



VALIDATION REPORT

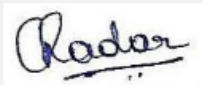
BUNDLED ROOFTOP SOLAR POWER PROJECT BY SPPL 01



Document Prepared by:

4K Earth Science Private Limited

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Client	Solaura Power Private Limited
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Summary:

A brief description of the validation and the project

Validation: 'Solaura Power Private Limited' has appointed '4K Earth Science Private Limited' to perform validation of the VCS project activity "Bundled Rooftop Solar Power Project by SPPL 01", with regard to the relevant requirements of VCS Standard version 4.5.

Project: The proposed project activity "Bundled Rooftop Solar Power Project by SPPL 01" is a bundled project which employs methodology; AMS-I.F. ver. 05.0/5/ The project involves installation of Solar Photovoltaic (SPV) Panels on rooftops in various districts of Tamil Nadu, India. The sole purpose of project activity is to install solar power plant for captive purpose and surplus generated electricity can be supplied to grid and further equivalent energy will be consumed from grid through net metering arrangement with state electricity board.

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 requirements 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. 4KES's objective is to perform a thorough, independent assessment of the validation of 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 (v4.4, dated 29/08/2023) /3/, VCS Standard (v4.5, dated 04/10/2023) /4/, Program Definitions (v4.3, dated 21/12/2022) /3/, Registration & Issuance Process (v4.3, dated 17/01/2023) /3/, VCS Validation and Verification Manual (v3.2, dated 19/10/2016) /4/ applicable at the time in order to confirm that the project meets the applicability conditions of the selected baseline and monitoring methodology AMS-I.F. ver. 05.0 /5/ 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:

- I. 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;
- II. Site Visit interviews with project stakeholders
 - Interviews with relevant stakeholders in host country with personnel having knowledge with 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;
- III. Reference to available information relating to projects or technologies similar to project under validation and review based on the approved methodology being applied for the appropriateness of formulae and accuracy of calculations.
- IV. The resolution of outstanding issues and the issuance of the final validation report and opinion.

The number of findings raised during validation

During the course of validation, a total of 08 findings were raised, which include:

02 Corrective Action Requests (CARs);

04 Clarification Requests (CLs);

02 Forward Action request (FAR);

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

Certification concludes the validation with a positive opinion that the VCS Bundled Project “Bundled Rooftop Solar Power Project by SPPL 01” as described in the PD **(version 3.2, dated 08/11/2024)** /1/, meets all applicable VCS requirements, including those specified in the VCS Standard (v4.5) /4/, relevant methodology, tools and guidelines.

The selected baseline and monitoring methodology (AMS-I.F. ver. 05.0.)/5/ are applicable to the project and correctly applied. ‘4K Earth Science Private Limited’ Certification therefore requests the registration of the project as a VCS bundled project.

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1 INTRODUCTION

1.1 Objective

Solaura Power Private Limited has commissioned '4K Earth Science Private Limited' to perform the VCS validation of the project activity: "*Bundled Rooftop Solar Power Project by SPPL 01*", with regard to the relevant VCS requirements of VCS Standard version 4.5; to attain real, measurable, additional and permanent emission reductions.

The purpose of validation is to ensure a thorough, independent assessment of the project description (PD), in particular the project's description eligibility, ownership, crediting period and details regarding its compliance with the law statutes and other regulatory frameworks

- The requirements of VCS Program Guide Version 4.4 /3/
- The requirements of VCS Standard Version 4.5 /4/
- To assess the project's compliance with other relevant rules, including the project country (India) legislation
- Other relevant rules are validated in order to confirm that the project description as documented is sound and reasonable and meet the stated requirements and identified criteria.

The validation is seen as necessary to provide assurance about the quality of the project and its intended generation of emission reductions over the project's crediting period without any double counting.

1.2 Scope and Criteria

The scope of the validation is defined as an independent and objective review of the project description document, where methodological requirements and the project's compliance in section 1 (i.e., project details) are reviewed against the requirements of VCS Standard. 4K Earth Science Private Limited has employed a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of emission reductions.

The items covered in the validation are described below:

- VCS Criteria, VCS standard version 4.5 /4/
- VCS Project Description
- Background investigation and follow up interviews
- Draft validation reporting with CARs, CLs and FARs, if any
- Final validation reporting
 - The validation is based on the information made available to 4K Earth Science Private Limited and on the contract conditions.
 - The validation is not meant to provide any consulting to the project proponent. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project description. The work carried out by 4K Earth Science Private Limited is free from any conflict of interest.

1.3 Reasonableness of Assumptions

The level of assurance of the validation report falls under reasonable assurance engagements as selected by the Client. The validation team verified the assumptions, limitations and methods for all the parameters and confirms that the reported ex-ante emission reductions are free from any type of material errors.

1.4 Summary Description of the Project

The project involves installation of Solar Photovoltaic (SPV) Panels on rooftops in various districts of Tamil Nadu State, India. The sole purpose of project activity is to install solar power plant for captive purpose and surplus generated electricity can be supplied to grid and further equivalent energy will be consumed from grid through net metering arrangement with state electricity board. It has been noted the shri Harikrishna cotton mill private limited with is the earliest commissioned on 05/01/2023 plant and followed that the Acsen Tex private limited plant commissioned on 07/01/2023 where else the remaining plants Sri Jayajothi and Company Private Limited and KM Knitwear Private limited are commissioned and the commissioning certificate is yet to come from the TANGEDCO hence the start date of the project is considered as earliest commissioned plant's date.

S. N O	UNITS		CAPACIT Y LOAD	SUPPORTING DOCUMENT	MW
1	Sri Jayajothi and Company Private Limited.	UNIT I	960 Kw	Issuance of Noted for Record letter dated 26.07.2022 from TANGEDCO	0.96
2		PC UNIT	880 kw	Issuance of Noted for Record letter dated 29.07.2022 from TANGEDCO	0.88
3		UNIT II	960 Kw	Issuance of Noted for Record letter dated June 2022 from TANGEDCO	0.96
4		OE UNIT	960 Kw	Issuance of Noted for Record letter dated 26.07.2022 from TANGEDCO	0.96
5	Shri Harikrishna Cotton Mills Private Limited		999 kw	Issuance of Noted for Record letter dated 27.09.2022 from TANGEDCO	0.999
6	KM Knitwear Private limited	Spinning Division	1.4 MW	Issuance of Noted for Record letter dated 05.02.2024 from TANGEDCO	1.4
7		Unit 14	0.056	Safety Approval accorded letter dated 28/07/2022 from Electrical Inspectorate	0.05
8	Acsen Tex Private limited		1812.6 KW	Issuance of Noted for Record letter dated 16.06.2022 from TANGEDCO	1.8126
				TOTAL	8.0216

The installed capacity of the aforementioned sites or SPVs was verified by cross-checking the Issuance of Noted for Record letter, Safety Approval accorded letter/16/ and commissioning certificate/17/ granted by the state government (TANGEDCO) was cross-verified to confirm the installed capacity. The end users of the project activity are the project proponents (installed industries) as the project's primary objective is to reduce the project site's reliance on grid electricity, thereby avoiding greenhouse gas emissions. The project is designed to generate solar electricity primarily for the captive use of the industrial facility, with any surplus energy exported to the grid solely in emergency situations through a net metering arrangement with the State Electricity Board. The capacity of the solar rooftop installation aligns with the contracted load, ensuring that the majority of the generated electricity is consumed on-site. According to the VCS Program Definitions, this project does not meet the criteria for grid-connected electricity generation, as the amount exported to the grid will remain below 50% of total annual generation. We acknowledge that the VCS Standard v4.5 excludes grid-connected solar PV activities from its scope; however, we emphasize that our project's main focus is on fulfilling onsite energy needs, with grid export only occurring under exceptional circumstances.

Under the concept of Net Metering, the customers are charged only for the net power that they consume from the electricity service provider that has accumulated over a specific period. In other words, if their renewable energy generating systems make more electricity than consumed, they may be credited or paid for the excess electricity contributed to the grid over the same period. Net metering is also a way to increase the energy in the power grid to keep up with increase in demand during peak power use times, and this is of particular interest to states facing power shortages.

As the total capacity is less than 15 MW capacity, small scale methodology AMS I.F is applicable for proposed project activity.

As per the applicable methodology, a Greenfield power plant is defined as “a new renewable energy power plant that is constructed and operated at a site where no renewable energy power plant was operated prior to the implementation of the project activity”.

