

GOLD STANDARD FOR THE GLOBAL GOALS (GS4GG)
REPORT
-
VERIFICATION



Project Title:	70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL 16-01)
Monitoring Period:	01/07/2021 to 05/11/2022 (Inclusive of both days)
GS project ID:	GS 5519
Internal ID:	TQC 54522
Customer:	Infinite Environmental Solutions
Date:	05/09/2023
Revision:	02

SUMMARY			
Reference No.	Date (first version)	Version No.	Date (last version)
A+SH_SYST_TQC_GS_VER_54522	08/05/2023	02	05/09/2023
GS4GG Verification			
GS4GG Certified Product (sought):		GHG Emission Reductions	
GS4GG SDG Impact Statement (sought):		Impact Certification	
General Information			
Client	Infinite Environmental Solutions LLP		
Project Title	70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL 16-01)		
Project Participants	Fortum Finnsurya Energy Private Limited		
Project Location	Village: Bhadla, District:Jodhpur, State: Rajasthan, Cuntry:India		
Contact Person	Ms Shagun Mantry		
Monitoring Period	01/07/2021 to 05/11/2022 (Inclusive of both days)		
GS4GG Version: GS4GG Principles and Requirements 1.2 GS4GG Activity Requirements: RE Activity Requirements 1.4 Applied Methodology Version: ACM0002: Grid-connected electricity generation from renewable sources - Version 17.0 ¹ The following tools and guidance's have been followed (References): • Tool to calculate the emission factor for an electricity system¹ - Version 05.0 (EB 87, Annex 09) • Tool for the demonstration and assessment of additionality- Version 07.0.0 (EB 70, Annex 8)		GS4GG Sectoral Scope: 2 UNFCCC CDM Sectoral Scope: 1 Technical Area: 1.2	
Draft Monitoring Report Version: 01 Date: 19/01/2023		Final Monitoring Report Version: 05 Date: 04/09/2023	
GS4GG Project Design Document Version: 04 ² Date: 04/04/2022			
Estimated SDG Goals: SDG 7 (Affordable and clean energy): 122,640 MWh SDG 8 (Decent work and economic growth): 1 training/annum, employment to 10 persons/annum SDG 13 (Climate action): 119,384 tCO ₂ e			
Actual SDG Goals achieved during current monitoring period: SDG 7 (Affordable and clean energy): 198,251 MWh SDG 8 (Decent work and economic growth): Trainings Provided – 27 nos. No. of Jobs generated - 38 nos. SDG 13 (Climate action): 193,829 tCO ₂ e.			
Selected Sustainable Development Goals (SDGs): 7, 8 and 13			
Verification Summary			
LGAI Technological Center, S.A. (hereafter referred to as Applus+ Certification) has been contracted by			

¹<https://cdm.unfccc.int/methodologies/DB/XP2LKUSA61DKUQC0PIWPGWDN8ED5PG>

² Completed its transition from GSCER to GSVER on 02/05/2022 with PDD version 04 dated 04/04/2022 and PDD approved at the time of transition review. Since this is the first verification after completion of transition, the same has been applied to the current monitoring period.

Fortum FinnSurya Energy Private Limited to perform the 5th verification of “70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL 16-01)” (Ref. No. GS 5519³) applying the methodology ACM0002, version 17.0. The management of Fortum FinnSurya Energy Private Limited is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions.

A desk review and a site visit have been conducted to verify the data submitted in the monitoring report. Applus+ Certification confirms the following have been reviewed:

- a. The GS4GG PDD version 04 including the monitoring plan (Transition from GS CER to GSVER) dated 04/04/2022;
- b. Monitoring report;
- c. The applied monitoring methodology;
- d. Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board;
- e. The Gold Standard for Global Goals “Principles and Requirements” Version 1.2 and GS4GG guideline and related Annex.
- f. All information and references relevant to the project activity’s resulting in emission reductions.

Fortum FinnSurya Energy Private Limited has implemented a Greenfield “70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL 16-01)” a large-scale grid-connected solar PV power project in Village Bhadla, District Jodhpur, Rajasthan state of India. The project activity consists of 70 MW grid-connected solar PV power project which is commissioned on 31/03/2017.

The project activity has been commissioned on 31/03/2017 and operational. The PA supplying generated electricity to INDIAN grid. The project activity has been also registered as a CDM project (UNFCCC Reference no 10403⁴ on 06/11/2017 and with GS on 03/01/2018 as GS-CER project. Moreover, the project activity completed its transition from GSCER to GSVER on 02/05/2022 with revised PDD. Version 04 dated 04/04/2022 and PP has followed the revised PDD for this current monitoring period.

The project activity involves installation of 70 MW_{AC} (87.5 MWp⁵) solar power plant. Electricity generated from the project activity is sent to the Indian Grid. As per GS PDD version 04, the annual average electricity generation from the project activity is estimated as 122,640 MWh/year and to be abated 119,384 tCO₂e emissions per year; and 613,200 MWh and 596,920 tCO₂e over the entire crediting period from 06/11/2017 to 05/11/2022 (Both days included)^{1/}. The project activity generated 198,251 MWh of electricity and abated 193,829 tCO₂e during the current monitoring period from 01/07/2021 to 05/11/2022 (Both days included)^{2/}.

Applus+ Certification confirms that the project is implemented in accordance with the GS4GG PDD version 04 dated 04/04/2022 (transition from GSCER to GSVER). The monitoring plan complies with the applied methodology ACM0002, version 17.0^{4/} and the Gold Standard for Global Goals “Principles and Requirements” V 1.2, GS4GG guidelines^{7/}. The monitoring has been carried out in accordance with the monitoring plan. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the project’s GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information reviewed and evaluated Applus+ Certification confirms that the implementation of the project has resulted in 193,829 tCO₂e emission reductions

³ <https://registry.goldstandard.org/projects/details/2605>

⁴ <https://cdm.unfccc.int/Projects/DB/Applus1506003422.59/view>

⁵ Total installed DC capacity is 87.5 MWp since commissioning of the project. There has been a typo error while mentioning the DC capacity in the PDD and the legacy error has been continued in subsequent verifications. However, there is no change in number modules and their capacity. Also, the AC capacity has also been same i.e. 70 MW from the beginning of the project. So, there is no impact on design of the project.

during the period 01/07/2021 to 05/11/2022 (Both days included).

