216 MW_{AC} KAMUTHI SOLAR POWER PROJECT

Document Prepared By: 4K Earth Science Private Limited

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Report Title	Verification Report: 216 MWac Kamuthi Solar Power Project
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Summary:

4K Earth Science Private Limited (4KES) has performed the verification of the project "216 MWac Kamuthi Solar Power Project" VCS ID 1768, against VCS Standard Version 4.1. The project involves installation and operation of 216 MW_{AC} Solar power project in the state of Tamil Nadu, India. The project is developed by Kamuthi Solar Power Limited. The electricity generated by the project activity displaces the grid electricity and there by avoid associated CO_2 emission.

During the current monitoring period, project activity undergoes continued operation since their commissioning and no major breakdown had taken place

The proposed project is a voluntary action being undertaken by Kamuthi Solar Power Limited. The Infinite Solutions (hereafter referred as "Infinite") is acting as the other party for this project activity.

The scope of verification includes confirming the implementation of the monitoring plan of the registered VCS PD (Version 2, Dated 15/07/2018) and the application of the monitoring methodology "ACM0002: Grid-connected electricity generation from renewable sources" Version 18.1.

The monitoring period covered in the verification is 01-October-2019 to 31-March-2021 (including both days)

The verification is consisted of three phases: i) desk review of the project; ii) interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted following 4KES internal quality procedures.

During the verification process 05 CARs, 01 CLs and 00 FARs were raised. All the findings have been closed satisfactorily and the same has been discussed in Appendix II.

4KES confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. The emission reductions from the project activity "216 MWac Kamuthi Solar Power Project" in India during the period 01-October-2019 to 31-March-2021 (including both days) amount to 519,157 tonnes of CO_2e.

CONTENTS

1 INTRODUCTION

1.1 Objective

Infinite Solutions has contracted 4K Earth Science Pvt. Ltd (4KES) to perform VCS Verification of the '216 MWac Kamuthi Solar Power Project' in India (hereafter called project). This project has already been registered as a VCS project (VCS ID 1768). The objective of this verification is a thorough and independent assessment of registered project activities against the applicable VCS requirement by the DOE. The verification process shall determine whether the proposed project activity complies with the requirements of latest VCS guidelines, applicability conditions of the selected methodology, relevant host country regulations and guidance issued by the VCS Board.

1.2 Scope and Criteria

The scope of 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

1.3 Level of Assurance

The verification team verified the complete monitoring data for all the parameters of the monitoring plan and confirms that the reported emission reductions are free from any type of material errors. Therefore, 4KES confirms that the verification is conducted with reasonable level of assurance

1.4 Summary Description of the Project

The main purpose of this project activity is to generate clean form of electricity through renewable solar energy sources. The project activity aims to harness solar energy through installation of solar power plant with total installed capacity of 216 MWac /258.5664 MWp. The project is located in Kamuthi in the district of Ramathapuram, Tamil Nadu State, India. The project is commissioned on 18-September-2016.

As per MR, the electricity generated from the project is supplied to grid which is confirmed form approved VCS PD/4/, verification of supporting documents, interview with PP.

As mentioned above, the project was commissioned on 18-September-2016. The commissioning date of the project is verified against the commissioning certificates/7/.

Location of the project was verified through Google Map (https://maps.google.com/maps) and found consistent with the data provided in the registered PD/4/

The Project activity is a new facility (Greenfield) and the electricity delivered by the project activity is exported to the Western regional grid (now part of Indian grid). The project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid.

As per registered PD, the project activity results in replacing anthropogenic emissions of greenhouse gases (GHG's) estimated to be approximately 346,116 tCO_2e per year, thereon displacing 358,559 MWh/year amount of electricity from the gird.

During the monitoring period from 01-October-2019 to 31-March-2021 (including both days), the project replaced 519,157 tonnes of CO_2e by displacing the 537,821 MWh electricity.

