BUNDLED SOLAR POWER PROJECT BY VECTOR GREEN ENERGY PRIVATE LIMITED

Document Prepared by

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Summary:

M/s VKU Certification Pvt. Ltd. (hereafter referred as VKU) was commissioned by M/s EKI Energy Services Limited (hereafter referred as EKI), to perform the fourth verification under first crediting period for the project activity "Bundled Solar Power Project by Vector Green Energy Private Limited" (VCS ID 1770[1]) in India, covering monitoring period from 02-April-2021 to 31-October-2022 (Inclusive of both start and end dates) under first crediting period[2] from 28-June-2016 to 27-June-2026 (Inclusive of both dates) with regard to the relevant requirements for VCS activities.

The project activity entails the installation of solar power projects in two different Indian states with 40 MW_{AC} Andhra Pradesh and 65 MW_{AC} in Telangana. The project's total installed capacity is 105 MW_{AC}. This is a bundled project which employs solar energy to generate electricity and then distributes that electricity to the Indian grid.

This project activity is a greenfield project, meaning that there were no renewable energy-based electricity generation facilities at each site of the bundled project, and the equivalent amount of electricity would have been provided by the grid that was dominated by fossil fuels. This project activity significantly reduces GHG emissions by substituting solar energy for fossil fuel-based electricity.

[1] https://registry.verra.org/app/projectDetail/VCS/1770

[2] This is the first renewable crediting period as per the registered VCS Joint PD&MR Version 02 dated 16-July-2018

The purpose of the verification is to have an independent review ex-post determination of the monitored reductions in GHG emission reductions and verify that the monitoring methodology was implemented according to the monitoring plan and monitoring data used to confirm the reductions in anthropogenic emissions by sources is sufficient, definitive and presented in a concise and transparent manner.

The verification scope of the project is:

- To verify that the project is implemented as described in the registered VCS Joint PD&MR/3/.
- To assess the project's compliance with other relevant rules including the host country legislation.
- To confirm that the monitoring system is implemented and fully functional to generate voluntary carbon units without any double counting /17/.
- To establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.
- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan of registered VCS Joint PD&MR/3/
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidences.

Verification was conducted using VKU's procedures in line with the requirements specified in the VCS Program Guide version 4.2/4/, VCS Standard Version 4.3/5/, VCS Validation and Verification Manual version 3.2/6/, CDM M&P, the latest version of the CDM Validation and Verification Standard/7/.

The verification consisted of desk review, on-site assessment and the resolution of outstanding issues and the issuance of the final verification report and certification.

The verification team ensured that the reported emission reductions are complete and accurate in accordance with applicable VCS requirements in order to be certified therefore the verification team has detected no further uncertainties.

The GHG emission reductions were calculated on the basis of the ACM0002, "Grid-connected electricity generation from renewable sources"- Version18.1[3]/9/ and "Tool to calculate the emission factor for

[3]https://cdm.unfccc.int/methodologies/DB/5725LCHYPYM4I1V8OD9SFYVAMFFWNP

an electricity system"; Version 6.0[4] /31/ and the monitoring plan included in the registered VCS Joint PD&MR version 02 dated 16-July-2018/3/.

During this verification, 03 Corrective Action Requests (CARs) and 02 Clarification Requests (CLs) were identified related to operation, monitoring and GHG emission reduction calculation of the VCS project activity in relation to all relevant VCS requirements for the project activity and the applied baseline and monitoring methodology, and these CARs and CL are successfully closed after necessary corrections/clarifications by the client. The same has been discussed in Appendix B of this verification report.

In conclusion, it is VKU's opinion that the project activity "Bundled Solar Power Project by Vector Green Energy Private Limited" (VCS ID 1770) in Andhra Pradesh and Telangana states of India meets all relevant requirements for VCS standard and guidelines and correctly applies the baseline and monitoring methodology ACM0002, Grid-connected electricity generation from renewable sources-Version 18.1/9/. The monitoring system is in place and the emission reductions are calculated without any material misstatement.

Hence, VKU is able to certify that the emission reductions from the project during the monitoring period from 02-April-2021 to 31-October-2022 (inclusive of both start and end dates) under the first crediting period from 28-June-2016 to 27-June-2026 (Inclusive of both dates) amount to 290,199 tCO_2e.

[4] https://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v6.pdf

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1 INTRODUCTION

1.1 Objective

M/s EKI Energy Services Limited (hereafter referred as EKI) Commissioned by M/s VKU Certification (here after referred as VKU) to perform the fourth verification under first crediting period; for the project "Bundled Solar Power Project by Vector Green Energy Private Limited" (VCS ID 1770) from 02-April-2021 to 31-October-2022 (Inclusive of both start and end dates) under first crediting period from 28-June-2016 to 27-June-2026 (Inclusive of both dates).

This report details the findings of the project's verification, which was carried out in accordance with the VCS Requirements, as well as guidelines for assuring uniform project operations, monitoring and reporting.

The purpose of the verification is to have an independent evaluation of a project activity by an accredited validation and verification body against the requirements of the VCS Program Guide Version 4.2/4/, VCS Standard Version 4.3/5/ and GHG program applied, on the basis of the registered VCS Joint PD&MR version 02 /3/.

This is the fourth verification under first crediting period for the period of 19 months i.e., from 02-April-2021 to 31-October-2022 (Inclusive of both start and end dates) that comes under first crediting period[5] from 28-June-2016 to 27-June-2026 (Inclusive of both dates).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- All structural characteristics (technology, project equipment, monitoring and metering equipment) of the project are in place, and the project activity has been carried out and operated in accordance with the registered VCS Joint PD&MR /3/;
- The monitoring report/1/ and other supporting documents are complete; the data is collected and calculated in accordance with the monitoring methodology /9/ and approved monitoring plan.
- To confirm that the monitoring system is implemented and fully functional to generate Verified Carbon Units (VCUs) without any double counting,
- To establish that the data reported are accurate, complete, consistent, transparent and free of any material error or omission by checking the monitoring records and the emissions reduction calculation

[5]This is the first crediting period of the project activity from 28-June-2016 to 27-June-2026. The project activity adopts renewable crediting period of 10 years period which can be renewed for maximum 2 times (As per registered VCS Joint PD&MR, version 02, dated 16-July-2018).

1.2 Scope and Criteria

The verification scope for the project activity is:

- To verify that the project is implemented as described in the registered VCS Joint PD&MR/3/
- To assess the project's compliance with other relevant rules including the host country legislation.
- To confirm that the monitoring system is implemented and fully functional to generate voluntary carbon units without any double counting.
- To establish that the data reported is accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.
- To verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan;
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement;
- To verify that reported GHG emission data is sufficiently supported by evidence.
- The verification shall ensure that the reported emission reductions are complete and accurate in order to be certified.

The project is evaluated in accordance with the requirements of the VCS Standard version 4.3/5/, VCS Programme Guide version 4.2/4/, VCS Validation and Verification Manual version 3.2/6/, as well as any applicable regulations and guidelines. VKU has used a rule-based approach in the conducting the verification, concentrating on the identification of critical reporting rules and the dependability of project monitoring, based on the recommendations in VCS Validation and Verification Manual Version 3.2/6/.

The method and criteria used for verification consisted of the following phases:

- Completeness check and desk review;
- Site visit and Onsite interviews with stakeholders;
- Resolution of outstanding issues and issuance of final verification report and signing of deed

Verification is not meant to provide any consultancy towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring report.

1.3 Level of Assurance

All the revisions in the verification report before being submitted to the client were subjected to an independent internal technical review to confirm that all verification activities had been completed according to the pertinent VKU's procedure, with a Reasonable level of assurance.

The verification report is based on the Monitoring report /1/, registered VCS Joint PD&MR /3/ and supporting documents /12//13//14//15//16//17//18//19/ made available to the assessment team and further information is also collected through performing interviews/28/ and site visit/23/.

The technical review was performed by a technical reviewer qualified in accordance with VKU's qualification procedure.

The following individuals were part of the Verification Team as presented in Table 1 below: -

Role/Qualification	Last Name	First Name
VCS Team Leader, VCS Verifier & Technical Expert (TA 1.2)	Kumar	Sanjay
Validator/Verifier-Trainee	Chauhan	Shivani
Project Trainee	Tripathi	Apoorva

The following individuals were part of the Technical Reviewer Team as presented in **Table 2** below: -

Role/Qualification	Last Name	First Name
Technical Reviewer & Technical Expert (TA 1.2)	Ahirwar	Vivek Kumar

1.4 Summary Description of the Project

The project activity involves electricity generation by renewable source (solar energy) and supplying the generated electricity to the Indian grid system which is under the purview of the Indian Electricity Grid of India. This is a greenfield project activity i.e., there was no renewable energy-based electricity generation facility in each site of this bundled project and equivalent amount of electricity would have been supplied by fossil-fuel dominated grid – which is pre-project scenario as well as baseline scenario for this project activity. The project activity ensures the reduction 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 is a grid-connected solar energy generation located at Karoor village of Mahabubnagar district and Indur village of Vikarabad district in Telangana state of India and Nelapalle village of Chittoor district in Andhra Pradesh state of India.

Winsol Solar Fields (Polepally) Pvt. Ltd. and Hindupur Solar Park Pvt. Ltd. are the Project Proponents of the project activity respectively.

The total installed capacity of the project activity is 105 MW_{AC}. The first project plant site in Andhra Pradesh was commissioned on 28-June-2016 by Hindupur Solar Park Pvt. Ltd. and is functioning successfully since then and dates are verified against registered VCS Joint PD&MR/3/ and commissioning certificates/15/ submitted by PP and also cross verified with the help of PPA/16/.

The details of the SPVs for the project and their location of installation are mentioned in **Table - 3** below: -

Project Investors	Project	Project Capacity in AC	Date of commissioning	Project location	State
Winsol Solar Fields (Polepally) Pvt.Ltd.	Solar	15 MW	01-July-2016	Karoor village of Mahabubnagar district and Indur village of Vikarabad district	Telangana
		50 MW	31-December-2016		
Hindupur Solar Park Pvt. Ltd.	Solar	40 MW	28-June-2016	Nelapalle village of Chittoor district	Andhra Pradesh

As per MR/1/, the electricity generated from the project is supplied to the state grid system which is under the purview of the Unified Indian Grid which is confirmed from registered VCS Joint PD&MR version 02, dated 16-July-2018/3/, Joint Meter Readings issued by APTRANSCO- (Transmission Corporation of Andhra Pradesh) & TSTRANSCO- (Transmission Corporation of Telangana Limited) /12/ and, previous verification reports/21/ and interview with PP/28/. This information was verified during on site assessment and found to be in line with the details provided in the registered VCS Joint PD&MR /3/.

The total emission reductions achieved In this monitoring period i.e., from 02-April-2021 to 31-October-2022 (inclusive of both dates) is 290,199 TcO_2e. The net electricity generated by the

bundled project activity that was evacuated to the grid during the current monitoring period from 02-April-2021 to 31-October-2022 (inclusive of both dates) is 300,631 MWh.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification was conducted using VKU's procedures in line with the requirements specified in the VCS Requirements, i. e. VCS Program Guide version 4.2/4/, VCS Standard version 4.3/5/. The GHG emission reductions are calculated on the basis of the approved Baseline and **monitoring methodology, ACM0002, Grid-connected electricity generation from renewable sources- Version 18.1**[6]**/9/**

Scope: 01 Energy Industries (renewable- and non-renewable sources)

Title: "Grid Connected Renewable Electricity Generation" (version 18.1) /9/.