All CARs and CLs raised during verification resolved prior to submitting a request for issuance. No FAR has been raised during this verification. Please refer Appendix 1 of this report. Total numbers of findings: CARs: 04, CLs: 04, FARs: 00

ASSESSMENT TEAM		
Team Members	Type of Resource ⁶	Organization (for OEs)
Lead Auditor: Mr. Jitendra Mohan Singh	☐ IR ☐ EI ☒ OE	M/s True Quality Certifications Private Limited
Auditor: Mr. Amit Rai	☐ IR ☐ EI ☒ OE	M/s True Quality Certifications Private Limited
Technical Reviewer: Mr. David Lubanga	☐ IR ☒ EI ☐ OE	LGAI Technological Center, S.A.

ABBREVIATIONS	
ACM	Approved Consolidated Methodology
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction
CL/CR	Clarification Request
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
DNA	Designated National Authority
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GS4GG (or GS)	Gold Standard for Global Goals
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-Governmental Organization
SDG	Sustainable Development Goal

⁶ IR (Internal Resource); EI (External Individual); OE (Outsourced Entity)

TAC	Gold Standard Technical Advisory Committee
OM	Operational Margin
PDD	Project Design Document
PP	Project Participant
RVPNL	Rajasthan Rajya Vidyut Prasaran Nigam Limited
UNFCCC	United Nations Framework Convention for Climate Change
VVB	Validation and Verification Body
VVS	Validation and Verification Standard

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Appendix 1: Corrective Action Request/Clarification Request/Forward Action Request resolution table.

Appendix 2: Calibration details of monitoring meters.

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1. INTRODUCTION

1.1 Objective

LGAI Technological Center, S.A. (hereafter referred to as Applus+ Certification) has been contracted by Fortum FinnSurya Energy Pvt. Ltd. to perform 5th periodic verification of "70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL-16- 01)" applying the methodology ACM0002, version 17.0^{/4/} and GS4GG guidelines. Gold Standard projects must undergo periodic audits and verification of emission reductions as the basis for issuance of Gold Standard VERs. The objective of the verification work is to assess the compliance with the requirements of paragraph 62 of the CDM Modalities and Procedures as well as the GS4GG guidelines and relevant Principles and Requirements. According to this assessment Applus+ Certification shall:

- Ensure that the project activity has been implemented and operated as per the revised GS PDD^{/1/} and transitional documents for registration and that all physical features (technology, project equipment, monitoring and metering equipment) of the project are in place;
- Ensure that the published MR^{/2/} and other supporting documents provided are complete, verifiable and in accordance with applicable CDM VVS for project activities version 03^{/4/} for the project activity and Gold Standard i. e. GS4GG requirements^{/7/};
- Ensure that the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology;
- Evaluate the data recorded and stored as per the ACM0002, version 17.0.

1.2 Scope

The verification scope encompasses an independent and objective review and ex-post determination of the monitored reductions in GHG emissions by the VVB. The verification is based on the submitted monitoring report, GS PDD^{/1/}, as well as its validation report^{/1/}, the applied monitoring methodology^{/4/}, relevant decisions, clarifications and guidance from the CMP and the EB, GS4GG guidelines^{/7/} and any other information and references relevant to the project activity's resulting emission reductions. These documents are reviewed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures, GS4GG guideline and relevant Principles and Requirements, as well as their related rules and guidance.

Based on the requirements in the CDM VVS for project activities, version 03.0 for the project activity as well as the GS4GG guideline, Applus+ Certification has applied a risk-based approach for the verification of the project. The principles of accuracy, completeness, relevance, reliability and credibility were combined with a conservative approach to establish a traceable and transparent verification opinion.

The verification considers both quantitative and qualitative information on emission reductions. The verification also considers the monitoring of sustainable parameters.

The verification is not meant to provide any consultancy towards the client. However, stated requests for clarifications, corrective and/or forward actions may provide input for improvement of the monitoring activities.

1.3 Description of the project activity

The project activity uses renewable energy (solar) as a clean fuel to generate electrical energy. The project involves installation of 70 MW_{AC} (88.2 MW_P) Solar Power Plant^{/1/}. The project activity is located in Bhadla Village, Jodhpur, Rajasthan.

The solar power produced from the project activity has been exported to Indian grid. As per validated PDD (version 04), the annual average of estimated electricity generation is 122,640 MWh/year resulting in estimated emission reductions of 119,384 tCO_{2e} per year during the crediting period (06/11/2017-05/11/2022) ^{/1/}. The project has been commissioned on 31/03/2017^{/3/}. The technical specifications are as follows:

Technical detail of the equipment	Remark
Technology	Solar PV Module
Solar photovoltaic module	First solar series 4TM PV Module
No of Modules	112.5Wp: - 88800, 115Wp: - 587000, 117.5Wp: - 85200
Make	First Solar
Capacity	112.5Wp, 115Wp, 117.5Wp
No of inverters	70
Make	ABB
Capacity	1000KVA
No. of transformers	18 (ITD) + 2 (PT)
Technical & Operational Lifetime	25 years

The technical specifications^{/14/} were confirmed during the site visit and suppliers catalogue submitted by PP.

2. METHODOLOGY

Applus+ Certification approach to the verification is a two-stage process. In the 1st stage, Applus+ Certification completed a strategic review and risk assessment of the project's activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

2.1 Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, Applus+ Certification has composed an assessment team in compliance with the Contract Review and Assessment Team appointment rules in the internal Quality Management System of Applus+ Certification.

The composition of the assessment Team (Applus+ Certification's team) has been approved by Applus+ Certification during the Contract Review process ensuring that the required skills are covered.

The qualification levels for Assessment Team members that are assigned by aforementioned appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A)
- Technical Expert (TE).
- Technical Reviewer (TR).
- Any of the above-mentioned roles in training (iT,e.g. AiT for auditor in training).

The Sectoral Scope / Technical Area required knowledge linked to the applied methodology(ies) is covered by the Assessment Team as shown below:

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Mr. Jitendra Mohan Singh	LA/TE	YES	YES	NA	YES
Mr. Amit Rai	AiT/TEiT	YES	YES	NA	YES
Mr. David Lubanga	TR	YES	YES	NA	NA

The complete list of CVs is included as Appendix 3 of this report.

2.2 Document review

In the 2nd stage, Applus+ Certification verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved site visit and a desk review of the Monitoring Report. This Verification Report describes the findings of this assessment

The Monitoring Report version 01^{/2/} was submitted to VVB before the verification activities started. The MR was assessed based on all the relevant documents. The aim of the assessment in the desk review was to:

- Verify the completeness of the data and the information presented in the MR;
- Check the compliance of the MR with respect to the monitoring plan depicted in the revised GS4GG PDD^{/1/} version 04 dated 04/04/2022 and verify that the applied methodology was carried out. Particular attention of the power plant was checked by the assessment team.

- Evaluate the data to the frequency of measurements, the quality of the metering equipment including calibration requirements, and the quality assurance and quality control procedures management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.
- Please check section 4 of this report for detail of the documents checked.