The estimated average annual GHG emission reduction from the project an annual average emission reduction of 13,511 tCO₂e and the total GHG emission reduction estimated for the whole crediting period from the project activity is 94,577 tCO₂e.

2 VALIDATION PROCESS

2.1 Method and Criteria

Validation was conducted using 4KES procedures in line with the requirements of VCS Standard, version 4.5 and the requirements specified in the CDM M&P, the latest version of the CDM Validation and Verification Standard, VCS validation and verification manual version 3.2/4/ and relevant decisions of the COP/MOP and the CDM EB and applying standard auditing techniques.

The validation consisted of the following phases:

- Document review;
- On-site assessment & interviews;
- Resolution of outstanding issues
- Issuance of the validation opinion

The following sections outline each step in more detail.

2.2 Document Review

After the submission of the draft PD/1/ and supporting background documents/2/13//14/15/16/17/18/19/20/ related to the project design and baseline from the client, the completeness of information made available is reviewed as per VCS standard version 4.5 requirements. Furthermore, the validation team used additional documentation like technical reports referring to the project design/16/ or to the basic conditions and technical data available on public domain/21/22/23/24/. The project has been listed in the VERRA (<https://registry.verra.org/app/projectDetail/VCS/4071>). A desk review is carried out to assess the project activity.

2.3 Interviews

The VVB has conducted the onsite visit for the validation of the project activity. Further the validation Team Leader/Team member (who was also the Local Expert) checked/verified on-ground information during the on-site audit. The interviews took place on 25/09/2023. The key personnel interviewed are summarized in the table below:

S. No	Name	Role/Organization	Date	Audit Team	TOPICS DISCUSSED
1	SEENIVASAN P	KM KINITEWEAR MILL PRIVATE LIMITED ELECTRICAL ENGINEER	25/09/2023	GURUBALAJI.K SWATI S ACHARYA	various questions regarding the following: - The projects involvement in carbon activity
2	RAJANDERAN S	LSC OF KM KINITEWEAR MILL PRIVATE LIMITED			

3	SAKTHIVEL K	HARIKRISHNA MILL PRIVATE LIMITED ELECTRICAL ENGINEER			- The work conditions in the site follows all the local and host country employment law -after the implementation of the project whether the job given to local peoples. - the stakeholder meeting - grievance register and the procedure for rise the grievance - land usage and people rehabilitation - Water usage -women employment and their safety
4	RAMASWAMY K	LSC OF HARIKRISHNA MILL PRIVATE LIMITED			
5	G. GOPU	SRI JAYAJOTHI AND COMPANY PRIVATE LIMITED ELECTRICAL ENGINEER			
6	RAMRAJ	LSC OF SRI JAYAJOTHI AND COMPANY PRIVATE LIMITED			
7	RAVIKUMAR	ASCEN TEX PRIVATE LIMITED ELECTRICAL ENGINEER			
8	PRAVEEN KUMAR	LSC OF ASCEN TEX PRIVATE LIMITED			
9	HARISH SHANKAR V	SENIOR MANAGER SOLAURA POWER PVT LTD			
10	NAVEEN SAI RAM	SOLAURA POWER PVT LTD			

2.4 Site Visits

The VVB has conducted the site visit for the validation of the project activity. Further the validation Team Leader/member (who was also the Local Expert) checked/verified on-ground information during the on-site audit. The interviews took place on 25/09/2023. The following was carried out during the interviews:

-
- An assessment of the project design and technical specifications, project location, implementation status and operation of the project activity as per the VCS-PD;
 - A review of information flows for generating, aggregating and reporting the monitoring parameters;
 - Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the VCS-PD;
 - A cross check between information provided in the VCS-PD and data from other sources such as database or similar data sources;
 - A check of status and observations of monitoring practices against the requirements of the VCS-PD, the applied methodology including applicable tool(s), and, where applicable, the applied standardized baseline;
 - A review of calculations and assumptions made in determining the GHG data and estimated emission reductions;
 - An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

The assessment team has verified sufficient appropriate audit evidences, to reduce audit risk to an acceptably low level as requisite to achieve reasonable level of assurance for the current validation.

2.5 Resolution of Findings

The objective of this validation is to resolve any outstanding issues which need to be clarified for 4KES's positive conclusion on the project description. To guarantee transparency a validation protocol has been customized for the project. The protocol shows in a transparent manner the requirements, means of validation and the results from verifying the identified criteria. The validation protocol consists of three tables; the different columns in these tables are described below.

A corrective action request (CAR) is raised if one of the following occurs:

- Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impair the estimate of emission reductions;
- Issues identified in a FAR during validation to be verified during verification have not been resolved by the project participants.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

In summary, 04 CLs, 02 CARs, were raised during this validation which were closed successfully and details are given under Appendix 3 of this report.

2.5.1 Forward Action Requests

02 FAR is raised during the validation process. The forward action requests are included in the appendix 4 of this report.

3 VALIDATION FINDINGS

3.1 Project Details

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Audit history	The audit type is Validation, with a review period from January 5, 2023, to January 4, 2030. The associated program is VCS, and the validation/verification body conducting the audit is 4K Earth Science Pvt Ltd. The project will span a duration of seven years.
Sectoral scope	The project is a rooftop solar project which is confirmed through the commissioning certificate/17/ therefore the project comes under sectoral scope 01 - Energy industries (renewable / non-renewable sources)
AFOLU project category, if applicable	Not applicable
Project activity type	The project is solar energy therefore it comes under the renewable energy projects.
General eligibility of the project to participate in the VCS Program	Under general eligibility criteria, the proposed project activity qualifies for the small-scale methodology AMS I.F as its total capacity is below 15 MW. According to this methodology, a Greenfield power plant is defined as a new renewable energy facility constructed and operated on a site where no such plant previously existed. The estimated total emission reductions over the selected 7-year "renewable crediting period" amount to 94,577 tCO ₂ e, with an annual average of 13,511 tCO ₂ e. This project activity falls within the small-scale category due to its annual average GHG emission reductions being less than 100,000 tCO ₂ e.
AFOLU project	Not applicable

eligibility, if applicable	
Transfer project eligibility, if applicable	Not applicable
Project design	Multiple locations or project activity instances (but not a grouped project).
Project ownership	The renewable energy technology installed at site of the project activity is under ownership of respective SPV/Project Proponent. The commissioning certificate / Noted for Record (NFR)/CEIG approval from electricity board/16/ for project activity are the supporting documents to demonstrate the project ownership. This demonstrates the right of use according to clause 3.6.1 (3) of VCS Standard (v4.5)/4/ – “a project ownership arising by virtue of a statutory, property or contractual right in the plant, equipment or process that generates GHG emission reductions and/or removals”. The same was also confirmed during the conducted interviews.
Project start date	The start date of the project activity is the commercial operation date, which is the date when the project began generating GHG emission reductions. Start date of project activity is 05/01/2023 which is the date of commissioning of the earliest commissioned solar unit involved in the project activity. which is considered as the start date of the project activity.
Project crediting period	The VCS Standard 4.5 states that the project crediting period for non-AFOLU projects shall be either seven years, twice renewable for a total of 21 years, or ten years fixed. Since this project is a non-AFOLU project, the renewable crediting period of 7 years, twice renewable for a total of 21 years is chosen by the Project Proponents (PPs). Hence the proposed crediting period is from 05-January-2023 and ends on 04-January-2030. The validation team confirms that the project crediting period is reasonably determined.
Project scale	The estimated volume of emission reduction from the project activity is less than 100,000 tons of CO ₂ e per year. The validation team confirms that the project activity falls under the category 1 ‘Projects’ as per para 3.9.1 of the VCS standard version 4.5, as it has the potential to reduce GHG emission less than 100,000 tCO ₂ e/year.
Likelihood of achieving	The estimated annual average and the total CO ₂ e emission reduction by the project activity over the renewable crediting period of 7 years are expected