During onsite visit/23/ verification team **reviewed 100% data for all the PV Modules, Inverters and Transformers** involved in this project at site **and hence no sampling is involved.**

The verification consisted of the following three phases

- Document review;
- On-site assessment including Interviews and actual project scenario;
- Resolution of any material discrepancy and the issuance of the final verification report and certification.

The following sections outline each step involved in verification in more detail.

2.2 Document Review

The monitoring report (MR) version 01 dated 19-December-2022, version 02 dated 31-January-2023, version 03 dated 13-February-2023, version 04 dated 20-March-2023, version 05 dated 15-June-2023 and final version 06 dated 23-June-2023; the emission reduction calculations spreadsheet version 1.0 dated 19-December-2022 and final version 02 dated 15-June-2023 /2/, were assessed as part of the verification. In addition, registered VCS Joint PD&MR /3/ in particular the baseline estimations and the monitoring plan for the project was reviewed.

The following **Table No.-4** lists the documentation that was reviewed during the verification.

/1/	EKI: VCS monitoring report for "Bundled Solar Power Project by Vector Green Energy Private Limited",

[6] https://cdm.unfccc.int/methodologies/DB/5725LCHYPYM4I1V8OD9SFYVAMFFWNP

	• Version 01 dated 19-December-2022 • Version 02 dated 31-January-2023 • Version 03 dated 13-February-2023 • Version 04 dated 20-March-2023 • Version 05 dated 15-June-2023 • Final Version 06 dated 23-June-2023
/2/	EKI: Emission Reduction Calculation Spreadsheet, • Version 01 dated 19-December-2022 • Version 02 dated 15-June-2023
/3/	EKI: registered VCS Joint PD&MR for the project 'Bundled Solar Power Project by Vector Green Energy Private Limited' version 2.0 dated 16-July-2018
/4/	VCS: VCS Program Guide, version 4.2 dated 22-June-2022
/5/	VCS: VCS Standard, version 4.3 dated 22-June-2022
/6/	VCS Validation and verification manual version 3.2 dated 19-October-2016
/7/	CDM Validation and Verification Standard version 3.0 dated 09-September-2021
/8/	VCS: Monitoring report Template VCS Version 4.1 dated 20-January-2022
/9/	CDM Executive Board: Baseline and Monitoring Methodology Baseline and monitoring methodology ACM0002", "Grid-connected electricity generation from renewable sources" (version 18.1)
/10/	UNFCCC: Project search: https://cdm.unfccc.int/Projects/projsearch.html
/11/	Gold Standard Foundation: https://registry.goldstandard.org/projects?q=&page=1
/12/	Monthly JMRs issued by PP to APTRANSCO- (Transmission Corporation of Andhra Pradesh) & TSTRANSCO- (Transmission Corporation of Telangana Limited) for the entire monitoring period from 02-April-2021 to 31-October-2022 (Inclusive of both dates).
/13/	Certificates of Calibration for all the meters that belongs to project activity for the current monitoring period from 02-April-2021 to 31-October-2022 (Inclusive of both dates)
/14/	Invoice issued by PP for current monitoring period from 02-April-2021 to 31-October-2022 (Inclusive of both dates) to: - • TSTRANSCO- (Transmission Corporation of Telangana Limited) for 15 MW_{AC} Solar Power Plant at Polepally • APTRANSCO- (Transmission Corporation of Andhra Pradesh) for 40 MW_{AC} MW Solar power Plant at Punganuru • TSTRANSCO- (Transmission Corporation of Telangana Limited) for 50 MW_{AC} Solar Power Plant at Tandur
/15/	Commissioning certificates of the project activity issued by respective state electricity authority: • 15 MW_{AC} Winsol Solar Fields (Polepally) Pvt. Ltd. has synchronized with grid on 01-July-2016 stated in letter dated 24-October-2016 • 50 MW_{AC} Winsol Solar Fields (Polepally) Pvt. Ltd. has synchronized with grid on 31-December-2016 stated in letter dated 23-March-2017

	• 40 MW_{AC} Hindupur Solar Park Pvt. Ltd. has synchronized with grid on 28-June-2016 stated in letter dated 04-November-2016
/16/	Power Purchase Agreements signed between: - • Southern Power Distribution Company of Telangana Limited and M/S First Solar power India Private Limited for establishment of 15 MW_{AC} Solar power Plant at Polepally dated 28-October-2016 • Southern Power Distribution Company of Andhra Pradesh Limited and M/S First Solar power India Private Limited for establishment of 40 MW_{AC} Solar power Plant at Punganuru dated 30-March-2015 • Southern Power Distribution Company of Telangana Limited and M/S First Solar Power India Private Limited for establishment of 50 MW_{AC} Solar power Plant at Tandur dated 08-November-2016
/17/	Letter of declaration dated 24-November-2022 from PP regarding not having created or sought any other form of environmental credit for the current monitoring period
18/	Monthly generation reports issued by O&M team for the current monitoring period from 02-April-2021 to 31-October-2022 (Inclusive of both dates): • For 40 MW_{AC} Solar power Plant at Punganuru, Andhra Pradesh between PP and Mahindra Teqo Private limited • For 15 MW_{AC} Solar power Plant at Polepally, Telangana between PP and Mahindra Teqo Private limited • For 50 MW_{AC} Solar power Plant at Tandur, Telangana between PP and Mahindra Teqo Private limited
/19/	Central Electricity Authority (Installation and Operation of Meters) Regulations Notified on 17-March-2006 No. 502/70/CEA/DP&D Amendments Notified on 26-June-2010 No. 502/6/2009/DP&D/D-I
/20/	LGAI Technological Center S.A. (Hereinafter referred as Applus+ Certification): Joint Validation & Verification report"Bundled Solar Power Project by Vector Green Energy Private Limited" of 23-July-2018 for Monitoring period 28-June-2016 to 22-May-2018 (Inclusive of both dates)
/21/	Previous VCS Verification Reports: Earthood services Private Limited: VCS Verification report for the Project"Bundled Solar Power Project by Vector Green Energy Private Limited" for monitoring period: 23-May-2018 to 22-December-2019 (Inclusive of both dates) Earthood services Private Limited: VCS Verification report for the Project "Bundled Solar Power Project by Vector Green Energy Private Limited" for monitoring period: 23-December-2019 to 01-April-2021 (Inclusive of both dates)
/22/	VERRA: https://registry.verra.org/app/projectDetail/VCS/1770
/23/	Site visit photographs and attendance sheet dated 05-January-2023 and 06-February-2023
/24/	Breakdown details of Andhra Pradesh and Telangana Sites
/25/	Technical Specifications of Solar Panels
/26/	Grievance Registers present on-site for the current monitoring period from 02-April-2021 to 31-October-2022 (Inclusive of both dates)

/27/	GPS Google software used for Location during site visit and Google earth to confirm the location of the project activity during desk review
/28/	Onsite personnel interviews dated 05-January-2023 and 06-February-2023 taken by assessment team at the site and recorded in VKU.F46W. Attendance Sheet of Onsite audit
/29/	REC website Renewable Energy Certificate Registry of INDIA for the current monitoring period from 02-April-2021 to 31-October-2022 (Inclusive of both dates) (Renewable Energy Certificate Registry of INDIA-- Registered RE Generator List (recregistryindia.nic.in)
/30/	EIA NOTIFICATION dated 14-September-2006; https://moef.gov.in/wp-content/uploads/2018/03/so1533.pdf
/31/	Tool to calculate the emission factor for an electricity system; Version 6.0

2.3 Interviews

An on-site inspection has been performed by the assessment team. However, the representatives of the PP and O&M team were interviewed personally by assessment team on 05-January-2023 at Indur village (of Vikarabad district) and Karoor village (of Mahabubnagar district) of Telangana and Nelapalle village of Chittoor district of Andhra Pradesh on 06-February-2023 respectively where personnel responsible for monitoring of the project activity, data collection and management, and QA/QC procedure were interviewed.

The details of the people interviewed are mentioned in the tables below.

Table No.-5; Lists down the site personnels interviewed for 50 MW Solar power Plant at Indur Telangana:

S. No.	Name	Designation	Topic of Discussion
1	G. Krishna Balaji	Plant In Charge	• Data archiving, breakdown details • Maintenance of generation records and Calibration of meters • Project Implementation and technical details of the Project like breakdown details, • Training requirement of the personnels • O&M of the plant site and personnel responsible for
2	B. Venkata Ramana	Sr Engineer	
3	R. Ranjith	Jr Engineer	
4	P. Tirumala Rao	Technician	
5	B. Mahesh	Technician	
6	P. Shasikanth Reddy	Technician	

7	Chandra Sekhar	Technician	monitoring of required monitored parameters and implementation of QA/QC Procedure.

Table No.-6: Lists down the local stakeholders interviewed for 50 MW Solar power Plant at Indur Telangana:

S. No.	Name	Category	Topic of Discussion
1	Y. Venugopal Reddy	Local Stakeholder	• Project activity implementation and its impact on social, economic and environmental condition of the local people. • The ongoing communication procedure and the addressal of their grievance by the project proponent • The employment generation due to project activity implementation.
2	Ramesh Reddy		

Table No.-7; Lists down the site personnels interviewed for 15 MW Solar power Plant at Karoor; Telangana:

S. No.	Name	Designation	Topic of Discussion
1	K. Veerattai	Plant In Charge	• Data archiving, breakdown details • Maintenance of generation records and Calibration of meters • Project Implementation and technical details of the Project like breakdown details, • Training requirement of the personnels • O&M of the plant site and personnel responsible for monitoring of required monitored parameters and
2	G. Vinod	Engineer	
3	M Jhon	Technician	

			implementation of QA/QC Procedure.

Table No.-8; Lists down the local stakeholders interviewed for 15 MW Solar power Plant at Karoor; Telangana:

S. No.	Name	Category	Topic of Discussion
1	S. Nuairattaur	Local Stakeholder	• Project activity implementation and its impact on social, economic and environmental condition of the local people. • The ongoing communication procedure and the addressal of their grievance by the project proponent • The employment generation due to project activity implementation.

Table No.-9; Lists down the site personnels interviewed for 40 MW Solar power Plant at Nelapalle, Andhra Pradesh:

S. No.	Name	Designation	Topic of Discussion
1	J. Bharath Kumar	Site In-charge	• Data archiving, breakdown details • Maintenance of generation records and Calibration of meters • Project Implementation and technical details of the Project like breakdown details,Training requirement of the personnelsO&M of the plant site and personnel responsible for monitoring of required monitored parameters and implementation of QA/QC Procedure.
2	Y. Mauoz Kumar	Senior Engineer	
3	Guru Swomy	Junior Engineer	
4	Mwaswain	Junior Engineer	

Table No.-10; Lists down the local stakeholders interviewed for 40 MW Solar power Plant at Nelapalle, Andhra Pradesh:

S. No.	Name	Category	Topic
1	K. Srinivas	Local Stakeholder	• Project activity implementation and its impact on social, economic and environmental condition of the local people. • The ongoing communication procedure and the addressal of their grievance by the project proponent • The employment generation due to project activity implementation.
2	Eshwaryya		
3	R. Ramchandr		
4	G. Krishna		
5	S. Ashok		
6	T. Sukumar		
7	B. Laxmero		
8	G. Prashanth		
9	B. Prshanth		

The topics covered during the onsite visit interview with the site personnels and O&M team ranges from general features and implementation of project to technical details of the project like calibration details, monitoring and measuring system and data collection, recording and archiving procedures. The assessment was drawn based on the feedback received during interview coupled with the documentation review

During the on-site stakeholder consultation interview, there were no negative comments received from stakeholders which need to be addressed by PP hence accepted. More information is provided in section 4.2.2 below for local stakeholder ongoing communication.