2.3 On site assessment and follow up interviews

Duration of on-site inspection: 18/03/2023				
No.	Activity performed on-site	Site location	Date	Team member
1.	1) an assessment of the implementation and operation of the GS4GG project activity as per the PDD 2) a review of information flows for generating, aggregating and reporting of the monitoring parameters 3) interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the Monitoring Plan 4) a cross-check between information provided in the MR and data from other sources 5) a check of the monitoring equipment including calibration performance, and observations of monitoring practices against the requirements of the PDD and the applied methodology 6) a review of calculations and assumptions made in determining the GHG data and ERs, and 7) an identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters	Village: Bhadla, District: Jodhpur State: Rajasthan (India)	18/03/2023	Mr. Jitendra Mohan Singh (LA) & Mr. Amit Rai (AiT)

During the physical site visit, following stakeholders were interviewed

Sr. No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Dogra	Mr. Deepak	Sr. Engineer PP representative)	18/03/ 2023	Project implementation, Baseline emissions, ER calculations, Sustainable monitoring, employment, grievance etc.	Mr. Jitendra Mohan Singh (LA) Amit Rai (AiT)
2.	-	Shivam	Compliance Consultant PP representative)	18/03/ 2023	Project implementation, Project Monitoring and reporting, calibration, employment, trainings	
3.	Kumar	Hemant	Chief Manager PP representative)	18/03/ 2023	Project implementation, Project Monitoring and reporting, calibration, employment, trainings	
1.	Paliwal	Ganesh	Chief manager Projects	18/03/ 2023	Office Work	
2.	Singh	Hem	Local Stakeholder (Farmer)	18/03/ 2023	Local area development, Local issues, Grievances	

As referred above, the objective of the site visit assessment was to verify the following issues:
 Confirm the implementation and operation of the project in line with GS4GG PDD^{/1/}:

- The implementation of the project activity is in line with the revised GS4GG PDD^{/1/} Version 04 dated 04/04/2022 and there is no change in capacity or design of the project activity since commissioning. Same was confirmed from commissioning certificates^{/3/}, technical specifications of Solar PV Modules, Inverters^{/14/}, PPA^{/15/}, interviews with PP/Site in charge and credit notes as well as invoices^{/17/} raised by PP towards state utility;

- Review the data flow for generating, aggregating and reporting the monitoring parameters:

Electricity generation monitoring and billing procedures are followed at the project site in line with the state utility practice and are in line with the registered GS4GG PDD^{/1/}. These were confirmed during the interviews with PP and the assessment team also checked entire monthly credit notes issued by the state utility for the project activity with the values provided in the ER sheet for the calculations of the emission reductions;

- Confirm the correct implementation of procedures for operations and data collection:
 During interviews with PP, it was confirmed that implementation of procedures for operations and data collection is in line with registered GS4GG PDD^{/1/}. Service provider is responsible for the operations, maintenance as well as maintaining other technical data of the project activity. Performance and operation data of solar project is controlled and maintained by the PP through dedicated software;
- Cross-check the information provided in the MR documentation with other sources:
 The information provided in the MR was crosschecked with the commissioning certificates, PPA, calibration certificates^{/8/} and Monthly Meter reading reports issued by DISCOM and invoices are used for cross-checking;
- Check the monitoring equipment against the requirements of the GS4GG PDD and the approved methodology, including calibrations, maintenance, etc.:
 Monitoring meters are checked with the Monthly Meter reading reports, interviews with PP, current photographs and calibration is checked with the calibration certificates issued by State Utility authorized third parties;
- Review the calculations and assumptions used to obtain the GHG data and ER:
 Calculation procedures and monthly generation data is checked with Monthly Meter reading reports and crosschecked with invoices;
- Identify if the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters:

During interviews with PP, it was confirmed that quality control and quality assurance procedures^{/11/} are in place. Metering arrangements & billing procedure is defined and controlled by state utility and PP do not have control on it. Assessment team checked all the monthly generation values which were crosschecked with the invoices and found that emission reductions are calculated^{/2/} conservatively.

Thus, to verify the implementation of project activity, onsite operation & maintenance, monitoring & management practices; assessment team has conducted interviews with onsite in-charge, O&M team and also had a detail discussion with the PP representative and reviewed third party statutory documents i.e. Commissioning certificates, Power Purchase Agreement, Complete set of Monthly Meter reading reports covering monitoring period, Invoice (for cross check of Net electricity supplied to the grid), training records^{/9/}, breakdown log^{/18/}, O&M schedule^{/15/}, complaint/feedback register^{/13/} and other relevant records.

2.4 Quality of evidences

Sufficient evidence covering the full verification period in the required frequency is available to verify the figures stated in the final MR Version 05^{2/}. Specific cross-checks have been done in cases that further sources were available. The monitoring report's figures were checked by the assessment team against the raw data. The data collection system meets the requirements of the monitoring plan as per the methodology.

2.5 Reporting of findings

As an outcome of the verification process, the assessment team can raise different types of findings.

Where a non-conformance arises the assessment team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

- Non-compliance with the monitoring plan or methodology 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.

The assessment team shall raise a Clarification Request (CL) if information is insufficient or not clear enough to determine whether the applicable CDM/GS requirements have been met.

All CARs and CLs raised during verification shall be resolved prior to submitting a request for issuance.

Forward Action Requests (FARs) may be raised during verification for actions where the monitoring and reporting require attention and/or adjustment for the next verification period.

Please refer Appendix 1 of this report. Total Numbers of findings: CAR: 04, CL: 04, FARs: 00

2.6 Internal Quality Control

As a final step of verification, the final documentation including the verification report has to undergo an internal quality control by the Technical Reviewer. Each report has to be finally approved either by the VVB's Technical Manager or the Deputy. This approval process also includes another quality assurance check in terms of Administrative Review. In case one of these two persons is part of the assessment team, the final approval can only be given by the person who is not a part of the assessment team. If the documents have been satisfactorily approved, the Request for Issuance is submitted to the GS Registry along with the relevant documents.

3. VERIFICATION FINDINGS

3.1 FARs from Validation / Previous Verification

The following FARs were raised from validation/or verification.

FAR from Last Performance Review (MP3:02/08/2020 - 31/12/2020 & MP4:01/01/2021 - 30/06/2021)

FAR#1: The VVB shall verify the physical implementation of Solar PV project, monitoring system and implement monitoring plan.

This FAR was closed during the Design Certification Renewal. The same has been confirmed through review of Design Certification Renewal Validation Report (Version 02 dated 03/11/2022).