estimated GHG emission reduction or removals	to be 13,511 tCO ₂ e/annum and 94,577tCO ₂ e respectively. The validation team confirmed that emission reduction forecast is reasonable if the underlying assumptions do not change.				
Technologies and measures implemented by the project activity or activities	The project involving the installation of Solar Photovoltaic (SPV) Panels on rooftops across districts in Tamil Nadu, India, for captive solar power generation and potential surplus supply to the grid under a net metering arrangement is subject to a GHG auditor assessment. The proposed project, being a Greenfield power plant with a capacity under 15 MW, falls within the scope of the AMS I.F methodology. The project's technical specifications include Mono PERC PV modules with an efficiency of 20.5% and a lifetime of 25 years, alongside inverters rated at 82.8 kW with a maximum input voltage of 1000 Vdc and an efficiency of 98.3%.				
Implementation schedule of the project activity or activities	A Greenfield power plant refers to a newly constructed and operated renewable energy facility established on a site where no previous renewable energy power plant was in operation before the implementation of the project activity.				
Project location	S.N O	ENTITY	LOCATION	INSTALL ED CAPACIT Y (AC MW)	GEODETIC CORDINAT ES
1	Sri Jayajothi Power Managem ent Company private limited	Unit I Rajapalayam, Virudhunagar District, Tamilnadu, India.	0.96	9°26'37.77" N (9.4438), 77°33'49.46 "E (77.5637)	
1	Sri Jayajothi Power Managem ent Company private limited	Unit 2 NallaManaickenpatti, Virudhunagar District, Tamilnadu, India.	0.96	9°23'08.17" N (9.3861), 77°34'28.68 E"(77.5741)	
1	Sri Jayajothi Power Managem ent Company private limited	PC Unit Rajapalayam Virudhunagar District, Tamilnadu, India.	0.88	9°26'36.47" N (9.4434), 77°33'55.40 "E (77.5653)	
1	Sri Jayajothi Power Managem ent Company private limited	OE Unit Virudhunagar District, Tamilnadu,India	0.96	9°31'37.66" N (9.5271), 77°56'35.50	

					"E (77.9432)
	2	Shri Harikrishn a Cotton Mills Private Limited	536-Dharapuram Karur Main Road, Kannivadi (POST), Mulanur-639 202. Tirupur District, Tamilnadu, India.	0.99	10°48'42.1" N (10.8117) 77°44'51.7" E (77.7477)
	3	KM Knitwear Private Limited	Spinning Division, Avinashpalayam, Tirupur District, Tamilnadu, India.	1.4	10°58'02.4" N (10.9673), 77°23'49.5" E (77.3970)
			Unit 14, Tirupur District, Tamilnadu, India.	0.05	11°13'31.9" N (11.2255), 77°21'31.0" E (77.3586)
	4	Acsen Tex Private Limited	Attur, Salem District, Tamilnadu, India.	1.8216	11°35'03.2" N (11.5842), 78°42'22.0" E (78.7061)
Conditions prior to project initiation	The project is a Greenfield solar power project and does not involve generation of GHG emissions for the purpose of their subsequent reduction, removal, or destruction. Prior to the initiation of the project activity, the equivalent amount of electricity would have been drawn from grid connected or new power plants, in Indian Grid. The grid is predominantly coal based and therefore is a major source of carbon dioxide emissions in India. The main emission in the pre project scenario is the power plants connected to the Indian Grid, and main GHG involved is CO₂. Electricity Generation: In the absence of the project activity, the electricity supply for all the mills were generated mainly from grid connected power plants, where the use of fossil fuel would also lead to GHG emissions.				
Project compliance with applicable laws,	The Electricity Act, 2003 and the National Electricity Policy, 2005, Tariff Policy 2006/22/ provide the legal framework for the development of renewable energy in India. The legal provisions relating to renewable energy is mentioned in Section 86(1) of the Electricity Act, 2003/22/. The section imposes a duty on state commissions to promote the generation of				

statutes and other regulatory frameworks	electricity from renewable sources of energy. The National Action Plan on Climate Change (NAPCC)/27/ set the targets and guidelines for renewable energy development.
Double counting and participation under other GHG programs	The project activity is neither registered nor applied for registration in other GHG or Non GHG program(s) to obtain the certified GHG emission reductions. The Project Developer is here by declaring that the emission reductions claimed under this project activity will not be double counted under any other GHG program. The declaration /15/ on the same has been provided and found appropriate.
No double claiming with emissions trading programs or binding emission limits	The project reductions and removals or project activities is not included in an emissions trading program or binding emission limit. The same is confirmed by the PP
No double claiming with other forms of environmental credit	The project activity not sought, received, or is planning to receive credit from another GHG-related environmental credit system which is confirmed by the PP during the interview and submitted the declaration/15/.
Supply chain (Scope 3) emissions double claiming	The project activities specified in Section 1.12 is not affect the emissions footprint of any product(s) (goods or services) that are part of a supply chain. Therefore there is no Supply chain (Scope 3) emissions double claiming.
Sustainable development contributions	The project contributes to the following Sustainable Development benefits: SDG 7-Affordable and clean energy The project activity contributes to generating electricity from renewable sources, that helps in country energy security, reduces the GHG emissions and encourages clean, renewable and efficient technologies. SDG 8- Decent work & economic growth

	The project is a clean technology investment in the region, which would not have taken place in the absence of the VCS benefits. In addition, the project activity will generate permanent and temporary employment opportunity within the vicinity of the project. This directly and indirectly positively effects the economy of nearby populace. SDG 13- Climate Action Project activity generates renewable energy-based electricity and mitigates the CO₂ emissions which would have been generated from the grid-connected power plants. Project has already commissioned and started reducing the emissions. Hence, complied to the SDG 13 The same was found reasonable based on the interviews and supporting documents submitted during the site visit.
Additional information relevant to the project	this renewable energy project based on solar technology concludes that no leakage emissions are considered, aligning with paragraph 29 of the small-scale methodology AMS.I. F (version 5.0). Therefore, a leakage management plan and implementation of leakage and risk mitigation measures are deemed not applicable for this project activity due to the nature of the technology and its inherent emissions characteristics. The public version of the project description contains no commercially sensitive information and no information has been excluded on these grounds.

3.2 Safeguards and Stakeholder Engagement

3.2.1 Stakeholder Engagement and Consultation

3.2.1.1 Stakeholder Identification

Item	Evidence gathering activities, evidence checked, and assessment conclusion
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Stakeholder identification	During the site visit and the stakeholder meeting attendance sheet it is confirmed that the local community/village peoples and the representative of the company where the rooftop solar is located.
Legal or customary tenure/access rights	During site visit the log/grievance book were maintained in the project location where the stakeholders can provide their grievance or feedback.
Stakeholder diversity and changes over time	The stakeholders are diverse in nature and there is no change in diversity due to activity which is confirmed during the site visit.
Expected changes in well-being	The project activity is likely to boost economic well-being by creating local employment opportunities. Additionally, by reducing greenhouse gas emissions through solar energy generation, the project will contribute to environmental well-being in the region. These anticipated changes align with the project's objectives and highlight its potential benefits for the community and the environment the same is confirmed by the employee details and energy generation bills
Location of stakeholders	Attur,Salem Rajapalyam, Virudhunagar, Mulanur, Tiruppur Avinashipalayam, Tiruppur
Location of resources	Not applicable

3.2.1.2 Stakeholder Consultation and Ongoing Communication

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Stakeholder engagement process	The stakeholder engagement or meeting is conducted by inviting the stakeholders by the public notice and the consultation of meeting were held in local language i.e., Tamil.
Consultation outcome	Feedback from stakeholders was predominantly positive, with no negative comments reported. This suggests strong support and

	acceptance of the project within the local community, aligning well with its environmental objectives.
Ongoing communication	During site visit the log/grievance book were maintained in the project location where the stakeholders can provide their grievance or feedback.
Stakeholder input	There were no negative comments received from the stakeholders.

3.2.1.3 Free, Prior, and Informed Consent

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Obtaining consent	Consent for implementing project activity was received from Safety and Electricity Board authorities.
Outcome of FPIC discussion	The project has not encroached on land, relocated people without consent, and forced physical or economic displacement which is confirmed during the site visit.

3.2.1.4 Grievance Redress Procedure.

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Development process	Feedback register is kept at project site office where any stakeholder can come and register his/her feedback.
Grievance redress procedure	Stakeholder's feedback is monitored daily and any grievance if found, resolved immediately.

3.2.1.5 Public Comments

Comments received	Actions taken by the project proponent	Evidence gathering activities, evidence checked, and assessment conclusion
No comments received	NA	Grievance logbook checked during site visit no comments were received.