2.4 Site Inspections

On-site visit was undertaken by the verification team to the project location identified in the MR at Indur village (of Vikarabad district) and Karoor village (of Mahabubnagar district) of Telangana state in India on 05-January-2023 and Nelapalle village of Chittoor district of Andhra Pradesh on 06-February-2023 to carry out the following; Refer Appendix-D for the onsite audit schedule followed by VVB: -

- A review of the operation and implementation of the registered project activity in accordance with the VCS Joint PD&MR /3/and VCS MR/1/.

- An analysis of the information flows used to generate, aggregating and reporting the monitoring parameters.
- Interviews/28/ with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the registered VCS Joint PD&MR /3/
- A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, DGR Reports, JMRs, or other similar data sources
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the VCS Joint PD&MR /3/ the applied methodology/9/ including applicable tool/31/
- A review of calculations and assumptions made in determining the GHG data and 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.

2.5 Resolution of Findings

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

- If monitoring and reporting reveal non-conformities with the monitoring plan or methodology, or if the evidence offered to demonstrate conformity is insufficient;
- Errors in the application of assumptions, data, or calculations of emission reductions have been made, which will affect the estimate of emission reductions;
- The project's proponent has not addressed issues encountered in a FAR during validation or previous verification which needs to be assessed during current verification.

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, **02 CLs, 03 CARs and 00 FARs** were raised during this current verification which were closed successfully and details are given under Appendix B of this report.

2.5.1 Forward Action Requests

This is the fourth periodic verification of the project activity and no FAR was raised from validation /20/ and previous verifications /21/ which needs to be closed in current verification.

2.6 Eligibility for Validation Activities

VKU has performed only the fourth periodic verification under first crediting period of the project activity and has not undertaken any validation activities as a part of the verification and does not

hold the accreditation for Validation[7] of projects under this or any relevant Sectoral Scope. Hence this section is not applicable for current verification.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The project is neither registered nor seeking registration under any GHG program and it is only registered under VCS with project ID: 1770[8]. Assessment Team has verified the same from Verra Registry and similar exercise was performed for CDM/GS/GCC/UCR registries with similar project title/capacity and Project Proponents but the assessment team was not able to trace any such project registered under any of the above stated registries or under any other similar mechanisms. This was further confirmed through a declaration/17/ submitted by the PP in which they have mentioned that they will not claim same GHG emission reductions of the project from any other GHG program thus ensuring emission reduction generated from the project activity for current monitoring period (from 02-April-2021 to 31-October-2022; Inclusive of both dates) will not be double counted hence accepted by the assessment team.

Audit team also checked the REC Mechanism database of India and found that the project activity is not accredited / registered under REC mechanism of India which was also verified from the REC website (Renewable Energy Certificate Registry of India)(Renewable Energy Certificate Registry of INDIA - Registered RE Generator List (recregistryindia.nic.in)/29/ Further, declaration/17/ for the same is submitted by the PP which was examined by the assessment team and was found correct. Later assessment team checked the following registries to confirm the same. The details of the registries checked are as follows:

1. https://www.recregistryindia.nic.in/
2. http://cdm.unfccc.int/
3. http://www.goldstandard.org/
4. https://verra.org/verra-standards-and-programs/.
5. https://www.ucarbonregistry.io/
6. https://projects.globalcarboncouncil.com/

[7] https://verra.org/validation-verification/vku-certification-pvt-ltd/#vcs

[8] https://registry.verra.org/app/projectDetail/VCS/1770

Rejection by other GHG programs

The Project is not rejected by other GHG programs. A declaration/17/ for the same is checked and found correct by the assessment team. Also, assessment team independently verified with the following registries and checked projects from the PP matching the same project design and found that no such project either exists or were rejected by the registries.

The details of the registries checked are as follows:

1. https://www.recregistryindia.nic.in/
2. http://cdm.unfccc.int/
3. http://www.goldstandard.org/
4. https://verra.org/verra-standards-and-programs/
5. https://www.ucarbonregistry.io/
6. https://projects.globalcarboncouncil.com/

Hence based on the aforementioned statements, it can be concluded that the project meets the requirement to participate in the VCS Program

3.2 Methodology Deviations

During the current monitoring period, no methodology deviation was observed and even during the previous verifications /21/, no methodology deviations were observed.

3.3 Project Description Deviations

Deviation 1-

PP has requested the deviation in section 1.7 of MR for the correction in the Geo-coordinates of 40 MW Hindupur Solar Park Pvt. Ltd., Chittoor, Andhra Pradesh site and they are revised to exact site location, there was some minor correction in minutes & Seconds of values in this monitoring period. The revised location by PP in the MR/1/ is assessed by assessment team properly with the help of google earth and found to be correct thus accepted by VKU. This deviation is of permanent nature and does not affect the additionality and baseline scenario of the project activity, hence accepted.

Deviation 2-

PP has requested the deviation in section in section 4.3 of MR to update the emergency preparedness of the meter monitoring. In the event that the main meter, which is used to record the net electricity exported by the project, is found to be faulty it will be repaired or replaced and the data from the check meter will be used in its place. In the unlikely event that the check meter

fails it will also be repaired or replaced. The emergency preparedness is seemed to be followed at site although no such situation has occurred in current monitoring period and same was verified through interview with the site personnel, hence accepted by VKU.

3.4 Grouped Project

This is not a grouped project. Therefore, this section is not Applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the onsite audit with PP representative, it was concluded that the project is implemented as per the requirement of the registered VCS Joint PD&MR /3/and approved monitoring plan. During the current monitoring period, it was observed through breakdown details provided by PP for all 3 sites /24/and Appendix section of MR/1/ that no unforeseen incident/event evolved which can impact the operation of the project activity. The project underwent continuous operation and only scheduled maintenance as per the manufacture's specification happened which is acceptable to the assessment team as verified during the interview with PP personnel/28/ Senior engineers/Junior engineer/Assistant manager present at site during onsite visit. Moreover, there is no unforeseen incident which can affect the applicability of the methodology and thus the same is acceptable to the assessment team.

During the current monitoring period, all the solar power plants were operational and the project activity has supplied 300,631 MWh of electricity, and thus contributing to 290,199 tCO_2e GHG emission reductions.

The breakdown and Operational hours for each site are mentioned in the **Table-9** below that occurred during the current monitoring period due to failed supply from GSS end, tripped inverter, string cable failure, FO cable communication, Insulation failure, etc. This breakdown information is listed in Appendix 2 of MR /1/ and verified with the help of breakdown details/25/ submitted by PP and found to be consistent. The overall breakdown length is computed as 8 hours 57 minutes for 40 MW Hindupur Solar Park Pvt.Ltd. Andhra Pradesh site and for 15 MW Winsol Solar Fields (Polepally) Pvt. Ltd. in Telangana as 12 hours 56 minutes and for 50 MW Winsol Solar Fields (Polepally) Pvt. Ltd. in Telangana as 37 hours 33 minutes.

The total breakdown hours for the project activity are calculated as 58 hours and 20 minutes which is just 0.42% of the total operational hours, hence there have been no substantial repercussions of plant breakdown on the project activity's reduction of GHG emissions.

The breakdown and operational hours site wise are mentioned in the **Table No.-11;** below: -

S.No.	Plant Site	Capacity	Net Operational Hours	Breakdown hours
1.	Winsol Solar Fields (Polepally) Pvt.Ltd.	15 MW	13,621 hours and 40 minutes	12 hours 56 minutes
		50 MW		37 hours 33 minutes
2.	Hindupur Solar Park Pvt.Ltd.	40 MW		8 hours 57 minutes
Total				58 hours 20 minutes

Project location is confirmed by the assessment team through the GPS Google software/27/. Moreover, assessment team confirms that the latitudes and longitudes as mentioned in the registered VCS Joint PD&MR /3/ are correct. The latitudes and longitudes of project activity are confirmed as listed in **Table No.-12** below:

S. No.	Project Owner	Capacity	District	State	Latitude (N)	Longitude (E)
1	Winsol Solar Fields (Polepally) Pvt.Ltd.	15MW	Mahabubnagar	Telangana	16°51'49.9"	78°05'33.6"
		50 MW	Vikarabad	Telangana	17°20'41.4"	77°36'56.6"
2	Hindupur Solar Park Pvt.Ltd.	40MW	Chittoor	Andhra Pradesh	13°19'31.90"	78°40'10.75"

Assessment team checked the commissioning certificates of all 3 sites/15/ and confirmed that the dates of commissioning for the Project are correct. Assessment team also confirmed during the onsite audit/23/ that there is no change in project design viz., capacity of the solar panels remained the same and the project is implemented as per the description provided in the registered VCS Joint PD&MR /3/. This has been further verified from the Validation report/20/ and previous verification reports/21/.

Commissioning dates for project activity are given below in **Table No.–13 below**:

S. No.	Project Owner	Capacity	Date of Commissioning	Village	Mandal	District	State

1	Winsol Solar Fields (Polepally) Pvt.Ltd.	15MW	01-July-2016	Karoor	Nawabpet	Mahabubnagar	Telangana
		50 MW	31-December-2016	Indur	Peddumal	Vikarabad	Telangana
2	Hindupur Solar Park Pvt.Ltd.	40MW	28-June -2016	Nelapalle	Peddapanjani	Chittoor	Andhra Pradesh

The parameters have been verified with the name plates as well as with the technical specifications of Solar Panels and also cross checked from the technical manual of the Manufacturers/25/. Assessment team confirms that the technical parameters are consistent with the registered VCS Joint PD&MR /3/.

The major technical specifications of the project activity are as follows:

Solar PV Project Technology Details –

The project activity aims to harness solar energy through installation of Solar PV project with total installed capacity of 105 MW_{AC}.

Table No.–14; The technical specification of 40 MW_{AC} plant by Hindupur Solar Park Pvt Ltd in Andhra Pradesh are as follows: -

S. No.	Technical details of the equipment	Description
1	Make of modules installed	First solar series4V2
2	No. of the modules installed	Wp capacity – 110 & 112.5 Wp Total No. of modules - 432300 Nos.
3	Tilt angle	11 degrees
4	Make & Model of Invertor	Make – ABB Model – PVS -800-57-1000kW-C
5	Number of Inverters	40 Nos.
6	Make & Number of Transformers& Capacity	Voltamp Transformer Ltd.- 2000 kVA – 20 Nos,

Table No.–15; The technical specification of 15 MW_{AC} plant by Winsol Solar Fields (Polepally) Pvt Ltd in Telangana are as follows: -

S. No.	Technical details of the equipment	Description
1	Make of modules installed	First solar series4V2
2	No. of the modules installed	Wp Capacity – 100, 102.5,105, 107.5 Wp. Total No. of modules – 172788 Nos.

3	Tilt angle	13 degrees
4	Make & Model of Invertor	Make – ABB Model – PVS-800-57-1000kW-C
5	Number of Inverters	15 Nos.
6	Make & Number of Transformers& Capacity	Voltamp – 2000 kVA – 7 Nos. Voltamp – 1000 kVA – 1 No. Schneider – 25/30 MVA – 1 No.