FAR # 2: VVB shall conduct in person stakeholder interview to confirm the grievances and SDG benefits from the project activity.

This FAR was closed during the Design Certification Renewal. The same has been confirmed through review of Design Certification Renewal Validation Report (Version 02 dated 03/11/2022).

FAR from Transition Review

The following FAR was raised during the transition from GS CER to GS VER under 1st CP (06/11/2017 – 05/11/2024)

FAR#1: The crediting period start date for the transitioned project will be 06/11/2017. The length of the 1st crediting period will be 5 years which can be renewed twice.

The 1st crediting period is from 06/11/2017-05/11/2024. PP has now considered the length of the 1st crediting period of 5 years which can be renewed twice in monitoring report of current verification (MP: 01/07/2021 to 05/11/2022). Thus, this FAR has been closed.

3.2 Project Implementation in accordance with the registered Project Design Document

The project activity was fully implemented according to the description presented in the revised registered GS4GG PDD^{1/}. The verification team confirms, through the visual inspection during site visit that all physical features of the project activity including data collecting system has been implemented in accordance with the revised GS4GG PDD^{1/}.

The project activity was in normal operational during the monitoring period and the same has been confirmed during the on-site interviews. No unusual activates observed during the monitoring period and plant was undergone scheduled maintenance as per the recommendation of the manufactures. No forced breakdown observed and the same is confirmed by the assessment team with the plant log details.

The installed capacity of the project activity is 70 MW (AC) (87.5 MWp)⁷. The project activity is located at Bhadla, Jodhpur, Rajasthan state of India. Verification team has checked the locations of the project activity during the physical site visit through GPS meter and google map and found that the latitude and longitude as mentioned in the registered PDD is correct^{5/}.

Village	District	Latitude	Longitude
Bhadla	Jodhpur	27° 28' 7.00" N	71° 58' 17.00" E

The project capacity was checked against commissioning certificates and submitted Power Purchase Agreement confirms that the generated power is sold to the grid.

The project activity has been commissioned on 31/03/2017 and operational. The PA supplying generated electricity to INDIAN grid. The project activity is also registered as a CDM project (UNFCCC Reference no 10403⁸. The project activity completed its transition from GSCER to GSVER on 02/05/2022 with revised GS4GG PDD. Version 04 dated 04/04/2022 and the same has been used during the current monitoring period.

Based on interview with PP representative, the verification team was able to confirm that the project implementation is in accordance with the project description contained in the revised registered GS4GG PDD^{1/}.

The technology employed by the Project Activity includes the generation of renewable electrical energy by harnessing solar power. Thus, this project actually displaces the electricity in the grid which is essentially fossil-fuel based to supply the generated electricity to the Indian Electricity Grid. The generation and consumption electricity from the Project Activity is monitored continuously through the energy meters at project site & substations. The data is used for the calculation of exports to the grid and imports from the grid.

Technical specifications of the SPV is provided in the section B.1 of the MR. Same are confirmed during the interviews with PP and commissioning certificates, validation report and found correct.

Technical detail of the equipment	Remark
Technology	Solar PV Module
Solar photovoltaic module	First solar series 4TM PV Module
No of Modules	112.5Wp: - 88800, 115Wp: - 587000, 117.5Wp: - 85200
Make	First Solar
Capacity	112.5Wp, 115Wp, 117.5Wp
No of inverters	70
Make	ABB
Capacity	1000KVA
No. of transformers	18 (ITD) + 2 (PT)

⁷ Total installed DC capacity is 87.5 MWp since commissioning of the project. There has been a typo error while mentioning the DC capacity in the PDD and the legacy error has been continued in subsequent verifications. However, there is no change in number modules and their capacity. Also, the AC capacity has also been same i.e. 70 MW from the beginning of the project.

⁸ <https://cdm.unfccc.int/Projects/DB/Applus1506003422.59/view>

Technical & Operational Lifetime	25 years
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The project activity was commissioned on 31/03/2017. The Verification team checked the commissioning date of the project activity onsite and by commissioning certificate issued by state utility and found correct.

Based on interview with PP representative during the physical site visit, the verification team was able to confirm that the project implementation is in accordance with the project description contained in the GS4GG registered PDD version 05^{1/}.

The operation of the project activity complies with all statutory requirements as the PP is submitting the monthly invoice to state utility. The monitoring data is recorded on continuous basis and available on hourly/daily basis as ERP and MIS reports. Training^{9/} has been provided to the operators handling the operation of the critical equipment such as PV Modules, Inverters, power evacuation systems and other equipments. The company has recruited personnel with relevant experience in the operation of the plant. There is no event or situation including emergency situations occurred during this monitoring period which has impacted the applicability of methodology. The outage record or breakdown report for this monitoring period was verified during site visit from logbooks^{18/} and found OK. No unforced shutdown/breakdown was observed.

The timeline of the project's implementation is as follows:

Milestone of the project activity	Timeline	Assessment by the verification team
Registration of the project activity under GS4GG Principles and Requirements version 1.2	Registered	The project webpage was checked to confirm the same https://registry.goldstandard.org/projects/details/1371
Crediting period: 1 st CP		
1 st monitoring period	06/11/2017 to 01/04/2019 (both dates included)	Verification completed
2 nd monitoring period	02/04/2019 to 01/08/2020 (both dates included)	Verification completed
3 rd & 4 th monitoring period	MP3:02/08/2020 to 31/12/2020(both dates included) MP4:01/01/2021 to 30/06/2021(both dates included)	Verification completed.
5 th monitoring period	01/07/2021 to 05/11/2022(both dates included)	Current verification

Assessment of actual emission reductions with the estimate emission reductions in PDD:

Estimated Emission Reduction as per registered PDD	The annual estimated emission reductions as registered PDD is 119,384 tCO ₂ e/year. As per GS4GG PDD version 04, Ers for 365 days – 119,384 tCO ₂ e and for this MP, total days are 493. Accordingly, emission reductions for this MP, estimated ER is 161,250 tCO ₂ e (119,384*493/365). Please refer calculation in ER Spread sheet ^{2/}
Actual Emission Reduction for the monitoring period	193,829 tCO ₂ e
Is any increase of VEs occurred?	Yes
Reason for increase of VEs	Actual Emission reduction is 20.20% higher than the estimated value during the current monitoring period. This is because of higher generation achieved during the current monitoring period. The actual PLF achieved for this monitoring period is 23.94 % which is higher than the PLF as per registered PDD (20.00%). Verification team re-visited the additionality of the project and found that the increased in PLF is within the sensitivity range (23.94%) which does not breach the Benchmark equity IRR assumption as per the registered PDD. Thus, acceptable to VVB.

