



SOLAR POWER PROJECT BY SAI SUDHIR ENERGY LIMITED



Document Prepared by Earthhood Services Private Limited

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Summary:

The project activity by Sai Sudhir Energy Limited (SSEL), is a greenfield solar power plant project with 5 MW of power generation. The start date of the project activity is 05/01/2012 which is also commissioning date of project. This is a greenfield project activity and supply the generated electricity to the National power grid i.e., Indian Grid. Thus, project activity has reduced the dependence on fossil fuel-powered power plants by substituting carbon-intensive energy with the clean renewable solar energy. As per the baseline scenario, "Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants that are fossil fuel fired power plants". The baseline scenario is the same as the scenario existing prior to the implementation of the project activity.

During the current monitoring period from 31/05/2012 to 31/12/2017 (First and last date included) the project activity has supplied 49,448 MWh of electricity, and thus contributing to 45,291 tCO₂e of GHG reductions.

EcoCapita Consulting Private Limited (EcoCapita) contracted Earthood Services Private Limited (ESPL) to conduct the second verification of the project. The scope of verification includes confirming the implementation of the monitoring plan in the registered VCS PD /01/ and the application of the monitoring methodology as per AMS-I. D version 17: "Grid Connected Renewable Electricity Generation".

The verification consisted of three phases: a. Desk review of the project; b. Follow-up remote audit; c. Resolution of outstanding issues and issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted following ESPL's internal quality procedures.

A risk-based approach has been followed to perform this verification. In the course of verification, 01 Corrective Action request (CARs), 00 Forward Action request (FARs), and 05 Clarification request (CLs) were raised and successfully closed.

Resolution of outstanding issues and issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted following ESPL's internal quality procedures.

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1 INTRODUCTION

1.1 Objective

Earthood Services Private Limited (ESPL) has been contracted by EcoCapita, to undertake the verification of the renewable energy project titled “Solar Power Project by Sai Sudhir Energy Limited” (VCS ID-1093). The verifiers have reviewed the GHG data collected to date for the monitoring period from 31/05/2012 to 31/12/2017 (both days included) covered in this verification. The objective of this verification is a thorough and independent assessment of registered project activities against the applicable VCS requirement by the VVB. The verification process shall determine whether the proposed project activity complies with the requirements of latest VCS guidelines, applicability conditions of the selected methodology, relevant host country regulations and guidance issued by the VCS Board.

1.2 Scope and Criteria

The scope of the verification is to establish/verify that:

- The appropriate VCS-MR form (and other templates) was used and correctly filled up; (as per (<https://verra.org/project/vcs-program/rules-and-requirements>)
- The project activity is in accordance with all relevant host country criteria (India).
- The project activity is in accordance with VCS standard 4.2/11/ and VCS program guide 4.1/12/.
- The project activity falls under Sectoral Scope: 01 - Energy industries (renewable / non-renewable sources); Project Type: I - Renewable Energy Projects.
- The project activity is in accordance with conditions of the latest version of applied methodology AMS-I.D version 17:“Grid Connected Renewable Electricity Generation”/07/.
- The project is not a grouped project and also non- AFOLU project.

The verification of the project activity is based on the VCS-PD/01/ and estimated GHG emission reduction calculations.

1.3 Level of Assurance

The level of assurance of the verification report falls under reasonable assurance engagements. Reasonable assurance is a high level of assurance regarding material misstatements, but not an absolute one.

Reasonable assurance includes the understanding that there is a remote likelihood that material misstatements will not be prevented or detected on a timely basis. To achieve reasonable assurance, the auditor needs to obtain sufficient appropriate audit evidence to reduce audit risk to an acceptably low level. This means that there is some uncertainty arising from the use of sampling, since it is possible that a material misstatement will be missed.

The evidence used to achieve a reasonable level of assurance is specified in section 2.3 and 2.4 of this report.

1.4 Summary Description of the Project

The project activity by Sai Sudhir Energy Limited (SSEL), is a greenfield solar power plant project with 5 MW of power generation. The project activity is located in the village – T. Veerapuram in Anantapur district of Andhra Pradesh state, India. It uses CIS (Copper-Indium-Selenium) thin film solar photovoltaic modules for producing green power.

The project activity involves electricity generation by the solar power supplying the generated electricity to the Indian grid. The project being a renewable energy generation activity, leads to reduction in fossil fuel dominated electricity generation. The project activity results in reductions of greenhouse gas (GHG) emissions that are real, measurable, and verifiable and also plays beneficial role in the mitigation of climate change.

The project activity has geographical coordinates of latitude 14° 45' 41.97" N and longitude 76° 57' 03.86" E. Location of the project was verified through Google Map (<https://www.google.com/maps>)/14/ and found consistent with the data provided in the registered PD /01/.

The project activity was commissioned on 05/01/2012. This is the first crediting period i.e., from 05/01/2012 to 04/01/2022. The same was verified against the registered VCS PD/01/ and commissioning certificates/09/.

The emission reductions from the project activity during the current monitoring period 31/05/2012 to 31/12/2017 (including both days) amount to 45,291 tCO₂e and the total net electricity generated is 49,448 MWh.

