and Verification Manual version 3.2 /B01-c/ and Registration & Issuance Process version 4.4/B01-d/.

The project activity provides the information in PD/01-d/ as required by the VCS Standard /B01-a/ and Validation and Verification Manual /B01-c/ and in Carbon Check's opinion meets the requirements of the applied baseline and monitoring methodology, AMS.II.C version 15.0 /B02/and is likely to achieve the estimated emission reductions. The validation has been performed using a risk- based approach, as described above. The expected annual average emission reductions from total number of 2,351,830 and 23,518,299 tCO2e respectively for this crediting period.

Carbon Check (India) Private Ltd concludes the validation with a positive opinion that the VCS grouped project "Shine I – Distribution of LED Lightbulbs in East India", as described in the PD (version 3.1 dated 15/10/2023) /01/ and the project activity instances meet all the applicable VCS requirements, including those specified in the Project Standard, relevant methodology, tools and guidelines.

The selected baseline and monitoring methodology (AMS-II.C, Version 15.0) is applicable to the project and correctly applied. Carbon Check (India) Private Ltd therefore requests the registration of the project as a VCS project activity.

CCIPL's validation opinion is purely based on the information made available to us by the project proponent during the course of validation and hence CCIPL cannot guarantee the accuracy or correctness of the information. Bearing this in mind, no party can hold CCIPL liable for any decisions made or not made in this report.
Validated GHG emission reductions and removals in the above period:

Year	Estimated baseline emissions or removals (tCO_2e)	Estimated project emissions or removals (tCO_2e)	Estimated leakage emissions (tCO_2e)	Estimated net GHG emission reductions or removals (tCO_2e)
Year 2023-24	841,024	100,350	-	740,674
Year 2024-25	2,051,184	244,744	-	1,806,439
Year 2025-26	3,173,169	378,617	-	2,794,552
Year 2026-27	3,141,437	374,831	-	2,766,606
Year 2027-28	3,101,862	370,109	-	2,731,753
Year 2028-29	3,051,023	364,043	-	2,686,979
Year 2029-30	2,990,002	356,762	-	2,633,240
Year 2030-31	2,907,161	346,878	-	2,560,282
Year 2031-32	2,793,743	333,345	-	2,460,397
Year 2032-33	2,654,055	316,678	-	2,337,377
Total	**26,704,661**	**3,186,357**	-	**23,518,299**

APPENDIX 1.1: REFERENCE DOCUMENTS

Ref	Document
/01/	Project description titled: a) VCS PD 3907_ Shine I – Distribution of LED Lightbulbs in East India_v1.0_(28/10/2022) b) VCS PD 3907_ Shine I – Distribution of LED Lightbulbs in East India_v2.0_(27/01/23) c) VCS PD 3907_ Shine I – Distribution of LED Lightbulbs in East India_v3.0_(25/09/23) d) VCS PD 3905_ Shine I – Distribution of LED Lightbulbs in East India_v3.1_(15/10/23)
/02/	a) Shine I – East-ER-Calculation-v01.(28/10/2022) b) Shine I – East-ER-Calculation-v02_(27/01/23) c) Shine I – East-ER-Calculation-v2.1_(15/10/23)
/03/	Invoice cum consent deed (Evidence for the start date of the grouped project)
/04/	• Technical specification of the LED being implemented under project activity. • Life Test Report for 7W and 12W as per IS 16102 (Part 2):2012.
/05/	PP Declaration No Double accounting, ownership, public funding
/06/	Company registration certificate for the PP
/07/	Local stakeholders meeting related evidence
/08/	Net Present Value Analysis Spreadsheet correspond supporting documents
/09/	Collection, Disposal & Destruction Record, Certificate, photo-video record
/10/	Distribution Record
/11/	KML file of project area
/12/	ICLs picture
/13/	End User's declaration and undertaking
/14/	Grid Emission factor_CEA_CO2 Database_V18 Calculation
/15/	Agreement with Mainavi Software for Database Management-Mar 2023

/16/	• Agreement with EWI for ICL Disposal-Feb 2023 • Agreement with Distribution Agencies for LED distribution and ICL collection-Feb 2023
/17/	Validation contract in between CCIPL and C-Quest Capital SG India LED Private Limited dated 30/11/2022.
/18/	Agreement with SYSKA for Supply of LED bulbs-Dec 2022

