Bundled Solar Power Project by Vector Green Sunshine Private Limited and Polepally Solar Parks Private Limited

Document Prepared by Earthood Services Private Limited

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Summary:

The project activity involves the generation of electricity through a greenfield solar photovoltaic plant with a capacity of 20 MW at Mansa in Punjab and 25 MW in at Mahbubnagar in Telangana that supply the generated electricity to the National power grid.

The project has aimed to reduce the dependence on fossil fuel-powered power plants by substituting carbon-intensive energy with the inexhaustible and clean solar energy. As per the baseline scenario, "Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants that are fossil fuel fired power plants". The baseline scenario is the same as the scenario existing prior to the implementation of the project activity.

During the Current Monitoring Period from 23-January-2020 to 22-March-2021 (inclusive of both dates) the project activity has supplied 91,106.20 MWh of electricity, and thus contributing to the GHG reductions 87,943 tCO2e.

Vector Green Sunshine Private Limited contracted ESPL to conduct the verification of the project "Bundled Solar Power Project by Vector Green Sunshine Private Limited and Polepally Solar Parks Private Limited". The scope of verification including confirming the implementation of the monitoring plan in the registered project "Bundled Solar Power Project by Vector Green Sunshine Private Limited and Polepally Solar Parks Private Limited (VCS ID-1745), VCS PD (Ver. 03 dated 21-March-2018) and the application of methodology ACM0002: Large-scale Consolidated Methodology: ACM0002: Grid-connected electricity generation from renewable sources - Version 17.0. The verification consisted of three phases: a. Desk review of the project; b. Follow-up onsite visit; c. Resolution of outstanding issues and issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted following ESPL's internal quality procedures.

A total of 03 CL and 02 CARs has been raised during the verification process of the project activity which was successfully closed.

- ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements.

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1 INTRODUCTION

1.1 Objective

"**M/s. Vector Green Sunshine Private Limited and Polepally Solar Parks Private Limited**"" has contracted ESPL (Hereinafter referred as Earthood) to conduct the verification of the project activity "Bundled Solar Power Project by Vector Green Energy Private Limited" according to the requirements of the Verified Carbon Standard version 4.0.

The objective of this verification is to verify and certify emission reductions reported for the PA "Bundled Solar Power Project by Vector Green Energy Private Limited" for the period 23-Jan-2020 to 22-Mar-2021.

1.2 Scope and Criteria

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

- the appropriate VCS-MR form (and other templates) was used and correctly filled up;

  (as per https://verra.org/wp-content/uploads/2019/09/VCS-V4-Summary-of-Effective-Dates.pdf the use of updated version of all VCS Program templates and representations is mandatory from 19 March 2020)

- the project activity is in accordance with all relevant host country criteria (India);
- the project activity is in accordance with all relevant VCS rules and requirements;
- the project activity is in accordance with conditions of the latest version of applied methodology ACM0002: Grid-connected electricity generation from renewable sources - Version 17.0/7/.

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

1.3 Level of Assurance

☒ Reasonable level of assurance

☐ Limited level of assurance

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

In our opinion, the estimated GHG emissions reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002: Grid-connected electricity generation from renewable sources - Version 17.0 and the VCS standard.

1.4 Summary Description of the Project

Grid-connected solar PV project in Punjab and Telangana generates renewable solar electricity and supplies power to the Indian power grid. The current monitoring period from 23-Jan-2020 to 22-Mar-2021 (First and last date included) involved the generation and supply of 91,106.20 MWh solar power from plants located in village- Gammiwala, Tehsil- Boha, District- Mansa in Punjab and in village-Ippaturu, Taluk- Nawabpet, District-Mahbubnagar in Telangana. The power generated by the grid will be replacing an equivalent amount of electricity from the grid system of India which is majorly dependent on fossil-fuel based grid imports for its electricity requirements.

The project is a voluntary action being undertaken by each project owner of the project activity. EKI Energy Services Limited (hereafter referred as "EKIESL") is acting as the other party for this project activity.

The main purpose of this project activity is to generate clean form of electricity through renewable solar energy source and Sale to State Utility. The project is a bundled project activity which involves installation of 45 MW solar project in two states of India.