The project activity is undergoing second verification of the first crediting period and the implementation of project activity is also verified. Based on the assessment of the documents, the assessment team can confirm that the project activity is fully functional and implemented as described in the registered VCS PD/01/ and the Monitoring Report/02/.

2 VERIFICATION PROCESS

The registered VCS project is undergoing second verification and the approach adopted to ensure the quality of emission reductions is described in the following sub-sections.

2.1 Method and Criteria

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using ESPL's internal procedures. The Project was verified against the latest requirements of VCS Standard version 4.2/11./

The verification process consists of the following three phases:

- A document review of the VCS PD/01/ and VCS MR/02/ (described in Section 2.2)
- Remote audit and follow up interviews with project stakeholders/08/ (described in Section 2.3 and 2.4)
- The resolution of outstanding issues and issuance of the final report and opinion. (Described in Section 2.5)

DOE's Sampling Approach: No sampling approach was required for undertaking the current verification since all monitored data was verified by the assessment team.

2.2 Document Review

The verification is performed primarily as a document review of the documents submitted at various stages of assessments. The review is performed by assessment team using dedicated protocols. The assessment team cross checks the information provided in the documents (PDD/01/, MR/02/, validation and previous verification report/20/) and information from sources other than those used, if available, and also conducts independent background investigations. Earthood conducted a desk review as under:

- a) A review of the data and information presented to verify their completeness.
- b) A review of the monitoring plan/01/, the monitoring methodology/07/ including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures.
- c) An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.3 Interviews

Due to the current situation with the global COVID-19 pandemic scenario, an on-site inspection has not been performed by the assessment team. Although domestic travel has resumed in India, it is still not recommended until necessary and considering health and safety a top priority, physical site visit for verification audit is not conducted. Furthermore, as per the Section 4.1.2 of the VCS Standard, v4.2/11/, it is not mandatory to conduct the on-site visit by VVB for verification. However, the representatives of the PP were interviewed during the virtual audit conducted on 15/03/2022 i.e., personnel responsible for monitoring of the project activity, data collection and management, and QA/QC procedure. The details of the people interviewed are mentioned in the table below:

Name	Organization	Topics Covered	Team Member
Bharat Bhushana Rao Macheria	SSEL	Project implementation, start date as per the VCS requirements.	N. Premjit Singh
Umapathi Meriyala	Site In- Charge	Electricity Generation Records Reliability & accuracy of readings considered for emission reduction calculations, Calibration procedure.	Mihika Saxena
Shwetangi Raj	EcoCapita	Consideration of monitoring period, monitoring methodology, project documentation and emission reduction calculations. Monitoring and measuring system, Collection of measurements Observations of established practices Data Verification of monitoring parameters. QA/QC procedures, data management, internal audits to maintain data quality & reliability, maintenance Practices.	Muskan Chawla

2.4 Site Inspections

As discussed in the above section, physical site inspection is not done for the current verification. However, to achieve a reasonable level of assurance, the assessment team has followed the alternative means to substantiate the verification criteria as described in the below table:

Assessment Criteria	Means of verification/source documents	Assessment opinion
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Description of project activity	Commissioning Certificate/09/ Technical specifications provided by technology supplier for the project activity /15/ VCS validation and previous verification reports /20/ Virtual site visit/08/ conducted on 15/03/2022.	The information with reference to project capacity, technology, plant equipment's and commissioning dates as provided in section 1.1 of MR are found consistent with the documents.
Compliance of the project implementation with the registered project description	Monthly JMR & Invoices issued by the state/17/ Geographical co-ordinates of project activity verified through Google Map/14/ VCS validation and previous verification reports /20/ Virtual site visit/08/ conducted on 15/03/2022.	Monthly JMRs/17/ issued by the state indicate the following information: Name of the pooling substation, Capacity of project and name of project participant. Location of project is verified through Google Map/14/ and found consistent with registered VCS PD/01/. All the information's regarding the project implementation as discussed above are further verified through VCS PD/01/ and found consistent.
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	Monthly JMR & Invoices issued by the state/17/ Virtual site visit/08/ conducted on 15/03/2022.	The organizational structure, responsibilities and competencies of the personnel confirmed through virtual interview/08/. Frequency of monitoring of parameters listed under approved monitoring

		plan/01/ is verified through JMR & Invoices/17/. The methods used for measuring, recording, storing, aggregating, and reporting the data on monitored parameters are verified through registered validation and previous verification reports/20/ virtual conversations with site personnel/08/. Procedure for data uncertainty, emergency preparedness, roles and responsibility, operational and management structure are mentioned in the MR/02/ is confirmed through virtual conversations with site personnel/08/.
Compliance with the calibration frequency requirements for measuring instruments	Calibration certificates of meters/04/ Photograph of energy meters indicating sr. No, accuracy class, make /19/. Central Electricity Authority (Installation and Operation of Meters) Regulations/21/	Calibration frequency and energy meter specifications (Sr. No, make, accuracy class) is verified through calibration certificates/04/ and previous VCS verification report/20/. Responsibility of calibration and maintenance of energy meters is solely under control of APCPDCL; this is verified through the previous verification report/20/.
Assessment of data and calculation of emission reductions or net removals	Monthly JMR & Invoices issued by the state/17/	Monthly values of monitoring parameter used in ER calculation/03/ are verified through share certificates/JMRs and cross