APPENDIX 1.2: BACKGROUND DOCUMENTS

Ref	Document
/B01/	VCS Requirements a. VCS Standard (v4.4, dated 17/01/2023) b. VCS Program Guide (v4.3, dated 17/01/2023) c. VCS Validation and Verification Manual version (v3.2, dated 19/10/2016) d. Registration & Issuance Process (v4.3, dated 17/01/2023) e. VCS Program Definitions version (v4.3, dated 17/01/2023)
/B02/	Applied baseline and monitoring methodology. a. AMS-II.C- Demand-side energy efficiency activities for specific technologies, version 15.0." b. AMS-I. D: Grid connected renewable electricity generation: Version 18.0
/B03/	Methodological Tool • Methodological tool 21: Demonstration of additionality of small-scale project activities version 13.1
/B04/	a. "Standard for sampling and surveys for CDM project activities and programme of activities" (version 09.0) b. Guidelines for sampling and surveys for CDM project activities and Programme of Activities (version 04)
/B05/	Website and links: 1. IPCC (http://www.ipcc-nggip.iges.or.jp) 2. http://cdm.unfccc.int 3. http://www.v-c-s.org

APPENDIX 2: ABBREVIATIONS

CDM	Clean Development Mechanism
BE	Baseline Emission
CAR	Corrective Action Request
CCIPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CL	Clarification Request
CO_2	Carbon Dioxide
CO_{2e}	Carbon Dioxide Equivalent
EB	CDM Executive Board
EF	Emission Factor
ER	Emission Reduction
FAR	Forward Action Request
FVR	Final validation Report
GHG	Greenhouse gas(es)
GWh	Giga Watt Hour
IPCC	Intergovernmental Panel on Climate Change
MW	Mega Watt
MWh	Mega Watt Hour
NA	Not Applicable
OSV	On Site Visit
PD	Project Description
PP	Project Proponent
QC/QA	Quality control/Quality assurance
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCU	Verified Carbon Unit
VVB	Validation Verification Body
VVM	Validation and Verification Manual
VVS	Validation and Verification Standard

APPENDIX 3: CERTIFICATES OF COMPETENCE

Carbon CHECK

Carbon Check (India) Private Limited

Certificate of Competency

Mr. Harish Sharma

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 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			

Issue Date
1st January 2023

Expiry Date
31st December 2023

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

CCIPL_FM 7.9 Certificate of Competency_V2.1_012023

Carbon CHECK

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
☒ SDG+	☒ Social no-harm(S+)	☒ Environment no-harm(E+)	☐ CCB Expert
☒ Financial Expert	☒ Local Expert for India and Sri Lanka		

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

1st January 2023

Expiry Date

31st December 2023

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

CCIPL_FM 7.9 Certificate of Competency_V2.1_012023

Carbon CHECK

Carbon Check (India) Private Limited

Certificate of Competency

Mr. Siddhant Bankar

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 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			

Issue Date
1st January 2023

Expiry Date
31st December 2023

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

CCIPL_FM 7.9 Certificate of Competency_V2.1_012023

APPENDIX 4: FINDINGS LOG

4.1 Clarifications (CLs)

4.1.1 CLs from this Validation

CL ID	01	Section no.	1.6	Date: 16/08/2023
Description of CL				
Under section 1.6 of the PD, PP to clarify the role of "Brightspark Energy Private Limited".				
Project participant response				Date: 23/09/2023
C- Quest Capital SG India LED Private Limited is the sole entity and name of Bright spark Energy Private Limited included is a typo and same corrected in PD.				
Documentation provided by project participant				
1. Revised VCS PD V3.0				
VVB assessment				Date: 05/10/2023
PP has clarified that "Brightspark Energy Private Limited" was typo error and “C- Quest Capital SG India LED Private Limited” is sole entity for project activity which further crosschecked from VCS registry and found to be appropriate. CL is closed				

CL ID	02	Section no.	1.10	Date: 16/08/2023
Description of CL				
Under section 1.10, In accordance with section 2.1.3 of the VCS standard V4.4 Large scale project replacing old lighting with more efficient lighting is excluded, PP to clarify the same.				
Project participant response				Date: 23/09/2023
As per table in Sec 2.1.3 of VCS Standard V4.4, "Large-scale means energy-efficient improvements with a maximum savings greater than 60 GWh/year. " For the grouped project activity as of project instances energy savings are well below <60Gwh/Year and there by does not fall under Large-scale excluded list as per Sec 2.1.3 of VCS scope.				
Documentation provided by project participant				
1. Revised VCS PD V3.0				