3.2.2 Risks to Local Stakeholders and the Environment

3.2.2.1 Management Experience

The project proponent's management experience appears well-rounded, combining expertise in overseeing industrial units with a specific focus on captive rooftop power plants. This suggests familiarity with both operational and strategic aspects of managing such facilities, which could be advantageous in ensuring effective project execution and optimization of resources.

3.2.2.2 Risk Assessment

Risk Identified	Evidence gathering activities, evidence checked, and assessment conclusion
Natural and human-induced risks to stakeholders' wellbeing	There was no risk by Natural and human-induced to stakeholder participation which is confirmed by interviewing the stakeholders during the site visit.
Risks to stakeholder participation	There was no risk to stakeholder participation which is confirmed by interviewing the stakeholders during the site visit.
Working conditions	The working conditions were maintained well by implementing the EHS policy and the same is confirmed by interviewing the plant workers during the site visit
Safety of women and girls	The safety of women and girls were maintained as per the national laws on women safety in work place the same is confirmed by interviewing the women employees in the project site during the site visit.
Safety of minority and marginalized groups, including children	The project proponent (PP) confirms adherence to local laws to ensure the safety of minority and marginalized groups, including children, at the project site. The same is confirmed by interviewing the employees in the project site.
Pollutants (air, noise, discharges to water, generation of	The implementation and operation of the project activity result in minimal pollution of air, noise, and water. The same is confirmed during the site visit.

waste, release of hazardous materials, and chemical pesticides and fertilizers)

3.2.3 Respect for Human Rights and Equity

3.2.3.1 Labor and Work

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Discrimination	There was no discrimination in the area of project activity and also the local law regarding the same is followed strictly in the state the same is confirmed by interviewing the stakeholders and company representatives during the site visit.
sexual harassment	There was no sexual harassment in the area of project activity and also the local law regarding the same is followed strictly in the state the same is confirmed by interviewing the stakeholders and company representatives during the site visit
Equal pay for equal work	by reviewing the SDG 8 supporting documents like pay slip of both men and women it is confirmed by the validation team the equal pay for equal work is followed properly
Gender equity in labor and work	During the site visit the documents submitted for SDG 8 is verified and confirmed there were no discrimination in gender equality in both providing job and wages.
forced labor	During the site visit PP has assured and explained the process of background verification of each employee is done and the verification team interviewed the employee of the plant so that it is confirmed that there is no forced labor.
child labor	During the site visit PP has assured and explained the process of background verification of each employee is done and the verification team reviewed the government proof of the employee to verify the age so that it is confirmed that there is no child labor.

Human trafficking	During the site visit PP has assured and explained the process of background verification of each employee is done so that it is confirmed that there is no human trafficking.
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3.2.3.2 Human Rights

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
No risk identified	During the onsite audit it is confirmed that there is no risk identified for the human rights of the people in the plant.

3.2.3.3 Indigenous Peoples and Cultural Heritage

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
No risk identified	The rooftop solar project ensures that indigenous people and cultural heritage at the project site will not be disrupted. The project proponent committed during the site visit that there will be no violations in this regard, both presently and in the future hence no risk was identified.

3.2.3.4 Property Rights

Risks identified	Evidence gathering activities, evidence checked, and assessment conclusion
No risk identified	During the onsite audit it is confirmed that there is no risk identified for the property rights.

3.2.3.5 Benefit Sharing

Item	Evidence gathering activities, evidence checked, and assessment conclusion
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Process used to design the benefit sharing plan	Not applicable
Summary of the benefit sharing plan	Not applicable
Approval and dissemination of benefit sharing plan	Not applicable

3.2.4 Ecosystem Health

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Impacts on biodiversity and ecosystems	No impact on biodiversity is likely to be caused the same is verified and confirmed by audit team during the site visit.
Soil degradation and soil erosion	The project is a rooftop solar therefore No soil erosion and degradation are likely to be caused the same is confirmed during the site visit.
Water consumption and stress	Water consumption will be of moderate level which is used for cleaning the panel very low amount of stress may cause.

3.2.4.1 Rare, Threatened, and Endangered species

Item	Evidence gathering activities, evidence checked, and assessment conclusion
Species and habitat	The project is not located in or adjacent to habitats for rare, threatened, or endangered species it is confirmed in the project location during the site visit.

Areas needed for habitat connectivity	The project is not located in or adjacent to habitats for rare, threatened, or endangered species it is confirmed in the project location during the site visit.
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3.2.4.2 Introduction of Species

Species introduced	Evidence gathering activities, evidence checked, and assessment conclusion
Not Applicable.	Not Applicable.

Existing invasive species	Evidence gathering activities, evidence checked, and assessment conclusion
Not Applicable.	Not Applicable.

3.2.4.3 Ecosystem conversion

Item	Evidence gathering activities and evidence checked
Ecosystem conversion	Not Applicable.

3.3 Application of Methodology

3.3.1 Title and Reference

Type I, Renewable Energy Projects:

AMS I.F, “Renewable electricity generation for captive use and mini-grid”, Version 05.0/5/

The methodologies also refer to the latest approved version of the following tools:

- Tool 07- Tool to calculate the emission factor for an electricity system, Version 07.0/8/
- Tool 21- Demonstration of additionality of small-scale project activities Version 13.1/7/

The methodology is valid at the time of validation of the project activity have been checked and confirmed by the assessment team.

3.3.2 Applicability

The project activity applies methodology; AMS I.F Version 05.0. The applicability criteria for the methodology are assessed by the audit team by means of document review and interviews. The audit team confirms that the project activity meets the criteria of the applied methodology.

Methodology ID	Applicability condition				Assessment and conclusion
AMS I.F, “Renewable electricity generation for captive use and mini-grid”, Version 05.0/5/	This methodology is applicable for project activities that: (a) Install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) Involve a capacity addition, (c) Involve a retrofit of (an) existing plant(s); or (d) Involve a replacement of (an) existing plant(s).				The project activity is installation of greenfield power plants. Hence the condition (a) justifies by the project activity
...	Project Type	A M S I.A .	A M S I.D .	A M S I.F .	As the solar units involved in the proposed project generate electricity primarily to deliver to captive consumers and excess electricity is to be supplied to the grid, this resembles the scenario listed at S.I no. 2 of the above table and hence the methodology AMS -I. F, is applied appropriately.Hence this condition is complied.
	Project supplies electricity to a national/regional grid		✓		

	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			✓	
	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		✓		

	Project supplies electricity to a mini grid ¹ system where in the baseline all generator s use exclusivel y fuel oil and/or diesel fuel			✓	
	Project supplies electricity to househol d users (included in the project boundary) located in off grid areas		✓		
	In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units	Project Activity is not capacity addition, and it is green field installation.			

¹ The sum of installed capacities of all generators connected to the mini-grid is equal to or less than 15 MW.

	added by the project should be lower than 15 MW and should be physically distinct from the existing units.	
	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15 MW.	This Project activity is not a retrofit or replacement of existing project activity.
	If the unit added has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15 MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	The project activity does not have a non-renewable component. Therefore, the said criterion is not applicable.
	Combined heat and power (co-generation) systems are not eligible under this category.	The project activity does not involve with co-generation
	Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology: a. The project activity is implemented in an existing reservoir with no change in the volume of reservoir;	The project activity is installation of Rooftop solar based electricity generation project. Therefore, the said criterion is not applicable.

	b. The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m²; The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m²;	
	If electricity and/or steam/heat produced by the project activity is delivered to a third party, i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered that ensures that there is no double counting of emission reductions.	The Project generate electricity primarily to deliver to captive consumers and excess electricity is to be supplied to the grid therefore no double counting in emission reductions. Hence this condition is not applicable.
	In the case the project activities utilize biomass, the "TOOL16: Project and leakage emissions from biomass" shall be applied to determine the relevant project emissions from the	The project activity instances do not involve with biomass usage.

	cultivation of biomass and the utilization of biomass or biomass residues.	
Tool 07: Tool to calculate the emission factor for an electricity system Tool 07, Version 07/8/	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g., demand-side energy efficiency projects).	The project activity is a grid connected greenfield solar power project and hence, according to the applied methodology, the baseline scenario is electricity delivered to the grid by the project activity that would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in "TOOL07: Tool to calculate the emission factor for an electricity system".
	Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e., option II a and option II b. If option II a is chosen, the conditions specified in "Appendix 1: Procedures related to off-grid power generation" should be met. Namely, the	Since the project activity is grid connected biogas-based electricity generation project this condition is applicable. Combined margin grid emission factor has been calculated as per the CO₂ emission factor data base published by the CEA in which for the calculation of emission factor CEA have only considered grid connected plants.

	total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.	
	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	The project activity is located in India, a non-Annex I country. Therefore, this criterion is not applicable for the project activity.
	Under this tool, the value applied to the CO₂ emission factor of biofuels is zero	Project Developer has used the combined margin grid emission factor from emission factor data base published by the CEA in line with Tool07 "Tool to calculate the emission factor for an electricity system", version 07.0 where the tool considers CO₂ emission of Biofuel as zero. Hence, Project Developer has considered the same.