	CEA CO2 Baseline Database for the Indian Power Sector /21/ VCS previous verification reports /20/	verified with the respective invoices/17/. Methods, formulae, and emission factor for calculating baseline emissions have been followed are in accordance with the applied methodology/07/ and as described in the approved VCS verification report /20/.
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It is noteworthy that no sampling plan for verification is applied as 100% data is verified for the current monitoring period. Most of the reference document referred by the assessment team (above table) are either issued by an external government agency or publicly available official data, hence is deemed authentic.

Based on the above assessment it can be concluded that the assessment team has verified sufficient appropriate audit evidence, to reduce audit risk to an acceptably low level as requisite to achieve reasonable level of assurance for the current verification.

2.5 Resolution of Findings

The objective of this step is to identify, discuss and conclude on the issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is done based on the desk review and interaction with site personnel over phone. The verification team prepares and/or updates a verification protocol (internal document) that records the conformities and non-conformities, which may be of following types:

- CAR (Corrective Action Request) is raised if one of the following occurs:
 - Non-compliance with the monitoring plan, the methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project participant, or if the evidence provided to prove conformity is insufficient.
 - Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participant.
 - Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions.
- Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants. Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. All CARs and CLs raised by the ESPL during verification shall be resolved prior to submitting a request for issuance.
- FAR (Forward Action Request) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

All CARs and CLs raised by the ESPL during verification shall be resolved prior to submitting a request for issuance. All the findings that are raised and communicated to project participant during the verification are included under Appendix 2. The section also includes the response, if provided, by the project participants and an assessment by the verification team if it was closed out or otherwise.

A total of 5 CLs and 1 CAR were raised and successfully closed for this verification.

2.5.1 Forward Action Requests

The project activity is undergoing second verification in VCS. No FARs are raised during the current monitoring period. There are also no open FARs raised during the previous verification report or validation report/20/ applicable for the current monitoring period.

Details for which can be checked from Appendix 2 of this verification report.

2.6 Eligibility for Validation Activities

This section is not applicable for present verification.

3 VALIDATION FINDINGS

As project is already validated and this is the second verification of the project. Hence, this section is not applicable.

3.1 Participation under Other GHG Programs

The project activity has been registered under CDM program under the UNFCCC Reference Number 6317. The PP has given declaration that the project activity will not claim emission reductions for the monitoring period claimed in CDM and avoid double counting of the emission reductions/13/. VVB raised CL02 related to this which was closed successfully during verification. Hence, VVB confirms that PP is not participating in any other GHG mechanism during current monitoring period. Furthermore, VVB has checked the web site of other program like UNFCCC, VERRA & REC Registry of India and confirms that the project with same SPV, installed capacity and locations are not listed.

3.2 Methodology Deviations

There is no methodology deviation identified during the current monitoring period.

3.3 Project Description Deviations

The PP has considered a permanent deviation in this monitoring period of the project activity. The details of which are mentioned below:

CDM crediting period: Ten years (from 31/05/2012 to 30/05/2022).

Earlier VCS 1st crediting period: 05/01/2012 to 30/05/2012

Revised 1st Crediting period: 05/01/2012 to 04/01/2022

The crediting period was revised as the PP had opted to avail Emission reductions only from VCS (VERRA) during the revised crediting period. Verification team has confirmed the claim by cross-verifying with other CDM website also with other GHG program registries. Therefore, the change in the crediting period doesn't have any impact on the additionality and baseline of the project activity. It is also confirmed assessing with the previous verification report/20/ that there is no other project description deviation applied for the project activity. Hence, the project deviation is valid and appropriate as per VCS standard v4.2/11/ and VCS program guidelines v4.1/12/.

3.4 Grouped Project

Not applicable. The project activity is not a grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity by Sai Sudhir Energy Limited (SSEL), is a greenfield solar power plant project with 5 MW of power generation. The project activity is located in the village – T. Veerapuram in Anantapur district of Andhra Pradesh state, India. The project activity involves electricity generation by the solar power supplying the generated electricity to the Indian grid.

During the verification remote audit/08/, it was concluded that the project is implemented as per the requirement of the registered PD/01/. During the current monitoring period, it was observed that no unforeseen incident/event evolved which can impact the operation of the project activity. The project has undergone continuous operation and only scheduled maintenance is observed as per the manufactures specification which is acceptable to the assessment team/06//17/.

Project location is confirmed by the assessment team during the remote audit/08/. Assessment team also checked with the GPS coordinates/14/, the latitude and longitude of the project site with VCS validation report and previous verification report/20/ and confirm that the details as mentioned in the MR/02/ are inline with registered PD/01/. The details are as below:

District	State	Latitude	Longitude
Anantapur	Andhra Pradesh	14° 45' 41.97" N	76° 57' 03.86" E

This proposed solar power project will reduce the GHG emissions generated by the current generation energy mix in India's Power Grid, which is dominated by fossil fuel-based grid connected power plants. The technical specification/15/ of the project activity equipment has been checked through the photographs/19/ of all the equipment installed at site and are found to be consistent with the mentioned under section 1.1 of MR. The current status of the project activity is verified through the screen shots of SCADA system/19/, indicating the real-time generation data and hence it is confirmed that the project is fully functioning.