2 VERIFICATION PROCESS

The registered VCS project is undergoing second verification under VCS (1st Crediting period) ~~apart from 3 verification completed in CDM~~, 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 4.1

2.2 Document Review

The verification is performed primarily as a document review of the approved VCS PD, previous MR and Verification report 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

Due nationwide lockdown due to COVID-19 spread, Verification team could not conduct the site visit. Since the date of closure of lockdown is uncertain due to the increase spread of COVID-19 and hence VVB did not conduct site visit for this project activity. However, the verification team performed the telephonic interview with the site person and reviewed documents to achieve a reasonable level of assurance in the verification. This is in line with Section 4.1.2 of the VCS Standard, v4.1~~0~~ which does not explicitly mandate site visits as part of the validation and verification process, only that VVBs must achieve a reasonable level of assurance on all validations and verifications.

No sampling procedures were adopted 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 (telephonic interview).

Sr. No	Name of the person	Role/Designation
1	Sankara Narayana	DGM, O&M, Kamuthi Solar Power Limited
2	Muruganan H.	Plant Head, Kamuthi Solar Power Limited
3	Richa T. Sah	Manager-Sustainability, Infinite Solutions,

2.4 Site Inspections

As mentioned above, due nationwide lockdown due to COVID-19 spread, Verification team could not conduct the site visit. Since the date of closure of lockdown is uncertain due to the increase spread of COVID-19 and hence VVB did not conduct site visit for this project activity. However, the verification team performed the video conference and telephonic interview with the PP, Consultant and the site person and reviewed documents to achieve a reasonable level of assurance in the verification. This is in line with Section 4.1.2 of the VCS Standard, v4.1~~0~~ which does not explicitly mandate site visits as part of the validation and verification process, only that VVBs must achieve a reasonable level of assurance on all validations and verifications

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 onsite assessment. 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 CDM 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 05 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

The project activity is undergoing third verification of 1st crediting period under VCS; there were no FARs raised during the validation or previous verification.

2.6 Eligibility for Validation Activities

The Validation and verification body holds accreditation to carry out both validation and verification activities. The accreditation scope can be checked from the below link:

http://cdm.unfccc.int/DOE/list/DOE.html?entityCode=E-0069

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

The assessment team checked registries of other carbon mechanism such as CDM & Gold Standard and confirmed the project is not registered under any other mechanism. PP has also provided a declaration/16/ that the PP will not claim emission reduction from any other GHG program for the reported monitoring period.

The project is not registered under any other emissions trading program or any other mechanism that includes GHG allowance trading PP also confirms that net GHG emission reductions or removals generated during this monitoring period shall not be used for compliance under any such programs or mechanisms. This was confirmed through a declaration/16/ submitted by the PP and hence accepted by the assessment team.

3.2 Methodology Deviations

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

3.3 Project Description Deviations

There the two deviations applied in the MR from the registered VCS PD.

1. Present monitoring Period: The total DC Capacity in approved PD is incorrectly added as 261.024, however it comes out to be 258.5664 MWp; this MR is revised with the correct sum of DC capacity.
2. Previous monitoring period: During the Site Visit the Geo-Coordinates were assessed to be different from the one in registered Project Description; this MR is revised with the correct coordinates.

PP has described the deviations and justified in the monitoring report. These changes are mere correction in the project description. Hence, this does not impact applicability of the methodology, additionality or the appropriateness of the baseline scenario. PP described the deviations in the monitoring report which is found to be acceptable and in line with section 3.18.2(2) of VCS Standard v.4.

3.4 Grouped Project

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

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity is installation of 216 MWac Solar power plant promoted by Kamuthi Solar Power Limited. The purpose of the project activity is to generate clean electricity with utilization of Solar energy. The project location and commissioning details are given below:

Project Investors' Name	Kamuthi Solar Power Limited
Capacity in MW_{AC}/ MWp	216/258.5664
Commissioning Date	18-September-2016
Location (Village/State)	O. Karisalkulam Village, Ramanathpuram Dist., Tamil Nadu
Geograpical Coordinates	9°18'21" N, 78°24'14" E

Starting date of the operation of the project activity is 18-September-2016 which is the date of commissioning/commercial operation of the solar plant.