VVB assessment	Date: 05/10/2023
In line with the VCS Standard v4.4 the project size is categorized as a large project as estimated GHG emissions reductions or removals per year are more than 300,000 tonnes CO2e. The maximum energy savings from a single project activity instance are calculated to be 1.548 MWh (considering five 12 W LEDs have replaced five ICLs in a household). Therefore, it is evident that the aggregate energy savings by a single project activity instance shall not exceed the equivalent of 60 GWh per year. Thus, each project activity instance under this grouped project meets the applicability criteria of the applied small-scale methodology and therefore it is deemed accepted that this grouped project does not fall under the excluded list of projects. CL is closed	

CL ID	03	Section no.	1.12	Date: 16/08/2023
Description of CL				
Under section 1.12, PP to KML for project location is missing, however figure shown under 1.12 is a grid map of India, it is not clear why the grid map of India is being considered as the project location is Jharkhand, West Bengal, Bihar, and Odisha. PP to clarify the same.				
Project participant response				Date: 23/09/2023
Section 1.12 of the PD updated with project boundary details and the East India states include under the project boundary are Bihar West Bengal, Odisha and Jharkhand. KML file provided to VVB as a pet of validation.				
Documentation provided by project participant				
1. Revised VCS PD V3.0 2. KML file				
VVB assessment				Date: 05/10/2023
PP has now submitted the project KML file and section 1.12 is now updated with relevant regional maps which fund to be in line with PD filling guide and VCS standard hence. CL is closed				

CL ID	04	Section no.	5.1	Date: 16/08/2023
Description of CL				
In line with ER sheet Net-to-gross factor is missing under section 5.1 of the PD, PP to clarify the same.				

Project participant response	Date: 23/09/2023
In section 5.1 of the PD, the Net to gross factor parameter table has now been added in line with the ER sheet.	
Documentation provided by project participant	
Updated VCS PD Version 3.0	
VVB assessment	Date: 05/10/2023
PP has now added "Net to gross factor" parameter table which found to be in line with applied methodology AMS.II.C v15.0 hence. CL is closed	

4.2 Corrective action required (CARs)

4.2.1. CARs from this Validation

CAR ID	01	Section no.	Front Page	Date: 16/08/2023
Description of CAR				
PP to use the latest version of Project description template available at VCS website i.e., V4.2.				
Project participant response				Date: 23/09/2023
VCS PD revised to latest VCS PD template version 4.2 and is being submitted to VVB.				
Documentation provided by project participant				
1. Revised VCS PD v.3.0				
VVB assessment				Date: 05/10/2023
PP has now updated the template with latest available version of the PD at VCS website and completed all relevant section in line with VCS standard v.4.5 hence, CAR is closed				

CAR ID	02	Section no.	1.1	Date: 16/08/2023
Description of CAR				
Under section 1.1 of the PD, PP to submit the baseline survey reports.				
Project participant response				Date: 23/09/2023

There is no specific baseline survey report, the evidence of baseline i.e., ICLs usage are captured pre-project.
Documentation provided by project participant
1. Revised VCS PD V3.0
VVB assessment | Date: 05/10/2023
PP has revised the section, VVB has confirmed that the project activity will use methodology AMS.II.C version 15.0 which gives pre-defined the baseline scenario i.e., continued use of existing luminaries in the household" in line with § 51 of applied methodology AMS II.C Version 15.0. CAR is closed

CAR ID	03	Section no.	1.1	Date: 16/08/2023
Description of CAR				
CME shall demonstrate the project eligibility in compliance with section 2.1 of the VCS standard V4.4.				
Project participant response				Date: 23/09/2023
The eligibility criteria as per section 2.1 of VCS standard V 4.4 is included in the revised PD as per Scope of the VCS programme.				
Documentation provided by project participant				
1. Revised VCS PD V3.0				
VVB assessment				Date: 05/10/2023
PP has now demonstrated the eligibility compliance of project under section 1.1 of the updated PD which found to be in line with section 2.1 of VCS standard v4.4. CAR is closed.				