The monitoring plan of registered VCS PD/01/ includes the parameter "Quantity of net electricity generation supplied by the project plant/unit to the grid in year y" ($EG_{PJ,y}$). This parameter being calculated on monthly basis as difference of electricity exported to the grid and electricity imported from the grid by the project and those are being measured by energy meters of accuracy class 0.2s located at project. This export and import parameters are measured continuously and at least monthly recording. This is in line with methodology/07/ and is accepted.

Monthly values of $EG_{PJ,y}$ obtained directly from the monthly JMRs/17/ issued by APCPDCL. The invoicing being done against electricity supplied by the project plant to the grid. The measurement results are cross checked with records of invoices/17/, and it is in line with applied methodology/07/. Thus, this parameter is considered in emission reduction calculations.

As verified through the JMRs that the export and import energy will be measured continuously using the Main & Check meters. Export & Import readings of Main & Check meters shall be taken on monthly basis by authorized officer of APCPDCL (Central Power Distribution Company of AP Limited) in the presence of PP or representative of PP. The meter reading will be taken jointly and signed by the representatives of the APCPDCL and SSEL. Based on the main meter readings, invoices will be raised by SSEL to NVVN.

The monitoring methodology/07/ applies consistently the choice of the option selected for monitoring of baseline emissions. The monitoring plan/01/ provide procedures for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period. This is checked through discussion with consultant and the project participant during the virtual interview/08/.

The VCS MR/02/ has been reviewed to check that the procedure for data uncertainty, emergency preparedness, roles and responsibility, operational and management structure are mentioned in the MR. The monitoring plan completely describes all measures to be implemented for monitoring all parameters required. The monitoring plan described the positioning of the equipment. Calibration frequency for Energy meters is once annually. Also, CEA Notification/21/ No. 502/70/CEA/DP&D dated 17/03/2006 which is considered as national standard mentions that “All interface meters shall be tested at least once in five years.” Hence calibration frequency “once annually” considered for the project activity is found to be appropriate.

The information relating to the project implementation, provided in the Monitoring Report /02/ is consistent with that stated in the registered PD /01/. The data and variables provided in the monitoring report are the same as stated in the registered PD/01/. Total emission reductions achieved under this monitoring period 31/05/2012 to 31/12/2017 (including both days) is 45,291 tCO₂e.

Assessment team concludes the following:

- a) There are no material discrepancies between project implementation and the project description provided in the registered PD/01/.
- b) The monitoring plan is implemented completely and monitoring system (i.e., process and schedule for obtaining, recording, compiling and analysing the monitored data and parameters) is appropriate.
- c) There are no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology/07/.
- d) The GHG emission reductions or removals generated by the project have not included in an emissions trading program or any other mechanism that includes GHG allowance trading/13/.
- e) The project has not received or sought any other form of environmental credit or has become eligible to do so since validation or previous verification/13/.
- f) The project activity is complying with indicators for sustainable development as discussed under section 1.11 of MR.

In view of the information's as verified above the assessment team is able to conclude that the project has been implemented as described in the project description.

4.2 Safeguards

4.2.1 No Net Harm

There is no negative impact to any socio-economic conditions of the region due to the project activity. As per the notifications issued by Ministry of Environment, Forest and Climate Change dated 13/05/2011; Environmental Impact Assessment (EIA) for the solar projects is not required to be done (Ref: <http://moef.gov.in/wp-content/uploads/2017/09/OM-SolarPV.pdf>).

This project activity will not involve any negative environmental or socio-economic impacts, as the project activity involves generation of power using solar energy which is a clean source of energy. Hence no mitigation measures are required.

4.2.2 Local Stakeholder Consultation

The project activity undergoing second verification and local stakeholder consultation was appropriately conducted prior to validation to inform the design of the project and maximize participation from stakeholders during the validation.

The project proponent has implemented mechanism for ongoing communication with local stakeholders to allow stakeholders to raise concerns about potential negative impacts during implementation and operation of the project activity. The project proponent has placed a grievance register at site office/18/, where the local villagers can register their concerns.

The assessment team has checked the copy of grievance register maintained at site office/18/ and confirmed that no negative grievances were received during the current monitoring period.