Verification team confirmed the capacity by verifying commissioning certificates/10/ and also physically verified during remote audit those plants are operational in both the locations (Punjab and Telangana). The technical specifications of 20 MW plant interconnection with grid on 24-March-2016 by Vector Green Sunshine Private Limited and technical specification of 25 MW plant interconnection with grid on 27-June-2016 by Polepally Solar Parks Private Limited confirmed with technical specifications from technology supplier and details as confirmed during remote audit provided in sec. 4.1 of this report. Project is promoted by Vector Green Sunshine Private Limited and Polepally Solar Parks Private Limited.

The electricity meters are of the make SECURE with a precision of 0.2S. The SCADA system allows the PV system to be manually or automatically controlled and monitored. The project is based on sectoral scope 1: Energy Industries (renewable sources) with ACM0002: Grid-connected electricity generation from renewable sources - Version 17.0.

During the current monitoring period from 23-Jan-2020 to 22-Mar-2021 (first and last date included) the project activity has supplied 91,106.20 MWh of electricity, and thus contributing to the GHG reductions 87,943 tCO_2e

2 VERIFICATION PROCESS

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

2.1 Method and Criteria

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using ESPL's internal procedures. The Project was verified against the latest requirements (Version 4.0) /14/ and guidance set out in VCS Standards as applicable.

- The validation/verification process consists of the following three phases;
- A document review of the VCS PD and VCS MR (described in Section 2.2)
- Site visit and follow up interviews with project stakeholders (described in Section 2.3 and 2.4)
- The resolution of outstanding issues and issuance of the final report and opinion. (described in Section 2.5)

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

2.2 Document Review

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

a) A review of the data and information presented to verify their completeness.

b) A review of the monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures.

c) An evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

2.3 Interviews

The Remote audit for the project activity were carried out from 20-May-2021 which covers all the sites (includes all the locations) in the state of Punjab & Telangana in India. No sampling procedures were adopted either in document verification and all the document were cross checked to ensure conservative

estimation of emission reduction. Kindly find below names of the persons interviewed (during remote audit) for all the sites.

S.N.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Jeengar	Mr. Lokesh	GM (Power Sales & Business) (Vector Green)	20-May-2021	Implementation of the project, monitoring and emission reduction calculations	Mr. Pankaj Kumar
2.	Saha	Tapti	Project Consultant EKI Energy	20-May-2021		
3.	-	Mukund	Villager	20-May-2021	Local stake holder meeting consultation	Mr. Pankaj Kumar
4.	Rao	Joga	Villager	20-May-2021		

During the remote audit, the PP representatives were questioned about the implementation of the project activity. Several topics like the verification of commissioning date of meters, the generation, recording, and monitoring of the data and the error accountability were discussed. Various documents like the JMR sheets, invoice slips, purchase slips etc. were also verified at the site itself.

Several photographs were also clicked at the site to capture the name plate data, meter specifications, key technical specifications of the major equipment like panel, inverter and meters and to establish the current status and the implementation of the Project Activity.

2.4 Site Inspections

Duration of on-site inspection:20/05/2021				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring.	**Vector Green Sunshine Pvt Ltd:** Vill. – Gammiwala, Tehsil- Boha, District- Mansa, Punjab **Polepally Solar Parks Pvt Ltd:** Vill- Ippaturu, Taluk- Nawabpet, District – Mahbubnagar, Telangana	20/05/2021	Pankaj Kumar

A remote audit was undertaken by the assessment team (Pankaj Kumar) during 20/05/2021 to carry out the following;

a. An assessment of the implementation and operation of the registered project activity as per the registered PD or any approved revised PD/1/ and MR/2/;

b. A review of information flow for generating, aggregating and reporting the monitoring parameters;

c. Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PD;

d. A cross-check between information provided in the monitoring report and data from other sources such as JMR sheets, invoice slips, PPA agreement etc.;

e. A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PD/1/, the applied methodology including applicable tool(s), and, where applicable, the applied standardized baseline;

f. A review of calculations and assumptions made in determining the GHG data and emission reductions;

g. 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

The findings may be of the following types: CAR- Corrective Action Request, CL- Clarification Request and FAR- Forward Action Request.