CAR ID	04	Section no.	1.1	Date: 16/08/2023
Description of CAR				
Under eligibility criteria 3. section 1.4 of the PD, it is not clearly defining which type of existing luminaries will be considered as baseline.				
Project participant response				Date: 23/09/2023

The baseline is usage of ICL of 60W and 100W in the rural and peri urban households. Updated the section 1.4 of the PD.
Documentation provided by project participant
1. Revised VCS PD V3.0
VVB assessment | **Date: 05/10/2023**
PP has now clearly mentioned under section 1.1 Eligibility criteria 3, that the existing luminaries will be 60W and 100W Incandescent lamps (ICLs), which satisfying the requirement and deemed to be appropriate hence. CAR is closed

CAR ID	**05**	**Section no.**	**3.5**	**Date: 16/08/2023**
Description of CAR				
Under section 3.5, PP to submit the NPV sheet for the review with all supporting evidence used for assumptions.				
Project participant response				**Date: 23/09/2023**
PP provided NPV calculations sheet along with all supporting evidence used for assumptions to VVB.				
Documentation provided by project participant				
1. NPV Calculation Sheet 2. Revised VCS PD V3.0				
VVB assessment				**Date: 05/10/2023**
PP has now submitted the NPV Sheet along with its supporting evidence the values are found to be consistent with source documents, assumptions & calculation for NPV is deemed to be appropriate, CAR is closed				

CAR ID	**06**	**Section no.**	**1.4**	**Date: 16/08/2023**
Description of CAR				
1. PP to submit the Project activity instance database. 2. PP to submit the Copy of Consent letter / record of consent given from End User to Project Proponent regarding emission reduction claims.				
Project participant response				**Date: 23/09/2023**
1. PP has submitted the Project activity instance database to VVB.				

2. Sample copy of consent letter from End User to Project Proponent regarding emission reduction claims provided to VVB
Documentation provided by project participant
1) Project activity database *2) Copy of End user consent*

VVB assessment	Date: 05/10/2023
1. PP has now provided a project database and implementation plan for upcoming instances. 2. PP has now submitted sample copy of consent form for end users, which deemed to be appropriate, and the content mentioned is fulfilling the need of 3.7 of VCS standard v4.5. CAR is closed	

CAR ID	07	Section no.	1.7	Date: 16/08/2023
Description of CAR				
Under section 1.7, PP to present proof of ownership in accordance with 3.7.1 of the VCS standard v4.4.				
Project participant response				Date: 23/09/2023
Section 1.7 of the VCS PD is revised. Submitted the proof of ownership in accordance with 3.7.1 of the VCS Standard v4.4. to VVB.				
Documentation provided by project participant				
1. Provided end user consent of owner ship rights with PP. 2. Revised VCS PD v3.0				
VVB assessment				Date: 05/10/2023
PP has now submitted sample copy of consent form for end users, which deemed to be appropriate, and the content mentioned in form is fulfilling the need of 3.7 of VCS standard v4.5. CAR is closed				

CAR ID	08	Section no.	1.8	Date: 16/08/2023
Description of CAR				
Under section 1.8, PP to prove compliance with section 3.8 of the VCS standard V4.4 and submit a start date proof for the project.				
Project participant response				Date: 23/09/2023

Start date is updated in section 1.8 of PD.
Documentation provided by project participant
1. Revised VCS PD V3.0 2. Proof of Start date of project activity (end user consent) provided
VVB assessment | **Date: 05/10/2023**
PP has provided a copy of consent form/end user agreement with end user sign dated 22 March 2023 which is date on which 1st LED was distributed this is found to be in line with section 3.8 of VCS standard v.4.5 hence. CAR is closed