4.3 AFOLU-Specific Safeguards

This is non AFOLU project, hence this section is not applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed the information flow (from data generation, calculation, and reporting of the parameters including the values) in the MR/02/. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the PD/01/.
Findings	CAR 01 was raised during the verification process and closed successfully. Refer Appendix 2 of this report for the detail closure of the CAR.
Conclusion	The baseline Emissions for a given year is calculated in accordance with the para 11 of approved methodology AMS-I.D. version 17/07/

	as the project activity claims emission reductions from electricity generation. Formula used: Baseline Emission: $BE_y = EG_{PJ,y} \times EF_{grid,y}$ Where: • BE_y = Baseline Emissions in year y (tCO₂) • $EG_{PJ,y}$ = Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh) • $EF_{grid,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (t CO₂/MWh) Here, $EG_{PJ,y} = 49,447.7 \text{ MWh}$ $EF_{grid,y} = 0.916$ $BE_y = 49,447.7 * 0.916 = 45,291 \text{ tCO}_2\text{e (Round- down value)}$ The emission reduction as per the applied methodology equals the baseline emissions (project emissions and leakage emissions for such project activities is considered zero). Emission reductions are calculated as follows: $ER_y = BE_y - PE_y - LE_y$ Where: ER_y = Emission reductions in year y (t CO₂) BE_y = Baseline Emissions in year y (t CO₂) PE_y = Project emissions in year y (t CO₂) LE_y = Leakage emissions in year y (t CO₂) Here,
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	Project Emission: As per para 20 of AMS I.D version 17, for Solar Power projects, project emission is considered as NIL. $PE_y = 0 \text{ tCO}_2\text{e}$ Leakage Emission: There is no leakage associated with the project activity was observed during the remote audit. $LE_y = 0 \text{ tCO}_2\text{e}$ Therefore, $ER_y = BE_y = 45,291 \text{ tCO}_2\text{e}$ Total Emission Reductions by the project activity during the monitoring period are 45,291 tCO₂e. The verification team confirms that appropriate methods and formulae for calculating baseline emissions have been followed. The assumptions, emission factors and default values that were applied in the calculations are justified.
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4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

All the data recorded is following the registered VCS PD/01/ and Monitoring Report/02/. The assessment team has checked the monthly invoices/17/ for electricity generation for the current monitoring period to verify the values of monitoring parameter reported in ER calculation sheet/03/ and found to be consistent.

The monitoring of the project activity is found to be in accordance with the monitoring methodology described in AMS.I-D, Version 17.0 /07/. The monitoring mechanism is effective and reliable. During the remote audit/08/, personnel involved at various levels of the operation of the project activity have been interviewed to confirm that the plant personnel are conscious of the importance of the monitoring activities.

The meters comply with appropriate quality standards applicable for the used technology. The accuracy class of the meters installed for the project activity was verified through the registered VCS PD/01/, MR /02/, and calibration certificates/04/.

The following parameters has been verified for current monitoring period:

Parameter 1: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y, $EG_{BL,y}$ (MWh)

Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	$EG_{BL,y}$ is monitored continuously and recorded on monthly basis.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The measuring and reporting frequency is in line with the monitoring plan as outlined in the registered PD/01/ and monitoring methodology/07/.
	Monitoring equipment	Energy meters of accuracy class 0.2s are used, (Calibration details of meter is provided separately in this section, under the heading "Calibration of meters")
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	Yes, the accuracy of the monitoring equipment used is 0.2s, which is as per the registered monitoring plan/01/.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes, the accuracy of monitoring equipment is valid for the entire range.

	Calibration frequency /interval:	The meters are calibrated annually, which is in line with notification by Central Electricity Authority, Govt. of India/21/ and meters have worked under their desired calibration period during the current monitoring period.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, pending until the findings are closed or as per the manufacturer's specifications?	Yes, calibration interval of meters is annual, which is in line with the monitoring plan/01/ and national standards/21/.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes, the calibration is conducted by state utility which is authorised government agency to conduct the same as per PPA.
	Is(are) calibration(s) valid for the whole reporting period?	Yes, the calibration is valid for entire monitoring period.
	How were the values in the monitoring report verified?	The values in the monitoring report were verified from the monthly JMRs/17/. Final value of net electricity supplied to the grid by the project activity is verified as 49,448 MWh .
	If applicable, has the reported data been cross-	The monthly reported values of $EG_{PJ,y}$ were further cross checked with the monthly invoices raised

	checked with other available data?	by the PP /17/ to state utility and found to be consistent.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management. QA/QC processes are in place.
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	Not Applicable
Findings	CL#01 was raised and resolved. Please refer to Appendix 2 for the detailed closure of the findings.	
Conclusion	Since 100% data has been monitored and verified, the verification team can ascertain that the values used for calculation of emission reduction are free from material errors. Implementation of the project is as per the registered monitoring plan/01/. The verification team is able to confirm that the project is implemented as per the registered PD/01/ and there is no discrepancy observed between the actual monitoring system/02/ and the monitoring plan set out in the registered PD/01/ and the applied methodology/07/. The emission reduction calculation for the project activity is estimated based on the electricity supplied by the Solar Power Plant. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Parameters fixed ex ante:

S.no.	Parameter	Value	Assessment team remark
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1.	EF _{grid,OM,y}	0.967	These values are considered from the national CEA database of India and validated in the registered VCS PD. The values are appropriately considered as per the registered VCS PD. CEA database, Version 06, March 2011 (https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver6.pdf)
2.	EF _{grid,BM,y}	0.763	
3.	EF _{grid,CM,y}	0.916	These values are considered from the national CEA database of India and validated in the registered VCS PD. The values are appropriately considered as per the registered VCS PD. CEA database, Version 06, March 2011 (https://cea.nic.in/wp-content/uploads/baseline/2020/07/user_guide_ver6.pdf) As per the EB guidelines a weightage of 75:25 is assumed in the calculation of emission factor as this is a solar based power generation project. The latest available information on CM emission factor value at the time of submission of project for request for registration would be used and this is fixed ex-ante

Calibration of meters:

The energy meters installed at respective sub-stations are of accuracy class 0.2s as verified through the calibration certificates/04/. The installation and working conditions of the meters were checked through calibration certificates/04/, JMRs/17/ and were found to be satisfactory. Details of meters are provided in below table:

- Previous Meter – ABT cum Tri-vector Meter

Parameters	Main Meter		Check Meter	
Make	L&T		L&T	
Type	3 phase 4W		3 phase 4W	
Serial No.	11080369		11080360	
Accuracy Class	0.2s		0.2s	
Calibration	Date of Calibration	Calibration due date	Date of Calibration	Calibration due date
	01/12/2011	01/12/2012	01/12/2011	01/12/2012
			01/12/2012	01/12/2013

	01/12/2012	01/12/2013	29/11/2013	29/11/2014
	29/11/2013	29/11/2014	28/11/2014	28/11/2015
	28/11/2014	28/11/2015		

- Current Meter – ABT cum Tri-vector Meter

Parameters	Main Meter		Check Meter	
Make	Secure		Secure	
Type	E3M024		E3M024	
Serial No.	APX00365		APX00366	
Accuracy Class	0.2s		0.2s	
Calibration	Date of Calibration	Calibration due date	Date of Calibration	Calibration due date
	04/02/2015	04/02/2016	04/02/2015	04/02/2016
	03/02/2016	03/02/2017	03/02/2016	03/02/2017
	03/02/2017	03/02/2018	03/02/2017	03/02/2018

It is evident from the above table that calibration of all the existing meters was valid during the current monitoring period, hence no delay in calibration of meters identified. The CEA Notification No. 502/70/CEA/DP&D dated 17/03/2006 and its amendments Notified on 26/06/2010 No. 502/6/2009/DP&D/D-I /21/ which is considered as national standard, mentions that for voltage of 650 V up to 33 kV, 0.5s accuracy class or above is recommended. Hence, the accuracy classes of 0.2s for the energy meters installed at the project activity site are found to be appropriate.

The details of monitoring equipment are involved in the project activity and their calibration details/04/ are mentioned in section 4.2 of the VCS MR/02/. The CEA Notification No. 502/70/CEA/DP&D dated 17/03/2006/21/ which is considered as national standard mentions that “All interface meters shall be tested at least once in five years.” Hence, the stipulated calibration frequency ‘once annually’ is appropriate.

In view of the above discussion the assessment team able to confirm that evidence used to determine the GHG reductions and removals are sufficient and appropriate with respect to quality and quantity.

4.6 Non-Permanence Risk Analysis

This project is not AFOLU project. Hence, this section is not applicable for the project activity.

5 VERIFICATION CONCLUSION

Earthood Services Private Limited (ESPL), contracted by EcoCapita Consulting Private Limited, to perform the independent second verification of the emission reductions for the VCS project activity reference number 1093 “Solar Power project by Sai Sudhir Energy Limited” in India for the monitoring period 31/05/2012 to 31/12/2017 (inclusive both days) reported in the Monitoring Report Version 03 dated 15/04/2022.

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity. ESPL commenced the verification on the basis of the baseline and monitoring methodology “AMS-I.D, Version 17.0”, the monitoring plan contained in the registered VCS PD/1/ and VCS guidelines version 4.1/12/, Monitoring Report Version 03 dated 15/04/2022 as per the process described under Section 2 of this report.

ESPL’s verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion the GHG emissions reductions reported for the project activity for the period 31/05/2012 to 31/12/2017 are fairly stated in the Monitoring Report Version 03 dated 15/04/2022. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology “AMS-I.D, Version 17.0” and the VCS standard version 4.2/11/.

The annual estimated emission reduction for this monitoring period is 46,180 tCO₂e. Whereas the actual emission reduction for this monitoring period is 45,291 tCO₂e. There was a decrease in generation as compared to the projected generation due to a minor difference in PLF, which has led to 1.925% lower ERs as compared to the estimated value.