The list of findings and their resolution are presented in Appendix IV of this verification report. The section also includes the response, if provided, by the project participants and an assessment by the assessment team if it was closed or otherwise. It is to be noted that all the findings have been satisfactorily resolved by the assessment team.

A total of 02 CAR and 03 CL were raised in the current verification. All the findings that are raised and communicated to project participant during the verification are included under Appendix 2. The section also includes the response, if provided, by the project participants and an assessment by the verification team if it was closed out or otherwise

2.5.1 Forward Action Requests

This is 3rd periodic verification of the project activity and no FAR is raised during current verification and no FAR from previous verification as well.

2.6 Eligibility for Validation Activities

As project is already validated and this is 3rd verification of the project. Hence, this section not applicable

3 VALIDATION FINDINGS

As project is already validated and this is 3rd verification of the project. Hence, this section not applicable

3.1 Participation under Other GHG Programs

This section is not applicable for present verification.

3.2 Methodology Deviations

No methodology deviation is envisaged for present verification.

3.3 Project Description Deviations

Not applicable as no deviation in project description observed during this monitoring period.

3.4 Grouped Project

This is not a grouped project. Thus, this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the verification remote audit it was concluded that the project is implemented as per the instruction of the registered PD/1/, Final Validation report and commissioning certificates/10/. During the current monitoring period it was observed that no unforeseen situation evolved which can impact the operation of the project activity. Breakdown summary is submitted by PP for the solar plants. Scheduled maintenance was carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team/9/.

The total installed capacity of the project is 45 MW; which involves 20 MW capacity in Punjab by Vector Green Sunshine Private Limited and 25 MW in Telangana by Polepally Solar Parks Private Limited/10/. The technical parameters/ specifications have been verified by the assessment team during the onsite visit/09/ with the nameplates as well as the same is also verified with the details as provided by the manufacturer/18/.
The assessment team physically visited the solar plant site in order to verify the status of the project implementation of the monitoring plan. It has also been verified as per the guidelines in ACM0002: Grid-connected electricity generation from renewable sources - Version 17.0,that the calculations for the GHG emission reductions are done in accordance with the aforesaid methodology/7/.

The assessment team also confirmed that the monitoring system for emission reduction calculation was in place and in accordance with the registered VCS PD/1/. There was no deviation observed by the assessment team in the implementation of the monitoring system form the registered VCS PD during the current monitoring period/1/.

During the current monitoring duration, no events have been found that can change the design of project.

The details of the PPs for the project and their location of installation are mentioned in the table below:

Name of PPs	Capacity in MW	Date of Commissioning	State	Latitude (N)	Longitude (E)
Vector Green Sunshine Private Limited	20	24-March-2016	Mansa, Punjab	29° 47' 52.47"	75° 31' 16.63"
Polepally Solar Parks Private Limited	25	27-June-2016	Mehbubnagar,Telangana	16°53' 20.0"	78°04' 57.8"

Capacity of the projects and date of commissioning verified with commissioning certificates/10/ and technical specifications provided by technology supplier/18/

Geo coordinates checked on google earth/17/ and also checked during remote audit and verification team conclude geo coordinates of project locations are consistent with registered PD.

Assessment team checked the technical details of the project activity from the manufactures specification and the detail 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 45 MW.

The technical specification of 20 MW plant interconnection with grid on 24-March-2016 by Vector Green Sunshine Private Limited are as follows:

Sl. No.	Technical details of the equipment	Comments
1.	Technology Used	Multi Crystalline
2.	Number of modules installed 67760	67760
3.	Sources(s) of the modules installed	Renesola
4.	Make & Number of Inverters	TMEIC- 23 Nos.
5.	Make & Number of Power Transformers	CG- 10 MVA, 2 Nos.
6.	Make & Number of Inverter Transformer	Esennar- 3MVA, 1.5 MVA, 750 MVA, 7 Nos.
7.	HT Panel	ABB
8.	Make & Number of UPS	EMERSON, 8 Nos.