Table No.–16;The technical specification of 50 MW_{AC} plant by Winsol Solar Fields (Polepally) Pvt Ltd in Telanganaare as follows: -

S. No.	Technical details of the equipment	Description
1	Make of modules installed	First solar series4V2
2	No. of the modules installed	Wp Capacity – 100, 112.5 Wp Total No. of modules – 551840 Nos.
3	Tilt angle	13 degrees
4	Make & Model of Invertor	SMA – SC 2500-EV – 19 Nos. ABB – PVS -980-58-2000 kVA-K – 2 Nos. ABB – PVS-980-58-2091 kVA -L – 1 No.
5	Number of Inverters	22
6	Make & Number of Transformers& Capacity	Voltamp – 2250 kVA – 9 Nos. Scilchar – 2250 kVA – 10 Nos. Scilchar – 2000 kVA – 2 Nos. Scilchar – 2700 kVA – 1 No Bharat Bijlee – 35/40 MVA – 2 Nos.

The assessment team confirmed through onsite interview with PP representatives /28/ that there is no proposed or actual change to the project design during this monitoring period except Deviation 1 and Deviation 2 explained in section 3.3 above. It was observed that the monitoring plan was implemented as per the registered VCS Joint PD&MR /3/and applied methodology ACM0002, Version 18.1/9/. The organizational role and responsibility as mentioned in the registered VCS Joint PD&MR /3/ is followed onsite. Meters are calibrated as per calibration frequency mentioned in registered VCS Joint PD&MR /3/.

Assessment team concludes the following:

- There are no material discrepancies between project implementation and the project description provided in the registered VCS Joint PD&MR /3/. However, 2 deviations in project description are requested by PP in section 2.1.2 of MR/1/ which have been verified by assessment team and explained in section 3.3 of this report.

- 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 as per the registered monitoring plan in VCS Joint PD&MR/3/ and MR/1/.
- There are no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology/9/. However, Deviation-2 is requested by PP in section 2.1.2 of MR/1/ in the current monitoring period regarding the emergency preparedness updation in monitoring plan set out in section 4.3 of MR/1/ submitted to assessment team. This has been verified during onsite visit interviews with PP and it is in line with the PPAs /16/ in place hence accepted by VKU. This has been properly addressed inn section 3.3 of this report.
- The GHG emission reductions or removals generated by the project have not been included in any emissions trading program or any other mechanism that includes GHG allowance trading/17/.
- The project has not received or sought any other form of environmental credit, or has become eligible to do so since validation/20/ or previous verifications/21/
- The project is registered under VCS only; however, PP has submitted the declaration stating/17/, they will not claim same GHG emission reductions of the project from any other GHG program for the current monitoring period when project is seeking to get GHG emission reduction from VCS. Audit team also checked the REC mechanism- Renewable Energy Certificate Registry of India (Renewable Energy Certificate Registry of INDIA - Registered RE Generator List (recregistryindia.nic.in))/29/ which confirms that the project is not registered under this mechanism.
- The project activity complies with 2 indicators for sustainable development in the interim approval guidelines for Clean Development Mechanism (CDM) projects from India as discussed under section 1.11 of MR. In which SDG indicator taken by PP are;
    - **7.2 i.e. (Renewable energy share in the total final energy consumption)** As a part of this project activity the renewable electricity supplied to Indian grid over project lifetime is 1,158,024 MWh which has helped to strengthen the renewable energy share in the energy mix. For the current monitoring period project has supplied the 300,631 MWh of electricity to Indian grid. Assessment team has referred previous verification reports/21/ to verify the claims and found that the above claimed renewable electricity supplied to Indian grid to be correct.
    - **13.0 i.e. (Tonnes of greenhouse gas emissions avoided or removed)** Due to installation of this project activity, PP has prevented the release 1,117,834 tCO_2e emissions into the atmosphere over project lifetime. For the current monitoring period the project activity has prevented the release of 290,199 tCO_2e emissions. Assessment team has referred previous verification reports/21/ to verify the claims and found that the above claimed emission reductions to be correct Thus, proving that the project generates eco-friendly, GHG free power which contributes to sustainable development of the region.

Table No.–17; SDG Contributions of the project activity

S. No.	Renewable energy share in the total final energy consumption (MWh)	Tonnes of greenhouse gas emissions avoided or removed (tCO_2e)	Monitoring Period dates
1	321,387	310,233	28-June-2016 to 22-May-2018 (Inclusive of both dates)
2	301,162	290,710	23-May-2018 to 22-December-2019 (Inclusive of both dates)
3	234,844	226,692	23-December-2019 to 01-April-2021 (Inclusive of both dates)
4	300,631	290,199	02-April-2021 to 31-October-2022 (Inclusive of both dates) (Current Monitoring period)
Total	1,158,024	1,117,834	

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 registered VCS Joint PD&MR/3/, All the above stated information was verified by VVB during onsite visit/23/ and site personnel interviews /28/

4.2 Safeguards

4.2.1 No Net Harm

Due to the project's use of renewable solar energy, there are no adverse socioeconomic or environmental effects. In fact, project activity benefits the area by promoting sustainable development through the provision of environmentally friendly power. Additionally, the generation of jobs aids in improving the socioeconomic standing of the region. As per the EIA notification dated 14-September-2006, the solar power projects are exempted from environmental clearance. Hence, Environmental impact assessment is not required for this project activity.

Ministry of Environment & forests vide their OM J-11013/41/2006 - IA II (I) dated 13-May-2011[9], has re-affirmed this and exempted solar power plants from EIA and Environmental Consent requirement. Hence verification team confirms that there are no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity. Hence verification team confirms that there are no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity.

Additionally, PP highlighted in MR/1/ that there was no influence on the area's air, water, or ecology during the project's operational and maintenance phases. The project activity helps to strengthen the region's skilled and unskilled labour force, as PP also emphasised in MR /1/. The project created job opportunities both during construction and operation phase of the project. This was confirmed during on-site interviews /28/ and has improved socio-economic impacts in the project region. The project activity increases the employment rate and standard of living for local residents nearby. As a result, the project activity has not caused any net harm.

4.2.2 Local Stakeholder Consultation

The Project is already registered with VCS and registered VCS Joint PD&MR /3/; sections 2.2 describe the Local Stakeholder Consultation Process as in-line with VCS requirements.

There were no additional significant objections or comments made by the stakeholders as part of ongoing feedback, and they were completely in favour of establishing these kinds of projects in the area.

In order to facilitate continuous engagement, the PP has placed a grievance register/26/ onsite, wherein the stakeholder can submit his/her complaints. PP has also kept provision for submitting comments/grievances/suggestions from local stakeholders through direct mail.

The Emails for the different sites are as follows –

- Winsol (15 MW – Mahabubnagar) – kesava.reddy@vector-green.com
- Winsol (50 MW – Vikarabad) – krishna.balaji@vector-green.com
- Hindupur (40 MW – Chittoor) – Bharath.kumar@vector-green.com

However, being a renewable solar energy project, there hasn't been any comments or complaints received throughout this monitoring period, which is confirmed from desk review and on-site interview with site personnel and local stakeholders on site.

The verification team has interacted with local stakeholders during on-site assessment and details are summarized in section 2.3 of this report. There were no negative comment or

[9] https://environmentclearance.nic.in/writereaddata/OMs-2004-2021/182_OM_07_07_2017.pdf

feedback received from local stakeholders as recorded by the verification team in the current verification.

4.3 AFOLU-Specific Safeguards

As the project comes under the category of NON-AFOLU projects therefore this section does not apply for this verification. Hence Not Applicable

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The project monitoring has been carried in accordance with the registered VCS Joint PD&MR /3/and the monitoring report/1/. The monitoring plan laid in the registered VCS Joint PD&MR/3/ is being followed at the site/23/. The assessment team has verified the information flow (from data generation, aggregation, to recording, calculation and reporting for these parameters including the values) in the MR/1/. The emission reductions are purely based on the net electricity generated and exported from the machines. PP has provided all the sufficient data for current monitoring period. The values of the parameter net electricity generation supplied to the grid by each phase used in deriving the GHG emission reduction could be very well correlated between the data sets and ER spreadsheet/2/ provided by PP. The verification of each monitoring parameter has been discussed later in section 4.5.

The project activity is expected to reduce emissions by 259,526 tCO_2e for the present monitoring period, whereas the actual emission reductions were 290,199 tCO_2e. The actual emission reductions achieved were 11.82% higher than what was anticipated. The higher electricity generation is chiefly responsible for this higher generation of electricity which depends upon the number of annual days of sunshine availability and many other natural conditions, which is not within the control of the project participant. The proper maintenance of solar panels by PP has also helped in higher generation of electricity. Therefore, it is acceptable to assessment team.

The details of generation variation trend observed during the previous monitoring periods and current monitoring period is presented in the **Table No.-18** below for better clarification;

S. No.	Monitoring Periods	Generation variation	Remark
1.	Monitoring period-1:	Higher by 12%	Generation variation is well below breaching value[10] (19.90%), hence acceptable

[10] Breaching value of 19.90% is the average of breaching value (in %) for PLF of three sites of bundle project activity as per the registered VCS Joint PD&MR/3/ {(19.93%+15.22%+24.55%)/3=19.90%}

	28-June-2016 to 22-May-2018 (Inclusive of both dates)		
2	Monitoring period-2: 23-May-2018 to 22-December-2019 (Inclusive of both dates)	Higher by 12%	Generation variation is well below breaching value (19.90%), hence acceptable
3.	Monitoring period-3: 23-December-2019 to 01-April-2021 (Inclusive of both dates)	Higher by 8.3 %	Generation variation is well below breaching value (19.90%), hence acceptable
4.	Monitoring period-4: 02-April-2021 to 31-October-2022 (Inclusive of both dates)	Higher by 11.82 %	Generation variation is well below breaching value (19.90%), hence acceptable

From the table it can be identified that the project is continuously generating high amount of emission reduction than expected ERs in the past 3 verifications with an average of 10.76% higher emissions. This has been achieved due to high quality maintenance by PP and high availability of sunshine days and period.

Furthermore, the additionality of the project is unaffected by higher generation of 11.82% as the breaching value is 19.90% as per the registered VCS Joint PD&MR/3/, hence the increase of ERs is less than benchmark and hence acceptable to VKU. The generation of electricity depends upon the number of annual days of sunshine availability and many other natural conditions and for solar power plant energy generation is not constant throughout the year, which are not within the control of the project participant.

In section 4.5 of this report and section 5.4 of MR /1/ calculations has been stated which can be further compiled in ER sheet/2/ which has been verified by the assessment team from Joint Meter Readings issued to PP by State Utilities (APTRANSCO&TSTRANSCO) /12/& invoices issued by PP to State Utilities (APTRANSCO&TSTRANSCO) respectively/14/ submitted to VVB by PP. Hence VVB verified that the calculation method and formulae used in calculating baseline emission is in compliance with the methodology used i.e., ACM0002 Version 18.1 /9/. Since project activity is a solar power project, leakage emission and project emission has been considered as zero.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

During the verification and onsite audit, all relevant documents were checked to assess the correctness and quality of data submitted by the project proponents, which are used to determine emission reductions.

All records needed for monitoring are archived in line with the requirements of the registered monitoring plan. No significant, lack of evidence and missing data were detected during verification. Hence, the verification team confirms that the monitoring system ensures required quality of the monitoring system to ensure the quality of the monitored data. All internal data are subjected to QA/QC measures.

The only monitoring parameter in the project activity is "Quantity of net electricity supplied to the project (Solar) plant/unit to the grid in year y", **EG $_{PJ,y}$** (MWh). This parameter is monitored through the reading of bulk energy meters installed.