Further, during interview with onsite personnel and local stakeholders, VVB team observed there is no hazardous oil or substance released or used by project activity. Moreover, as the project activity refers to Solar PV modules-based power plant. There are no pollutions causing technology installed at the project site. Also, no flora and fauna including birds harmed during operation of project activity.

Assessment team also checked that the projects are not registered under the REC mechanism of India and the same can be cross-checked at <https://recregistryindia.nic.in>. Also International REC (I-REC) registry (<https://evident.services/device-register>) is cross-checked and found that this project is not under I-REC as well. Thus, double counting for the current monitoring period is ruled out.

The project activity has been registered UNFCCC with reference ID10403⁹. However, PP has submitted declaration for not claiming the emission reductions in any other GHGs programme (no double counting). Further, VVB confirms that there is no risk of double counting also VVB has obtained written declaration from project developer (PD) for no double counting dated 22/08/2023. Further VVB confirms that project activity is not included within and counted under a regulated domestic climate mitigation target or NDC target of India. PD has not signed any agreement with the Government of India regarding its contribution to NDC targets of India. There is no legal compliance to mandate the PD to be a part of regulated domestic climate mitigation target or NDC target of India. The project activity is a voluntary initiative by the PD and the PD.

Grievance Mechanism:

During the interviews with PP, the verification team confirmed that there is a grievance book/form with GS contact information at the project site office and are accessible to local

⁹ <https://cdm.unfccc.int/Projects/DB/Applus1506003422.59/view>

stakeholders. By checking grievance book submitted by PP^{13/}, it was able to confirm there are no comments received from the local people for the present monitoring period towards project activity. Local people are happy with the implementation of the project activity as it entrusts employment and improve living standard of local people and villagers. Also, during interview with the PP, VVB team observed there is no legal Contest arise on project activity during monitoring period.

Materiality adopted in Verification:

Consideration of materiality in planning the verification

No.	Risk that would lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk levels	Justification	
1	Human errors: Readings from Meters (if not automatic)	LOW	Human error is likely to occur if the monitoring personnel are not trained well or inexperienced in data recording procedures and monitoring process	All the personal are well trained to monitor and collect data and thus risk associated with Human error is minimized. Assessment team checked the training records to confirm that all the personal are well trained to handle the activities related to monitoring. Assessment team checked the training records for the complete monitoring period and confirm that the personal are well trained to monitor and collect data for the project activity.
2	Human error: Quantification of emission reduction	LOW	Use of spread sheets without adequate data control, changes/updates, version tracking, traceability and security	All the energy statement i.e. JMR sheets and the invoices for the complete monitoring period are checked and thus the assessment team confirms that the ER value is conservative and correct.

Consideration of materiality in conducting the verification

In line with Guidelines for Application of materiality version 02.0^{4/} in verifications, the verification team has conducted a complete verification of all the information presented in the monitoring report and data monitored as presented in the emission reduction calculation spread

sheet. It invoices follows the paper trail back to the raw data such as meter reading records and invoices. There are no material errors, overestimation of ER, omission or misstatement.

In summary, verification team confirms that actual emission reductions are lower than the estimates as per GS4GG PDD^{1/} for the current monitoring period.

Verification team considers the project and monitoring description of the project contained in the Monitoring report to be complete and accurate. The Monitoring report complies with the relevant methodology, tools, forms and guidance which are in line with that available in the registered documents (including GS4GG PDD) with Gold Standard.

Opinion:

- a) In opinion of the assessment team the implementation and operation of the project activity is in compliance with the description in the GS4GG PDD version 04.
- b) There is no revision in monitoring plan or post registration change for the current monitoring period.
- c) The actual emission reductions for the current monitoring period are 193,829 tCO₂e which is higher than the estimated Ers (161,250 tCO₂e) for the comparable period.

3.3 Compliance of the Monitoring Plan with the Monitoring Methodology

The verification team is able to confirm that the monitoring plan and the monitoring system implemented are in compliance to the applied monitoring methodology ACM0002, version 17.0. All other requirements of the applied methodology are met.

During the verification all relevant monitoring parameters (as listed in the GS4GG PDD^{1/}) have been verified with regard to the appropriateness of the applied measurement/determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures.

Opinion:

The monitoring plan mentioned in the GSPDD^{1/} is in line with the applied methodology i.e. — ACM0002, version 17.0. The monitoring mechanism is in line with the methodology and is effective and reliable.

3.4 Completeness of Monitoring

The monitoring has been carried out in accordance with the monitoring plan contained in the PDD. During the course of verification, all relevant monitoring parameters have been verified with regard to the appropriateness of the applied measurement / determination method and applied QA/QC procedures. It is confirmed that the monitoring parameters have been measured / determined without material misstatements.

The verification team reviewed the actual monitoring during the site visit and from document review and compared it against the requirements of the monitoring plan in the GS4GG PDD and found in line.

The verification team assessed the monitoring techniques and each monitoring value in the monitoring report; and provided a short summary on the verification of every parameter listed in the monitoring plan and used for calculation of emission reductions.

a. Data and parameters fixed ex ante or at renewable of crediting period

$EF_{grid,OM,y}$, $EF_{grid,BM,y}$, & $EF_{grid,CM,y}$ were mentioned as ex-ante fixed parameter.

The values for $EF_{grid,OM,y}$, $EF_{grid,BM,y}$, & $EF_{grid,CM,y}$ have been checked with the revised registered PDD version 04 and found consistent. The default values in turn are used for baseline calculation as per the formula given in the registered GS4GG PDD^{1/} for the current monitoring period. Assessment team checked the values, source of data, choice of data, purpose of the data mentioned in the MR from the registered GS4GG PDD^{1/} and confirms that the similar approach was considered for the current monitoring period also.

The relevant Emission factor values used for emission reduction calculation are as below. Also as GS4GG "Principles and Requirements" version 1.2^{7/}, ex-ante fixed parameters are now connected to relevant SDG indicator which is acceptable to the assessment team.

