



RENEWABLE SOLAR POWER PROJECT BY SHAPOORJI PALLONJI



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Summary:

4K Earth Science Private Limited (4KES) has been contracted by “Virescent Infrastructure Investment Manager Private Limited¹” to undertake verification and certification for the greenhouse gas (GHG) emission reductions reported from ‘Renewable Solar Power Project by Shapoorji Pallonji’ for the monitoring period 01/10/2021 – 31/12/2022 in the initial monitoring report version 1.0, date 20/09/2023.

The project activity generates electricity through renewable solar energy source. The project is bundled involving 220 MW solar projects in three states of India (Maharashtra, Tamilnadu & Karnataka). Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant. The electricity generated from the project activity is being exported to the Indian electricity grid.

The details of the projects are mentioned in the table below:

Name of SPV	Capacity (MW) /21/	COD /10/	District	State	PPA signed /18/
Solar Edge Power and Energy Private Limited	50	26-April-2018 by SECI	Jalgaon	Maharashtra	Sale to Solar Energy Corporation of India Limited (SECI)
	50	08-April-2018 by SECI	Beed		
	30	22-April-2018 by SECI	Beed		
Terralight Rajapalayam Solar Private Limited	50	26-September-2018 by TANGEDCO	Virudhunagar	Tamil Nadu	Sale to Grid (TANGEDCO)
Suryoday One Energy Private Limited	40	30-March-2018 by Hubli Electricity Supply Company Limited	Belgavi (Gokak)	Karnataka	Sale to Grid

The project plants were commissioned and started to supply electricity to the national grid as per the dates mentioned in the above tables as verified from the commissioning certificates /10/. Project capacity has been verified from the inspection report/Connectivity report from government departments /21/ and found consistent.

The net electricity generated from this project is supplied to the national grid via the transmission line and PPA is signed between PP and the grid companies /18/ which is still valid.

The technical details of the project equipment have been verified from site visit interview, Manufacturer technical specifications /09/, commissioning certificate /10/, Single line diagram

¹ Parent company to all the companies mentioned under section 1.3 of the monitoring report as verified from share transfer details.

/15/, photographs /19/ and inspection/connectivity reports /21/ etc.

The project activity is operational since commissioning and during current monitoring period i.e. from 01/10/2021 – 31/12/2022, the project activity has supplied 481,729 MWh net electricity to the grid, there by resulted in emission reduction of 451,284 tCO₂e. The monitoring period subject to this monitoring report is inclusive of first and last day of period.

A risk based approach has been followed to perform the 4th periodic verification of the project activity. In the course of the verification, 06 Corrective Action Requests (CARs) and 01 Clarification (CL) were raised.

The management of the ‘Solar Edge Power and Energy Private Limited, Terralight Rajapalayam Solar Private Limited and Suryoday One Energy Private Limited’ responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project final monitoring report Version 1.3 dated 19/01/2024. The calculation and determination of GHG emission reductions from the project is the responsibility of the management of the ‘Emergent Ventures India Private Limited’. The development and maintenance of records and reporting procedures are in accordance with the Monitoring Report Version 1.3 dated 19/01/2024.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions and on the calculation of GHG emission reductions from the project for the period 01/10/2021 – 31/12/2022 based on the reported emission reductions in the final monitoring report Version 1.3 dated 19/01/2024 for the same period.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, 4KES planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

4KES confirms the following;

Reporting period: 01/10/2021 – 31/12/2022

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2021 (01/10/2021 – 31/12/2021)	85,965	0	0	85,965
2022	365,319	0	0	365,319

(01/01/2022 - 31/12/2022)				
Total	451,284	0	0	451,284

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1 INTRODUCTION

1.1 Objective

4KES has been commissioned by 'Virescent Infrastructure Investment Manager Private Limited²' to perform verification of its registered VCS project 'Renewable Solar Power Project by Shapoorji Pallonji', for the reported GHG emission reductions for the given monitoring period 01/10/2021 – 31/12/2022 (both dates included). The VCS projects must undergo an independent third-party verification and certification of emission reductions as the basis for issuance of Voluntary Emission Reductions (VERs).

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

- The project activity has been implemented and operated as per the project description (PD) and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Monitoring report and other supporting documents are complete;
- The data is recorded and stored as per the monitoring methodology and approved monitoring plan.
- To confirm that the monitoring system is implemented and fully functional to generate Voluntary Emission Reductions (VERs/VCUs) without any double counting, and
- 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.

1.2 Scope and Criteria

The scope of verification is to assess the claims and assumptions made in the VCS monitoring report (MR) against the VCS criteria, including but not limited to, VCS standard, applied methodology and other relevant rules and requirements established for VCS project activities.

The Verification is not meant to provide any consulting towards the project participants. However, stated requests for clarification and/or correction actions request may have provided inputs for improvement of the project design.

² Parent company to all the companies mentioned under section 1.3 of the monitoring report as verified from share transfer details.

1.3 Level of Assurance

The verification team verified the complete monitoring data /11/, /12/, /14/, /17/ and /22/ for all the monitoring parameters of the monitoring plan against the Monitoring report /1.2/ and ER Calculation sheet /2.2/ and confirms that the reported emission reductions are free from any type of material errors. Site visit was also conducted to verify the implementation and monitoring plan of the project activity. The implementation of the project activity (i.e. major equipment and the metering arrangement) was verified during the site visit and found in accordance with the monitoring report /1.2/ and registered VCS PD /05/. Verification team has also verified the technical details of the project equipments and metering arrangement with the supportive documents /09/, /10/, /15/, /19/ and /21/ and found correct. Therefore, 4KES confirms that the verification is conducted with reasonable level of assurance.

1.4 Summary Description of the Project

The project activity generates electricity through renewable solar energy source. The project is bundled involving 220 MW solar projects in three states of India (Maharashtra, Tamilnadu & Karnataka). Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant. The electricity generated from the project activity is being exported to the Indian electricity grid.

The details of the projects are mentioned in the table below:

Name of SPV	Capacity (MW) /21/	COD /10/	District	State	PPA signed /18/
Solar Edge Power and Energy Private Limited	50	26-April-2018 by SECI	Jalgaon	Maharashtra	Sale to Solar Energy Corporation of India Limited (SECI)
	50	08-April-2018 by SECI	Beed		
	30	22-April-2018 by SECI	Beed		
Terralight Rajapalayam Solar Private Limited	50	26-September-2018 by TANGEDCO	Virudhunagar	Tamil Nadu	Sale to Grid (TANGEDCO)
Suryoday One Energy Private Limited	40	30-March-2018 by Hubli Electricity Supply Company Limited	Belgavi (Gokak)	Karnataka	Sale to Grid

The project plants were commissioned and started to supply electricity to the national grid as per the dates mentioned in the above tables as verified from the commissioning certificates /10/. Project capacity has been verified from the inspection report/Connectivity report from government departments /21/ and found consistent.

The net electricity generated from this project is supplied to the national grid via the transmission line and PPA is signed between PP and the grid companies /18/ which is still valid.

The technical details of the project equipment have been verified from site visit interview, Manufacturer technical specifications /09/, commissioning certificate /10/, Single line diagram /15/, photographs /19/ and inspection/connectivity reports /21/ etc.

This project is located as follows:

Name of SPV /13/	Capacity (MW)	Village	Taluka	District	State
Solar Edge Power and Energy Private Limited	50	Wadhav, Hartale & Manpur	Muktainagar	Jalgaon	Maharashtra
	50	Parli	-	Beed	
	30	Parli	-	Beed	
Terralight Rajapalayam Solar Private Limited	50	Thenkarai	Vembakottai	Virudhunagar	Tamil Nadu
Suryoday One Energy Private Limited	40	Gokak Falls	Gokak	Belgavi	Karnataka

Name of SPV	Capacity (MW)	Latitude	Longitude
Solar Edge Power and Energy Private Limited	50	21° 01' 36.01"	75° 59' 6.82"
	50	18° 55' 21.06"	76° 21' 29.28"
	30	18° 55' 21.06"	76° 21' 29.28"
Terralight Rajapalayam Solar Private Limited	50	9° 33' 14.52"	77° 53' 03.25"
Suryoday One Energy Private Limited	40	16° 10' 40.92"	74° 47' 22.56"

Verification team has verified the physical address through internet /08/ and found consistent.

The project activity is operational since commissioning and during current monitoring period i.e. from 01/10/2021 – 31/12/2022, the project activity has supplied 481,729 MWh net electricity to the grid, there by resulted in emission reduction of 451,284 tCO₂e. The monitoring period subject to this monitoring report is inclusive of first and last day of period.