Table No.-19 below describes how the parameter **EG$_{PJ,y}$**, is to be measured according to the monitoring plan, has been verified to confirm that the actual monitoring complies with the monitoring plan, monitoring data has been thoroughly assessed and that the calibration requirements are met:-

Parameter	**Quantity of net electricity generation supplied by the project plant/unit to the grid in year y, EG $_{PJ,y}$(MWh)**	
Means of verification	**Criteria/Requirements**	**Assessment/Observation**
	Measuring /Reading /Recording frequency	Continuous measurement and at least monthly recording for net electricity generation supplied by the project plant/unit to the grid in year y. The net generated electricity supplied to the grid is determined through SEB energy meter installed at delivery points (i.e., the connected sub-station). Net electricity generated and supplied by the project plant/unit to the grid in year y=

			Electricity Export to the grid – Electricity Import from the grid.
		Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the registered VCS Joint PD&MR /3/and monitoring methodology/9/. This was verified by assessment team during desk review and by Team Leader during onsite visit and interviews with site personnel. /28/
		Monitoring equipment	ABT cum Tri vector meter are used with specifications: Data type: Measured Type of meter: Static type meter (Main, Check & Standby meter). Accuracy Class: 0.2s
		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?	The accuracy of the monitoring equipment is 0.2s, which is as per the registered VCS Joint PD&MR /3/ which is as per the norm defined in the PPAs/16/.
		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's is valid for the entire range which is as per the registered VCS Joint PD&MR /3/
		Calibration frequency /interval:	Calibration frequency of the meters is once in 5 years.

		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, or as per the manufacturer's specifications?	Yes. The calibration frequency is once in 5 years as outlined in the registered VCS Joint PD&MR /3/which is in accordance with the national standards/19/i.e., Clause 18 of Central Electricity Authority (Installation and Operation of Meters)[11]. This was also confirmed during interview with onsite personnel /28/,
		Is the calibration of measuring equipment carried out by an accredited person or institution?	Calibration of the measuring equipment's is carried out by state Electricity boards as mentioned in VCS Joint PD&MR /3/and was verified during onsite personnel interviews/28/ with PP and calibration certificates submitted/13/ by PP
		Is(are) calibration(s) valid for the whole reporting period?	Calibration of energy meters is valid for whole reporting period for project activity.
		Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes. As per the calibration certificates, error variation observed is lesser than the error variation specified. Hence, it is within the measurable range. The calibration is carried out appropriately as per the registered monitoring plan.
		How were the values in the monitoring report verified?	Cumulative value of $EG_{PJ,y}$ for entire monitoring period is reported in the monitoring report/1/, and monthly values are mentioned in the ER

[11] Regulations Notified on 17-March-2006 No. 502/70/CEA/DP&D Amendments Notified on 26-June-2010 No. 502/6/2009/DP&D/D-I

			calculation sheet/2/. The monthly values were verified from JMRs /12/ issued by state utilities and cross verified with the help of invoices issued by PP /14/ and they are found to be consistent. Value of this parameter for the current monitoring period was verified as 300,631 MWh.
		If applicable, has the reported data been cross-checked with other available data?	The monthly reported values of $EG_{PJ,y}$ were further cross checked with the monthly invoices raised by PP /14/ to state utilities 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?	On site personnel interview/28/ with the project stakeholder of the project activity confirms that the necessary QA/QC procedures are in place and the data management system is effective and reliable for the net electricity supplied by the project plant/unit to the grid in year y
		In case project proponents 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?	No such issues.
Findings	CL#01, CAR#01 and CAR#03 were raised and resolved		
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring		

	results were recorded consistently as per the approved frequency in the monitoring plan. The emission reduction calculation for the project activity is estimated based on the electricity supplied by the WTGs. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.

Table No.-20 below shows the Parameters fixed ex ante:

Parameter	Unit	Description	Value	MOV
$EF_{grid,OM,y}$	tCO2/MWh	Operating Margin CO2 Emission Factor in year y	0.9843 tCO_2/MWh is consistent with the registered VCS Joint PD&MR /3/	The values are verified through desk review of the MR submitted /1/ and registered VCS Joint PD&MR /3/ which is found acceptable
$EF_{grid,BM,y;}$	tCO2/MWh	Build Margin CO2 Emission Factor in year y	0.9083 tCO_2/MWh is consistent with the registered VCS Joint PD&MR /3/	The values are verified through desk review of the MR submitted /1/ and registered VCS Joint PD&MR /3/ which is found acceptable
$EF_{grid,CM,y}$	tCO2/MWh	Combined Margin CO2 Emission Factor in year y	0.9653 tCO_2/MWh is consistent with the registered VCS Joint PD&MR /3/	The values are verified through desk review of the MR submitted /1/ and registered VCS Joint PD&MR /3/ which is found acceptable

Calibration of meters: During the verification assessment of the project activity, accuracy of all the metering equipment have been checked and found appropriate. The installation and working conditions of the meters were checked during the site inspection and were found to be satisfactory.

Meter Calibration details for current monitoring period are provided in below **Table No.-21**:

For Winsol Solar-15 MW_{AC}			
Meter Details	Main Meter	Check Meter	Standby Meter

Meter Serial No	APX00924	APX00925	APX00926
Make	Secure Meters	Secure Meters	Secure Meters
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Calibration	30-August-2019	30-August-2019	30-August-2019
Due date of Calibration	29-August-2024	29-August-2024	29-August-2024
Calibration Frequency	Once in 5 years	Once in 5 years	Once in 5 years
Delay in Calibration	No Delay	No Delay	No Delay
For Winsol Solar-50 MW_{AC}			
Meter Details	**Main Meter**	**Check Meter**	**Standby Meter**
Meter Serial No	APW00111	AP925645	APX00645
Make	Secure	Secure	Secure
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Calibration	25-October-2018	25-October-2018	25-October-2018
Due date of Calibration	24-October-2023	24-October-2023	24-October-2023
Calibration Frequency	Once in 5 years	Once in 5 years	Once in 5 years
Delay in Calibration	No Delay	No Delay	No Delay
For Hindupur Solar-40 MW_{AC}			
Hindupur Solar Park Pvt Ltd- I			
Meter Details	**Main Meter**	**Check Meter**	**Standby Meter**
Meter Serial No	APX00864	APX00865	APX00866
Make	Secure	Secure	Secure
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Calibration	18-January-2020	18-January-2020	18-January-2020
Due date of Calibration	17-January-2025	17-January-2025	17-January-2025
Calibration Frequency	Once in 5 years	Once in 5 years	Once in 5 years
Delay in Calibration	No Delay	No Delay	No Delay

Hindupur Solar Park Pvt Ltd- II			
Meter Details	**Main Meter**	**Check Meter**	**Standby Meter**
Meter Sl. No	APX00858	APX00859	APX00860
Make	Secure	Secure	Secure
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Calibration	18-January-2020	18-January-2020	18-January-2020
Due Date of Calibration	17-January-2025	17-January-2025	17-January-2025
Calibration Frequency	Once in 5 years	Once in 5 years	Once in 5 years
Delay in Calibration	No Delay	No Delay	No Delay
Hindupur Solar Park Pvt Ltd- III			
Meter Details	**Main Meter**	**Check Meter**	**Standby Meter**
Meter Sl. No	APX00861	APX00862	APX00863
Make	Secure	Secure	Secure
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Calibration	22-February-2021	22-February-2021	22-February-2021
Calibration Frequency	Once in 5 years	Once in 5 years	Once in 5 years
Due Date of Calibration	21-February-2026	21-February-2026	21-February-2026
Delay in Calibration	No Delay	No Delay	No Delay
Hindupur Solar Park Pvt Ltd- IV			
Meter Details	**Main Meter**	**Check Meter**	**Standby Meter**
Meter Sl. No	APX00867	APX00868	APX00869
Make	Secure	Secure	Secure
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Calibration	22-February-2021	22-February-2021	22-February-2021
Due Date of Calibration	21-February-2026	21-February-2026	21-February-2026
Calibration Frequency	Once in 5 years	Once in 5 years	Once in 5 years

Delay in Calibration	No Delay	No Delay	No Delay

The energy meter calibration certificates/13/ are checked and found that the calibration details provided in the MR /1/ are correct. From the verification of above table, verification team also confirms that the energy meter calibrations are valid for the complete monitoring period i.e., from 02-April-2021 to 31-October-2022 (Inclusive of both start and end dates).

The verification team has checked all the meters during onsite visit and confirmed that the meters were working satisfactorily. Also, the calibration of meters is completely under purview of state utility and PP has no control over the same as confirmed through interviews of site personnel and PPAs signed by PP with state utilities (TSTRANSCO& APTRANSCO)/16/.

Hence it can be concluded that the approach followed by the PP is conservative and in line with the guidelines provided under paragraph 3.4.2 of VCS Validation and Verification Manual version 3.2/6/.

There is no change in metering arrangement observed since commissioning as per the revised MR/1/ submitted by PP and verified during the site visit. The VKU assessment team also confirms through the desk review of JMRs and Invoices that it was raised as per the registered VCS Joint PD &MR /3/. The procedure established by PP for all three sites including the four different lines at Hindupur site for monitoring the electricity supply to grid are in place. Hindupur solar power project {40 (4X10) MW} is connected to 132/33 KV Punganur SS by M/s. Hindupur Solar Park Pvt. Ltd. Located at Nelapalle village, Peddapanjani mandal, Chittoor district, Andhra Pradesh as per the registered procedure during commissioning (Ref Commissioning Certificate No. CGM/P&MM and IPC /TPT/GM/IPC/F.HSPPL/D.No.660/16 Dtd. 04-Nov.-2016) /15/ and registered VCS Joint PD & MR /3/.

At the time of last verification from 23-December-2019 to 01-April-2021 (Inclusive of both start and end dates) /21/, there was an error made due to the existence of another similar capacity 40 MW project connected to the 132/33 KV Hindupur SS set up by M/s. Hindupur Solar Park Pvt. Ltd. Located at Beechiganipalli village, Parigi mandal of Hindupur division in Ananthapuram district, Andhra Pradesh with (CoD – 31-March-2016, Ref Commissioning Certificate No. SE/O/ATP/Coml-I/F.No.HSPPL/D.No.391/16 Dated. 06-May-2016, which is verified by VKU assessment team.

The meters were changed for the aforementioned site (ie., non-VCS solar power project) and not the site involved in the bundled project of VCS 1770, based on the assessment during site visit and desk review.

This change in the meters and the attendant calibration were considered, due to similarity in the project capacity and name of PP of the project activity being same, however in the current verification this change was not assessed and it is clear that the meter change is not valid for this project activity.

This meter change has been thoroughly assessed by the team with the help of commissioning certificates /15/ and JMRs issued by state utility for current monitoring period /12/.

Based on the evidences, viz., SLD, meter calibration certificates/13/ the change in meters cannot be attributed to PP and the meter is installed as per the information provided in the registered PD and the status quo is maintained for the current monitoring period.

Hence, it can be confirmed that there is no change in metering arrangement at Hindupur (40 MW) site during the current monitoring period.

The registered VCS Joint PD&MR /3/& MR /1/ and site audit observations confirm that the metering equipment are sealed and maintained by the state utility.