The technical specifications of the project are as below:

Module

Module Supplier	Module Type	Capacity (p)	Number	Total Capacity (MWp)
Canadian Solar International Limited	Poly C-Si	310	83,680	25.9408
		315	326,400	102.816
		320	155,040	49.6128
Trina Solar	Poly C-Si	310	56,000	17.36
		315	70,720	22.2768
Hanwha	Poly C-Si	310	46,080	14.2848
		315	33,920	10.6848
Suntech	Poly C-Si	310	26,880	8.3328
		315	23,040	7.2576
Total				**258.5664**

Inverters

Make	ABB
Model	PV800
Rated Capacity	1000 KW
No. of Inverters	216
Rated Input Voltage	380 V

Transformers

Make	ABB	Schneider
Capacity	120 MVA	4MVA
No. of Transformers	2	54
Voltage Ratio	33/230 kV	380/33 kV

The installation and specification of solar power plant has been checked with power plant Technical Specification/6/ and commissioning certificates/7/. The commissioning has also been duly validated in the VCS validation report of the project activity/04/. 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. However there some corrections applied in the MR which are assessed in section 3.3 above. The project design as mentioned in the registered VCS PD & monitoring report submitted is implemented and thus the same is acceptable to the assessment 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 & monitoring report is followed onsite. All the monitoring equipment was calibrated as per the specified interval in the registered VCS PD & monitoring report. No delay is observed in Calibration for the current monitoring period and hence the calibration is valid for the complete monitoring period. All the emergency preparedness as mentioned in the registered VCS PD & monitoring report is followed onsite and no discrepancies were found regarding the same.

It was also observed during the verification process that project is not rejected by any other GHG program around the world. Declaration in that effect is also provided by PP.

The assessment team found that the project is in line with the registered VCS PD except the deviation described in section 3.3 above, monitoring report, and no other deviation on project design or monitoring plan is observed.

Assessment team concludes the following:

- There is no material discrepancies between project implementation and the project description provided in the registered PD/04/.
- There are some mistakes in the registered PD. The same is corrected in MR and described as project description deviation in the MR./01/

- 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.
- There is no material discrepancies between the actual monitoring system, and the monitoring plan set out in the project description and the applied methodology/08/.
- 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/16/.
- 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.

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

4.2 Safeguards

4.2.1 No Net Harm

The project is a solar power project which is a cleaner source of power generation. The solar power project does not emit any GHG or any other toxic gases. Hence, solar power plant has no significant impact on the environment. As per the EIA notification dated 14thSeptember 2006, the solar power projects are exempted from environmental clearance. Hence, Environmental impact assessment is not required for this project activity.

The report on "Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects" prepared by MNRE dated September 2013 also confirms that solar power project activity operations do not result in direct air pollution, noise pollution. Hence verification team confirms that there are no any significant impacts due to implementation of project activity on air, water, soil quality and ambience are envisaged due to the project activity.

4.2.2 Local Stakeholder Consultation

As per the section 2.2 of the MR, the projects have continuous feedback mechanism and kept a grievance register to receive any feedback/grievances from stakeholder.

As verified from the copy of grievances register from site/19/ no grievances/feedback received on the operation of the project activity. Verification team also discussed with the site in-charge and confirmed that no grievances are received during the monitoring period.

4.3 AFOLU-Specific Safeguards

Not Applicable.

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

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 VCS PD and MR.

In detail the following has been verified:

Transparency: It has been checked whether the calculation of baseline emissions is fully traceable and, where used, the Excel calculation provides all calculation formulae.

Parameter consistency: It has been checked whether all internal and external parameters and data used for the calculation are applied consistently in the monitoring report and the calculation spreadsheet.

Correctness: It has been checked whether the applied formulae and methods for calculating baseline emissions are in accordance with the monitoring plan and the approved methodology.

Completeness: It has been checked whether all calculations are complete and without omissions

Baseline emission: The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor. The grid in this case would be the 'Indian Grid'

Formula Used:-

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

Where;

BE_y : Baseline emissions in year y (tCO_{2e}/yr)

$EG_{PJ,y}$: Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the 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" (tCO2/MWh)

$EG_{PJ,y}$: The verification team has checked the entire monthly JMR/credit reports and invoices applicable for the monitoring period as per the project activity applied for verifications and found all the parameters are monitored and recorded as per the monitoring plan in the approved PD. The verification team has crosschecked the emission reduction sheet and monitoring report data with the JMR sheet and invoice bills and found all the values are matching.