2 VERIFICATION PROCESS

The registered VCS project is undergoing 4th verification under VCS (1st Crediting period), the approach adopted to ensure the quality of emission reductions is described in the following sections.

2.1 Method and Criteria

4KES assessed and determined whether the proposed implementation and operation of the project activity, and the steps taken to report emission reductions comply with the criteria and relevant guidance provided by the VCS Board. The validation/verification process consist of the following three phases;

- A desk review of the VCS PD and VCS MR
- follow up interviews with project stakeholders
- The resolution of outstanding issues and issuance of final report and opinion.

The prepared verification report and other supporting documents then undergo an internal quality control before being submitted to the VCS executive board for issuance of credits as per VCS standard version v4.4.

Duration of Verification:

Verification Contract	19/07/2023
On-site visit	13/10/2023 to 18/10/2023 (On-site visit by Mr. Chetan Swaroop Sharma and Ms. Rama Shivanjali)
Findings raised	08/11/2023
Draft Verification Report	10/01/2024
Final Verification Report	19/01/2024

2.2 Document Review

The verification is performed primarily as a document review of the approved VCS PD and associated documents as stated in detail in appendix 1 of this document. The assessment is performed by a verification team using a protocol. The cross checks between information provided in the Monitoring report, VCS PD and information from sources other than those used, if available, the team's sectoral or local expertise and, if necessary, independent background investigations.

2.3 Interviews

Verification team performed the Physical site visit and interviewed PP representatives/site person/Local Stakeholders (identified randomly from nearby local village) and reviewed documents to achieve a reasonable level of assurance in the verification. No sampling procedures were adopted in document verification and all the document were cross checked to ensure conservative estimation of emission reduction. The assessment was drawn based on the feedback received during interview coupled with the documentation and observations.

Kindly find below names of the persons interviewed.

Location	Name of SPV	Capacity (MW)	Village	Taluka	District	State	Latitude	Longitude
	Solar Edge Power and Energy Private Limited	50	Wadhav, Hartale & Manpur	Muktainagar	Jalgaon	Maharashtra	21° 01' 36.01"	75° 59' 6.82"
		50	Parli	-	Beed		18° 55' 21.06"	76° 21' 29.28"
		30	Parli	-	Beed		18° 55' 21.06"	76° 21' 29.28"
	Terralight Rajapalayam Solar Private Limited	50	Thenkarai	Vembakottai	Virudhunagar	Tamil Nadu	9° 33' 14.52"	77° 53' 03.25"
	Suryoday One Energy Private Limited	40	Gokak Falls	Gokak	Belgavi	Karnataka	16° 10' 40.92"	74° 47' 22.56"
Dates	13/10/2023 (District Jalgaon, Maharashtra)							
	14/10/2023 (District Beed, Maharashtra)							

	16/10/2023 (Karnataka) 18/10/2023 (Tamilnadu)	
Key points discussed	Name of person, interviewed	Designation, Organization
Project Implementation, Operational data, Calibration, Data collection, QA/QC, procedures, Calculation of ERs, VCS requirements	Shankar Solanki	Deputy Manager, Solar Edge Power and Energy Private Limited (Jalgaon district)
	Geeunor Deubte	Site Engineer, Solar Edge Power and Energy Private Limited (Jalgaon district)
	Dattatraya Hegde	Senior Manager, Solar Edge Power and Energy Private Limited (Beed district)
	G.M. Nimbalkar	Junior Engineer, Suryoday One Energy Private Limited
	Mohammad Arif	Office admin, Suryoday One Energy Private Limited
	Praveen	Technician, Suryoday One Energy Private Limited
	Sagar	Technician, Suryoday One Energy Private Limited
	Akash	Technician, Suryoday One Energy Private Limited
	Harikumar Krishnan	Deputy Manager, Terralight Rajapalayam Solar Private Limited
Sustainable development Impact, Complaints, Mode of communication, Environmental impact, any other concerns	Patil Rajendra	Sarpanch, Jalgaon district, Maharashtra (Local people)
	Patil Motiram Kadu	Farmer, Jalgaon district, Maharashtra (Local people)
	Tayde Sandit Pundalik	Farmer, Jalgaon district, Maharashtra (Local people)
	Amol Munde	Farmer, Bhilegaon, Beed district, Maharashtra (Local people)
	Satish Munde	Farmer, Waghala, Beed district, Maharashtra (Local people)
	Nathurao Musle	Farmer, Malnathpur, Beed district, Maharashtra (Local people)
	Shyam Gitte	Farmer, Parchundi, Beed district, Maharashtra (Local people)
	Maning Sonakhi	Sarpanch, Karnataka (Local People)
	Shafi Seetar	Farmer, Karnataka (Local People)
	Balappa Naies	Farmer, Karnataka (Local People)
	Ramesh Pujeri	Farmer, Karnataka (Local People)

	Ganesun	Farmer, Tamilnadu (Local People)
	Ramkumar	Shopkeeper, Tamilnadu (Local People)
	Saravanan	Farmer, Tamilnadu (Local People)
	Selvam	Farmer, Tamilnadu (Local People)
	Kannan	Farmer, Tamilnadu (Local People)

2.4 Site Visits

Verification team performed the Physical site visit and interviewed PP representatives/site person/Local Stakeholders (identified randomly from nearby local village) and reviewed documents to achieve a reasonable level of assurance in the verification. No sampling procedures were adopted in document verification and all the document were cross checked to ensure conservative estimation of emission reduction. The assessment was drawn based on the feedback received during interview coupled with the documentation and observations. The name of the persons interviewed is reported under section 2.3 of this report.

2.5 Resolution of Findings

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

CAR (Corrective Action Request) is raised if one of the following occurs:

- Non-compliance with the monitoring plan, the methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met. All CARs and CLs raised by the 4KES during verification shall be resolved prior to submitting a request for issuance.

FAR (Forward Action Request) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

During the Verification process, total 06 CAR and 01 CL were raised and resolved satisfactorily. No FAR has been raised in the verification. The list of CARs/CLs/FARs raised and the response provided, the mean of validation, reasons for their closure and references to correction in the relevant documents are provided in Appendix II of this report.

2.5.1 Forward Action Requests

No FAR raised during the verification.

2.6 Eligibility for Validation Activities

4KES conducted the verification activity; the validation was performed by the other VVB. 4KES has a valid UNFCCC accreditation in the sectoral scope from UNFCCC. The accreditation scope can be checked from the below link: <http://cdm.unfccc.int/DOE/list/DOE.html?entityCode=E-0069>

3 VALIDATION FINDINGS

Use this section to provide details of all validation activities that took place during the verification, such as gap validation, validation of methodology deviations and project description deviations, and the inclusion of new project activity instances into grouped projects.

3.1 Participation under Other GHG Programs

The project is registered in VCS only, verification team confirms that it has checked that there is no double counting associated with project activity being participation of other GHG programs. Declaration has also given by the PP /20/ for the same.

3.2 Methodology Deviations

The verification team confirms that the registered PD /05/ complies with the requirements in the applied monitoring methodology ACM0002- Version 19.0 /07/. Therefore, no methodology deviations are applied during the monitoring period. The verification team confirms that no deviations were observed during the current monitoring period.

3.3 Project Description Deviations

Following deviations were approved in last verifications:-

- a) There was a change in ownership of the SPVs located in Tamil Nadu and Maharashtra of the project activity. The details of the new owner are mentioned in Section 1.3 of previous Monitoring Report (version 03 dated 18-April-2022). The deviation was accepted and approved by VVB during last verification (2nd periodic verification).
- b) In addition to that, the earliest Commissioning date of 40 MW installation Suryoday One Energy Private Limited at Karnataka is 30-March-2018. However, as per the approved VCS-PD, PP has taken 08-April-2018, which is the Commissioning date of installations at Maharashtra as the start date of the project activity. As earliest commissioning date is 30-March-2018, same is considered as project start date. The deviation was accepted and approved by VVB during last verification (2nd periodic verification).
- c) At Karnataka Site (Suryoday One Energy Private Limited, 40 MW), PP has considered transmission losses at substation end as mentioned in JMR as a conservative approach for emission reduction calculation. Emission reduction calculation is done considering transmission losses as a conservative approach. The deviation was accepted and approved by VVB during last verification (3rd periodic verification).