The assessment team has verified the monthly JMRs issued by the state utilities (TSTRANSCO & APTRANSCO) confirmed that only the data recorded through main meters is used to calculate net electricity supplied to the grid consequently for ER calculations recorded in ER sheet /2/

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

GHG Calculations:

The emission reduction calculated as per the applied methodology equals the baseline emissions (project emissions and leakage emissions for such project activities is considered zero).

The formula provided for the calculation of baseline emissions is:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$$

Where:

BE_y: Baseline emissions in year y (tCO_2e/yr)
$EG_{PJ,y}$: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)
$EF_{grid,CM,y}$: Combined Margin CO_2 emission factor in year y in tons CO_2/MWh.

Parameter	Unit	Value
$EG_{PJ,y}$	MWh	300,631
$EF_{grid,CM,y}$	tCO_2e	0.9653
BE_y	=	300,631.00 * 0.9653
	=	290,199.00 (Round down value)

The verification team attests to the correctness of the formulas and methodologies used to compute baseline emissions. The applied default values, emission factors, and assumptions in

the calculations are all reasonable. The verification team attests to the correctness of the formulas and methodologies used to calculate baseline emissions.

The assumptions, emission factors and default values that were applied in the calculations are justified. The actual emission reduction achieved during the current monitoring period are 11.82% higher than the estimated emission reductions. We as VVB accepted this as this is mainly due to the higher generation of electricity achieved during current monitoring period which is due to high PLF. High PLF is the consequence of the higher generation of electricity which depends upon the number of annual days of sunshine availability and many other natural conditions and high maintenance by PP for solar power plant energy generation which is not constant throughout the year, which are not within the direct control of the project participant.

The higher generation during the current verification period is due to certain natural conditions and hence acceptable by VKU and it is as per registered VCS Joint PD&MR /3/.

Furthermore, the additionality of the project is unaffected by higher generation of 11.82% from the estimated value as breaching Value is 19.90% as per the registered VCS Joint PD&MR/3/. Thus, the higher generation is below the benchmark, hence acceptable by VKU.

VKU further states that the verification is done for a period of nineteen months from 02-April-2021 to 31-October-2022 (Inclusive of both dates) and 11.82% higher actual emission reduction achieved during the current monitoring period is due to higher electricity generation in current monitoring period due to various factors stated above. All the supporting documents and ER sheet was verified by assessment team and found to be acceptable hence higher generation of 11.82% is acceptable by VKU Assessment team.

However as mentioned in appendix 2 of the monitoring report/1/, the breakdown that took place during the current monitoring period was for a total of - 58 hours 20 minutes. Please refer **Table-9** for further bifurcation of breakdown hours. The overall time of the breakdown is just 0.42% of the total operational hours therefore there is no discernible effect on the emission reductions made during the current monitoring period.

The generation of electricity depends upon many other climatic conditions, which are not within the control of the project proponent. The higher generation during the current verification period is due to certain climatic variations due to change in season Hence, it is acceptable to the assessment team.

All the data were made available and have been monitored as per required monitoring frequency. The means of verification for the values of parameters, used for baseline emission calculation, is described above.

VKU is of the opinion that this method of calculation of emission reductions is accurate and results in conservative estimation of emission reduction and is in line with the applicable VCS requirements.

4.6 Non-Permanence Risk Analysis

There is no non-permanence risk that could lead to material errors, omissions or misstatements rating determined by the project proponent for the project activity and no risk was identified in the audit/verification plan hence not applicable.

5 VERIFICATION CONCLUSION

VKU Certification Pvt. Ltd. has performed the fourth verification of the project activity "Bundled Solar Power Project by Vector Green Energy Private Limited" in India, VCS Project ID 1770, for the monitoring period from 02-April-2021 to 31-October-2022 (Inclusive of both start and end dates), under first crediting period from 28-June-2016 to 27-June-2026 (Inclusive of both dates) with regard to the relevant requirements for VCS activities.

As described in the report from section 1 to 4, VKU has performed the entire verification according to the verification criteria for projects and their GHG emission reductions or removals set out in VCS Standard Version 4.3/5/, VCS Validation and Verification Manual Version 3.2/6/ and VCS Program Guide, version 4.2 /4/.

The project proponents of the "Bundled Solar Power Project by Vector Green Energy Private Limited" project are responsible for:

- The preparation of greenhouses gas emissions data and the reported greenhouse gas emission reductions from the project on the basis set out in the monitoring plan contained in the registered VCS Joint PD&MR version 2.0 dated 16-July-2018/3/.
- The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of greenhouse gas emission reductions of the project.

It is the responsibility of VKU to express an independent verification opinion about the project's conformity with the requirements of VCS Standard version 4.3/5/ and GHG program applied, on the reported greenhouse gas emission reductions from the project.

Based on documented evidence and corroborated by an on-site assessment, VKU can confirm that:

- The project has been implemented and operated as per the registered VCS Joint PD&MR /3/;
- The monitoring report and other supporting documents provided are complete and verifiable and in accordance with the applicable VCS Standard version 4.3/5/ requirements;
- The monitoring is in place as per the applied baseline and monitoring methodology/9/;

- The monitoring plan in the registered VCS Joint PD&MR /3/is as per the applied baseline and monitoring methodology/9/ and tool applicable/31/.

VKU'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. VKU planned and performed the verification by obtaining evidence and other information and explanations that VKU considered necessary to give reasonable level of assurance that reported GHG emission reductions are fairly stated.

It is VKU's opinion that the GHG emission reduction stated in the monitoring report version 4.0 dated 20-March-2023 for the "Bundled Solar Power Project by Vector Green Energy Private Limited" in India for the period 02-April-2021 to 31-October-2022 (Inclusive of both start and end dates) are fairly stated.

The GHG emission reductions are calculated on the basis of approved methodology ACM0002 version 18.1 and the monitoring plan included in the registered VCS Joint PD&MR, version 2.0 dated 16-July-2018/3/

Hence VKU is able to certify that the emission reduction from the project during the monitoring period 02-April-2021 to 31-October-2022 (Inclusive of both start and end dates) amounts to 290,199 tCO_2e.

Verified GHG emission reductions and removals in the above verification period are stated in the **Table No.-22** below vintage wise:

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
Year 2021 (02-April-2021 to 31-December-2021)	132,513	0	0	132,513
Year 2022 (01-January-2022 to 31-October-2022)	157,686	0	0	157,686
Total	290,199	0	0	290,199

APPENDIX A: ABBREVIATIONS

Abbreviations	Full texts
APTRANSCO	Transmission Corporation of Andhra Pradesh
BE	Baseline Emissions
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM M&P	Modalities and Procedures of CDM
CEA	Central Electricity Authority
CER(s)	Certified Emission Reduction(s)
CH4	Methane
CL	Clarification Request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
EB	Executive Board
EF	Emission Factor
ER	Emission Reductions
FAR	Forward Action Request
GHG(s)	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
MoV	Means of Verification
MR	Monitoring Report
NGO	Non-governmental Organization
ODA	Official Development Assistance
PDD	Project Design Document

PE	Project Emission
PP(s)	Project Proponent(s)
Ref.	Document Reference
SS(s)	Sectoral Scope(s)
TA(s)	Technical Area(s)
TSTRANSCO	Transmission Corporation of Telangana Limited
UNFCCC	United Nations Framework Convention on Climate Change
VCU	Verified Carbon Unit
VKU	VKU Certification Ltd.
VCS	Verified Carbon Standard
VVS	Validation and Verification Standard
VVB	Validation and verification body

APPENDIX B: AUDIT FINDINGS

Type			Date	10-January-2023
CL#01			Reference	Section 01/DR Section 02/DR Section 04/DR
Description of the Non-Conformance				
1. **In section 1.9 of MR:** PP is requested to submit the declaration confirming the project is not participating in any other GHG program or taking any other kind of benefits as per guideline of VCS MR Template version 4.1 2. **In section 1.10 of MR:** PP is requested to submit the declaration stating they are not claiming any other form of GHG related environmental credits and other form of emission trading and other binding limit. 3. **In section 2.2 of MR:** PP is requested to update about the existing method of recording grievance that is followed at site and also submit evidences for the same to assessment team. In the same vein, explain how existing communication with the local stakeholders is continuing during the monitoring period. 4. **In section 4.3 of MR:** • PP is requested to submit the O&M contract. • PP is requested to submit the personnel training records 5. **In section 4.3 of MR:** PP is requested to clarify regarding the monitoring mechanism available at site, which will ensure continuous monitoring of energy generation, during non-working of both the meters.				
1st Response from PP			**Date**	31-January-2023
1. Submitting herewith declaration for the project is not participating in any other GHG program or taking any other kind of benefits. 2. Submitting herewith declaration for the project is not claiming any other form of GHG related environmental credits and other form of emission trading and other binding limit. Also, declaring that the present project activity has not applied under IREC or domestic REC mechanism. 3. Grievance register maintained at site for continuous stakeholder consultation. Submitting herewith copy of the same to DoE for verification. 4. Necessary details added for mechanism employed for on-going communication with the local stakeholders in section 2.2 of revised MR (version 02) 5. Submitting herewith valid O & M contract for the project activity. 6. Submitting herewith O & M training records of plant personnel to DoE for verification. 7. Necessary description added for emergency preparedness for non-working of main & check meters.				
1st Assessment by Audit Team	**Status**	Open	**Date**	09-February-2023
1. **In section 1.9 of MR:** The assessment team confirms that PP has submitted the declaration confirming that the project is not participating in any other GHG programs or receiving any other type of benefit in accordance with the guidelines of VCS MR Template version 4.1, hence accepted				

2. **In section 1.10 of MR:** The Assessment team confirms that PP has submitted the declaration certificate stating they are not claiming any other form of GHG related environmental credits and other form of emission trading and other binding limit.
3. **In section 2.2 of MR:** Assessment team confirms that PP has updated the Grievance mechanism procedure for ongoing consultation with stakeholders, and also submitted the grievance register. However, PP is requested to provide the mail id used for taking grievances and a photograph as evidence for keeping the stated grievance mechanism. (Open)
6. **In section 4.3 of MR:**
    - PP has submitted the O&M contracts and verified by assessment team, hence accepted
    - Assessment team confirms that PP has submitted the training records and verified, hence accepted.
    - PP is requested to submit the personnel training records
4. **In section 4.3 of MR:** Assessment team confirms that PP has stated the monitoring mechanism for the meters and process for continuous monitoring and emergency preparedness in revised MR version 02 which is submitted to VVB. However, this is not as per the monitoring plan stated in registered VCS Joint PD&MR. Hence PP is requested to take a deviation for same according to para 3.19.2 of VCS Standard version 4.3. (Open)

Hence CL#01 is Open

2nd Response from PP	**Date**	13-February-2023

3. Mentioning herewith email id used for taking grievances at respective site in section 2.2 of revised MR (Version 03) and a photograph as evidence for keeping the stated grievance mechanism.

4. Necessary description added to section 4.3 of revised MR (version 03) regarding emergency preparedness, the deviation request also mentioned in section 2.1.2 under project description deviation in revised MR (version 03).

2nd Assessment by Audit Team	**Status**	Closed	**Date**	28-February-2023

3. In section 2.2 of MR: PP has updated this section and included the email ids used for taking grievances at the respective sites, however it was assessed that there were no grievances addressed by any local stakeholder in the current monitoring period. Hence accepted.

4. In section 4.3 of MR: Assessment team confirms that PP has updated the section 4.3 and simultaneously updated section 2.1.2 in the revised MR version 03 submitted by PP and now it is found to be in line with the stated the monitoring mechanism for the meters. Hence accepted.