		Therefore, this criterion is not applicable for the project activity.
Tool 21- Demonstration of additionality of smallscale project activities Version 13.1/7/	The use of the methodological tool “Demonstration of additionality of small-scale project activities” is not mandatory for project participants when proposing new methodologies. Project participants and coordinating/managing entities may propose alternative methods demonstrate additionality for consideration by the Executive Board.	This condition is applicable. The project participants not proposing new methodology.
	Project participants and coordinating/managing entities may also apply “TOOL19: Demonstration of additionality of microscale project activities” as applicable	This condition is not applicable as project is not a microscale project activity.

3.3.3 Project Boundary

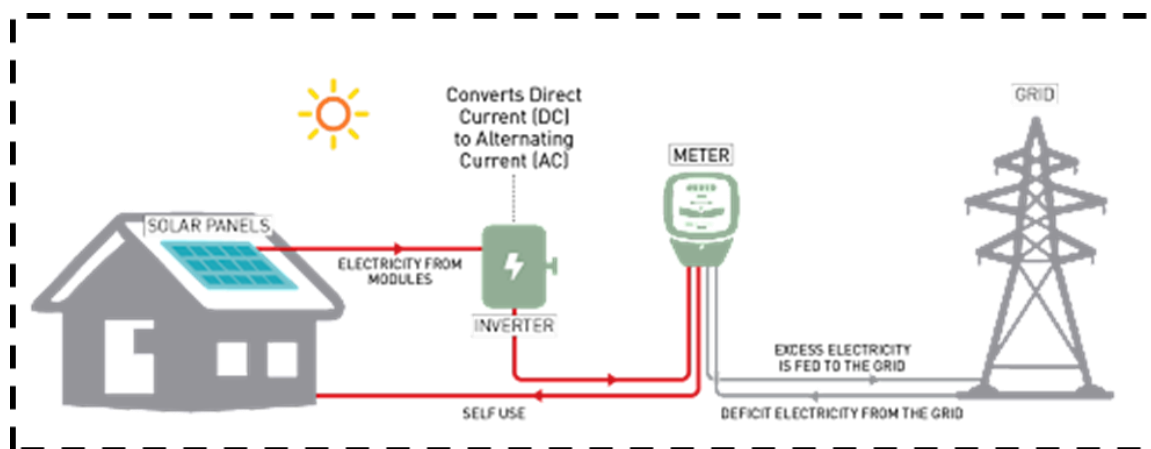
The project boundary includes the solar project installed at the user’s premises. Users might also be connected to the Indian grid. Therefore, the entire Indian grid and all connected power plants have been considered in the project boundary for the proposed VCS project activity. The table below provides an overview of the emissions sources included or excluded from the project boundary for determination of baseline and project emissions. The project boundary is explained as follows:

Source		Gas	Included?	Justification/Explanation
Baseline	Grid connected	CO2	Yes	Main emission source
		CH4	NO	Minor emission source

Project	electricity generation	N2O	NO	Minor emission source
	Greenfield Solar Power Project activity	CO2	NO	No CO2 emissions are emitted from the project
		CH4	NO	Project activity does not emit CH4
		N2O	NO	Project activity does not emit N2O

The solar power plant will be rooftop, and main purpose is captive.

The pictorial depiction of the project boundary is given below:



The validation team concludes that the project boundary is correctly identified in accordance with the methodology.

3.3.4 Baseline Scenario

As per para 21 AMS-I.F.: RENEWABLE ELECTRICITY GENERATION FOR CAPTIVE USE AND MINI-GRID, VERSION 5.0; “For project activities that displace grid electricity and fossil fuel fired on-site captive electricity, the baseline emission factor should reflect the emissions intensity of the grid and the captive power plant in the baseline scenario i.e. the weighted average emission factor for the displaced electricity is calculated using values based on the historical, prior three year ratios of electricity from captive plants and the grid”. For new facilities, the most conservative (lowest) of the emission factor for the two power sources should be used. Hence, the baseline for the project activity is the equivalent amount of power from the INDIAN grid. The combined margin (EFCO_{2,y}) is the result of a weighted average of two emission factor pertaining to the electricity system: the operating margin (OM) (having weightage 75%) and build margin (BM) (having weightage 25%). Calculations for this combined margin must be based on data from an official source of CEA database (where available) and made publicly available

Parameter	Value	Nomenclature	Source
EF _{grid,CM,y}	0.9352 tCO ₂ /MWh	Combined margin CO ₂ emission factor for the project electricity system in year y	Calculated as the weighted average of the operating margin (0.75) & build margin (0.25) values, sourced from Baseline CO ₂ Emission Database, Version 19, November 2023 published by Central Electricity Authority (CEA), Government of India
EF _{grid,OM,y}	0.9580 tCO ₂ /MWh	Operating margin CO ₂ emission factor for the project electricity system in year y	Calculated as the last 3 years (2020-21, 2021-22 and 2022-23) generation-weighted average, sourced from Baseline CO ₂ Emission Database, Version 19, November 2023 published by Central Electricity Authority (CEA), Government of India
EF _{grid,BM,y}	0.8670 tCO ₂ /MWh	Build margin CO ₂ emission factor for the project electricity system in year y	Baseline CO ₂ Emission Database, Version 19, November 2023 published by Central Electricity Authority (CEA), Government of India

Therefore, validation team based on review of the VCS PD confirms that the above baseline scenario is relevant, and correctly quoted and interpreted in the project description. The baseline scenarios were also confirmed through interviews with the representatives of PP/13/. Validation team confirms that the baseline scenario opted by the project activity is in accordance with the requirements of the applied methodology and is justified.

3.3.5 Additionality

Legal Requirement Test:

Further, assessment team reviewed and studied the applicable laws & rules in the host country i.e. India. The Project activity conforms to all the applicable laws and regulations in India. Power generation using solar energy is not a legal requirement or a mandatory option. The Indian Electricity Act, 2003/22/ (May 2007 Amendment) does not influence the choice of fuel used for power generation. There is no legal requirement on the choice of a particular technology for power generation. In host country there no regulatory frameworks or policies relevant regulatory surplus requirements.

Additionality Test Assessment:

As per the 'Guidelines on the demonstration of Additionality of small-scale Project Activity' (version 10.0), a positive list of grid-connected renewable electricity generation technologies are listed that are automatically defined as additional, without further documentation of barriers. The positive list

comprises of the following grid-connected renewable electricity generation technologies of installed capacity up to 15 MW:

- 1) Solar technologies (photovoltaic and solar thermal electricity generation);
- 2) Off-shore wind technologies.
- 3) Marine technologies (wave, tidal).
- 4) Building-integrated wind turbines or household rooftop wind turbines of a size up to 100 kW.

Since the project activity is a bundled project comprising of installation of solar rooftop units at various buildings with a cumulative capacity of 8.0216 MW, it can be concluded from the above list that the project activity is automatically additional and does not require demonstration of barriers. The project activity is the captive off grid project as per the para 11(a) of tool 21(chrome-extension://efaidnbmnnnibpcajpcgclefindmkaj/https://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-21-v12.pdf) which led to the appendix and the appendix clearly explains that the small scall off grid project are auto additional Thus, it is well established that the proposed project activity is additional.