Current verification:

During the current verification, it was noted that the technical specifications provided in the registered PD /05/ were not correct. The details are now correctly provided in section 3.1 above. The supporting documents are provided to VVB to establish that the technical details now provided were the ones available at the time of commissioning of the project. The correction does not affect the scale, baseline or the additionality of the project.

VVB Justification: Correct technical details are now provided under section 3.1 of the revised MR /1.2/ and found consistent with the technical information /09/, Chief Electrical Inspection Report for Karnataka and Tamilnadu/Connectivity report from Maharashtra State Distribution Company Limited for Maharashtra /21/ and the on-site visit. Verification team confirm that technical details are not changed since commissioning as confirmed from supportive /21/ however they were mention erroneously in the registered VCS PD /05/. The details are now correctly provided under section 3.1 of the revised MR /1.2/. Considering this change with respect to registered VCS PD /05/, section 3.2.2 of the MR /1.2/ is filled accordingly which is found OK. Corrections do not affect the scale, baseline or the additionality of the project and hence accepted to the verification team. CAR-04 has been raised in this respect and successfully closed. Refer append II of this report for more details.

3.4 Grouped Project

The project is not a grouped project. Therefore this section is not applicable.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity generates electricity through renewable solar energy source. The project is bundled involving 220 MW solar projects in three states of India (Maharashtra, Tamilnadu & Karnataka). Over the 10 years of first crediting period, the project will replace anthropogenic emissions of greenhouse gases from the generation-mix of power plants connected to the Indian grid, which is mainly dominated by thermal/fossil fuel based power plant. The electricity generated from the project activity is being exported to the Indian electricity grid.

The details of the projects are mentioned in the table below:

Name of SPV	Capacity (MW) /21/	COD /10/	District	State	PPA signed /18/
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	50	08-April-2018 by SECI	Beed		
	30	22-April-2018 by SECI	Beed		

Terralight Rajapalayam Solar Private Limited	50	26-September-2018 by TANGEDCO	Virudhunagar	Tamil Nadu	Sale to Grid (TANGEDCO)
Suryoday One Energy Private Limited	40	30-March-2018 by Hubli Electricity Supply Company Limited	Belgavi (Gokak)	Karnataka	Sale to Grid

The project plants were commissioned and started to supply electricity to the national grid as per the dates mentioned in the above tables as verified from the commissioning certificates /10/. Project capacity has been verified from the inspection report/Connectivity report from government departments /21/ and found consistent.

The net electricity generated from this project is supplied to the national grid via the transmission line and PPA is signed between PP and the grid companies /18/ which is still valid.

The technical details of the project equipment have been verified from site visit interview, Manufacturer technical specifications /09/, commissioning certificate /10/, Single line diagram /15/, photographs /19/ and inspection/connectivity reports /21/ etc.

The technical details are described in the tables below.

40 MW solar project by Suryoday One Energy Private Limited, Gokak, Karnataka				
SN	Technical details of the equipment	Description		
1	Technology	Solar PV technology (Poly-Crystalline)		
2	Modules	Make	Capacity	Number
		Canadian	345 Wp 350 Wp 355 Wp	23,622 101,928 34,348
3	Inverters	SMA	2500 kW	16
4	Transformers	CG	20 MVA	2

50 MW solar projects by Terralight Rajapalayam Solar Private Limited, Virudhunagar, Tamilnadu				
SN	Technical details of the equipment	Description		
1	Technology	Solar PV technology (Poly-Crystalline)		
2	Modules	Make	Capacity	Number
		JA Solar	325 Wp 330 Wp	83,040 81,900
3	Inverters	SINENG	1250 kW	40
4	Transformers	EMCO	24 MVA	2

50 MW solar projects by Solar Edge Power and Energy Private Limited, Muktainagar, Jalgaon, Maharashtra				
SN	Technical details of the equipment	Description		
1	Technology	Solar PV technology (Poly-Crystalline)		
2	Modules	Make	Capacity	Number
		Canadian Solar	320 Wp 325 Wp 330 Wp	7,998 16,120 31,682
		JA Solar	325 Wp 330 Wp	15,934 7,998
		Astronergy	320 Wp	121,892
3	Inverters	ABB	2000kW	25
4	Transformers	CGL	25 MVA	2

30 MW solar project by Solar Edge Power and Energy Private Limited, Beed, Maharashtra				
SN	Technical details of the equipment	Description		
1	Technology	Solar PV technology (Poly-Crystalline)		
2	Modules	Make	Capacity	Number
		JA Solar	325 Wp 330 Wp	70,680 48,484
3	Inverters	ABB	2000 kW	15
4	Transformer	PROLEC	50 MVA	1

50 MW solar project by Solar Edge Power and Energy Private Limited, Beed, Maharashtra				
SN	Technical details of the equipment	Description		
1	Technology	Solar PV technology (Poly-Crystalline)		
2	Modules	Make	Capacity	Number
		Canadian Solar	320 Wp 325 Wp 330 Wp	37,944 79,174 3,472
		Chint Solar	325 Wp	79,980
		ABB	2000kW	25
4	Transformer	PROLEC	50 MVA	1

Operation and maintenance of the project activity is taken care by the EPC contractor as checked from the O&M contracts /16/.

During the process of verification, 4KES confirmed the capacity, power generation, arrangement for evacuation of electricity generated, technical specifications, date of commissioning, arrangements for Operation & Maintenance (O&M). List of documents reviewed during the course of verification is presented under Appendix I of this report.

The selected monitoring period i.e. 01/10/2021 – 31/12/2022 (both days included) is within the 1st crediting period i.e. 30/03/2018 – 29/03/2028 which is accepted to the verification team.

There was no major breakdown or shutdowns during the monitoring period which might affect the applicability of methodology or might cause material errors in emission reductions.

The assessment team confirmed that there is no proposed or actual change to the project design during this monitoring period except a deviation as mentioned under section 3.3 of this report which do not affect the scale, baseline or the additionality of the project and hence accepted to the verification team. All required monitoring equipment's and procedures as mentioned in the registered VCS PD & monitoring report are available and implemented in an appropriate manner.

The organisational role and responsibility as mentioned in the registered VCS PD /05/ & monitoring report /1.2/ is followed onsite. All the monitoring equipment was calibrated as per the specified interval in the registered VCS PD & monitoring report. All the emergency preparedness as mentioned in the registered VCS PD & monitoring report is followed onsite and no discrepancies were found regarding the same.

The assessment team found that the project is in line with the registered VCS PD, monitoring report, and no deviation on project design or monitoring plan is observed except a deviation as mentioned under section 3.3 of this report which do not affect the scale, baseline or the additionality of the project and hence accepted to the verification team.

PP has declared that the project is not registered in other GHG programs, PP confirmed that the project will only be going forward with VCS registry, as declared in VCS-PD /05/. Thus emission reductions generated by project will be solely claimed by PP and PP has the right of use, which is acceptable. Net GHG emission reductions or removals generated by this project will not be used for compliance with an emissions trading program or to meet binding limits on GHG emissions as the host country i.e. India is not a participant in any emission trading programs or nor does it have any binding limits.

PP will not claim the environmental/carbon credits under any other GHG emission reduction scheme for the crediting period under VCS and PP has provided declaration on the same /20/. Hence, there is no possibility of double counting.

Verification team has checked the supportive for the activities that result in the SD contributions from the project activity for each SDG.

SDG Target 7.2: During the current monitoring period, the project activity generated 481,729 MWh of net renewable energy, which displaced part of the electricity otherwise supplied by grid connected fossil fuel fired power plants. Verification team has checked the calculation from the monitoring report /1.2/ and the ER calculation sheet /2.2/ and found correct.

SDG Target 8.5: The project activity provided multiple jobs (more than 1) as confirmed from the supportives /24/. The average salary is much higher than income per capita of the local level. All employees are trained on various topics as confirmed from training records /22/. Verification team has also verified the same during the site visit interviews.

SDG Target 13.0: The project, in the current reporting period has resulted in emission reduction of 451,284 tCO₂e. Verification team has checked the calculation from the monitoring report /1.2/ and the ER calculation sheet /2.2/ and found correct.

The emission reduction achieved during the current monitoring period i.e., from 01-October-2021 to 31-December-2022 is 16.71% lower than the ex-ante estimation for the same period, i.e. 541,852 tCO₂e. As the actual emission reduction are less than the estimated emission reduction, hence no impact on the project activity.

Project activity provide local jobs and upgrade the existing roads, directly contributing to the improvement of infrastructure in region. Section 1.11 of the Monitoring report has been checked and found OK. The project activity contributes positively to sustainable development which has been verified from the site visit interview of the Local people (Section 2.3 of this report) and supportive documents /22/, /24/.