Verification period: From 31/05/2012 to 31/12/2017

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2012 (31/05/2012 to 31/12/2012)	4,834	0	0	4,834
2013 (01/01/2013 to 31/12/2013)	8,284	0	0	8,284
2014 (01/01/2014 to 31/12/2014)	8,201	0	0	8,201
2015 (01/01/2015 to 31/12/2015)	8,302	0	0	8,302
2016 (01/01/2016 to 31/12/2016)	7,759	0	0	7,759

2017 (01/01/2017 to 31/12/2017)	7,911	0	0	7,911
Total	45,291	0	0	45,291



Approved by

Kaviraj Singh

Managing Director

Earthood Services Private Limited

Date: 28/04/2022

Place: Gurgaon, Haryana

APPENDIX 1: DOCUMENT REFERENCES

S.No	Title of Document	Version	Date
1.	Registered PD	01	04/03/2013
2.	VCS Monitoring Report	03	15/04/2022
3.	ER spread sheet	01	08/03/2022
4.	Certificates of Calibration for all energy meters	-	Various
5.	MNRE Report on “Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects”	-	01/09/2013
6.	Plant Records/Logbooks/DCS record for the duration of monitoring period (31-May-2012 to 31-December-2017)	-	-
7.	AMS I.D: Grid Connected Renewable Electricity Generation	17	-
8.	Remote Audit through Skype video call/Telephonic discussions	-	15/03/2022
9.	Commissioning certificate	-	-
10.	VCS webpage for the project, https://registry.verra.org/app/projectDetail/VCS/1093	-	Last accessed on 22/04/2022
11.	VCS Standard	4.2	Last accessed on 22/04/2022
12.	VCS Program Guide	4.1	Last accessed on 22/04/2022
13.	Letter of declaration dated from PP regarding not having created or sought any other form of environmental credit for the same period and double counting	-	21/04/2022
14.	Google Earth desktop/Mobile application	-	Last accessed on 23/03/2022
15.	Technical Specifications by technology supplier	-	-
16.	Skill development training course certificates for 20 numbers of children attended	-	12/07/2016
17.	JMR & Invoices	-	-
18.	Copy of grievance register/suggestion box placed at site office	-	-
19.	Latest photographs of SCADA system, solar panel, invertors, transformers, and energy meters installed at site	-	-
20.	Validation Report	1.2	07/05/2012
	Previous Verification Report https://registry.verra.org/app/projectDetail/VCS/1093	01	04/03/2013
21	Central Electricity Authority (Installation and Operation of Meters) Regulations	06	17/03/2006
	CEA Database: CO ₂ Baseline Database for Indian Power sector		

APPENDIX 2: FINDINGS OVERVIEW

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

FAR ID	NA	Section no.	NA	Date : DD/MM/YYYY
Description of FAR				
No FAR from validation or verification.				
Project participant response				Date : DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

Table 2. CL from this verification

CL ID	01	Section no.	NA	Date : 15/03/2022
Description of CL				
PP is requested to submit the calibration details.				
Project participant response				Date : 15/04/2022
The calibration certificate is submitted to DOE.				
Documentation provided by project participant				
1. Calibration certificate				
DOE assessment				Date: 25/04/2022
PP has submitted the calibration certificates for all energy meters which confirm the regular operation of the meters. Thus, CL01 is closed.				

CL ID	02	Section no.	1.9 of MR	Date : 15/03/2022
Description of CL				
Please submit declaration confirming that the GHG Emission reductions or removals generated by the project activity will not be used for compliance with an emission trading program or to meet binding limits on GHG Emissions.				
Project participant response				Date : 15/04/2022
The declaration is provided to DOE with aforementioned statement.				
Documentation provided by project participant				
1. Declaration from PP				
DOE assessment				Date: 25/04/2022
PP has submitted a declaration in effect of avoiding double counting with regard to participation under other GHG Programs/other forms credits, rejection under other GHG program, renewable energy certificate schemes. Thus, CL02 is closed.				

CL ID	03	Section no.	1.11 of MR	Date : 15/03/2022
Description of CL				
PP is requested to adhere to VCS Guidelines and provide atleast 3 Sustainable Development Contributions.				
Project participant response				Date : 15/04/2022
The revised Monitoring Report is updated with three SDG contributed by Project Participant.				
Documentation provided by project participant				

1. Updated MR version 02 and Appendix 1 with photographs for Classroom sessions of Grade 1 - Foundational Literacy and Numeracy for the children.
2. Skill development training course certificates (12/07/2016) for candidates attended.
DOE assessment
Date: 25/04/2022
The revised MR is checked and found that section 1.11 of MR is updated with SDG 7.2, 13 and 4.1. Evidence such as JMR and invoices for SDG 7.2 and ER spreadsheet for SDG 13 are already submitted and verified. For SDG 4.1, PP has now provided the photographs for Classroom sessions of Grade 1 - Foundational Literacy and Numeracy in Appendix 1 of the revised MR. Also, skill development training course certificates dated 12/07/2016 for 20 numbers of children attended are provided for verification and found to be appropriate.
Thus, CL03 is closed.

CL ID	04	Section no.	2.0 of MR	Date : 15/03/2022
Description of CL				
PP is requested to provide grievance register to verify the details of the stakeholder's comments mentioned in section 2.2 of the MR.				
Project participant response				Date : 15/04/2022
The scanned copy of the grievance register is provided to DOE				
Documentation provided by project participant				
1. Scanned copy of complaint / grievance register				
DOE assessment				Date: 25/04/2022
PP has submitted the grievance register and it was checked that no complaints were received from the stakeholders.				
Thus, CL04 is closed.				