The technical specification of 25 MW plant interconnection with grid on 27-06-2016 by Polepally Solar Parks Private Limited are as follows:

Sl. No.	Technical details of the equipment	Comments
1.	Technology Used	Multi Crystalline
2.	Number of modules installed	290430 95Wp = 29880 (FS-395-PLUS) 97.5Wp = 189180 (FS-397-PLUS) 100WP = 71370 (FS-3100-PLUS)
3.	Sources(s) of the modules installed	First Solar
4.	Make & Number of Inverters	SMA- 30 Nos
5.	Make & Number of Power Transformers	Schneider Electric- 25/30 MVA, 1No.
6.	Make & Number of Inverter Transformer	Silchar Technologies- 1.8 MVA 15 Nos.
7.	HT Panel	Technocraft- 24 Nos.
8.	LT Panel	Arrow Engineers- 16 Nos.
9.	Make & Number of UPS	Delta, 3 Nos. (10KVA, 3KVA & 3KVA)

The project is running smoothly ever since commissioning with regular scheduled maintenance.

Assessment team concludes the following:

a) The implementation status of project activity was found to be in compliance with registered PD/1/.

b) DOE has conducted the remote audit to confirm the implementation status of the project/9/.

c) The commissioning date of the project activity was found to be accurately and consistently recorded/10/.

d) The actual operation of project activity was found to be in compliance with the flow diagram provided in registered PD/1/.

e) The emission reductions achieved during the current monitoring period are 87,943 tCO2e.

The project activity contributes to the sustainable development by utilising solar energy for generating electricity which otherwise would have been generated through fossil fuels. Thereby reduction in usage of non-renewable sources used to generate energy.

Further the GHG emission reductions generated by the project activity has not been included by any other an emissions trading program or any other mechanism that includes GHG allowance trading. Also, the project has not received any other form of environmental credit and has not been participated/rejected under any other GHG programs.

Sustainable Development- The project will contribute to the sustainable development in the following ways

1. Environmental: Since the project activity leads to cleaner production of energy, it is leading to displacement of fossil fuel-based energy.
2. Social: Setting up of the project activity has created new job openings hence is supporting employment of the local people around.
3. Cleaner Air: Since the project activity leads to lesser GHG emission it results in better air quality.

Further the project has been implemented as described in the Project Description/1/. No CAR, was raised on the editorial issue of description and same resolved by revision in the MR.

The total emission reductions achieved in this monitoring period i.e. from 23-Jan-2020 to 22-Mar-2021 are 87,943 tCO2e.

4.2 Safeguards

4.2.1 No Net Harm

As PP does not see and identify any potential negative environmental and socio-economic impacts. During site visit, verification team checked by interviewing the site personnel and confirm that there are no any potential negative environmental and socio-economic impacts attributed to this project activity. VVB confirmed that, project activity does not involve any major construction activity except installation of solar PV panels and other accessories. VVB also checked MNRE report on “Developmental Impacts and Sustainable Governance Aspects of

Renewable Energy Projects" dated Sept. 2013 which explicitly mention that solar PV project activity operations do not result in direct air and noise pollution. Hence, no significant impacts on air, water, soil quality and overall ambience due to project activity.

4.2.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration. However, as part of ongoing continuous mechanism for communication with stakeholders, PP has kept a grievance register at project site office which is readily available to stakeholders to record their feedback or grievance if any which addressed by project site manager immediately. Grievance of any can be communicated to project proponent also through email. This mechanism was checked by VVB during remote audit and found the system appropriate and in line with description provided in MR and registered PD

4.3 AFOLU-Specific Safeguards

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

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the MR.
Findings	CL 02 and CAR 06 was raised during the verification process and closed successfully.
Conclusion	**Ex-ante Parameter:** **$EF_{grid,OM,y}$ =** Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.9843 tCO_2/MWh. Verification team found same was used in the ER calculations. Ex ante value of emission factor is taken from CEA database, Ver. 12, May, 2017. Verification team checked the EF value and found in consistent with registered PD **$EF_{grid,BM,y}$ =** Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.9083 tCO_2/MWh. Verification team found same was used in the ER calculations. Ex ante value of emission factor is taken from CEA database, Ver. 12, May, 2017. Verification team checked the EF value and found in consistent with registered PD **$EF_{grid,CM,y}$** = Parameter is fixed ex-ante for the entire crediting period and as per the validated VCS PD same is fixed 0.9653 tCO_2/MWh. Verification team found same was used in the ER calculations.