Finding: CAR-01, CAR-02, CAR-03 and CAR-04 are raised and successfully closed.

Opinion:

Assessment team concludes the following:

- a) There is no material discrepancies between project implementation and the project description provided in the registered PD /05/ except a deviation as mentioned under section 3.3 of this report which do not affect the scale, baseline or the additionality of the project and hence accepted to the verification team.
- b) The monitoring plan is implemented completely and monitoring system (i.e., process and schedule for obtaining, recording, compiling and analysing the monitored data and parameters) is appropriate.
- c) There is no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology.
- d) The GHG emission reductions or removals generated by the project have not included in an emissions trading program or any other mechanism that includes GHG allowance trading.
- e) The project has not received or sought any other form of environmental credit, or has become eligible to do so since validation or previous verification.
- f) The project is registered under VCS only.

In view of the information's as verified above the assessment team is able to conclude that the project has been implemented as described in the project description except a deviation as mentioned under section 3.3 of this report which do not affect the scale, baseline or the additionality of the project and hence accepted to the verification team.

4.2 Safeguards

4.2.1 No Net Harm

The project activity does not involve major construction activity. It primarily requires the installation of the solar PV panels, transformer station and transmission line.

There was no harm identified from the proposed project activity and hence no need to apply mitigation measures. Hence verification team confirms that there are no significant impacts on air, water, soil quality and ambience due to the project activity.

The project activity doesn't cause negative socioeconomic impacts which is confirmed from the site visit interview of the local people (refer section 2.3 of this report). The project activity creates positive socioeconomic impacts by providing jobs/trainings as confirmed from the site visit interview of the local people (refer section 2.3 of this report) and from the supportive documents /22/ and /24/.

4.2.2 Local Stakeholder Consultation

Detailed local stakeholders consultation was conducted during the registration of the project – by identification of stakeholders, identification of local stakeholders, invitation of them, held meeting where project activity was explained in details and the PP also took due care of comments/suggestions of the local stakeholders.

The process of local stakeholder consultation is continuous. During the current monitoring period, the project proponent has kept grievance register in plant site offices and sought comments/grievances/suggestions from local stakeholders including local community, government agencies and NGOs. Besides, the PP has also kept provision for submitting comments/grievances/suggestions from local stakeholders through direct mail. However, no major comments/grievances/suggestions have been received from the aforementioned stakeholders during the current monitoring period and all such minor suggestions have been taken care by the PP. The same is confirmed during the local stakeholder interview and grievance books /25/.

4.3 AFOLU-Specific Safeguards

Not Applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The verification team was able to confirm that the monitoring plan contained in registered VCS-PD /05/ and MR /1.2/ is in accordance with the approved large scale methodology applied for

the project activity i.e. “ACM0002 ver. 19 - Grid-connected electricity generation from renewable sources” /07/ and its applicable tools.

All parameters stated in the monitoring plan /05/ and the applied methodology /07/ have been fulfilled in the current monitoring period.

The GHG emission reductions were correctly calculated on the basis of the applied methodology ACM0002 Version 19.0 /07/, VCS-PD /05/ and the formulae given in the monitoring report /1.2/.

Parameters monitored:

Verification team confirms through site visit verification and from the document review, the actual monitoring system complies with the monitoring plan mentioned in the registered validated VCS-PD /05/. According to the monitoring plan in the registered VCS-PD, there are 3 monitoring parameters required to be monitored.

For Karnataka Site:

		VVB Assessment
Data / Parameter	EG _{PJ, y}	The monitoring parameter, Unit and descriptions are as per the registered VCS-PD /05/.
Data unit	MWh	
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh	
Source of data	Monthly B-Forms	The monitoring parameter is measured by energy meters installed at 110kV Switchyard. The installed electricity meters are digital bi-direction meters. The metering system includes the main system and back-up system. There are two lines going from the project to the grid and each line has a separate main and back-up meter. The metering arrangement is verified during the site visit. The monthly electricity is jointly measured by PP and Karnataka Power

		Transmission Corporation Limited (KPTCL) in Monthly B-forms /11/ as confirmed during the site visit. The source of data is in accordance with the registered VCS-PD /05/.
Description of measurement methods and procedures to be applied	The difference of final value of export and 115% import is used for monthly values of net electricity supplied to the grid by the project activity and same value has been considered for ER calculations.	The monitoring parameter is measured by energy meters installed at 110kV Switchyard. The installed electricity meters are digital bi-direction meters. The metering system includes the main system and back-up system. There are two lines going from the project to the grid and each line has a separate main and back-up meter. The metering arrangement is verified during the site visit. The monthly electricity is jointly measured by PP and Karnataka Power Transmission Corporation Limited (KPTCL) in Monthly B-forms /11/ as confirmed during the site visit. The source of data is in accordance with the registered VCS-PD /05/. Verification team has checked the calculation under the MR /1.2/ and ER sheet /2.2/ and found correct.
Frequency of monitoring/recording	Continuous measurement & monthly recording	The electricity export and import are continuously measured and monthly recorded in the form of the monthly B-forms /11/ as verified during the site visit.

		The frequency of monitoring/recording is in accordance with the registered VCS-PD /05/.
Value monitored	83,281.75	Verification team has verified the reported electricity export and import data with the monthly B-forms /11/ and found consistent.
Monitoring equipment	The electricity exported/supplied by the plant to pooling substation and further to substation. This meter also measures electricity imported by the plant from the grid.	Verification team has checked the meter details during the site visit and found consistent with the details mentioned in the monitoring report /1.2/. The energy meters are in accordance with the registered VCS-PD /05/. During the monitoring period, no replacement of meter was observed.
QA/QC procedures to be applied	The meters is approved, tested & sealed by the State Utility. The meters are in the custody of State Utility. The frequency of calibration is once in 5 years ³ . The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines have been applied appropriately to confirm the conservativeness of metering. The metering arrangement, accuracy class of meters, calibration frequency is under control of state electricity board and PP does not	Verification team has verified the calibration certificate of the energy meters /14/ and confirm that they were calibrated during this monitoring period. The calibration was conducted by Hublli Electricity Supply Company Limited which is a government authority and hence accepted to the verification team. The calibration frequency is in accordance with the latest government regulation. The calibration

³ meter_reg.pdf (cea.nic.in)

	have any control on it. PP is getting value of net electricity supplied to grid and the same is considered the monitoring parameter. The billing is raised based on substation meters.	performance was checked from the calibration certificates /14/ and found within the accuracy limit. Verification team confirm that energy meters are calibrated in accordance with the registered VCS-PD /05/. The electricity export data is also cross-checked from the monthly invoices /12/ and found consistent.
Purpose of the data	Calculation of baseline emissions	The purpose of the monitoring parameter is to calculate the baseline emission which is in accordance with the registered VCS-PD /05/.
Calculation method	Net electricity supplied to the grid by the project plant in a given month = Export, kWh– 115% Import, kWh– transmission losses at substation end	The calculation method is in compliance with the registered VCS-PD /05/.
Comments	Data are being archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.	The archiving method is in compliance with the registered VCS-PD /05/.

For Maharashtra Site

		VVB Assessment
Data / Parameter	EG _{PJ, y}	The monitoring parameter, Unit and descriptions are as per the registered VCS-PD /05/.
Data unit	MWh	
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh	
Source of data	Joint Meter Reading Reports	The monitoring parameter is measured by energy meters

		installed at 132 kV GSS⁴ Muktainagar (Jalgaon District 50 MW Solar project) and 132 kV GSS Pangri (Beed district 30 MW and 50MW Solar project). The installed electricity meters are digital bi-direction meters. The metering system includes one main system and one back-up system at each substation. The metering arrangement is verified during the site visit. The monthly electricity is jointly measured by PP and Maharashtra State Electricity Distribution Company Limited (MSEDCL) in Monthly Joint Meter Reading report /11/ as confirmed during the site visit. The source of data is in accordance with the registered VCS-PD /05/.
Description of measurement methods and procedures to be applied	The difference of final value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value has been considered for ER calculations.	The monitoring parameter is measured by energy meters installed at 132 kV GSS⁵ Muktainagar (Jalgaon District 50 MW Solar project) and 132 kV GSS Pangri (Beed district 30 MW and 50MW Solar project). The installed electricity meters are digital bi-direction meters. The metering system includes one main system and one back-up system at each