$EF_{grid,CM,y}$ As verified from the registered PD the Combined margin CO_2 emission factor for grid is 0.9653 tCO2/MWh which is fixed ex-ante

Project Emission:

Since the project is a greenfield renewable energy generation facility (solar), PE_y= 0.

Leakage: As per methodology and registered VCS PD the leakage is zero. LE_y= 0.

Emission Reduction:

Emission reduction is calculated as below:

ERy = BEy – PEy - LEy

PP has submitted emission reduction the calculation in the excel sheet/2/. The emission reduction calculation in the excel sheet is checked whether the calculation is in accordance with the formula given in the approved PD/4/ and the selected methodologies/8/.

The verification team confirms the following:

- The calculations of emission reduction have been carried out in accordance with the equations and methods described in the registered monitoring plan and applied methodology.
- The emission factor applied is an ex-ante value valid for the fixed crediting period.
- Any assumptions used in emission or removal calculations have been justified.
- Appropriate emission factor and other reference values have been correctly applied. It can be confirmed that the emission reduction calculation is overall correct.
- The ER calculation sheet provided is clear, transparent and the calculations provided in the sheet are reproducible.
- Hence, the emission reduction reported in the monitoring report for the monitoring period is verified to be correct

4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

The only monitoring parameter in the project activity is “Quantity of net electricity generation supplied by the project plant/unit to the grid in year” (**$EG_{PJ,y}$).** This parameter is monitored through energy meters installed at the project substation. The project has dedicated energy meter at high voltage level and the export and import reading are recorded every month. The DISCOM (TANGEDCO) will record the export, import and net electricity (as difference between export & import).

The export, and import & net energy generated will be reported in monthly JMR/credit report which is the source for the parameter "Quantity of net electricity generation supplied by the project plant/unit to the grid in year" (**$EG_{PJ,y}$**).

The monthly net export are recorded in the Joint meter reading (JMR)/ credit certificate which is signed by DISCOM and PP. The appropriateness of reading is assessed as below:

Criteria/Requirements	Assessment/Observation
Measuring /Reading /Recording frequency	The electricity exported to the grid is determined through static meter reading and bulk energy meter installed at government sub-station. The electricity exported is measured on continuous basis and reported monthly.
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the approved PD/04/ and monitoring methodology/8/.
Monitoring equipment	Energy meters (main & Check) installed at substation.
Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The energy meters are two-way tri-vector meters of accuracy class 0.2s. Accuracy of the monitoring equipment's is in accordance with the monitoring plan as outlined in the PD.
Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes the accuracy valid for the entire measuring range.
Calibration frequency /interval:	5 year
Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes
Is the calibration of measuring equipment	Calibration of the measuring equipment's is

carried out by an accredited person or institution?	carried out by an accredited entity.
Is(are) calibration(s) valid for the whole reporting period?	Yes, the calibration is valid for the whole monitoring period.
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes, calibration carried out for a measuring range comparable with the range for which measurements have been carried.
How were the values in the monitoring report verified?	Reported values of this parameter have been verified with monthly joint metering/ credit report/12/. Value of this parameter for the current monitoring period are verified and the values is 537,821 MWh Furthermore monthly values of this parameter is reported in the ER calculation sheet/02/ are also verified with the MR/01/ and found to be consistent.
If applicable, has the reported data been cross-checked with other available data?	The monthly reported values of this parameter were further cross checked with the monthly invoices raised by the PP /13/ and found to be consistent.
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the adequate QA/QC procedures were implemented by all the stakeholders, namely, the Grid Authority, the PP and the O&M team. The Net electricity exported to the grid is cross checked against the invoice raised by the PP towards the DISCOM and found to be correct
In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.

Parameter fixed ex-ante:

$EF_{grid,CM,y}$; tCO_{2e}/MWh: it is the Combined Margin emission factor for Indian grid fixed at the time of project registration and mentioned value of 0.9653 tCO_{2e}/MWh is consistent with the registered VCS PD/04/.

$EF_{grid,OM,y}$; tCO_{2e}/MWh: it is the Operating Margin emission factor for Indian Grid fixed at the time of project registration and mentioned value of 0.9843 tCO_{2e}/MWh is consistent with the registered VCS PD/04/.