3.3.6 Quantification of GHG Emission Reductions and Carbon Dioxide Removals

Assessment team checked the baseline, project and leakage calculation and confirm that the evaluation of baseline, project and leakage is as per the approved methodology and formula used to calculate the same is correct. The detail analysis is as below:

Baseline Emissions:

As per para 19 of AMS-I.F.: Renewable Electricity Generation for Captive Use and Mini-Grid, Version 5.0, the Baseline emissions for other systems are the product of amount electricity displaced with the electricity produced by the renewable generating unit and an emission factor.

$$BE_y = E_{GBL,y} \times EF_{grid,y}$$

Where:

BE_y = Baseline emissions in year y (tCO₂/yr)

$E_{GBL,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr) $EF_{CO_2,y}$ = Emission factor(tCO₂/MWh)

The combined margin emissions factor is calculated as follows:

$$EF_{grid, CM,y} = EF_{grid, OM,y} * W_{OM} + EF_{grid, BM,y} * W_{BM}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO2 emission factor in year y (tCO2/MWh)

$EF_{grid,OM,y}$ = Operating margin CO2 emission factor in year y (t CO2/MWh)

W_{OM} = Weighting of operating margin emissions factor (per cent)

W_{BM} = Weighting of build margin emissions factor (per cent)

Project Emissions: -

As per the approved consolidated Methodology AMS I.F. Version 5.0 para 26 “For most renewable energy power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y}$$

Where:

PE_y = Project emissions in year y (t CO2e/yr)

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (t CO2/yr)

$PE_{GP,y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO2e/yr)

$PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y (t CO2e/yr)

As the project activity is the installation of a new grid-connected solar Power plant and does not involve any project emissions from fossil fuel, operation of dry, flash steam or binary geothermal power plants, and from water reservoirs of hydro power plants. Therefore $PE_{FF,y}$, $PE_{GP,y}$, $PE_{HP,y}$ are equal to zero and thus, $PE_y = 0$.

Leakage Emissions: -

As per the para 30 of AMS-I.F. version 5.0, the formula to calculate the emission reduction is

$$ER_y = BE_y - PE_y - LE_y$$

As the project activity is a solar project, there is not any leakage emission from the project activity.

Hence, $LE_y = 0$, therefore, Emission Reductions for this project activity are calculated as follows:
 $ER_y = BE_y - PE_y$

Where:

$$ER_y = \text{Emission reductions in year y (t CO2e/yr)}$$

BE _y	=	Baseline emissions in year y (t CO ₂ /yr)
PE _y	=	Project emissions in year y (t CO ₂ e/yr)

Year	Estimated baseline emissions or removals (tCO ₂ e)	Estimated project emissions or removals (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated net GHG emission reductions or removals (tCO ₂ e)
2023(05/01/2023 to 31/12/2023)	13,363	0	0	13,363
2024(01/01/2024 to 31/12/2024)	13,511	0	0	13,511
2025(01/01/2025 to 31/12/2025)	13,511	0	0	13,511
2026(01/01/2026 to 31/12/2026)	13,511	0	0	13,511
2027(01/01/2027 to 31/12/2027)	13,511	0	0	13,511
2028(01/01/2028 to 31/12/2028)	13,511	0	0	13,511
2029(01/01/2029 to 31/12/2029)	13,511	0	0	13,511
2030(01/01/2030 to 04/01/2030)	148			148
Total	94,577	0	0	94,577

emission reduction is 94,577 tCO₂e over 07 years crediting period.

Through the validation process, 4KES has confirmed that:

- All the assumptions and data used by the project participants are listed in the PD including their references and sources;
- All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PD;
- All values used in the PD are considered reasonable in the context of the VCS project activity

- The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PD.

3.3.7 Methodology Deviations

The project activity has used the AMS.I. F, ver.05.0/5/ the PP has completely followed the methodology for the development of the VCS PD. The validation team has confirmed that the PP does not make any deviations from the applied methodology.

3.3.8 Monitoring Plan

The validation team evaluated the monitoring plan through site visits and interviews with the project manager and staff and confirms that the monitoring plan has been constructed in line with the approved baseline and monitoring methodology “AMS-I. F”, version 05.0./5/

For the evaluation, the validation team has crosschecked the provided information on monitoring equipment with supporting documents, such as calibration details, and confirmed the suitability of the monitoring equipment to the monitoring plan. Upon site visits and document review, it is confirmed that the monitoring plan will give opportunity for real measurement of achieved emission reductions.

The project has a robust framework for monitoring greenhouse gas emissions through regular calibration and maintenance of energy meters, with intervals set at a minimum of once every five years as per CEA regulations. Energy consumption data will be continuously recorded and verified monthly by authorized personnel in the presence of the plant supervisor, ensuring accurate tracking of both export and import electricity. This data will be stored for at least two years after the crediting period, with regular checks by the Plant Manager for accuracy. Additionally, emergency preparedness measures are in place, with backup meters to address any discrepancies. Staff will receive comprehensive training on equipment operation and data management to maintain the integrity of the monitoring process. Overall, the procedures outlined ensure reliable data collection and effective management of emissions associated with the project.

Validation team has checked all the parameters presented in the monitoring plan against the requirements of the methodology; no deviations relevant to the project activity have been found in the plan. Validation team confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and the means of implementation of the monitoring plan is sufficient to ensure the emission reductions achieved by resulting from the proposed VCS project activity can be reported ex post and verified.

Data and parameters available at validation

Following parameters are fixed for the entire crediting period and are mentioned in section 5.1 of the VCS PD.

Parameters	VVB Assessment
EF _{grid,OM,y} - Operating Margin CO ₂ emission factor in year y	The value was sourced from CO2 Emission Database, Version 19.0 November 2023 published by Central Electricity Authority

	(CEA), Government of India/16/. The same was checked by the assessment team and found consistent. Value: 0.9580 tCO₂e/MWh
EF _{grid,BM,y} - Build Margin CO ₂ emission factor in year y	The value was sourced from CO₂ Emission Database, Version 19.0 November 2023 published by Central Electricity Authority (CEA), Government of India/16/. The same was checked by the assessment team and found consistent. Value: 0.8670 tCO₂e/MWh
EF _{grid,CM,y} - Combined Margin CO ₂ emission factor in year y	The value was sourced from CO₂ Emission Database, Version 19.0 November 2023 published by Central Electricity Authority (CEA), Government of India/16/. The combined margin emissions factor is calculated as follows: $EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$ $EF_{grid,CM,y} = 0.9580 * 0.75 + 0.8670 * 0.25$ $EF_{grid,CM,y} = 0.9352 \text{ tCO}_2/\text{MWh}$ Value: 0.9352 tCO₂e/MWh

Data and parameters monitored

Following parameters are monitored during the crediting period and are mentioned in section 5.2 of the VCS PD:

NOTE: KM Knitwear Private limited and Ascen Tex Private Limited has installed a Reverse protection relay to avoid export of electricity to the grid. Sri Jayajothi Private Limited and Shri Harikrishna Cotton Mills Private have bidirectional meter, to monitor parameter $EG_{grid\ final}$.

Parameters	VVB Assessment
$EG_{grid\ final}$ - Quantity of net electricity exported by the project activity to the grid	The validation team confirms that the data and parameters related to the electricity exported to the grid ($EG_{grid\ final}$) have been appropriately monitored and verified. The monitoring process involves continuous measurement of electricity exported through HT metering systems (Metering Slip/Metering Card) with monthly recording. The data is cross-checked against the monthly HT consumption bills to ensure accuracy. The value applied is to be less than 50% of the total electricity generated. The monitoring equipment, including bidirectional meters and reverse protection relays, has been installed by the respective companies to prevent unauthorized export to the grid. The QA/QC procedures ensure that meters are calibrated/18/ in accordance with national standards, thereby providing reliable and consistent data. The frequency of monitoring is monthly, with a clear purpose to track compliance with the electricity export limit and verify the project's emission reduction impact. Value- The amount of energy delivered to the grid should be less than 50% of the total energy generated.