	Ex ante value of emission factor is taken from CEA database, Ver. 12, May, 2017. Verification team checked the EF value and found in consistent with registered PD. **Baseline Emissions:** The baseline Emissions for a given year is calculated by multiplying the energy baseline with the grid emission factor. The grid in this case would be the 'Indian Grid' Formula Used: - $$BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$$ Where: BE_y = Baseline emissions in year *y* (t CO_2/yr) $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr) $EF_{grid,CM,y}$ = Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO_2/MWh) **Monitored Parameter:** **$EG_{PJ,y}$ =** 91,106 MWh The verification team has checked the entire monthly JMR reports/06/ for net electricity generated & supplied to the grid and crosschecked same with the invoices/05/ raised by PP towards State Utilities for the monitoring period. All values are found correct. All the parameters are monitored and recorded as per the monitoring plan in the MR. The verification team has crosschecked the revised emission reduction sheet and monitoring report data with the JMR sheet and invoice and found all the values are matching. PE_y = As per ACM0002 - Version 17, all renewable energy power generation project activities, emissions due to the use of fossil fuels for the backup generator can be neglected. As the project activity involved wind power project emissions (PE_y) are taken as zero. Leakage: As per ACM0002 - Version 17, Leakage emissions are not considered for the project activity.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	The verification team checked the break down log for the monitoring period. During the verification site visit and the feeder wise location of the solar plants is also checked.

The metering arrangement is tri-vector bi-directional energy meters (main and check and also one standby meter) at the State Electricity Board (SEB) substation. These meters record parameters including electricity exported & imported. Moreover, the meters are located at the HT side of the transformer and are of accuracy class of 0.2S for project activity applied for verification.

These electricity meters are being used by state electricity board for JMR (Joint Meter Reading) electricity generation statements. The Net electricity supplied to the grid is then calculated from export and import values. The net electricity exported to the grid is also cross checked from the invoices raised to respective state electricity board which is in line with Methodology requirement for large scale project activity. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point and signed by the representatives of state utility and O&M personnel. In the event of failure of main meter, the check meter is used in monitoring the electricity data. The agency is experienced in the monitoring system and is managing O&M of numerous other solar farm projects. Verification team confirms the metering process by interviewing the O&M personnel and PP representatives during remote audit t and found the monitoring process is in line with approved PD.

Calibration of all the meters is done by state electricity board officials as per the industry standards. However, the calibration is done once in a 5 year/19/ The details of Calibration of the meters as confirmed during site visit and calibration certificates are mentioned below. The assessment team checked the same and found correct.

Calibration and Meter Details

Meter Calibration details of 20 MW solar project by **Vector Green Sunshine Private Limited**

Meter Details	Main Meter	Check Meter
Sl. No.	15191785	15191778
Make	Secure	Secure
Accuracy Class	0.2 s	0.2 s
Date of Subsequent Meter Calibration	08- January 2019	08- January 2019
Due date of Meter Calibration	07- January 2024	07- January 2024

Meter Calibration details of 25 MW solar project by **Polepally Solar Parks Private Limited**

Meter Details	Main Meter	Check Meter	Standby Meter
Sl. No.	XC510829	XC510830	APX00481
Make	Secure	Secure	Secure

Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Meter Calibration	30 August 2019	30 August 2019	30 August 2019
Due date of Meter Calibration	29 August 2024	29 August 2024	29 August 2024

The energy meter recording the export and import from the grid at substation is under the control and supervision of state electricity board officials. Similarly, O&M contractor is responsible for monitoring of the generation data at CMS.

PP representatives confirmed that the CMS data as well as JMR sheets and invoices will be kept for 2 years following the end of the crediting period. During remote audit and discussion with PP, assessment team confirm that the data will be kept for 2 years following the end of the crediting period.