$EF_{grid,BM,y}$; tCO_{2e}/MWh: it is the Build Margin emission factor for Indian grid fixed at the time of project registration and mentioned value of 0.9083 tCO_{2e}/MWh is consistent with the registered VCS PD/04/.

Calibration of meters: During the verification assessment of the project activity, accuracy of all the metering have been checked and found appropriate. The bulk energy meters installed at the substation are at the control of DISCOM and are regularly calculated by DISCOM. Details of meter calibration are provided in below table:

Meter Type	Meter No	Calibration Date	Validity
Main	TNG64528	16/09/2016	15/09/2021
Check	TNG64529	16/09/2016	15/09/2021
Standby	TNG64484	16/09/2016	15/09/2021

The energy meter calibration certificates/14/ are checked and found that the calibration details provided in the MR is correct. It is found that energy meters are calibrated as per the required frequency (ie,5 years).

The assessment team has verified the monthly joint meter reading report issued by respective state utility and confirmed that only the data recorded through main meters is used to calculate net electricity supplied to the grid by the projects belongs to particular developer and consequently for ER calculations. As verified through the calibration certificates, that meters were working satisfactorily during the current monitoring period.

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

GHG Calculations

The emission reduction as per the applied methodology equals the baseline emissions (project emissions and leakage emissions for such project activities is considered zero). The formula provided for the calculation of baseline emissions is:

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

Year	$EG_{PJ,y}$ (MWh)	$EF_{grid,CM,y}$ (tCO2/MWh)	BEy (tCO2)*
2019	78,630	0.9653	75,901
2020	364,599	0.9653	351,946
2021	94,593	0.9653	91,310

Total	**537,821**	**-**	**519,157**

*rounded down values

Since project emission and leakage are zero, baseline emission is equal to emission reduction.

$ER_y = BE_y$

The emission reduction is estimated for each month in ER calculation sheet, and the summary of emission reduction is as below:

Year	Baseline emissions or removals* (tCO2e)	Project emissions or removals (tCO2e)	Leakage emissions (tCO2e)	Net GHG emission reductions or removals (tCO2e)
2019	75,901	0	0	75,901
2020	351,946	0	0	351,946
2021	91,310	0	0	91,310
Total	**519,157**	**0**	**0**	**519,157**

* rounded down value

The verification team confirms that appropriate methods and formulae for calculating baseline emissions have been followed. The assumptions, emission factors and default values that were applied in the calculations are justified. All the data were made available and have monitored as per required monitoring frequency. The means of verification for the values of parameters, used for baseline emission calculation, is described above.

However, verification team has observed that the actual ER achieved during the current monitoring period is 0.09% lower than the estimated ER as per registered PD for the comparable period. Since the emission reduction is less than the estimated emission reduction, no further justification is required.

4.6 Non-Permanence Risk Analysis

Not applicable.

5 VERIFICATION CONCLUSION

4K Earth Science Pvt. Ltd (4KES), contracted by Infinite Solutions, has performed the independent verification of the emission reductions for the VCS project activity "216 MWac Kamuthi Solar Power Project" (VCS ID- 1768) in India for the monitoring period 01-October-2019 to 31-March-2021 as reported in the Monitoring Report Version 02 dated 10-June-2021. The Infinite Solutions and the project proponent 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 18.1., the monitoring plan contained in the registered VCS PD (Dated 15-July-2018 and VCS guidelines version 4.1, Monitoring Report (Version 032 dated 17-August~~10-June~~ 2021) 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-2019 to 31-March-2021 are fairly stated in the Monitoring Report Version 032 dated 17-August~~0 June~~ 2021. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002, Version 18.1, and the VCS standard.

Verification period: From 01-October-2019 to 31-March-2021

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

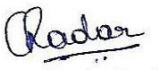
Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2019	75,901	0	0	75,901
2020	351,946	0	0	351,946

2021	91,310	0	0	91,310
Total	**519,157**	**0**	**0**	**519,157**

Approved by

Chandrakala R.