Hence CL#01 is Closed

Type	**Date**	10-January-2023
CL#02	**Reference**	Section 01/DR Section 02/DR

		Section 04/DR
Description of the Non-Conformance		
The breaching value reference is not clear in all 3 monitoring periods, kindly clarify the source of the breaching value used as the value is not found in the registered VCS Joint PD & MR and ER sheet submitted by PP.		
1st Response from PP	**Date**	23-June-2023
Breaching value 19.90% mentioned as per average of breaching values (in %) for PLF of three sites of bundle project activity i.e., 19.90% as per VCS Joint PD & MR (Version 02, dated 16-July-2018).		
1st Assessment by Audit Team / **Status** / Closed	**Date**	25-June-2023
Assessment team confirms that the breaching value of 19.90% is found to be correct and it is as per the registered VCS Joint PD & MR which includes the breaching value of all three sites. Hence accepted. **Hence CL#02 is Closed**		

Type	**Date**	10-January-2023
CAR#01	**Reference**	Section: MR/DR Section 01/DR Section 03/DR Section 04/DR Section 05/DR
Description of the Non-Conformance		
1. **In section 1.2 of MR;** PP is requested to indicate whether the project is AFLOU or not according to VCS MR current version 4.1 2. **In section 1.7 of MR;** VVB was not able to trace down any particular solar power project so PP is requested to mention the correct Geo-coordinates of the project implementation site. (Hindupur solar park Pvt. ltd 40MW Andhra Pradesh state) 3. **In section 1.11 of MR;** PP is requested to provide the reference of the contributions mentioned in the SDG contribution table for better traceability. 4. **In section 2.2 of MR;** PP is requested to mention the date of the local stakeholder meeting took place initially as per the VCS MR template version 4.1 5. **In section 3.1 of MR;** PP is requested to update the hyperlink according to the current monitoring period and submit the technical specification details. • AC power or DC power. PP is requested to employ consistent notation throughout the report. • PP is requested to provide the tilt angle, type of the solar panel, make of the inverter is mentioned but model number is not mentioned, make and number		

of UPS is not mentioned, HT panel, number of inverters is mentioned as 40 while in the next row it is mentioned as 20. PP is requested the discrepancy as well as the mention the units • What is the nameplate rating of the solar panel? And how many types are available constituting these numbers for all 3 sites. 6. **In section 3.1 of MR;** PP is requested to mention the current monitoring period ERs achieved and amount of electricity supplied to grid 7. **In section 3.2 of MR;** PP is requested to mention if there are any deviations taken during the previous verifications and validation • Is DSM adopted at site? Does it affect the monitoring than what is stated in registered VCS Joint PD&MR. 8. **In section 4.3 of MR;** PP is requested to submit some sample log book sheet and electronic records for the current for the current monitoring period • PP is requested to update the diagram of organization structure for monitoring as per VCS project and submit the SLD of the project activity 9. **In section 5.2 and 5.3 of MR;** PP is requested to mention the reference of the methodology para/section referred here, and same as for project emission. • PP is requested to clarify how cleaning of the panels is conducted at site. Are there any potential sources of emissions due to this activity. 10. **In section 5.4 of MR;** PP to provide sufficient justification of the potential causes for the difference in actual versus estimated GHG ERRs. • PP is requested to provide information that could possibly lead to the substantial difference between the ex-ante and ex-post GHG ERR.

1st Response from PP	Date	31-January-2023

1. Necessary description added to section 1.2 of revised MR (Version 02) regarding AFLOU project.
2. The correct Geo-coordinates for Hindupur solar park Pvt. ltd 40MW Andhra Pradesh state is now mentioned in section 1.7 of revised MR (version 02)
3. Reference of the contributions mentioned in the SDG contribution table has been added to section 1.11 of revised MR (version 02)
4. Date of invitation & date of meeting, conducted initially during registration for all sites are now mentioned in section 2.2 of revised MR (version 02).

5. Reference of technical specifications of all SPVs involved in project activity now added to section 3.1 of revised MR (version 02).
   - Technical specification is revised
   - Technical specification is revised

6. Necessary details have been added for current monitoring period ERs achieved and amount of electricity supplied to grid in section 3.1 of revised MR (Version 02)

7. There was no deviation taken during the previous verification and validation of the project activity, necessarydetails have been added to section 3.2 of revised MR (Version 02).
   - The project activity has been implemented & got registered as per ACM0002: Grid-connected electricity generation from renewable sources (Version 17) and followed the registered monitoring plan at site and do not have any deviation regarding methodology that impact ER estimation of the project activity.
8. Submitting herewith sample log sheet and electronic generation data (copy of DGR for the month of Oct.21) to DoE for verification.

- Diagram of organization structure for monitoring as per VCS project has been revised in section 4.3 of revised MR (version 02), submitting herewith SLD of respective site to DoE for verification.

9. Reference of the methodology para/section referred for not including any project and leakage emissions is now added to in section 5.2 & 5.3 of revised MR (version 02)

10. The values have been corrected for estimated and achieved emission reductions in section 5.4 of revised MR (version 02), also the causes for increase in actual ER amount added to revised MR.

1st Assessment by Audit Team	Status	Open	Date	09-February-2023

1. **In section 1.2 of MR**: Assessment team confirms that the project is a solar project, not an AFOLU, and that a description has been added. Hence accepted.
2. **In section 1.7 of MR:** Assessment team confirms that PP has updated the Geo coordinates for Hindupur site in revised MR and found to be correct when verified from google earth. PP has also taken a deviation for the same in section 2.1.2 below as it is a project description deviation from the registered VCS Joint PD&MR. Hence Accepted.
3. **In section 1.8 of MR:** The footnote No. 4 given in this section is not relevant to the description mentioned. PP is requested to update the same. (Open)
4. **In section 1.11 of MR:** Assessment team confirms that PP has provided the hyperlink for the project contributions achieved towards SDGs, hence accepted
5. **In section 2.2 of MR:** The assessment team confirms that PP has included all local stakeholder consultation details in the revised MR. Hence accepted
6. **In section 3.1 of MR:** The footnote given is updated by PP in revised MR version 02, hence accepted.
   - PP is requested to update the specific power mentioned by PP. (Open)
   - PP is requested to provide the details asked in the comment above as this has not been revised by PP(Open)
   - Assessment team confirms that PP not updated the details in revised MR for all 3 sites. (Open)
7. **In section 3.1 of MR:** Assessment team confirms that PP has mentioned the net electricity supplied to the grid and ERs value in revised MR, hence accepted
8. **In section 3.2 of MR:** Assessment team confirms that PP has taken no methodology deviations during current and during the previous verifications and validation, hence accepted
   - During site visit it was observed that the DSM was effectively used at site. Thus, PP is requested to clarify how this does not affect the monitoring plan and project implementation. (Open)
9. **In section 4.3 of MR:** Assessment team confirms that PP has submitted the sample log book for month of October and verified by assessment team and found to be correct, hence accepted
   - Assessment team confirms that the organizational structure diagram has been updated in revised MR version 02. Hence accepted.
10. **In section 5.2 and 5.3 of MR:** PP has mentioned the reference of the methodology para/section referred for not including any project and leakage emissions in this section and found to be correct in revised MR version 02.
    - PP is requested to give a clarification on the cleaning mechanism of solar panels. (Open)
11. **In section 5.4 of MR:** Assessment team confirms that PP has updated the statement and emission reduction value in revised MR version 02 submitted to team and this has been found to be in line with the revised ER sheet submitted, hence accepted

Hence CAR#01 is Open				
2nd Response from PP			**Date**	13-February-2023
3. The footnote No. 4 is now revised in section 1.8 of revised MR (version 03) **6.** Specific power is now mentioned in section 3.1 of revised MR (version 03) as per site wise plant commissioning certificate. Also, PP has now mentioned necessary technical details as per comments in section 3.1 of revised MR (version 03). **8.** Regarding DSM implementation, at Telangana (Winsol–15 & 50 MW) the implementation of DSM is on pilot basis, the effective commercial implementation date will be 01-April-2023 (Please. Refer attached gov. letter (No. CE/SLDC/F.RE DSM /D.555/22, Dated 28-December-2022) for the same. At Hindupur (40 MW), billing is still as per JMR (Export-Import basis), hence during this monitoring period project description deviation for DSM is not applicable. **10.** Clarification on the cleaning mechanism of solar panels - Some project activities may involve project emissions that can be significant. As per applicable methodology, project emission from fossil fuel consumption, Project emissions from the operation of dry, flash steam or binary geothermal power plants and Project emissions from water reservoirs of hydro power plants can be significant. The solar panels cleaning done with wet method once in a fortnight with minimal water usage and done manually. The above-mentioned operations not applicable to solar plant project, Hence Project emission considered as zero.				
2nd Assessment by Audit Team	**Status**	Closed	**Date**	28-February-2023
3. In section 1.8 of MR: Assessment team confirms that PP has updated the footnote No. 4 given in this section and it is now found to be relevant with the description mentioned. Hence accepted. **6. In section 3.1 of MR:** Assessment team confirms that PP has mentioned the specific power in this section and updated the technical specification as per the technical specification document and registered VCS PD&MR. Hence accepted. **8. In section 3.2 of MR:** Assessment team confirms from the letter submitted by PP that the DSM mechanism will be implemented at Telangana sites from 01-April-2023. For the Hindupur sites-Andhra Pradesh, the DSM is still not implemented and billing is done with the help of JMRs and same was verified during desk review. Hence no project description deviation is applicable for DSM mechanism. **10. In section 5.2 and 5.3 of MR:** Assessment team confirms that the cleaning mechanism that is followed on site does not cause any project emissions as it does not use any fossil fuel and with minimal water usage cleaning is done which was also confirmed from PP during site visit interviews. Hence accepted. **Hence CAR#01 is Closed**				

Type			Date	10-January-2023
CAR#02			Reference	MR Template Section 04/DR
Description of the Non-Conformance				
1. PP to ensure editorial correction throughout the report. Please ensure proper formatting and spacing between sentences and letters. Ensure that there is no tampering of the MR template. 2. **On title Page of MR** PP is requested to update the font size according to the VCS MR template version 4.1 • PP is requested to update the format of table according to the VCS MR template version 4.1 3. **In section 1.11 of MR** PP is requested to use the correct unit for the emissions avoided 4. **In section 2.2 of MR** PP is requested to use the consistent font colour throughout the MR				
1st Response from PP			**Date**	31-January-2023
1. Necessary corrections have been done regarding formatting throughout revised MR (Version 02). 2. Font size and colour are now consistent throughout the revised MR (version 02). 3. For emission reduction, Unit is now corrected in section 1.11 of revised MR (version 02). 4. Font colour has been revised in section 2.2 as well as in all applicable sections of revised MR (Version 02)				
1st Assessment by Audit Team	**Status**	Closed	**Date**	09-February-2023
1. All the necessary editorial corrections have been made by PP in revised MR version 02 and verified by assessment team and found correct. Hence accepted. 2. **On title Page of MR:** Assessment team confirms that PP has updated the font size according to MR template Version 4.1. Hence accepted. • Assessment team confirms that PP has update the table of content, hence accepted 3. **In section 1.11 of MR:** VVB confirms that PP has updated the unit of emission avoided, hence accepted. 4. **In section 2.2 of MR:** The assessment team confirms that PP has used a consistent font colour throughout the revised MR version 02, hence accepted. **Hence CAR#02 is Closed**				

Type			Date	10-January-2023
CAR#03			Reference	Section: Appendix 1/2 ER SHEET/DR/OSV
Description of the Non-Conformance				

1. **In Appendix 1 (METER CAIBRATION DETAILS) of MR:** PP is requested to update the calibration details of the meters installed at site as they are found to be inconsistent with the calibration certificates submitted. 2. **In Appendix 2 (BREAKDOWN DETAILS) of MR**: PP is requested to submit the breakdown and DGR details sheet for all sites. (Winsol 15MW, 50MW and Hindupur 40MW) 3. **In ER SHEET:** The net unit billed values as per JMR stated here are not traceable in the JMRs submitted to the VVB by PP 4. **In ER SHEET:** PP is requested to update the value for month of December 2021 (Winsol -Karoor site) it seems not consistent with the JMR.