⁴ Grid Substation

⁵ Grid Substation

		substation. The metering arrangement is verified during the site visit. The monthly electricity is jointly measured by PP and Maharashtra State Electricity Distribution Company Limited (MSEDCL) in Monthly Joint Meter Reading report /11/ as confirmed during the site visit. The source of data is in accordance with the registered VCS-PD /05/. Verification team has checked the calculation under the MR /1.2/ and ER sheet /2.2/ and found correct.
Frequency of monitoring/recording	Continuous measurement & monthly recording	The electricity export and import are continuously measured and monthly recorded in the form of the Monthly Joint Meter Reading report /11/ as verified during the site visit. The frequency of monitoring/recording is in accordance with the registered VCS-PD /05/.
Value monitored	298,910.55	Verification team has verified the reported electricity export and import data with the Monthly Joint Meter Reading report /11/ and found consistent.
Monitoring equipment	The electricity exported/supplied by the plant to pooling substation and further to substation. This meter also measures electricity imported by the plant from the grid.	Verification team has checked the meter details during the site visit and found consistent with the details mentioned in the monitoring report /1.2/. The energy meters are in

		accordance with the registered VCS-PD /05/. During the monitoring period, no replacement of meter was observed.
QA/QC procedures to be applied	The meters is approved, tested & sealed by the State Utility. The meters are in the custody of State Utility. The frequency of calibration is once in 5 years ⁶. The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines will be applied appropriately to confirm the conservativeness of metering. The metering arrangement, accuracy class of meters, calibration frequency is under control of state electricity board and PP does not have any control on it. PP is getting value of net electricity supplied to grid and the same is considered the monitoring parameter. The billing is raised based on substation meters.	Verification team has verified the calibration certificate of the energy meters /14/ and confirm that they were calibrated during this monitoring period. The calibration was conducted by MSEDCL which is a government authority and hence accepted to the verification team. The calibration frequency is in accordance with the latest government regulation. The calibration performance was checked from the calibration certificates /14/ and found within the accuracy limit. Verification team confirm that energy meters are calibrated in accordance with the registered VCS-PD /05/. The electricity export data is also cross-checked from the monthly invoices /12/ and found consistent.
Purpose of the data	Calculation of baseline emissions	The purpose of the monitoring parameter is to calculate the baseline

⁶ meter_reg.pdf (cea.nic.in)

		emission which is in accordance with the registered VCS-PD /05/.
Calculation method	Net electricity supplied to the grid by the project plant in a given month = Export, kWh – Import, kWh	The calculation method is in compliance with the registered VCS-PD /05/.
Comments	Data are being archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later	The archiving method is in compliance with the registered VCS-PD /05/.

For Tamil Nadu Site

		VVB Assessment
Data / Parameter	EG _{PJ, y}	The monitoring parameter, Unit and descriptions are as per the registered VCS-PD /05/.
Data unit	MWh	
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh	
Source of data	Joint Meter Reading Reports	The monitoring parameter is measured by energy meters installed at 110 kV Tamil Nadu Generation and Distribution Corporation (TANGEDCO) Substation. The installed electricity meters are digital bi-direction meters. The metering system includes one main system and one back-up system. The metering arrangement is verified during the site visit. The monthly electricity is jointly measured by PP and TANFEDCO in Monthly Joint Meter Reading report /11/ as confirmed during the site visit. The source of data is in accordance with the registered VCS-PD /05/.

Description of measurement methods and procedures to be applied	The difference of final value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and same value has been considered for ER calculations.	The monitoring parameter is measured by energy meters installed at 110 kV Tamil Nadu Generation and Distribution Corporation (TANGEDCO) Substation. The installed electricity meters are digital bi-direction meters. The metering system includes one main system and one back-up system. The metering arrangement is verified during the site visit. The monthly electricity is jointly measured by PP and TANFEDCO in Monthly Joint Meter Reading report /11/ as confirmed during the site visit. The source of data is in accordance with the registered VCS-PD /05/. Verification team has checked the calculation under the MR /1.2/ and ER sheet /2.2/ and found correct.
Frequency of monitoring/recording	Continuous measurement & monthly recording	The electricity export and import are continuously measured and monthly recorded in the form of the Monthly Joint Meter Reading report /11/ as verified during the site visit. The frequency of monitoring/recording is in accordance with the registered VCS-PD /05/.
Value monitored	99,537.00	Verification team has verified the reported electricity export and import data with the Monthly Joint Meter Reading report /11/

		and found consistent.
Monitoring equipment	The electricity exported / supplied by the plant to pooling substation and further to substation. This meter also measures electricity imported by the plant from the grid.	Verification team has checked the meter details during the site visit and found consistent with the details mentioned in the monitoring report /1.2/. The energy meters are in accordance with the registered VCS-PD /05/. During the monitoring period, no replacement of meter was observed.
QA/QC procedures to be applied	The meters is approved, tested & sealed by the State Utility. The meters are in the custody of State Utility. The frequency of calibration is once in 5 years ⁷ . The monthly electricity supplied/exported by the project activity in the JMR report is cross checked with the monthly invoices of sale. In the absence or delay in the meter calibration appropriate Guidelines has been applied appropriately to confirm the conservativeness of metering. The metering arrangement, accuracy class of meters, calibration frequency is under control of state electricity board and PP does not have any control on it. PP is getting value of net electricity supplied to grid and the same is considered the monitoring parameter. The billing is raised based on substation meters.	Verification team has verified the calibration certificate of the energy meters /14/ and confirm that they were calibrated during this monitoring period. The calibration was conducted by Measurement India which is an accredited laboratory and hence accepted to the verification team. The calibration frequency is in accordance with the latest government regulation. The calibration performance was checked from the calibration certificates /14/ and found within the accuracy limit. Verification team confirm that energy meters are calibrated in accordance with the registered VCS-PD /05/.

⁷ [meter_reg.pdf \(cea.nic.in\)](#)

		The electricity export data is also cross-checked from the monthly invoices /12/ and found consistent.
Purpose of the data	Calculation of baseline emissions	The purpose of the monitoring parameter is to calculate the baseline emission which is in accordance with the registered VCS-PD /05/.
Calculation method	Net electricity supplied to the grid by the project plant in a given month = Export, kWh – Import, kWh	The calculation method is in compliance with the registered VCS-PD /05/.
Comments	Data are being archived in paper & electronic form for two years after the end of crediting period or of the last issuance of VERs for this project activity, whichever occurs later.	The archiving method is in compliance with the registered VCS-PD /05/.

Finding: CL-01 and CAR-06 are raised and successfully closed.

Opinion: The verification team confirms;

- The monitoring plan has been implemented as per the registered PD /05/;
- The monitoring complies with the requirement of the applied methodology /07/;
- The information inflow (from data generation, aggregation, to recording, calculation and reporting) is included above under each parameters and confirms to the requirement of the PD;
- The values included in the monitoring report and corresponding emission reduction sheets are verified and included under each monitoring parameter, wherever appropriate;

Compliance with the calibration frequency requirements for measuring instruments:

Verification team has checked whether the calibration of the measuring equipment that has an impact on the claimed GHG emission reductions is conducted by the PP at a frequency specified in the monitoring plan /05/.

There are three monitoring parameters

1. $EG_{PJ,y}$ (Karnataka Site)
2. $EG_{PJ,y}$ (Maharashtra Site)
3. $EG_{PJ,y}$ (Tamil Nadu Site)

1. $EG_{PJ,y}$ (Maharashtra Site)

The monitoring parameter is measured by energy meters installed at 132 kV GSS⁸ Muktainagar (Jalgaon District 50 MW Solar project) and 132 kV GSS Pangri (Beed district 30 MW and 50MW Solar project). The installed electricity meters are digital bi-direction meters. The metering system includes one main system and one back-up system at each substation. The metering arrangement is verified during the site visit.

Verification team has verified the calibration certificate of the energy meters /14/ and confirm that they were calibrated during this monitoring period. The calibration was conducted by MSEDCL which is a government authority and hence accepted to the verification team.

The calibration details of the monitoring equipments is given in the below table.