Director Date:28-June-2021



4K Earth Science Private Limited Place: Bangalore, India

APPENDIX I: LIST OF DOCUMENTS

Ref. No	Title of Document	Version	Date
1	Monitoring Report	1.0	15/05/2021
		2.0	10/06/2021
		3.0	17/08/2021
2	Emission Reductions Calculation Spread sheet	1.0	15/05/2021
		2.0	10/06/2021
3	VCS Project page: https://registry.verra.org/app/projectDetail/VCS/1768	-	-
	Registered VCS Project Description	2	15/07/2018
	VCS Validation Report	2	16/07/2018
5	Previous Monitoring Report (2nd Monitoring)	2	22/10/2019
	Previous Verification Report (2nd Verification)	1	22/10/2019
6	Technical specifications of the project plant		
7	Commissioning certificates of the solar power plant	-	-
8	CDM Methodology: ACM0002: Grid-connected electricity generation from renewable sources	Version 18.1	-
9	VCS Standard	Version 4.1	22/04/2021~~19/09/2019~~
	VCS Program Guide	Version 4	19/09/2019
10	Clean Development Mechanism Validation and Verification Standard	02.0	29/11/2018
9	Grievances Registers	-	-
12	Joint Meter Reading/credit reports of project for the monitoring period	-	-
13	Invoices for the electricity sold for the monitoring period	-	-
14	Energy meter Calibration Certificates		
15	Break down details of the complete monitoring period	-	-
16	Declaration regarding no participation in other GHG program for the concerned monitoring period	-	-
17	Developmental Impacts and Sustainable Governance Aspects of Renewable Energy Projects" prepared by MNRE dated September 2013	-	-
18	MOEF Notification http://envfor.nic.in/legis/eia/so1533.pdf		14/09/2006

APPENDIX II: VERIFICATION FINDINGS

FAR from validation and/or previous verification

~~FAR ID~~		~~Section no.~~		~~Date:~~
~~Description of CAR~~				
~~NA~~				
~~Project participant response~~				~~Date:~~
~~Documentation provided by project participant~~				
~~DOE assessment~~				~~Date:~~

Clarification Requests

CL ID	1	**Section no.**		**Date:** 26/05/2021
Description of CL				
In section 3 of the MR, the technical specification provided is not consistent with the technical specification provided in section 1.1. • In section 3, though total installed DC capacity of the entire project is mentioned as 261.024 MWp, the total installed capacity as per the actual installed modules is works out to be 258.5664 MWp. PP shall clarify the same.				
Project participant response				**Date:** 10/06/2021
• The total installed DC capacity of the entire project is mentioned as per the actual installed modules is 258.5664 MWp. And the same is corrected throughout the MR. The deviation detail is mentioned in the section 2.3.2 of the MR and the DOE is requested to accept the deviation from the approved VCS PD.				
Documentation provided by project participant				
Revised MR				
DOE assessment				**Date:** 17/06/2021
PP has corrected the total DC capacity to 258.5664 MWp. Since the mistake is there in the registered VCS PD, the same is now reported in the section 2.3.2 (Project Description Deviations) of the MR. CL is closed.				

Corrective Action Requests

CAR ID	01	**Section no.**		**Date:** 26/05/2021
Description of CAR				

PP shall submit the following undertaking: • Confirmation that Project neither has not intends to generate any form of GHG related environmental credit for GHG emission reductions or removals claimed under the VCS program • Confirmation that the project is not availing other forms of environmental credit for the same monitoring period under consideration
Project participant response **Date:** 10/06/2021
The Declaration for NO-Double counting has now been submitted to the DOE mentioning that the project has not intended to pursue credits from other GHG program for the concerned monitoring period. Please refer the link https://recregistryindia.nic.in/# which is also mentioned in the MR to cross check that no REC benefits is taken for the present Monitoring period covered under VCS.
Documentation provided by project participant
Declaration for NO-Double counting.
DOE assessment **Date:** 17/06/2021
PP has provided the undertaking confirming the above mentioned points. Also the other environmental registries like CDM, GS, Indian REC registry and International REC registries are checked and confirmed this project doe not avail any other form of environmental credits. CAR is closed.