CAR ID	**09**	**Section no.**	**1.11**	**Date: 16/08/2023**
Description of CAR				
1. Under section 1.11, PP to provide proof against specifications (i.e., Test certificate, the average lifetime, and other specifications) for LED bulbs being distributed in project activity. 2. Under section 1.11, PP to provide proof against specifications (i.e., Test certificate or any other proof) for the data meter being used to monitor the operational hours of LED bulbs.				
Project participant response | **Date: 23/09/2023**				
1. PP has been submitting the test report of project LED bulbs for average life and other specifications. *3)* During the on-site visit, PP has facilitated the visit of VVB to the households where the data meters were installed, explained its functioning and data capturing process. It was also evidenced that all the end users where in data meters installed have provided their consent for the data meter(s) use. Also, a declaration by the device manufacturers about the equipment, its functionality, and maintenance requirements is submitted to the VVB.				
Documentation provided by project participant				
1. LED Test Report is submitted to VVB. 2. Data meter record is submitted to VVB.				
VVB assessment | **Date: 05/10/2023**				
PP has submitted the manufacturer specification and test certificates for the project devices (LEDs), VVB has confirmed that the information given under section 1.11 are consistent with manufacturer specification and test certificates and deemed to be acceptable. CAR is closed				

CAR ID	10	Section no.	1.14	Date: 16/08/2023
Description of CAR				
Under section 1.14 of PD, PP proof in accordance with paragraph 43 and footnote of AMS-II.C. v15.0 is missing. Furthermore, PP haven't provided source web links for the information provided under section 1.14 as a footnote.				
Project participant response				**Date: 23/09/2023**
1. ICLs that being collected from end-users under the grouped project activity by PP; are separately packed and transported for destruction. ICLs bulbs will be destroyed by the agency contracted for this purpose. The contracted agency will destroy the ICLs and provide the certificate of destruction to PP as and when occurs under the project. Document evidence for the ICL destruction activity provided to VVB. 2. Also provided the weblink source as footnote in Sec 1.14 of the PD.				
Documentation provided by project participant				
1. ICLs collection, disposal, destruction records, certificate, photos, and videos submitted to VVB. 2. Revised VCS PD V3.0				
VVB assessment				**Date: 05/10/2023**
PP has now provided evidence for ICLs collection and destruction which was further confirmed by VVB from video and contract with destruction company (e-waste company), furthermore it is confirmed during site visit from end users and stakeholder that ICLs are being collected in return of LEDs, evidence provided are found to be sufficient in line with requirements set out in paragraph 43 and footnote of AMS-II.C. v15.0. **CAR is closed**				

CAR ID	11	Section no.	1.15.1	Date: 16/08/2023
Description of CAR				
PP to present a proof against section 1.15.1 of the PD.				
Project participant response				**Date: 23/09/2023**
An undertaking by PP provided to VVB as that the present project activity not been registered nor will seek registration under any other GHG program.				
Documentation provided by project participant				
1. PP Declaration is provided to VVB.				
VVB assessment				**Date: 05/10/2023**

VVB has assessed the PP response, & declaration and found in line with raised query. **CAR is closed**

CAR ID	**12**	**Section no.**	**1.16.2**	**Date: 16/08/2023**
Description of CAR				
Under section 1.16.2, In line with the latest template V4.2 of VCS PD, demonstration to compliance with scope 3 emissions requirement stated under section 3.23 of the VCS standard v4.4 is missing.				
Project participant response				**Date: 23/09/2023**
PP has demonstrated compliance with the scope 3 emissions requirements stated under section 3.23 of the VCS Standard v4.4 in section 1.16.2 of the PD.				
Documentation provided by project participant				
1. Revised VCS PD V3.0				
VVB assessment				**Date: 05/10/2023**
PP has now updated the section 1.16.2 of the PD and provided a proof of public statement[16] and a proof of email communication with IP, in Appendix 2 of PD which found to be in line with 3.23 of the VCS standard v4.4, for supply chain (scope 3 emissions). **CAR is closed**				

CAR ID	**13**	**Section no.**	**1.17**	**Date: 16/08/2023**
Description of CAR				
Under section 1.17, PP is to note if the SD-VISta process has not commenced yet, in line with VCS standard V4.4 section 3.17.1 PP to update the section with relevant information or provide proof of SD-VISta project commencement process.				
Project participant response				**Date: 23/09/2023**
VCS PD Section 1.17 was updated with the sustainable development contributor's information				
Documentation provided by project participant				
1. Revised VCS PD V3.0				
VVB assessment				**Date: 05/10/2023**

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

Considering the fact since the SD-VISta process has not commenced yet for this project, PP has updated the section 1.17.1 and 1.17.2, and in line with 3.17.1 of VCS standard v4.4 contribution to three SDGs has shown with current project contribution along with contribution over project time which deemed to be appropriate. **CAR is closed**