The responsibilities and authorities of project management, data handling and recording, measurement methods and QA/QC procedure have been systematically established and formalized and the same was verified during the site visit by interviewing O&M personnel and checking of records/ log books maintained at site.

Findings

CAR 04 was raised during the verification process. The description of the CAR and its closure is described below in Appendix 2 of this report.

Conclusion

The assessment team confirms that the value of net electricity exported to the grid as used in emission reduction calculation is correct.

The verification team therefore is of the opinion that the project participant through the O&M agency is capable of implementing the monitoring plan in the context of the project activity.

On-remote audit and interview with O&M personnel also confirms that the operational and organizational chart as mentioned in MR is as per the site practice and thus assessment team confirms that the details are correct.

The break down log is checked and found that the solar Panels undergone scheduled maintenance as per the guideline provided by the manufacturer which is acceptable to the assessment team. No unforeseen incident observed during the monitoring period which could alter the applicability of the methodology or change in project specification as mentioned in the registered PD. The project undergone Continuous operation from the inception/commissioning and the same is confirmed from the JMR reports and invoices raised for the said period of verification.

Comparison of actual and estimate emission reductions achieved:

	Assessment team checked the calculation of estimated VER vs. Actual VER. As per the registered VCS PD the amount of VERs annually is 70,073 tCO2e. The days involved in present monitoring period are 425 Therefore, on pro-rata basis, the estimated VERs for the monitoring period is 81,591 tCO2e. Actual VERs obtained for the monitoring period is 87,943 tCO2e and thus the actual VER is 7.22% higher than the estimated VER. This variation is majorly due to the variations in availability of climatic conditions, grid availability and other parameters which are not in the control of PP. Sensitivity analysis already carried out in registered PD up to 10% increase in PLF and rise in PLF in this monitoring period is still below the range of 10% Hence verification team confirms that increase in VER by 7.22% in this monitoring period is acceptable.

4.6 Non-Permanence Risk Analysis

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
NA	NA	NA	NA	NA

5 VERIFICATION CONCLUSION

Earthood Services Private Limited (Earthood), contracted by Vector Green Sunshine Private Limited and Polepally Solar Parks Private Limited has performed the independent verification of the emission reductions for the VCS project activity reference number 1745 “Bundled Solar Power Project by Vector Green Sunshine Private and Polepally Solar Parks Private Limited” in India for the monitoring period 23-Jan-2020 to 22-Mar-2021 reported in the Monitoring Report Version 03 dated 15-July-2021.

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity.

Earthood commenced the verification on the basis of the baseline and monitoring methodology “ACM0002 - Version 17.0”, the monitoring plan contained in the PD version 02 and VCS guidelines version 4.0, Monitoring Report Version 03 dated 15-July-2021as per the process described under Section 2 of this report.

Earthood’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. Earthood planned and

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

In our opinion the GHG emissions reductions reported for the project activity for the period 23-January-2020 to 22-March-2021 (inclusive of both dates) are fairly stated in the Monitoring Report Version 03 dated 15-July2021. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology "ACM0002 - Version 17.0" and the VCS standard.

Verification period: 23-January-2020 to 22-March-2021 (inclusive of both dates)

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

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)
2020	69,009	0	0	69,009
2021	18,934	0	0	18,934
Total	87,943	0	0	87,943[1]

Approved by

Dr. Kaviraj Singh

Managing Director **Date: 28/07/2021**

Earthood Services Privated Limited **Place: Gurgaon, Haryana**

[1] Round down value

APPENDIX 1: DOCUMENTS REVIEWED OR REFERENCED (VERIFICATION)