EGPJ, y - Quantity of electricity generated from the project activity in year y (MWh)	EGPJ, y is monitored continuously at Ascen Tex private limited and Shri Harikrishna Cotton Mills Private Limited, data will be monitored as per HT Metering Slip/Metering Card and at Sri Jayajothi Private Limited and KM Knitwear Private Limited, data will be monitored as per values are recorded Net Electricity Reading as per Inverter Data. The metering testing & installation at the above sites is under process and it shall be completed in due course of time. It is recording on a monthly basis, aggregated monthly and yearly. The electricity meters are calibrated in accordance with national calibration standards. The energy generation value is calculated by using the PLF value given by the third-party engineering company. This value of PLF is cross verified with the source report from the different engineering companies /25/ where the project is located. Value – 14,447 MWh/y
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SOLAR LT CT METER DETAILS

The details of the energy meters for the three sites mentioned above are deemed acceptable, having been confirmed by the validation team through cross-verification with the technical specifications and the calibration certificate/18/ provided by the PP. The FAR02 has been raised regarding the meter details of another KM knit wear unit

Sri Jayajothi Power Management Company							
S.N O	Details of Meter	UNIT I		UNIT II		PC UNIT	
		Main Meter	Check Meter	Main Meter	Check Meter	Main Meter	Check Meter
1	Serial number	X224344 1	X2243442	X224343 9	X2243440	X224344 3	X2243444
2	Manufacture	Secure	Secure	Secure	Secure	Secure	Secure
3	Model	E3T055	E3T055	E3T055	E3T055	E3T055	E3T055
4	Accuracy class	0.5s	0.5s	0.5s	0.5s	0.5s	0.5s

S.NO	Details of Meter	OE UNIT LOACTION 1	OE UNIT LOACTION 2
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		Main Meter	Check Meter	Main Meter	Check Meter
1	Serial number	X2308815	X2308816	X2308817	X2308818
2	Manufacture	Secure	Secure	Secure	Secure
3	Model	E3T055	E3T055	E3T055	E3T055
4	Accuracy class	0.5s	0.5s	0.5s	0.5s

Shri HariKrishna Cotton Mills Private Limited		
S.NO	Details of Meter	LT CT Meter
1	Serial number	04013103
2	Manufacture	Inesh Smart Energy Private Limited
3	Name	3 Phase 4 wire AC Operated Smart Energy
4	Accuracy class	0.5s

KM Knitwear Private Limited				
S. N O	Details of Meter	Meter 1	Meter 2	Meter 3
1	Serial number	04016991	04016992	04016993
2	Manufa cture	Inesh	Inesh	Inesh
3	Name	AC Static 3 Phase 4 wire Operated Smart Energy Meter	AC Static 3 Phase 4 wire Operated Smart Energy Meter	AC Static 3 Phase 4 wire Operated Smart Energy Meter
4	Accura cy class	0.5s	0.5s	0.5s

Ascen Tex Private Limited					
S. NO	Details of Meter	Meter 1	Meter 2	Meter 3	Meter 4
1	Serial number	22055741	22055742	22055735	22055738

2	Manufacture	L&T	L&T	L&T	L&T
3	Model	ER300P	ER300P	ER300P	ER300P
4	Name	Trivector 3 Phase 4 wire Meter	Trivector 3 Phase 4 wire Meter	Trivector 3 Phase 4 wire Meter	Trivector 3 Phase 4 wire Meter
5	Accuracy class	0.5s	0.5s	0.5s	0.5s

Bidirectional Meter details

Sri Jayajothi Power Management Company					
S.NO	Details of Meter	UNIT I	UNIT 2	OE UNIT	PC UNIT
1	Make	HPL	HPL	HPL	HPL
2	SL.No	5205415	5205419	5205420	5205418
3	Class	0.2s	0.2s	0.2s	0.2s
4	Rating	3*63.5V,-/5A	3*63.5V,-/5A	3*63.5V,-/5A	3*63.5V,-/5A
5	Type	CT PT 5.24	CT PT 5.24	CT PT 5.24	CT PT 5.24

Shri Harikrishna Cotton Mills Private Limited			
S.NO	Details of Meter	Check meter	Main Meter
1	Serial number	6129491	6129489
2	Manufacture	Genus Power Infrastructure Ltd	Genus Power Infrastructure Ltd
3	Model	Trienergy	Trienergy
4	Name	3 Phase 4 wire AC static Meter	3 Phase 4 wire AC static Meter
5	Accuracy class	0.2s	0.2s

3.4 . Non-Permanence Risk Analysis

Non-permanence risk analysis is not applicable as the Project is not an AFOLU (Agriculture, Forestry and Other Land Use) project.

4 VALIDATION OPINION

4.1 Validation Summary

Solaura Power Private Limited has commissioned '4K Earth Science Private Limited' to do VCS validation of the project activity: "Bundled Rooftop Solar Power Project by SPPL 01" having VCS ID 4071, with regard to the relevant requirements of VCS Standard version 4.5 /4/; to attain real, measurable, additional and permanent emission reductions.

A risk-based approach has been followed to perform this validation. In the course of the validation, 02 Corrective Action Requests (CARs), 04 Clarification Requests (CLs) raised and successfully closed and 02 Forward Action Requests (FARs) were raised.

4.2 Validation Conclusion

The validation is based on the VCS PD, additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and supporting documents made available to the validation team by project proponent.

As a result of the validation, the validation team confirms that:

- The project fulfils criteria of VCS Standard Version 4.5.
- The project is in line with all relevant VCS requirements.
- The project baseline is sufficiently justified in the PD.
- The calculation of the emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 94,577 tCO₂e /2/ is most likely to be achieved within the 07 years of renewable crediting period.
- No restrictions or uncertainties were identified related to the validation.

Crediting period: From [05-01-2023] to [04-01-2030]

Validated estimated GHG emission reductions and carbon dioxide removals for the project crediting period:

Vintage period	Estimated baseline emissions (tCO ₂ e)	Estimated project emissions (tCO ₂ e)	Estimated leakage emissions (tCO ₂ e)	Estimated reduction VCU (tCO ₂ e)	Estimated removal VCU (tCO ₂ e)	Estimated total VCU (tCO ₂ e)
2023(05/01/2023 to 31/12/2023)	13,363	0	0	13,363	0	13,363
2024(01/01/2024 to 31/12/2024)	13,511	0	0	13,511	0	13,511
2025(01/01/2025 to 31/12/2025)	13,511	0	0	13,511	0	13,511
2026(01/01/2026 to 31/12/2026)	13,511	0	0	13,511	0	13,511
2027(01/01/2027 to 31/12/2027)	13,511	0	0	13,511	0	13,511
2028(01/01/2028 to 31/12/2028)	13,511	0	0	13,511	0	13,511
2029(01/01/2029 to 31/12/2029)	13,511	0	0	13,511	0	13,511
2030(01/01/2030 to 04/01/2030)	148	0	0	148	0	148
Total	94,577	0	0	94,577	0	94,577

APPENDIX 1: COMMERCIALY SENSITIVE INFORMATION

Not applicable

APPENDIX 2: DOCUMENT REFERENCES

The following table lists the documentation that were reviewed during this validation of the bundled project activity:

1.	VCS PD for “Bundled Rooftop Solar Power Project by SPPL 01 version 1.0 dated 10/01/2023 VCS PD for “Bundled Rooftop Solar Power Project by SPPL 01 version 3.0 dated 05/03/2024 VCS PD for “Bundled Rooftop Solar Power Project by SPPL 01 version 3.1 Dated 23/09/2024 VCS PD for “Bundled Rooftop Solar Power Project by SPPL 01 version 3.2 Dated 08/11/2024
2	Emission Reduction Calculation Excelsheet (ex-ante) and version 02 dated 23/01/2024
3	VCS: VCS Program Guide, version 4.4 dated 29.08.2023 VCS Program Definitions (v4.3, dated 21/12/2022) VCS Registration & Issuance Process (v4.3, dated 17/01/2023)
4	VCS: VCS Standard, version 4.5 dated 04.10.2023 VCS Validation and Verification Manual version 3.2 dated 19/10/2016
5	CDM approved methodology: AMS I.F, “Renewable electricity generation for captive use and mini-grid”, Version 05.0 https://cdm.unfccc.int/methodologies/DB/9KJWQ1G0WEG6LKHX21MLPS8BQR7242
6	UNFCCC: Guidelines for Sampling and Surveys for CDM Project activities and Programme of Activities, Ver. 4.0 (EB86, Annex 4)
7	Tool 21- Demonstration of additionality of smallscale project activities Version 13.1 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-21-v13.1.pdf
8	Tool 07- Tool to calculate the emission factor for an electricity system, Version 07.0 https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v7.0.pdf
9	VERRA: Project search: https://registry.terra.org/app/search/VCS/All%20Projects