For CP 1:

$EF_{grid,OM,y}$ - Relevant SDG Indicator= SDG13: Climate Action= 0.9941 tCO₂e/MWh

$EF_{grid,BM,y}$ - Relevant SDG Indicator= SDG13: Climate Action= 0.9285 tCO₂e/MWh

$EF_{grid,CM,y}$ - Relevant SDG Indicator= SDG13: Climate Action= 0.9777 tCO₂e/MWh

b. Data and parameters monitored

Relevant SDG Indicator	SDG 7: Affordable and Clean Energy	
Data/parameter:	$EG_{PJ,y}$	
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 checked by the assessment team	Monthly JMRs	
Value(s) of monitored parameter	198,251 MWh	
	Monitoring Period (Vintage)	Values (MWh)
	01/07/2021 to 31/12/2021	70,758
	01/01/2022 to 05/11/2022	127,493
	Total	198,251
The Meter Reading Statement (i.e, JMR sheets) issued by State board which provide the values of net export. The project activity includes metering at the substation managed by state discom. The parameter $EG_{PJ,y}$ is calculated based on the difference between values of "export" and "import" on the energy meter at the sub-station		

	(evacuation point). The metering is being done at plant by dedicated meter (standby meter) and common metering point at substation (GSS). Common metering at the substation: All the plants (including the project activity solar plant and other investors solar plant) are further connected to a common metering point at Pooling substation 132/220 KV GSS II and further electricity is transferred to 220/400 KV RRVPNL substation. The common metering point consists of both main & check meters (ABT Meters) having accuracy class of 0.2s. The export/import losses between these two substations are apportioned based on pooling substation readings. The difference of final apportioned value of export and import is used for monthly values of net electricity supplied to the grid by the project activity and the same is thus used for emission reduction calculation in ER sheet ^{/4/} thus emission reduction calculation is correct. Measurement methods and procedures: Data Typed :Measured Monitoring Frequency :Continuously Recording Frequency :Monthly Calibration Frequency : Once in 5 years				
Means of verification:	The details of monitoring meters:				
	Meter	Sr. No.	Make	Model	Accuracy Class
	Main Meter	16195106	L&T	ER300P	0.2s
	Check meter	16195107	L&T	ER300P	0.2s
	Standby meter	16195098	L&T	ER300P	0.2s
	The details of the Meters are provided in appendix 2 of the report.				
Cross check mechanism	The JMR values have been cross-checked with the invoices ^{/05/} . Emission reduction calculated in thus correct and accurate. The cross-check mechanism is presented in the emission reduction calculation sheet/ ^{04/} and the same is found correct.				

Relevant SDG Indicator	SDG 13.2.1: Climate Action						
Data/parameter:	ER_y						
Unit	tCO ₂						
Description	Reduction in CO ₂ emission reduction due to implementation of project activity						
Source of data checked by the assessment team	Emission reduction sheet						
Value(s) of monitored parameter	124,649 tCO ₂ e <table border="1"> <thead> <tr> <th>Monitoring Period (Vintage)</th><th>Values (tCO₂e)</th></tr> </thead> <tbody> <tr> <td>01/07/2021 to 31/12/2021</td><td>69,180</td></tr> <tr> <td>01/01/2022 to 05/11/2022</td><td>124,649</td></tr> </tbody> </table>	Monitoring Period (Vintage)	Values (tCO ₂ e)	01/07/2021 to 31/12/2021	69,180	01/01/2022 to 05/11/2022	124,649
Monitoring Period (Vintage)	Values (tCO ₂ e)						
01/07/2021 to 31/12/2021	69,180						
01/01/2022 to 05/11/2022	124,649						

Means of verification:	The baseline emissions are the product of electrical energy baseline $EG_{PJ,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by an emission factor. Verification team checked that the calculation in ER sheet and found correct. The value of $EG_{PJ,y}$ has been checked with JMRs^{/16/} and cross-checked with the invoices. Emission reduction calculated is thus correct and accurate. The details calculations are provided in Section 3.6 of this report.
Cross check mechanism	All the formulas are applied inline with the registered GS4GG PDD Version 04 ^{/1/} .

Relevant SDG Indicator	SDG 8: Decent Work and Economic Growth												
Data/parameter:	Quantitative employment and income generation												
Unit	Number												
Description	Number of people employed directly due to the project activity. Number of men and women employed by the project activity. Type of job like temporary/permanent or skilled/unskilled, etc also monitored and it is ensued that peoples will get equal payment for equal work.												
Source of data checked by the assessment team	Plant records / Letter from O&M contractor for employment generation/ DOE interview with employees, local stakeholders etc.												
Value(s) of monitored parameter	There are 19 Skilled, 14 Semi-skilled and 5 Unskilled are employed in the project and continued till end of current monitoring period. Hence, in terms of numbers PP has provided a total of 38 employment during the current monitoring period from 01/07/2021 to 05/11/2022. The vintage wise breakup is provided in below table. VVB team checked that for Quantity of employment and income generation. Employment is given in office work, O&M, Security etc. . The employment records ^{/16/} for the monitoring period is checked by the VVB team and found correct. VVB also checked the salary slips of the employees and found that the salaries of the employees in the project activity are in line with Indian industry standard. <table><tr><td>Monitoring Period (Vintage)</td><td>Skilled</td><td>Semi-skilled</td><td>Unskilled</td></tr><tr><td>01/07/2021 to 31/12/2021</td><td>19</td><td>14</td><td>5</td></tr><tr><td>01/01/2022 to 05/11/2022</td><td>19</td><td>14</td><td>5</td></tr></table> No women are employed Being located at remote site. The Project thus provides employment opportunities and pays salaries and welfares and also helps to increase the income and living standards of the employees. The value for number of employments created is taken from Plant employment records and O&M agreement. Further, verification team found that the average hourly earnings of a person are higher than the local level. The income to all the unskilled workers is made on day-to-day basis better than the minimum wage requirements. As per minimum wages notification, 2021 by Department of Labour Rajasthan dated 30/07/2021 (https://labour.rajabasthan.gov.in/notification.aspx), all the unskilled workers under schedule – I, S. No. 24 are required to be paid minimum 252 INR per day or 6552 INR per month in Rajasthan state. However, the unskilled workers employed on the project are being paid 397 INR per day. Further, for example, a highly skilled is getting a monthly salary of INR	Monitoring Period (Vintage)	Skilled	Semi-skilled	Unskilled	01/07/2021 to 31/12/2021	19	14	5	01/01/2022 to 05/11/2022	19	14	5
Monitoring Period (Vintage)	Skilled	Semi-skilled	Unskilled										
01/07/2021 to 31/12/2021	19	14	5										
01/01/2022 to 05/11/2022	19	14	5										

	20,335 ^{10/} then his average daily earnings will be as follows: = 20,335/30 = INR 678. This is higher than the average wage per day in India (Average daily earnings of highly skilled workers for Zone B is INR 509 ¹⁰).
Means of verification:	The value for number of employments created is taken from Plant employment records, verification team interviewed some employees during site visit.
Cross check mechanism	The number of persons employed has been cross checked with the plant register/attendance register ^{10/} during the site visit.