1st Response from PP	**Date**	31-January-2023
1. Calibration details updated, submitting herewith applicable calibration certificate for current monitoring period to DoE for verification. 2. Submitting herewith breakdown details & DGR sheet for respective sites to DoE for verification. 3. **For Hindupur Solar Park Pvt. Ltd. (40 MW)**, there are 4 feeders, separate JMR readings is taken for 4 feeders, for more traceability the values are now highlighted for export & import units in the submitted JMR. Also, the values are separately mentioned for each month (for 4 feeders) in ER calculation sheet. Submitting herewith revised ER sheet to VVB for verification. 4. For Winsol- Karoor site for the month of Dec. 21 JMR is divided into Part – A & Part – B, separate meter reading mentioned now in revised ER sheet for more clarity.		

1st Assessment by Audit Team	**Status**	Open	**Date**	09-February-2023
1. **In Appendix 1 (METER CAIBRATION DETAILS) of MR:** Assessment Team verified and confirmed that PP has updated the calibration details in revised MR and provided calibration certificates of all meters. Hence accepted. 2. **In Appendix 2 (BREAKDOWN DETAILS) of MR:** Assessment Team could not verify the breakdown details provided by PP in the supporting document. As a response, PP is requested to provide appropriate data and specify the total breakdown hours so that VVB may verify the same. (Open) 3. **In ER SHEET:** The assessment team confirms that PP has submitted all JMR for the (40 MW Hindupur Solar Park Pvt. Ltd.) site and that the amended ER sheet has been updated. Hence, accepted 4. **In ER SHEET:** Assessment team confirms that PP has mention the value of December 2021 in revised ER sheet, Hence, accepted **Hence CAR#03 is Open**				

2nd Response from PP	**Date**	13-February-2023
2. Submitting herewith supportive doc. for break down details. (Site wise)		

2nd Assessment by Audit Team	**Status**	Closed	**Date**	28-February-2023
2. In Appendix 2 (BREAKDOWN DETAILS) of MR: Assessment team confirms that PP has submitted the breakdown details for both HSPPL and WSFPL sites which is found to be consistent with the breakdown details provided in revised MR version 03. Hence accepted **Hence CAR#03 is Closed**				

~~Type~~			~~Date~~	~~DD/MM/YYYY~~
~~FAR~~			~~Reference~~	
~~Description of the Non-Conformance~~				
~~1st Response from PP~~			~~Date~~	~~DD/MM/YYYY~~
~~1st Assessment by Audit Team~~	~~Status~~	~~Open/Closed~~	~~Date~~	~~DD/MM/YYYY~~

APPENDIX C: COMPETENCE STATEMENTS

Team Leader-

COMPETENCE STATEMENT

Name	Sanjay Kumar K
Nationality	Indian
Countries of Experience	India
Education Qualification	B.E. (Civil Engineering) M. Tech (Environmental Engineering)
Year of Experience	20 Years +
Area of Expertise	Climate Change & Environment Sustainable Development GHG Footprints
Eligible Sectoral Scope	TA 1.2 - Renewables TA 3.1 - Energy Demand TA 6.1 - Construction

Roles

Project Trainee	NO
Validator/Verifier Trainee	NO
Validator	YES
Verifier	YES
Team Leader	YES
Technical Reviewer	YES
Local Expert (Country Wise)	YES
TA Expert (1.2, 3.1, 6.1)	YES
Financial Expert	YES

Reviewed by	Vandana Gupta (Quality Manager)	Date	03.03.2023
Approved by	Vivek Kumar Ahirwar (Technical Manager)	Date	03.03.2023

Validator/Verifier-Trainee-

Certification Pvt. Ltd. VKU.F50W. Competence Statement

COMPETENCE STATEMENT

Name	Shivani Chauhan
Nationality	Indian
Countries of Experience	India
Education Qualification	B.Sc. (Environmental Science) M.Sc. (Environmental Science)
Year of Experience	2 years as Intern and 6 months as Employee
Area of Expertise	Climate Change & Environment
Eligible Sectoral Scope	NA

Roles

Project Trainee	NO
Validator/Verifier Trainee	YES
Validator	NO
Verifier	NO
Team Leader	NO
Technical Reviewer	NO
Local Expert (Mozambique)	NO
TA Expert (X.X)	NO
Financial Expert	NO

Reviewed by	Vandana Gupta (Quality Manager)	Date	02.02.2023
Approved by	Vivek Kumar Ahirwar (Technical Manager)	Date	02.02.2023

Project Trainee-

Certification Pvt. Ltd. VKU.F50W. Competence Statement

COMPETENCE STATEMENT

Name	Apoorva Tripathi
Nationality	Indian
Countries of Experience	India
Education Qualification	B.Sc. (BCZ) M.Sc. (Environmental Science)
Year of Experience	NA, Fresher
Area of Expertise	Climate Change & Environment
Eligible Sectoral Scope	NA

Roles

Project Trainee	YES
Validator/Verifier Trainee	NO
Validator	NO
Verifier	NO
Team Leader	NO
Technical Reviewer	NO
Local Expert (Country Wise)	NO
TA Expert (X.X)	NO
Financial Expert	NO

Reviewed by	Vandana Gupta (Quality Manager)	Date	06/12/2022
Approved by	Vivek Kumar Ahirwar (Technical Manager)	Date	06/12/2022

Technical Reviewer-

Certification Pvt. Ltd.

VKU.F50W. Competence Statement

COMPETENCE STATEMENT

Name	Vivek Kumar Ahirwar
Nationality	Indian
Countries of Experience	India, Madagascar, Thailand, Indonesia, Bangladesh, Nepal, Ghana, Uganda, Kenya etc
Education Qualification	B.E. (Mechanical Engineering) M. Tech (Energy Management)
Year of Experience	12 Years +
Area of Expertise	Climate Change & Environment
Eligible Sectoral Scope	TA 1.1 - Thermal energy generation and Renewables TA 1.2 - Renewables TA 2.1 - Process GHG Emission Expert TA 3.1 - Energy Demand TA 6.1 - Construction TA 13.1 - Solid waste and wastewater TA 13.2 - Manure

Roles

Project Trainee	NO
Validator/Verifier Trainee	NO
Validator	YES
Verifier	YES
Team Leader	YES
Technical Reviewer	YES
Local Expert (Country Wise)	YES
TA Expert (1.1, 1.2, 3.1, 6.1, 13.1, 13.2)	YES
Financial Expert	YES

Reviewed by	Vandana Gupta (Quality Manager)	Date	25/02/2023
Approved by	Vivek Kumar Ahirwar (Technical Manager)	Date	25/02/2023

APPENDIX D: ONSITE AUDIT SCHEDULE FOLLOWED BY VVB

On-site Audit Planning and schedule

VKU Certification would conduct on-site audit to confirm relevant information and to resolve issues identified in the first document review. The audit plan below shall be communicated to the client. The plan is subject to change and times provided are estimates.

The audit schedule envisaged for this verification of project is as follow:

Schedule (Verification) Location 01: Winsol Solar Fields (Polepally) Pvt. Ltd.

a) Sub Location 1: Village: Karoor, Taluk: Nawabpet, District: Mahabubnagar, State: Telangana

b) Sub Location 2: Village: Indur, Taluk: Peddumal, District: Vikarabad, State:Telangana

Location 02: Village Nelapalle, District: Chittoor, State: Andhra Pradesh

(Please be noted that the times mentioned are indicative and may vary at site)

Date	Time (Min)	Focus Areas / Scope
Location 01 (a)		
05/01/2023	**15 min**	Opening Meeting at Location 1 (a): Introduction, scope and objective of work, roles and responsibilities of audit team, resources required, and timetable of the onsite audit including venue for closing meeting and any concerns from PP.
05/01/2023	**20 min**	Implementation and operation of project activity (project boundary, technology, project equipment, monitoring and metering equipment) as per registered PD/previous verification. Management and monitoring procedures followed at project site.
05/01/2023	**40 min**	Physical inspection of the project activity: Site visit and interview of monitoring personnel and review of monitored data and relevant document in accordance with registered monitoring plan and applied monitoring methodology
05/01/2023	**15 min**	Stakeholders Interviewed: The relevant local stakeholders and end users shall be interviewed
05/01/2023	**15 min**	Management and operational system: Documentation, allocation of responsibilities, qualification and training, data recording &archiving, internal audit and management review and emergency procedures.

05/01/2023	15 min	Compilation of the audit finding for Site Location 01 (a).

Date	Time (Min)	Focus Areas / Scope
Location 01 (b)		
05/01/2023	15 min	Opening Meeting at Location 01 (b): Introduction, scope and objective of work, roles and responsibilities of audit team, resources required, and timetable of the onsite audit including venue for closing meeting and any concerns from PP.
05/01/2023	20 min	Implementation and operation of project activity (project boundary, technology, project equipment, monitoring and metering equipment) as per registered PD/previous verification. Management and monitoring procedures followed at project site.
05/01/2023	40 min	Physical inspection of the project activity: Site visit and interview of monitoring personnel and review of monitored data and relevant document in accordance with registered monitoring plan and applied monitoring methodology
05/01/2023	15 min	Stakeholders Interviewed: The relevant local stakeholders and end users shall be interviewed
05/01/2023	15 min	Management and operational system: Documentation, allocation of responsibilities, qualification and training, data recording &archiving, internal audit and management review and emergency procedures.
05/01/2023	15 min	Compilation of the audit finding for Site Location 01(b).

Schedule (Verification) Location 02- Hindupur Solar Park Pvt Ltd Village Nelapalle, District: Chittoor, State: Andhra Pradesh **Please be noted that the times mentioned are indicative and may vary at site**		
Date	**Time (Min)**	**Focus Areas / Scope**
06/02/2023	**30 min**	Opening Meeting at Location 02: Introduction, scope and objective of work, roles and responsibilities of audit team, resources required, and timetable of the onsite audit including venue for closing meeting and any concerns from PP.
06/02/2023	**30 min**	Implementation and operation of project activity (project boundary, technology, project equipment, monitoring and metering equipment) as per registered PD/previous verification.
06/02/2023	**45 min**	Management and monitoring procedures followed at project site.
06/02/2023	**45 min**	Physical inspection of the project activity: Site visit and interview of monitoring personnel and review of monitored data and relevant document in accordance with registered monitoring plan and applied monitoring methodology
06/02/2023	**45 min**	Lunch
06/02/2023	**30 min**	Stakeholders Interviewed: The relevant local stakeholders and end users shall be interviewed
06/02/2023	**30 min**	Management and operational system: Documentation, allocation of responsibilities, qualification and training, data recording &archiving, internal audit and management review and emergency procedures.
06/02/2023	**25 min**	Compilation of the audit findings for Location 02.
06/02/2023	**40 min**	Compilation of the audit finding for the project and discussion with Client.