	CDM project standard for project activities, version 03.0 CDM validation and verification standard, version 03.0
10	https://registry.terra.org/app/projectDetail/VCS/4071
11	VERRA Rules and Requirements: https://verra.org/programs/verified-carbon-standard/vcs-program-details/#rules-and-requirements
12	VCS: VCS Project Description template, VCS Version 4.2 of 21/12/2022
13	Central Electricity Authority (CEA) Database Version 19, November 2023 https://cea.nic.in/wp-content/uploads/baseline/2023/01/version_19.zip
14	Supporting documents for the local stakeholder consultation (individual invitations, photographs, attendance sheets etc.) Local Stakeholder Consultation report
15	Declaration to comply with various requirements under VERRA Declaration form on avoidance of double counting of the project activity
16	Note For Record Certificate (NFR)
17	Project Commissioning Certificate
18	technical details, and calibration certificate
19	2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories
20	2006 IPCC Guidelines for National Greenhouse Gas Inventories; 5th Assessment Report
21	2006 IPCC Guidelines for National Greenhouse Gas Inventories; Volume 4 Energy, Chapter 10 Introduction
22	Electricity Act 2003 https://cercind.gov.in/Act-with-amendment.pdf
23	National Electricity Policy 2005 https://powermin.gov.in/en/content/national-electricity-policy
24	The Electricity Regulation Commission Act, 1998 https://cercind.gov.in/ElectReguCommiAct1998.pdf

25	PLF document for Ascen Tex Private Limited by Techno-commercial report submitted by Viridis Engineering India Pvt Limited
	PLF document for Shri Harikrishna cotton Mills Private Limited by Energy Generation Report provided by Peak Qualish Systems
	PLF document for KM Knitwear Private Limited by Techno-commercial report submitted by Viridis Engineering India Pvt Limited
	PLF document for Sri Jayajothi Power Management Company private limited Engineering Report by Evolve Energy Group

APPENDIX 3: ABBREVIATIONS

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
EB	Executive Board
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel for Climate Change
ISO	International Organization for Standardization
LE	Local Expert
MP	Monitoring Period
MR	Monitoring Report
MW	Mega Watt
MWh	MegaWatt hour
PD	Project Description
PP	Project proponent
QA/QC	Quality Assurance/Quality Control
tCO ₂	Tonnes of Carbon Dioxide
TE	Technical Expert
TL	Team Leader
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard

VCSA	Verified Carbon Standard Association
VCU	Verified Carbon Unit

APPENDIX 4: VALIDATION FINDINGS

Table 1: CLs from this Validation

CL ID	01	Section no.	DOCUMENTS	Date:02/11/2023
Description of CL				
Project Participant's (PP) is requested to submit the following documents / supporting's: 1. Details of Sanctioned Connected Load / Contract Demand of all the installations. 2. Proof for Start date of project. 3. Waste management practices and record keeping process. 4. Calibration certificates for the energy meters. 5. The project allotment license 6. The equipment purchasing contract 7. The power purchase agreement 8. Commissioning certificate 9. Energy meter bill 10. Employment record				
Project Participant's response				Date: 23/01/2024
<i>The above mentioned documents will be submitted.</i>				
Documentation provided by project participant				
VVB assessment				Date: 27/01/2024
The documents provided are verified and acceptable. Thus, CL 01 is closed.				

CL ID	02	Section no.	1	Date:02/11/2023
Description of CL				

1. In section 1.1 kindly mention the exact commissioning date of the project. 2. In section 1.14 kindly provide the reference footlink for all the laws, statutes and other regulatory 3. In section 1.17.2 kindly update the contribution over project lifetime column in table.	
Project Participant's response	Date: 23/01/2024
1. The Exact commission date of the project is 05/01/2023 which is the commissioning date of earliest commissioned plant. 2. The reference foot link for all the laws, statutes and other regulatory is provided in PDD. 3. The contribution over project lifetime column is provided in table format as required.	
Documentation provided by Project participant	
<i>1. Commissioning Certificate earliest commissioned plant.</i>	
VVB assessment	Date: 27/01/2024
The required documents are submitted and revision made was verified. Hence, CL 02 is closed.	

CL ID	03	Section no.	2	Date: 02/11/2023
Description of CL				
1. In section 2.2 kindly provide the attendance sheet or any proof for the LSC for reference. 2. Kindly update the LSC.				
Project Participant's response				Date: 23/01/2024
<i>1. The proof for LSC will be provided.</i>				
Documentation provided by Project participant				
VVB assessment				Date: 27/01/2024
The required documents are submitted and revision made was verified, hence cl03 is closed.				

CL ID	04	Section no.	3	Date: 02/11/2023
Description of CL				
1. In section 3.4 kindly provide the foot link of the source of the EF for reference.				
Project Participant's response				Date: 23/01/2024
The footlink of the source of the EF for reference is provided in the PDD.				

Documentation provided by Project participant	
VVB assessment	Date: 27/01/2024
The required documents are submitted and revision made was verified, hence cl04 is closed.	

Table 2: CARs from this Validation

CAR	01	Section no.	3	Date:02/11/2023
Description of CAR				
1. In section 3.2 kindly revise the applicability condition mentioned is inconsistent with AMS.I. F Version 5.0				
Project Participant's response				Date:23/01/2024
The applicability condition mentioned is made consistent with AMS.I. F Version 5.0.				
Documentation provided by Project Participant's				
VVB assessment				Date: 27/01/2024
The required documents are submitted and revision made was verified. Hence CAR01 is closed.				

CAR	02	Section no.	5	Date:02/11/2023
Description of CAR				
1. In section 5.1 the value of EF grid, CM, y is inconsistent with the ER sheet.				
Project Participant's response				Date:23/01/2024
The value of EF grid, CM, made consistent with ER Sheet.				
Documentation provided by Project Participant's				
VVB assessment				Date: 27/01/2024
The required documents are submitted and revision made was verified. Hence CAR02 is closed.				

Table 3. FAR from this validation

FAR ID	01	Section no.	Commissioning Certificate	Date: 02/11/2023
Description of FAR				
The commissioning certificate of following project sites are not available. The same shall be checked during verification. a. Sri Jayajothi Power Management Company private limited b. KM Knitwear Private Limited				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
VVB assessment				Date: DD/MM/YYYY

FAR ID	02	Section no.	Net Meters	Date: 02/11/2023
Description of FAR				
During the site visit, it has been noted that the net meter was not available in two sites named "KM KNITWEAR PVT LTD" and "SRI JAYAJOTHI POWER MANAGEMENT COMPANY PRIVATE LIMITED". The emission reduction value has to be calculated not from the beginning it has to be calculated from the date of metre installation only. This has to be rectified and the net meter has to be installed before the next verification. The same shall be checked during verification.				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
VVB assessment				Date: DD/MM/YYYY

APPENDIX 5: TEAM COMPETENCE

<u>Certificate of Competence</u>						
Name	☒ Mr. ☐ Ms.	Ma Paa Puratchikkanal				
Qualification Procedure	Fulfil the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
<i>Appointed</i>	Yes	Yes	Yes	Yes	Yes	Yes
<i>Appointed Date</i>	15-07-2023					
Authorized to work as Technical Expert for:						
<i>Authorized Technical Area</i>	Sectoral Scope		TA Code	Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)		1.1	Thermal energy generation		
	Energy industries (renewable - / non-renewable sources)		1.2	Renewables		
	Energy demand		3.1	Energy demand		
	Construction		6.1	Construction		
	Waste handling and disposal		13.1	Solid waste and wastewater		
	Waste handling and disposal		13.2	Manure		
	Agriculture		15.1	Agriculture		
Authorized to work as Local Expert for:						
<i>Country/Countries</i>	India and Sri Lanka					
<u>Compliance check by:</u> Anand S. R.						

<u>Certificate of Competence</u>		
Name	☒ Mr. ☐ Ms.	Gurubalaji K
Qualification Procedure	Fulfil the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.	

Appointed to work as:						
	Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
<i>Appointed</i>	No	No	Yes	No	No	No
<i>Appointed Date</i>	15-07-2023					
Authorized to work as Technical Expert for:						
<i>Authorized Technical Area</i>	Sectoral Scope		TA Code	Technical Area within the scope		
Authorized to work as Local Expert for:						
<i>Country/Countries</i>	-					
Compliance check by: Anand S. R.						

<u>Certificate of Competence</u>						
Name	☐ Mr. ☒ Ms.	Swati S Acharya				
Qualification Procedure	Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
<i>Appointed</i>	Yes	Yes	Yes	Yes	No	No
<i>Appointed Date</i>	15-07-2023					
Authorized to work as Technical Expert for:						

<i>Authorized Technical Area</i>	Sectoral Scope	TA Code	Technical Area within the scope
	Energy industries (renewable - / non-renewable sources)	1.2	Renewables
<i>Authorized to work as Local Expert for:</i>			
<i>Country/Countries</i>	India		
<u>Compliance check by:</u> Anand S. R.			