Solar Edge Power, Muktainagar (Maharashtra) - 50 MW		
Type of meter	Main	Check
Meter Number	02840872	02840873
Meter Make	elster	elster
Accuracy	0.2S	0.2S
Meter location	Muktainagar GSS ⁹	Muktainagar GSS
Calibration	24-March-2018	24-March-2018
Validity	23-March-2023	23-March-2023

Solar Edge Power, Beed (Maharashtra) - 80 MW		
Type of meter	Main	Check
Meter Number	XC475851	XC475852
Meter Make	SECURE	SECURE
Accuracy	0.2S	0.2S
Meter location	Pangri GSS	Pangri GSS
Calibration	01-March-2018	01-March-2018
Validity	28-February-2023	28-February-2023

2. EG_{PJ,y} (Tamil Nadu Site)

The monitoring parameter is measured by energy meters installed at 110 kV Tamil Nadu Generation and Distribution Corporation (TANGEDCO) Substation. The installed electricity

⁸ Grid Substation

⁹ GSS is Grid Substation

meters are digital bi-direction meters. The metering system includes one main system and one back-up system. The metering arrangement is verified during the site visit.

Verification team has verified the calibration certificate of the energy meters /14/ and confirm that they were calibrated during this monitoring period. The calibration was conducted by Measurement India which is an accredited laboratory and hence accepted to the verification team.

The calibration details of the monitoring equipments is given in the below table.

Terralight Rajapalayam Solar, Virudhunagar (Tamil Nadu) - 50 MW		
Type of meter	Main	Check
Meter Number	17076769	17076792
Meter Make	L&T	L&T
Accuracy	0.2S	0.2S
Meter location	GSS	GSS
Calibration	29-June-2018	29-June-2018
Validity	28-June-2023	29-June-2023

3. EGPI, y (Karnataka Site)

The monitoring parameter is measured by energy meters installed at 110kV Switchyard. The installed electricity meters are digital bi-direction meters. The metering system includes the main system and back-up system. There are two lines going from the project to the grid and each line has a separate main and back-up meter. The metering arrangement is verified during the site visit.

Verification team has verified the calibration certificate of the energy meters /14/ and confirm that they were calibrated during this monitoring period. The calibration was conducted by Hubblil Electricity Supply Company Limited which is a government authority and hence accepted to the verification team.

The calibration details of the monitoring equipments is given in the below table.

Suryoday One Energy, Gokak (Karnataka) - 40 MW				
	Bay 1		Bay 2	
Type of meter	Main	Check	Main	Check
Meter Number	18037240	18037249	18037252	18015450
Meter Make	L&T	L&T	L&T	L&T
Accuracy	0.2s	0.2s	0.2s	0.2s
Meter location	110kV Switchyard	110kV Switchyard	110kV Switchyard	110kV Switchyard

Calibration I	10-June-2020	10-June-2020	10-June-2019	10-June-2019
Validity	09-June-2025	09-June-2025	09-June-2024	09-June-2024
Calibration II	19-November-2021	19-November-2021	19-November-2021	19-November-2021
Validity	18-November-2026	18-November-2026	18-November-2026	18-November-2026

Calibration frequency: Once in five years as per latest government regulation.

The accuracy class of the energy meters is as per the registered VCS-PD /05/. The Calibration performance was checked from the calibration reports /14/ and found that the meters were within the respective accuracy level as verified from the calibration results.

The calibration validity of the energy meters /14/ during this monitoring period were verified from the corresponding calibration certificates /14/. No delay in calibration was observed.

The monitoring equipment's have been installed in the project activity according to registered monitoring plan /05/.

Parameters not monitored/ex-ante:

4.4.4 $EF_{grid,OM,y}$ (tCO₂/MWh)

Operating Margin CO₂ emission factor in year y

	Discussion and verification assessment
Purpose of data	Calculating the combined margin emissions factor ($EF_{grid,CM,y}$) and Baseline Emission.
Verified value	0.9610 tCO ₂ /MWh
Source of value	Registered VCS-PD /05/ Calculated as per "Tool to calculate the emission factor for an electricity system, version 07" as 3-year generation weighted average using data for the years 2015-16, 2016-17 & 2017-18. The data are obtained from "CO ₂ Baseline Database for Indian Power Sector" version 14, published by the Central Electricity Authority, Ministry of Power, and Government of India.
Justification	It is fixed for the entire crediting period as per the registered VCS-PD /05/. The value of the operating margin emission factor has been

	correctly taken as per the registered VCS-PD /05/ and Hence accepted by the verification team.
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4.4.5 $EF_{grid,BM,y}$ (tCO₂/MWh)

Build Margin CO₂ emission factor in year y

	Discussion and verification assessment
Purpose of data	Calculating the combined margin emissions factor ($EF_{grid,CM,y}$) and Baseline Emission.
Verified value	0.8644 tCO ₂ /MWh
Source of value	Registered VCS-PD /05/ Calculated as per “Tool to calculate the emission factor for an electricity system, version 07” as per the latest data available for the most recent year 2017-18. The data is obtained from “CO ₂ Baseline Database for Indian Power Sector” version 14, published by the Central Electricity Authority, Ministry of Power, and Government of India.
Justification	It is fixed for the entire crediting period as per the registered VCS-PD /05/. The value of the build margin emission factor has been correctly taken as per the registered VCS-PD /05/ and Hence accepted by the verification team.

4.4.6 $EF_{grid,CM,y}$ (tCO₂/MWh)

Combined Margin CO₂ emission factor in year y

	Discussion and verification assessment
Purpose of data	Calculation of baseline emissions
Verified value	0.9368 tCO ₂ /MWh
Source of value	Registered VCS-PD /05/
Justification	It is fixed for the entire crediting period as per the registered VCS-PD /05/. The value of the combined margin emission factor has been correctly taken as per the registered VCS-PD /05/ and Hence accepted by the verification team.

Opinion:

In the opinion of assessment team, emission factor values that were applied in the calculations is consistent with registered VCS PD /05/ and correctly applied in MR /1.2/, emission reduction spread sheet /2.2/ and justified.

Assessment of Data and Calculation of GHG emission reductions:

According to the approved methodology ACM0002, Version 19.0, Emission Reductions are calculated as follows:

Baseline Emissions

The baseline emissions are calculated as follows:

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

Where:

BE_y	=	Baseline emissions in year y(tCO 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 VCS 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(tCO ₂ /MWh)

Calculation of net electricity by project activity $EG_{PJ,y}$

The process of calculating $EG_{PJ,y}$ is different between different types of project activities. For the project activities include the installation of a new renewable energy power plant, $EG_{PJ,y}$ is calculated as follow:

$$EG_{PJ,y} = EG_{facility,y} = EG_{export,y} - EG_{import,y}$$

Where:

$EG_{PJ,y}$	=	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the VCS project activity in year y (MWh/yr)
$EG_{facility,y}$	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)
$EG_{export,y}$	=	Quantity of electricity supplied to the grid by project activities in the year y (MWh/yr)
$EG_{import,y}$	=	The amount of electricity imported from the grid by the project

activity (MWh/yr)

$EG_{PJ,y}$ is an ex-post parameter and $EF_{grid,CM,y}$ is an ex-ante parameter which are justified above.

The baseline emission (BE_y) for the monitoring period is:

$$BE_y = 0.9368 * 481,729 \text{ MWh}$$

$$= 451,284 \text{ tCO}_2\text{e (Rounded down value).}$$

Project Emissions

As per the approved consolidated Methodology ACM0002 (Version 19.0) /07/ para 34: "For most renewable energy power generation project activities, $PE_y = 0$. However, some project activities may involve project emissions that can be significant. These emissions shall accounted for as project emissions by using the following equation:

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

Where:

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

$PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (t CO₂e/yr)

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

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

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

Leakage

As the project activity does not involve the energy generating equipment transfer to or from another activity, leakage is not to be considered.

Emission reductions

Reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in year y (t CO₂e/yr)

BE_y = Baseline emissions in year y (t CO₂e/yr)

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

The results of the emission reduction are shown in the table below:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
01-October-2021 to 31-December-2021	85,965	0	0	85,965
01-January-2022 to 31-December-2022	365,319	0	0	365,319
Total	451,284	0	0	451,284

Opinion:

The verification team confirms that

- The complete data set for the identified and required parameters for the operational days in the current monitoring period was available;
- The reported data has been cross checked with available records, as indicated in the section 4.4 above under each monitored data, wherever appropriate;
- The baseline, project and leakage emissions have been determined in accordance with the requirement of the applied methodologies, as contained in the final monitoring report and corresponding emission reductions spreadsheet;
- The assumptions, emission factors and default values used are justified, as indicated in the section 4.4 above.

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

All relevant documents were checked to assess the correctness and quality of data submitted by the project participants, which are used to determine emission reductions.

All records needed for monitoring are archived in line with the requirements of the registered monitoring plan /05/. No significant lack of evidence and missing data were detected during desk review and physical site visit. 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 monitoring parameters have been measured / determined without material misstatements and is in line with all applicable standards and relevant requirements. The information inflow (from data generation, aggregation, to recording, calculation and reporting) is included in section 4.4 under each parameter and confirms to the requirement of the PD /05/.