S.No	Title of Document	Version	Date
1.	Registered VCS PD	version 03	21-March-2018
2.	VCS Monitoring Report	03	15-July-2021
3.	ER spreadsheet (corresponding to the final monitoring report)	2	15-June-2021
4	Certificates of Calibration for all the meters belongs to project activity: Vector Green Sunshine Pvt. Ltd. Polepally Solar Parks Pvt. Ltd.	-	 08-Jan-2019 30-Aug-2019
5.	Invoice issued by PP for the duration of monitoring period	-	01-Feb-2018 to 22-Jan-2020
6.	Joint Meter Readings for the duration of monitoring period	-	01-Feb-2018 to 22-Jan-2020
7.	"Consolidated baseline methodology for grid-connected electricity generation from renewable sources", ACM0002,	"ACM0002 - Version 17.0"	-
8.	CO_2 Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, Govt.	version 12	-
9.	On-site assessment, interviews of plant staff	-	20/05/2021
10.	Commissioning certificate for all the Solar plants of the project activity: Vector Green Sunshine Pvt. Ltd. Polepally Solar Parks Pvt. Ltd.	-	 05-April-2016 06-Jan-2015
11.	Power Purchase Agreements: Vector Green Sunshine Pvt. Ltd. Polepally Solar Parks Pvt. Ltd.	-	 31-March-2015 29-April-2014
12.	VCS webpage for the project, VCS ID 1745; https://registry.verra.org/app/projectDetail/VCS/1745	-	Last accessed on 05-July-2021
13.	O&M contract for all project sites: Vector Green Sunshine Pvt. Ltd. (Punj Lloyd Infrastructure Ltd.) Polepally Solar Parks Pvt. Ltd. (Mahindra Sustain Pvt. Ltd.)	-	 10-Feb-2016 28-Jan-2016
14.	VCS Standard	Version 4.0	Last accessed on 05-July-2021
15.	VCS Program Guide	Version 4.0	Last accessed on 05-July-2021

S.No	Title of Document	Version	Date
16	Letter of declaration dated from PP regarding not having created or sought any other form of environmental credit for the same period and double counting	-	02/03/2020
17	Google Earth desktop/Mobile application	-	Last accessed on 06-July-2021
18	Technical specifications (DPR): Vector Green Sunshine Pvt. Ltd. Polepally Solar Parks Pvt. Ltd.		07-Sept.-2015 21-Aug-2015
19	Meter calibration guidelines: http://cea.nic.in/reports/regulation/CEA_metering_regulation_amendment_2019.pdf		

APPENDIX 2: CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS (CAR/CL/FAR)

Table 1. Remaining FAR from previous verification

FAR ID	01	Section no.		Date : 23/02/2020
Description of FAR				
There is no FAR from the validation/previous verifications of the project activity				
Project participant response				Date :DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY

NA

Table 2. CL from this verification

CL ID	02	Section no.	1.1	Date : 26/05/2021
Description of CL				
In sec. 1.1, total GHG emission reductions in the current monitoring period not consistent with ER sheet. PP shall clarify				
Project participant response				**Date : 15/06/2021**
Correct value of total GHG emission reductions in the current monitoring period has been added in sec 1.1 in MR.				
Documentation provided by project participant				
1. *Revised MR.* 2. *Revised ER sheet*				
DOE assessment				**Date:** 16/06/2021
PP has now corrected the value of total GHG emission reductions in the revised MR version 02 and made consistent with ER sheet. Hence, **comment closed**.				

CL ID	03	Section no.	1.9, 1.10	Date : 26/05/2021
Description of CL				
PP shall provide an undertaking regarding no double counting of emission reductions claimed for this monitoring period.				
Project participant response				**Date : 15/06/2021**
VCS Declaration on double counting has been submitted to DOE.				
Project participant response				**Date : 05/07/2021**
VCS Declaration on double counting has been submitted to DOE.				
Documentation provided by project participant				
VCS Double Counting Declaration letter				
DOE assessment				**Date:** 16/06/2021
PP has not provided undertaking regarding no double counting document of emission reductions. Hence, **comment open.**				
DOE assessment				**Date: 06/07/2021**
PP has now provided undertaking regarding no double counting document of emission reductions. Hence, **comment closed .**				