Relevant SDG Indicator	SDG 8: Decent Work and Economic Growth	
Data/parameter:	Quality of Employment	
Unit	Number	
Description	Training of staffs	
Source of data checked by the assessment team	Training records ^{9/} for all the employees/Letter from O&M contractor ^{10/} for employment generation/ DOE interview with employees, local stakeholders etc.	
Value(s) of monitored parameter	27 trainings	
	Monitoring Period (Vintage)	Trainings
	01/07/2021 to 31/12/2021	06
	01/01/2022 to 05/11/2022	21
	Total	27

¹⁰ <https://clc.gov.in/clc/node/684>

Means of verification:	VVB has checked the training records ^{9/} and found that the number of trainings provided is correct.
Cross check mechanism	Not applicable

The verification team confirms;

- The monitoring plan implemented is in line with monitoring plan included in revised registered GS4GG PDD^{1/}.
- The monitoring complies with the requirement of the applied methodology.
- The information inflow (from data generation, aggregation, to recording, calculation and reporting) is included above under each parameter and confirms to the requirement of the revised registered GS4GG PDD^{1/}.
- The values included in the monitoring report and corresponding emission reduction sheets are verified, cross checked and included under each monitoring parameter, wherever appropriate
- The findings relevant to each parameter, wherever appropriate are discussed in detail in Appendix 1 of this report.

In summary, the verification team confirms that all the ex-post parameters are monitored in accordance with the approved monitoring plan and applied methodology.

c. Implementation of sampling plan

PP did not apply sampling plan to determine data and parameters monitored during this monitoring period. The verification team has checked all the documents such as credit notes issued by State electricity board and Invoices and hence sampling plan was not required. The verification team hereby confirms that has checked all the documents.

d. Compliance with the calibration frequency requirements for measuring instruments

The calibration details such as make, accuracy class serial number is as per the meters available onsite and checked during verification site visit. The Calibration details are presented in Appendix 2 of this report. Calibration of meters carried out by a NABL accredited company for testing and calibration, Govt of India (<http://www.nabl-india.org/>) to carry out calibration.

Verification team checked the same and found that the calibration is appropriate and correct as traceability is ensured. The meters were calibrated as per the norms of NABL and the meters are within the permissible error limit.

3.5 SDG Outcomes Monitoring

For Contributions to Sustainable Development

The verification team checked the sustainable development indicator parameters during the site visit interviews.

In Summary, it is Applus+ Certification's opinion that the monitoring of the project owner regarding to sustainability is in line with requirement of the GS4GG guideline.

As per the sustainability monitoring plan in the GS4GG PDD^{1/}, verification team evaluated all sustainable development indicators as followed in the table:

Item	Baseline estimate	Project estimate	Net benefit
SDG 7: Affordable and Clean Energy	Electricity supplied to grid = 0 MWh	Electricity supplied to grid = 198,251 MWh	Electricity supplied to grid = 198,251 MWh
SDG 8: Decent Work and Economic Growth			
Trainings provided to O&M staff (Nos)	0	27	27
No. of Employment opportunities created (Nos)	0	38	38
SDG 13: Climate Action	193,829 tCO ₂ e	0 tCO ₂ e	193,829 tCO ₂ e

Comparison of actual value of outcomes with estimates in approved GS4GG PDD^{1/}

Item	Values estimated in ex ante calculation of approved PDD	Actual values achieved during this monitoring period
SDG 7: Affordable and Clean Energy	165,648 MWh (as per registered GS4GG PDD for 365 days) 165,648 MWh for the Monitoring period (493 days)	198,251 MWh
SDG 8: Decent Work and Economic Growth	No. of trainings given: 01 Jobs created: 10	No. of trainings given: 27 Jobs created: 38
SDG 13: Climate Action	119,384 tCO ₂ /Year (365 days) 161,250 tCO ₂ for the monitoring period (493 days)	193,829 tCO ₂ e

The adequacy and compliance of the monitoring plan in the Monitoring report was found as per the requirements of the approved GS4GG PDD^{1/}. The information flow (from data generation, aggregation, to recording, calculation and reporting) is already included under respective parameter above. The verification team has verified all the data and collected evidence as per the required monitoring frequency and found to be correct and appropriate meeting the requirements of the applied methodology and revised registered GS4GG PDD^{1/}.

As a part of continuous feedback from stakeholders, the grievances register is being placed at site and is being continuously monitored and addressed through the grievances cell on regular basis and maintained in a register at site office¹³. The grievance register provide to verification team was also checked, it was found that during the current monitoring period, no comments/feedbacks were received from the local stakeholders.

Also during site visit, Applus+ Certification conducted interviews with the PP representative and local stakeholders please find the summary of the interview as below:

Sections	Debriefing
Trainings & salaries of the employees	During the site audit, Deepak Dogra (Sr. Engineer), Shivam (Compliance office), Hemant Kumar (Chief Manager), Ganesh Paliwal (Chief Manager Projects) and Him Singh Local stakeholder were interviewed. It was noted that regular technical & non-technical trainings were conducted and the salaries are in line with the industry standard.

In Summary, it is Applus+ Certification's opinion that the monitoring of the project owner regarding to sustainability is in line with requirement of the GS4GG guideline.

3.6 Assessment of Data and Calculation of Greenhouse Gas Emission Reductions

As a result of verification of the ER calculation process, the assessment team confirmed that all the parameters required for the determination of the emission reductions have been included in the Monitoring report Version 04 and corresponding ER calculation spreadsheet and are consistent with the applied methodology ACM0002, version 17.0 and the monitoring plan contained in the approved GS4GG PDD^{1/}(version 04). The parameters are complete in this monitoring period.

After verifying the reported figures with the raw data sources, it is confirmed that the values of the parameters from the raw data sources are consistent with those quoted in the Monitoring Report Version 05 and corresponding ER calculation spreadsheets. The verification process for the same has been clearly described in above section of the report. See below for the detailed data:

Baseline Emissions for the amount of electricity supplied by project activity, BE_y is calculated as:

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

Where,

BE_y – baseline emissions for the project activity (tCO₂e)

EG_{PJ,y} – Quantity of the net electricity is the electricity generation that is produced and fed into grid as a result of the implementation of the CDM project activity in year y (MWh)

EF_{grid,CM,y} – = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO₂/MWh)

For the monitoring period

$$EG_{PJ,y} = 198,251 \text{ MWh}$$

$$EF_{grid,CM,y} = 0.9777 \text{ tCO}_2/\text{MWh}$$

Therefore,

$$BE_y = 198,251 \text{ MWh} \times 0.9777 \text{ tCO}_2/\text{MWh} \\ = 193,829 \text{ tCO}_2\text{e}$$

Vintage wise summary of baseline emission is given below;

Baseline Emission for the year 2021	69,180tCO ₂ e
Baseline Emission for the year 2022	124,649tCO ₂ e

Total baseline emissions during the current monitoring period are 193,829 tCO₂e.