CAR ID	02	**Section no.**		**Date:** 26/05/2021
Description of CAR				
In section 3 of the MR, PP has mentioned that the project will result in 566,148 tCO_2e per year emission reduction, thereon displacing 586,500 MWh/year amount of electricity from the grid. This is not consistent with the approved PD. Corrective action is requested.				
Project participant response				**Date:** 10/06/2021
The MR has been revised with the correct annual estimated carbon emissions and generation in the revised section 3 of the MR.				
Documentation provided by project participant				
Revised MR				
DOE assessment t				**Date:** 17/06/2021
PP has nowcorrected the estimated emission reduction as per the registered VCS PD. CAR is closed.				

CAR ID	03	**Section no.**		**Date:** 26/05/2021
Description of CAR				
In section 4.2 of MR • Quantity of net electricity generation is reported is not consistent with the ER calculation sheet. Corrective action is requested. • PP mentioned the calibration date of the energy meter is 16/09/2016. But the calibration certificate is not submitted for verification				
Project participant response				**Date:** 10/06/2021

• The MR has been revised and Quantity of net electricity generation i.e. 537,821 MWh is now consistent with the ER calculation sheet. • Calibration certificate are hereby submitted for assessment.
Documentation provided by project participant
• *Revised MR* • *Calibration certificates*
DOE assessment t — **Date:** 17/06/2021
In section 4.2 of MR • PP corrected the Quantity of net electricity generation which is now in consistent with the ER calculation sheet. • PP has provided missing calibration certificates CAR is closed.

CAR ID	04	**Section no.**		**Date:** 26/05/2021
Description of CAR				
In section 5.4, • The emission reduction value for the year 2020 is rounded up which is not conservative. • The estimated emission reduction provided for the monitoring period is not consistent with the value estimated in the ER sheet. Corrective action is requested				
Project participant response				**Date:** 10/06/2021
• MR is now revised with rounded down value for the year 2020 as a conservative approach. • The estimated emission reduction for this MP is corrected in the MR to be consistent with the value in ER sheet.				
Documentation provided by project participant				
• *Revised MR* • *Revised ER sheet*				
DOE assessment t				**Date:** 17/06/2021
In section 5.4, • PP now rounded down the emission reduction value for the year 2020. • PP corrected the estimated emission reduction provided for the monitoring period which is now consistent with the value estimated in the ER sheet. CAR is closed				

CAR ID	05	**Section no.**		**Date:** 26/05/2021
Description of CAR				
In ER calculation sheet, the following data of Project I is not consistent with the respective JMR/invoice. • December 2019 – data not consistent with JMR & Invoice Corrective action is requested.				

Project participant response	**Date:** 10/06/2021
The ER sheet has been revised and the data has been made consistent with the JMR and Invoice of Dec 2019	
Documentation provided by project participant	
Revised ER Sheet *JMR & INVOICE*	
DOE assessment t	**Date:** 17/06/2021
PP December 2019 data is now corrected to be consistent with the JMR & Invoice. CAR is closed.	

Forward Action Requests

~~FAR ID~~		~~Section no.~~		~~Date:~~
~~Description of CAR~~				
~~NA~~				
~~Project participant response~~				~~Date: 20/04/2020~~
~~Documentation provided by project participant~~				
~~DOE assessment~~				~~Date: 23/04/2020~~

APPENDIX III: TEAM COMPETENCE

Certificate of Competence							
Name	☒ Mr. ☐ Ms.	**Ma Paa Puratchikkanal**					
Qualification Procedure		*Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.*					
Appointed to work as:							
		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					
Compliance check by: Anand S. R.							

Certificate of Competence							
Name	☐ Mr. ☒ Ms.	**Indumathi .C**					
Qualification Procedure		*Fulfils the requirement as per the appointment of personnel procedure of 4KES for Validation and Verification of CDM/VCS/GS/GHG Projects.*					
Appointed to work as:							
		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		
		Waste handling and disposal		13.1	Solid waste and wastewater		
		Waste handling and disposal		13.2	Manure		
Authorized to work as Local Expert for:							
Country/Countries		India					
Compliance check by: Anand S. R.							

APPENDIX IV: ABBREVIATIONS

BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
DPR	Detailed Project Report
EB	Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel for Climate Change
JMR	Joint Meter Readings
LCS	Local Controller System
MP	Monitoring Period
MR	Monitoring Report
MW	Mega Watt
MWh	MegaWatt 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