It was also verified that the plant's team involved in the monitoring of project activity is well experienced. Hence, the verification team concludes that competent staff is employed by the project proponent to carry out the relevant tasks with sufficient accuracy. Furthermore, it was confirmed during site visit that internal training program for the monitoring staff are conducted on regular basis.

Evidences (Documents/site visit) referred for verification of individual monitoring parameter and fixed parameter are defined under section 4.4. We further confirm that, sufficient evidence covering the entire monitoring period and at the required frequency were available. A list of referred documents for verification is also included in Appendix 1 of this report.

4.6 Non-Permanence Risk Analysis

Not applicable.

5 VERIFICATION CONCLUSION

4K Earth Science Pvt. Ltd. (4KES), contracted by 'Virescent Infrastructure Investment Manager Private Limited¹⁰', has performed the independent verification of the emission reductions for the VCS project activity (VCS ID- 1976) "Renewable Solar Power Project by Shapoorji Pallonji" in India for the monitoring period 01-October-2021 to 31-December-2022 as reported in the

¹⁰ Parent company to all the companies mentioned under section 1.3 of the monitoring report as verified from share transfer details.

Monitoring Report Version 1.3 dated 19/01/2024. Solar Edge Power and Energy Private Limited, Terralight Rajapalayam Solar Private Limited and Suryoday One Energy Private Limited are responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity. It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity.

4KES commenced the verification on the basis of the baseline and monitoring methodology ACM0002- Version 19.0, the monitoring plan contained in the registered VCS PD /05/, VCS standard version 4.4 and Monitoring Report (Version 1.3 dated 19/01/2024) as per the process described under Section 2 of this report.

4KES 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. 4KES planned and performed the verification by obtaining evidence and other information and explanations that 4KES 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 01-October-2021 to 31-December-2022 are fairly stated in the Monitoring Report Version 1.3 dated 19/01/2024. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002- Version 19.0 and the VCS standard.

Verification period: From 01-October-2021 to 31-December-2022

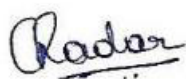
Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2021 (01/10/2021 – 31/12/2021)	85,965	0	0	85,965
2022	365,319	0	0	365,319

(01/01/2022 - 31/12/2022)				
Total	451,284	0	0	451,284

The comparison of the estimated ex-ante GHG emission reductions and removals and the achieved emission reductions and removals for this monitoring period are reported in the below table.

Year	Ex-ante emissions reductions/removals	Achieved emissions reductions/removals	Percent difference	Justification for the difference
01-October-2021 to 31-December-2022	541,852 tCO ₂ e	451,284 tCO ₂ e	-16.71%	The actual emission reductions are less than the estimated emission reductions. The actual emission reduction achieved is 16.71% lower than ex-ante estimation for same period. The decrease in actual emission reduction is mainly because of low PLF (unfavourable sun) which is a natural phenomenon and beyond the control of the Project Proponent. The same is accepted to the verification team.



Approved by
Chandrakala R.

Director
4K Earth Science Private Limited

Date: 19-January-2024
Place: Bangalore, India

APPENDIX I: LIST OF DOCUMENTS

/1/	/1.1/ Monitoring Report, Version 1.0, dated 20/09/2023 (Initial Version) /1.2/ Monitoring Report, Version 1.3 dated 19/01/2024 (Final Version)
/2/	/2.1/ Draft Emission Reduction calculation sheet (corresponding to initial Version of VCS MR) /2.2/ Final Emission Reduction calculation Sheet (corresponding to final Version of VCS MR)
/3/	VCS Standard Version v4.4 https://verra.org/project/vcs-program/rules-and-requirements/
/4/	VCS Program Guide, v4.3 https://verra.org/project/vcs-program/rules-and-requirements/
/5/	Registered VCS PD version 02 dated 10/12/2019
/6/	Web-Link for the Registered project activity for Validation Report and Grid Emission factor calculation https://registry.verra.org/app/projectDetail/VCS/1976
/7/	Approved monitoring methodology: ACM0002 ver. 19 - Grid-connected electricity generation from renewable sources
/8/	Websites referred: http://www.itouchmap.com/latlong.html (Latitude-Longitude location finder)
/9/	Technical Specifications of major equipments: Energy meter, PV module, Inverter and Transformer
/10/	Commissioning certificates
/11/	Monthly JMR Sheet/B forms for electricity exported/imported
/12/	Monthly invoices for the electricity supplied for this monitoring period
/13/	Company registration and ownership change document
/14/	Calibration certificates for the electricity meters corresponding to this monitoring period
/15/	Single line diagram showing monitoring points along with grid connection
/16/	O & M Agreements
/17/	Outage details for this monitoring period
/18/	Power Purchase Agreements
/19/	Name plate pictures for PV modules, Inverter, transformer and meters

/20/	Declaration by PP for No double counting of Emission Reductions dated 18/12/2023
/21/	Supportive for the installed capacity of the project activity: Chief Electrical Inspection Report for Karnataka and Tamilnadu Connectivity report from Maharashtra State Distribution Company Limited for Maharashtra
/22/	Training records
/23/	Organization structure
/24/	Supporting document for the sustainability criteria: List of employees, wages, contract etc.
/25/	Grievance mechanism book

APPENDIX II: VERIFICATION FINDINGS

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

This is the 4th periodic verification of the project activity. There is no remaining FAR from Validation or previous verification (1st, 2nd or 3rd Verifications).

FAR ID	xx	Section no.	Date: DD/MM/YYYY
Description of FAR			
Project participant response			Date: DD/MM/YYYY
Documentation provided by project participant			
DOE assessment			Date: DD/MM/YYYY

Table 2. CL from this verification

CL ID	01	Section no.	4.4	Date: 08/11/2023
Description of CL				
1. Verification team has found that energy meter details for Maharashtra site are not consistent with the previous verification monitoring period. PP need to clarify if there is any meter change during this monitoring period.				
2. For Tamilnadu site, Main meter SI.no :17076769 and Check Meter SI.no:17076792 are installed at grid substation and used for monthly electricity report and invoicing. However Monitoring report mention Main meter Sr. No. 17074152 and Check Meter SI.no. 17076761.				
Project participant response				Date: 14/12/2023

1. In the previous monitoring reports for Maharashtra, the meters number given in MR were of the plant end whereas in this monitoring report, the meters number given are of at the grid substation (GSS). Same can be confirmed with the old JMRs. Meters at GSS are the ones used for invoicing purposes.	
2. For Tamilnadu site, Main and Check Meters number in the monitoring report have been corrected to Sr. No. 17076769 and Sl.no. 17076792 respectively.	
Documentation provided by project participant	
MR V1.1 June-21 JMR of Jalgaon June-21 JMR of Beed Calibration report of meters at Virudhunagar, Tamilnadu	
DOE assessment	Date: 10/01/2024
1. Clarification has been provided by PP and found convincing. Verification team has checked the meter details during the site visit and from JMRs /11/ during this monitoring period. Based on old JMRs (before this monitoring period) /11/, Verification team has also confirmed that no meter has been changed on Grid Substation. Hence this part of CL is closed. 2. Corrections have been done under appendix-1 of the revised MR /1.2/ and found OK. Verification team has checked the meter details during the site visit and found consistent. Hence this part of CL is closed.	

Table 3. CAR from this verification

CAR ID	01	Section no.	4.1	Date: 08/11/2023
Description of CAR				
1. Under section 1.2 of the MR, PP need to mention whether project is a grouped project. (As per VCS MR template requirement) 2. Under section 2.1 of the MR, PP need to Summarize any potential negative environmental and socio-economic impacts and the steps taken to mitigate them. (As per VCS MR template requirement) 3. Under section 3.1 of the MR, PP need to describe the operation of the project activity(s) during this monitoring period, including any information on events that may impact the GHG emission reductions or removals and monitoring. (As per VCS MR template requirement)				
Project participant response				Date: 02/01/2024
1. The project is not a grouped project. Same has been mentioned under Section 1.2 of the MR. 2. This being a solar power project does not have any negative impact on environment as well as socio-economic conditions. Same has been mentioned under section 3.2.2 of the MR. 3. Outage data added in MR Appendix 2. Supporting documents for outage are also given for all the four sites.				
Documentation provided by project participant				
MR V1.2 Supporting outage documents				
DOE assessment				Date: 10/01/2024

1. Correction has been done under section 1.2 of the revised MR /1.2/ and found OK. Hence this part of CAR is closed.
2. Correction has been done under section 2.1 of the revised MR /1.2/ and found OK. Clarification provided by PP is found convincing which is also checked during the site visit. Hence this part of CAR is closed.
3. Correction has been done under section 3.1 of the revised MR /1.2/ and found consistent with the supportive documents. Outage details have been added under appendix-2 of the Monitoring report /1.2/ which are found consistent with the supportive /17/. Hence this part of CAR is closed.