CL ID	05	Section no.	3.2 of MR	Date : 27/04/2022
Description of CL				
PP is requested to clarify on the correct crediting period as the website of VERRA shows (refer below weblink) from 15/04/2012 -14/04/2022.				
https://registry.verra.org/app/projectDetail/VCS/1093				
Project participant response				Date : 15/04/2022
It is to clarify that the project was registered on APX registry and later it has been transferred to VERRA registry. During this transition phase the VERRA has wrongly mentioned the crediting from 15/04/2012 - 14/04/2022. It is to be noted that the crediting period as per the registered PD is from 5/01/2012 – 30/05/2012 and for the CDM crediting was from 31/05/2012 to 30/05/2022.				
https://registry.verra.org/mymodule/ProjectDoc/Project_ViewFile.asp?FileID=40151&IDKEY=kq934lkm_sad39asjdkfj90qlkalsdkngaf98ulkandDfdvDdfh955368229/				
However, PP has not claimed any credits from the CDM and also not intended to claim in future (please refer the below the CDM weblink)				
https://cdm.unfccc.int/Projects/DB/RINA1338475072.72/view				
The crediting period is revised as the PP has opted to avail Emission reductions only from VCS (VERRA) during the revised crediting period.				
Apart from this there has been no project description deviation applied during validation & previous verifications as well as in the current monitoring period. This change in crediting does not affect the additionality of the project				
Documentation provided by project participant				

NA	
DOE assessment	Date: 25/04/2022
The explanation provided by the PP have been cross verified with the information available in VERRA website as well as with the CDM website. It is confirmed that the PP has not claimed any credits from CDM. The crediting period from 15/04/2012 -14/04/2022 showing in VERRA is not correct as this might have erroneously mentioned due to transition from APX registry to VERRA. PP has revised the crediting period from 31/05/2012 to 30/05/2022 which is valid and inline with VCS standard 4.2 and VCS program 4.1 guidelines. This change doesn't affect the additionality proven for the project activity. Also, PP has submitted a declaration in effect of avoiding double counting with regard to participation under other GHG Programs/other forms credits, rejection under other GHG program, renewable energy certificate schemes as raised in CL02 and successfully closed. Thus, CL05 is closed.	

Table 6. CAR from this verification

CAR ID	01	Section no.	5.4 of MR	Date : 15/03/2022
Description of CAR				
The PP is requested to revise the ex-ante estimation for the emission reduction for current monitoring period mentioned in section 5.4 of the monitoring report.				
Project participant response				Date : 15/04/2022
The ex-ante estimation for the emission reduction for current monitoring period mentioned in section 5.4 of the monitoring report is corrected in revised monitoring report				
Documentation provided by project participant				
1. Updated Monitoring Report version 03				
DOE assessment				Date: 25/04/2022
The revised MR is checked and found that section 5.4 of MR is updated correctly.				
Thus, CAR01 is closed.				

APPENDIX 3: ABBREVIATIONS

Abbreviations	Full texts
ABT	Availability Based Tariff
BEF	Baseline Emission Factor
BM	Build Margin
CAR	Corrective Action Request
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CL	Clarification Request
CMS	Central Monitoring System
CMP	Conference of Parties Serving as Meeting of Parties
CO ₂	Carbon dioxide
DISCOM	Distribution Company
EB	Executive Board
FAR	Forward Action Request
GHG	Green House Gas
ISO	International Standards Organization
JMR	Joint Meter Reading
KW	Kilowatt
KWh	Kilowatt hour
MFR	Multi-Function Relay
MR	Monitoring Report
MWh	Megawatt-hour
NVVN	NTPC Vidyut Vyapar Nigam Ltd.
PD	Project Description
PLF	Plant Load Factor
PP	Project Proponent
QA/QC	Quality Assurance and Quality Control
APEPDCL	Eastern Power Distribution Company of AP Limited
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCSA	Voluntary Carbon Standard Association
VCS PD	VCS Project Description

VCUs	Voluntary Carbon Units
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APPENDIX 4: COMPETENCY STATEMENTS

Competence Statement			
Name	N Premjit Singh		
Education	B.Tech in Mechanical Engineering M.Tech in Energy Technology		
Experience	9+ Years		
Field	Climate Change, Energy		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS I.D		
Local expert	YES		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	YES (TA 1.2)		
Reviewed by	Deepika Mahala (Quality Manager)	Date	19/08/2021
Approved by	Ashok Gautam (Technical Manager)	Date	25/08/2021

Competence Statement			
Name	Harsh Raval		
Education	Bachelor of Engineering in Chemical Engineering Master of Science in Environmental and Energy Engineering		
Experience	15 Years		
Field	Climate Change, Environment and Waste Management		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	YES (AMS-I.D, ACM0002)		
Local expert	YES (INDIA)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert (1.2)	YES		
Reviewed by	Deepika Mahala (Quality Manager)	Date	08/12/2021
Approved by	Ashok Gautam (Technical Manager)	Date	08/12/2021

Competence Statement			
Name	Mihika Saxena		
Education	B. Tech Civil Engineering		
Experience	NA		
Field	Environmental Engineering		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	YES		
Reviewed by	Deepika Mahala	Date	09/03/2022
Approved by	Ashok Gautam	Date	09/03/2022