CL ID	04	Section no.	4.4	Date : 26/05/2021
Description of CL				
PP shall provide copies of JMR and invoices of entire monitoring period along with calibration certificates of all the meters involved in monitoring				
Project participant response				**Date : 15/06/2021**
JMR, Invoices and all Calibration Certificates have been submitted to DOE.				
Project participant response				**Date: 05/07/2021**
All documents have been submitted to DOE.				
Documentation provided by project participant				
JMR, Invoice, Calibration Certificates				
DOE assessment				**Date: 16/06/2021**
PP has not provided copies of JMR/invoices and calibration certificates of all meters involved. Hence, **comment open**.				
DOE assessment				**Date: 06/07/2021**
PP has now provided copies of JMR/ invoices and calibration certificates of all meters involved. Hence, **comment closed.**				

Table 3. CAR from this verification

CAR ID	05	Section no.	2.1 & 2.2	Date: 26/05/2021
1. In sec. 2.1 of MR, PP shall provide weblinks for EIA notification referred. 2. In sec. 2.2, PP shall explain the ongoing communication process with local stakeholders and provide a copy of grievance register pertaining to the current monitoring period				
Project participant response				**Date: 15/06/2021**
1. Weblink of EIA notification has been added in sec 2.1 of MR. *2. A grievance register has been kept at site so that local people can write comment about this project. Sec 2.2 of MR has been revised as per comment.*				
Project participant response				**Date: 05/07/2021**
3. A grievance register has been submitted to DOE.				
Documentation provided by project participant				
1. Revised MR *2. Grievance Register*				
DOE assessment				**Date: 16/06/2021**

1. PP has now provided weblink for EIA notification in the revised MR version 02. Hence, **comment closed.** 2. PP has explained the communication process with local stakeholders in the revised MR ver. 02 but PP has not provided the copy of grievance document to the DOE team. Hence, **comment open.**	
DOE assessment	**Date:06/07/2021**
PP has now provided the copy of grievance document to the DOE. Hence, **CAR closed**.	

CAR ID	06	**Section no.**	5.1	**Date:** 26/05/2021
In sec. 5.1, value of total baseline emissions is not rounded down. Corrective action required				
Project participant response				**Date: 15/06/2021**
Value of total baseline emissions have been rounded down in sec 5.1 in MR.				
Documentation provided by project participant				
1. *Revised ER Sheet* 2. *Revised MR*				
DOE assessment				**Date: 16/06/2021**
PP has now rounded down the value of total baseline emission in the revised MR ver.02. which checked by the DOE and found correct. Hence**, CAR closed.**				

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Competence Statement			
Name	Pankaj Kumar		
Education	M.Sc. in Environment Management Post Graduate Diploma in Environment Law B.Sc. (Hons.) Environment and Water Management		
Experience	15 Years		
Field	Climate Change/Waste Management/EIA		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	YES (AMS I.D, ACM0002)		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (1.2)	YES		
Reviewed by	Shreya Garg	Date	01/11/2019
Approved by	Anshika Gupta	Date	01/11/2019

Competence Statement	
Name	Shreya Garg
Country	India
Education	M.Sc. (Climate Science & Policy), TERI University
Experience	7 Years +
Field	Climate Change
Approved Roles	
Team Leader	YES
Validator	YES

Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	**Date**	01/03/2018
Approved by	Ashok Gautam	**Date**	01/03/2018

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential

OM	Operating Margin
PLF	Plant Load Factor
PP	Project Participant
JMR	Joint Metering Report
PPA	Power Purchase Agreement

APPENDIX 5: METER CALIBRATION DETAILS

Meter Calibration details of 25 MW solar project by Polepally Solar Parks Private Limited

Meter Details	Main Meter	Check Meter	Standby Meter
Sl. No.	XC510829	XC510830	APX00481
Make	Secure	Secure	Secure
Accuracy Class	0.2 s	0.2 s	0.2 s
Date of Meter Calibration	30 August 2019	30 August 2019	30 August 2019
Due date of Meter Calibration	29 August 2024	29 August 2024	29 August 2024

Meter Calibration details of 20 MW solar project by Vector Green Sunshine Private Limited

Meter Details	Main Meter	Check Meter
Sl. No.	15191785	15191778
Make	Secure	Secure
Accuracy Class	0.2 s	0.2 s
Date of Subsequent Meter Calibration	08- January	08- January

	2019	2019
Due date of Meter Calibration	07- January 2024	07- January 2024