CAR ID	02	Section no.	4.1	Date: 08/11/2023
Description of CAR				
Under section 1.7 of the MR, the project location under the Map of Tamilnadu is not clear.				
Project participant response				Date: 14/12/2023
Project location under the Map of Tamilnadu is clearly indicated in MR now.				
Documentation provided by project participant				
MR V1.1				
DOE assessment				Date: 10/01/2024
Correction has been done under section 1.7 of the revised MR /1.2/ and found OK. Hence this CAR is closed.				

CAR ID	03	Section no.	4.1	Date: 08/11/2023
Description of CAR				
For SDG Target 8.0 (Under section 1.11 of the MR), PP need to elaborate employment details for this monitoring period along with supportive.				
Project participant response				Date: 14/12/2023
Employment details for this monitoring period are provided now.				
Documentation provided by project participant				
Supporting employment documents.				
DOE assessment				Date: 10/01/2024
Corrections have been done under section 1.11 of the revised MR /1.2/ and found OK. Verification team has checked the employment details with the supportive documents /24/ and found consistent. Hence this CAR is closed.				

CAR ID	04	Section no.	4.1	Date: 08/11/2023
Description of CAR				
Under section 3.1 of the MR, PP need to provide detailed information about project technology i.e. Number, make, capacity of solar panels, inverters, transformers etc. During the site visit, verification team has found that some of the technical information is not matching with the information of the equipment installed however no details have been provided under section 3.2.2 of the MR.				
Project participant response				Date: 02/01/2024

Detailed information about the project technology is provided now. Technical information of the equipment installed has been corrected in the MR.

During the current verification, it was noted that the technical specifications provided in the registered PD were not correct. The details are now correctly provided in section 3.1 above. The supporting documents are provided to VVB to establish that the technical details now provided were the ones available at the time of commissioning of the project. The correction does not affect the scale, baseline or the additionality of the project.

Documentation provided by project participant

MR V1.2

CEIG Connectivity approvals

DOE assessment

Date: 10/01/2024

Corrections have been done under section 3.1 of the revised MR /1.2/ and found consistent with the technical information /09/, Chief Electrical Inspection Report for Karnataka and Tamilnadu/Connectivity report from Maharashtra State Distribution Company Limited for Maharashtra /21/ and the on-site visit. Verification team confirm that technical details are not changed since commissioning as confirmed from supportive /21/ however they were mention erroneously in the registered VCS PD /05/. The details are now correctly provided under section 3.1 of the revised MR /1.2/. Considering this change with respect to registered VCS PD /05/, section 3.2.2 of the MR /1.2/ is filled accordingly which is found OK. Corrections do not affect the scale, baseline or the additionality of the project and hence accepted to the verification team. Hence this CAR is closed.

CAR ID	05	Section no.	3.3	Date: 08/11/2023
Description of CAR				
Under section 3.2.2 of the MR, PP need to describe any project description deviations applied during this monitoring period and explain the reasons for the deviation. Identify whether the deviation impacts the applicability of the methodology, additionality or the appropriateness of the baseline scenario and provide an explanation of the outcome. Describe and report on any project description deviations applied in previous monitoring reports. (As per VCS MR template requirement).				
Project participant response				Date: 02/01/2024
During the current verification, it was noted that the technical specifications provided in the registered PD were not correct. The details are now correctly provided in section 3.1 above. The supporting documents are provided to VVB to establish that the technical details now provided were the ones available at the time of commissioning of the project. The correction does not affect the scale, baseline or the additionality of the project.				
Documentation provided by project participant				
MR V1.2				
DOE assessment				Date: 10/01/2024

Corrections have been done under section 3.1 of the revised MR /1.2/ and found consistent with the technical information /09/, Chief Electrical Inspection Report for Karnataka and Tamilnadu/Connectivity report from Maharashtra State Distribution Company Limited for Maharashtra /21/ and the on-site visit. Verification team confirm that technical details are not changed since commissioning as confirmed from supportive /21/ however they were mention erroneously in the registered VCS PD /05/. The details are now correctly provided under section 3.1 of the revised MR /1.2/. Considering this change with respect to registered VCS PD /05/, section 3.2.2 of the MR /1.2/ is filled accordingly which is found OK. Corrections do not affect the scale, baseline or the additionality of the project and hence accepted to the verification team. Hence this CAR is closed.

CAR ID	06	Section no.	4.4	Date: 08/11/2023
Description of CAR				
Under the ER sheet:				
1. For Beed (Maharashtra)- 80 MW (50+30) site: electricity import data for the month June 2022 (reported under the ER sheet) is not matching with the monthly joint meter reading report.				
2. For Karnataka site, the electricity data reported under the ER sheet is not matching with the B-forms.				
Project participant response				Date: 14/12/2023
1 June 2022 data for Beed (Maharashtra) has been corrected.				
2 Karnataka data has been corrected				
Documentation provided by project participant				
MR V1.1				
Revised ER				
DOE assessment				Date: 10/01/2024
1. Correction has been done in the revised ER sheet /2.2/ and revised MR /1.2/ and found consistent with the monthly joint meter reading report /11/. Hence this part of CAR is closed.				
2. Corrections have been done in the revised ER sheet /2.2/ and revised MR /1.2/ and found consistent with B-forms /11/. Hence this part of CAR is closed.				

Table 4. FAR from this verification

No FAR raised during this verification.

FAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of CAR				
NA				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

APPENDIX III: TEAM COMPETENCE

<i>Certificate of Competence</i>						
Name	☒ Mr. ☐ Ms.	Chetan Swaroop Sharma				
Qualification Procedure	Fulfil the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
<i>Appointed</i>	Yes	Yes	Yes	Yes	Yes	No
<i>Appointed Date</i>	28-02-2023					
Authorized to work as Technical Expert for:						
<i>Authorized Technical Area</i>	Sectoral Scope	TA Code		Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)	1.1		Thermal energy generation		
	Energy industries (renewable - / non-renewable sources)	1.2		Renewables		
	Energy distribution	2.1		Energy distribution		
	Energy demand	3.1		Energy demand		
	Waste handling and disposal	13.1		Solid waste and wastewater		
	Waste handling and disposal	13.2		Manure		
Authorized to work as Local Expert for:						
<i>Country/Countries</i>	India, Mauritius, Vietnam, Senegal and Thailand					
Compliance check by: Anand S. R.						

<u>Certificate of Competence</u>						
Name	☒ Mr. ☐ Ms.	Ma Paa Puratchikkanal				
Qualification Procedure	Fulfil the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.					
Appointed to work as:						
	CDM Validator/Verifier	Team Leader	Team Member	Technical Expert	Technical Reviewer	Financial Expert
Appointed	Yes	Yes	Yes	Yes	Yes	No
Appointed Date	27-04-2021					
Authorized to work as Technical Expert for:						
Authorized Technical Area	Sectoral Scope	TA Code		Technical Area within the scope		
	Energy industries (renewable - / non-renewable sources)	1.1		Thermal energy generation		
	Energy industries (renewable - / non-renewable sources)	1.2		Renewables		
	Energy demand	3.1		Energy demand		
	Construction	6.1		Construction		
	Waste handling and disposal	13.1		Solid waste and wastewater		
	Waste handling and disposal	13.2		Manure		
	Agriculture	15.1		Agriculture		
Authorized to work as Local Expert for:						
Country/Countries	India and Sri Lanka					
Compliance check by: Anand S. R.						

APPENDIX IV: ABBREVIATIONS

BM	Build Margin
CAR	Corrective Action Request
CL	Clarification Request
EB	Executive Board
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel for Climate Change
JMR	Joint Meter Readings
MP	Monitoring Period
MR	Monitoring Report
MW	Mega Watt
MWh	Mega Watt hour
OM	Operating Margin
O&M	Operation & Maintenance
PD	Project Description
PP	Project proponent
PPA	Power Purchase Agreement
QA/QC	Quality Assurance/Quality Control
tCO ₂	Tonnes of Carbon Dioxide
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCU	Verified Carbon Unit