CAR ID	**14**	**Section no.**	**2.1**	**Date: 16/08/2023**
Description of CAR				
Under section 2.1 of the PD, Along with Environmental impact, assessment of any other negative socio-economic impact as well as its mitigation is missing.				
Project participant response				**Date: 23/09/2023**
No potential negative environmental or socio-economic impacts have been identified for the project. Sec 2.1 of the PD updated accordingly.				
Documentation provided by project participant				
1. Revised VCS PD V3.0				
VVB assessment				**Date: 05/10/2023**
PP has now updated the section 2.1 of the PD in line with PD filling guide from the assessment it is found that project have no negative impact on environment or social aspects, furthermore VVB has witnessed the LSC meet and response and feedback for project are found to be appropriate hence. **CAR is closed.**				

CAR ID	**15**	**Section no.**	**2.2 & 2.4**	**Date: 16/08/2023**
Description of CAR				
In line with PD filling guide Sections 2.2 and 2.4 of the PD is missing with relevant information.				
Project participant response				**Date: 23/09/2023**
Included the details of the local stakeholder consultation in section 2.2 and information about Global Stakeholder Consultation in section 2.4.				
Documentation provided by project participant				
1. Revised VCS PD V3.0 2. LSC documents shared with VVB.				
VVB assessment				**Date: 05/10/2023**

PP has now updated the section 2.2 with stakeholder engagement which found to be in line with 3.18 of the VCS standard v4.5, Furthermore, in line with section 2.3 filing guide PP has now updated the section with info to global stakeholder consultation which was conducted from 19-December-2022 to 18-January-2023, which further checked through VCS registry and found to be correct, VVB has confirmed during this period no public comments were received. **CAR is closed**

CAR ID	**16**	**Section no.**	**3.3**	**Date: 16/08/2023**
Description of CAR				
Under section 3.3 in line with PD filling guide in addition to the table, diagram of the equipment, systems, and flows of mass and energy, Including the GHG emission sources identified in the project boundary is missing.				
Project participant response				**Date: 23/09/2023**
In section 3.3 of the PD, PP has now provided a project boundary diagram and included the table of GHG emission sources as identified in the project boundary.				
Documentation provided by project participant				
1. Revised VCS PD V3.0				
VVB assessment				**Date: 05/10/2023**
PP has now updated the section with relevant information in line with PD filling guide, which deemed to appropriate all the information under section 3.3 of PD is now in line with applied methodology AMS.II.C. v15.0, hence. **CAR is closed**				

CAR ID	**17**	**Section no.**	**3.4**	**Date: 16/08/2023**
Description of CAR				
Under section 3.4, PP Explain and justify key assumptions, rationale, and methodological choices. Provide all relevant references in the information provided.				
Project participant response				**Date: 23/09/2023**
In section 3.4, PP has explained and justified key assumptions, rationale and methodological choices and relevant references have been provided.				
Documentation provided by project participant				
1. Revised VCS PD V3.0				

VVB assessment	Date: 05/10/2023
PP has now updated the section 3.4 of the PD; the project activity will use methodology AMS.II.C version 15.0 which gives pre-defined the baseline scenario i.e., continued use of existing luminaries in the household" in line with § 51 of applied methodology AMS II.C Version 15.0. In this project scenario existing luminaries are incandescent lamps (ICLs) which will be replaced by project equipment i.e., LEDs which is more efficient than ICLs. The baseline described in the PD complies with the requirements of the methodology. The validation team confirms that the baseline scenario opted by the project activity is in accordance with the requirements of the applied methodology. **CAR is closed.**	

CAR ID	18	Section no.	5.1	Date: 16/08/2023
Description of CAR				
Under section 5.1 PP to refer the latest version available of "CO2 Baseline Database for the Indian Power Sector User Guide" for the values of emission factor.				
Project participant response				**Date: 23/09/2023**
In section 5.1. PP has referred to the latest version (v.18) of "CO_2 Baseline Database for the Indian Power Sector" for the value of emission factor.				
Documentation provided by project participant				
1. Revised VCS PD V3.0 2. Revised ER sheet				
VVB assessment				**Date: 05/10/2023**
PP has now referred the latest version of CO_2 Baseline Database for the Indian Power Sector for the value of emission factor used to calculate the emission reductions, VVB has cross checked the ER estimation sheet and value applied is appropriate in line with applied methodological requirement hence. **CAR is closed**				

CAR ID	19	Section no.	5.2	Date: 16/08/2023
Description of CAR				
Under section 5.2 of the PD, for parameter "Ly" In line with AMS-II. C. The average annual technical grid losses shall be determined using recent, accurate, and reliable data available from the host country. This value can be determined from recent data published either by a national utility or an official governmental body. As these values are publicly available for India, PP should use the same for each monitoring period.				

Project participant response	Date: 23/09/2023
The parameter "l_y" describes average annual technical grid losses. According to section AMS.II-C, v.15, para. 22 states that the default value 0.10 can be used if no recent data are available or the data cannot be regarded accurate and reliable. In India (host country) data w.r.t technical grid losses being published by the Central Electricity Authority of India (CEA) The document states that the electricity lost in transformation, transmission and distribution is 19.27%,*(All India Electricity Statistics for year 2021-22 report released in year 2023 https://cea.nic.in/general-review-report/?lang=en)* which also includes unaccounted electricity. However, there is no publicly available data that provides the data on transmission losses separately from non-technical/ commercial losses (as required by the applied methodology AMS-II.C Ver 15, para 22). Therefore, due to a lack of credible sources with relevant data and considering that the methodology default value (0.10) will result in comparatively more conservative emission reduction estimates, PP has considered the applied methodology AMS-II.C Ver 15 default value for parameter Ly" in emission reduction estimates in PD & ER sheet.	
Documentation provided by project participant	
1. Revised VCS PD V3.0	
VVB assessment	**Date: 05/10/2023**
PP has clarified that the default value from "Ly" i.e., 10% for average annual technical grid losses has been used based on the option given in the applied methodology AMS-II. C, Furthermore, Considering end users is from supply circles of different electricity supply companies, it has observed and crosschecked that no credible sources for data of T&D losses is available for specific region and electricity supply companies hence in line with methodology AMS-II. C using default value is deemed to be appropriate. **CAR is closed**	

CAR ID	20	Section no.	5.2 & 5.3	Date: 16/08/2023
Description of CAR				
Under sections 5.2 and 5.3, for monitoring of "Average annual operating hours" reference to "Clarification on the frequency of monitoring of oi (operating hours of project lamps) under AMS-II.C v15.0 provided by UNFCCC is missing, information should be updated under section 5.3 of PD with a reference link for clarification.				
Project participant response				**Date: 23/09/2023**
PP has given reference to 'Clarification on the frequency of monitoring of oi under AMS-II.C, v15.0 provided by UNFCCC. PD sections 5.2 and 5.3, updated with the above information with reference sources.				
Documentation provided by project participant				

Revised VCS PD V3.0	
VVB assessment	**Date: 05/10/2023**
PP has now clearly mentioned the monitoring plan. PP has now provided details of sampling/survey done for the parameter "average annual operating hrs of project equipment" and average annual operating hrs and clarified as per the given CDM clarification of AMS-II.C v15.0, baseline equipment for project are now mentioned in PD, details of the sampling plan has been updated and found to be in line with methodological requirement. **CAR is closed**	

4.3 Forward action required (FARs)

4.3.1. FARs from this Validation

FAR ID	01	**Section no.**	5.2 & 5.3	**Date: 05/10/2023**
Description of FAR				
Under sections 5.3 and in line with methodology clarification[17] PP has the option to monitor the operating hours of either on the project equipment or the baseline equipment for the calculation of baseline emission and/or project emission. Hence, the PP has chosen to monitor the operating hours of project LEDs for a period of 90 days at representative households for this purpose and the same value will be used to determine the operating hours of baseline ICLs. As per the clarification, for o_i (operating hours of project lamps) sample survey is required to be conducted once, prior to or concurrent with the first ex-post monitoring survey, considering at the time of validation project is at implementation stage and study for monitoring of "Average annual operating hours" is going, PP to provide data collected and values calculation of baseline emission and/or project emission during first verification. Same needs to be validate by verifying VVB.				
Project participant response				**Date: XX/XX/XXXX**
Documentation provided by project participant				
VVB assessment				**Date: XX/XX/XXXX**

[17] CDM: SSC_740: Clarification on frequency of monitoring of oi (operating hours of project lamps) and ni (number of project lamps that are operational during time interval t) under AMS-II.C. (unfccc.int)