Project emissions:

Project Emissions, PE_y = 0

Leakage emissions:

As per applied methodology, leakage emissions are not applicable.

Emission reductions:

$$ER_y = BE_y - PE_y - LE_y$$

$$= 193,829 \text{ tCO}_2\text{e} - 0 \text{ tCO}_2\text{e} - 0 \text{ tCO}_2\text{e}$$

Vintage wise summary for the ER calculation is presented below

Emission Reduction for 2021	69,180 tCO ₂ e
Emission Reduction for 2022	124,649 tCO ₂ e

Total emission reductions for the current monitoring period are 193,829 tCO₂e.

The actual GSVERs is 193,829 tCO₂e which is 20.20% higher than the estimated VERs 161,250 tCO₂e (119,384 tCO₂e/365 days x 493 days) during this monitoring period. This is because of higher PLF/generation achieved by the project activity. The ex-ante PLF in registered PDD is 20%. However, actual PLF achieved by the project activity is 23.94%. VVB has assessed the additionality by re-test of sensitivity analysis of project by considering actual PLF 23.94% in registered IRR sheet and observed IRR of the project is found 13.26% which is still below the benchmark of 15.28%. Hence accepted by VVB.

The verification team confirms that: -

- The complete data set for the monitoring parameters was available as mentioned in the monitoring plan in the GS4GG approved GS4GG PDD^{/1/} for the duration of 01/07/2021 to 05/11/2022 (including both the days).
- The cross checks were undertaken for all the parameters indicated in the respective sections and were found complying with the requirements of the monitoring plan of the approved GS4GG PD (version 04);
- Appropriate methods and formulae for calculating baseline emission, project emissions and leakage have been followed
- The claimed emission reductions are free from material errors, omissions or misstatements, with a reasonable level of assurance

3.7 Management and Operational System

The responsibilities of data measurement, collection, verifying, archiving etc. have been clearly defined in the approved GS4GG PDD version 04^{/1/}. The same practice is followed onsite and it is confirmed by the assessment team during the site visit. The data related to ER calculation as well as data monitoring, collection process etc. have been internally reviewed by the management of the Monitoring team regularly. The responsibility of each function is consistent with the monitoring plan in the approved GS4GG PDD (Version 04) ^{/1/}.

The information flow of each parameter has been verified by the assessment team via interviewing with responsible personnel.

It's verified during the site visit, the monitoring procedure as well as the internal quality management and control procedures are stipulated in the approved GS4GG PDD (version 04). The monitoring personnel have been interviewed by the assessment team and it's confirmed that the monitoring is implemented as per the procedure. Also, the training records (training register and attendance sheet) has been checked by the assessment team and it is confirmed that the monitoring personnel are sufficient train to perform the monitoring.

All the data and documents, either hard copies or soft copies, will be kept for two years after the end of the last crediting period or the last issuance of GS VERs for this Project, whichever occurs later.

4. REFERENCE

LIST OF DOCUMENTS	
S. No.	Document/Evidence/Reference/Web link, Version, Date
1.	GS4GG PDD version 04 dated 04/04/2022 (Transition from GS CER to GS VER) Transition Assessment document of PA by GS
2.	GS Monitoring report version 01 dated 19/01/2023 (Draft) GS Monitoring report version 04 dated 15/05/2023(Final) Emission reduction Sheet version 01 dated 19/01/2023 (Draft) Emission reduction Sheet version 03 dated 03/05/2023 (Final) GS Monitoring report version 05 dated 04/09/2023 (submission during GS performance review)
3.	Commissioning certificate of project activity dated 26/10/2017

4.	CDM methodology - ACM0002, version 17.0 Tools: Tool to calculate the emission factor for an electricity system Version 05.0 Tool for the demonstration and assessment of additionality -Version 07.0.0 CDM VVS for the project activities, version 03.0 Guidelines for application of materiality, version 02.0
5.	Actual geo-coordinates of project activity
6.	Logbook records for scheduled maintenance for the complete monitoring period Breakdown details of project activity
7.	GS4GG "Principles and Requirement" version 1.2 GS4GG Activity Requirements: RE Activity Requirements version 1.4
8.	Calibration certificates for energy meters
9.	Training record
10.	Employment records/O &M contractor records, Salary slips/attendance register
11.	EHS Policy / QA and QC policies
12.	CSR records
13.	Copy of Grievance Register
14.	Technical Specifications of solar PV plant
15.	Power Purchase Agreement
16.	Monthly JMRs and Invoices
17.	Declaration for no double counting dated 22/08/2023
18.	Verification report of previous monitoring period

5. FINAL VERIFICATION STATEMENT

Applus+ Certification has been engaged by Fortum Finnsurya Energy Private Limited to perform the 5th verification of the “70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL 16-01)”.

The management of Fortum Finnsurya Energy Private Limited is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project’s Monitoring Plan in the registered PDD and the applied methodology ACM0002, version 17.0.

Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board and Gold Standard. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. The verification can confirm that:

- the project is operated as planned and described in the approved GS4GG project design document;
- the monitoring plan is as per the applied methodology ACM0002, version 17.0;
- the monitoring in Monitoring Report is as per the GS4GG PDD^{1/} and the monitoring plan approved by GS4GG;
- the development and maintenance of records and reporting procedures are in accordance with the registered monitoring plan;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.

In our opinion, the GHG emission reductions for “70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL 16-01)” for the monitoring period 01/07/2021 to 05/11/2022 (Both days included) as reported in Monitoring Report, prepared on the basis of the project’s Monitoring Plan are fairly stated.

Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: 01/07/2021 to 05/11/2022 (Both days included)

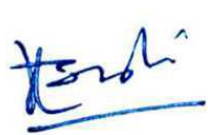
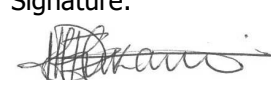
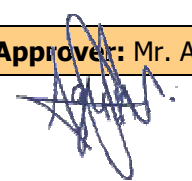
Verified emissions in the above reporting period:

Leakage emissions	0 tCO ₂ e
Project emissions	0 tCO ₂ e
Baseline emissions	193,829 tCO ₂ e
Emission reductions	193,829 tCO ₂ e

Date: 05/09/2023
Lead Auditor: Mr. Jitendra Mohan Singh
Auditor in Training: Mr. Amit Rai
Tech. Expert: Mr. Jitendra Mohan Singh
Technical Expert in Training: Mr. Amit Rai
Tech. Reviewer: Mr. David Lubanga

Approver (*Applus+ Certification VVB Technical Manager*)

Mr. Agustín Calle de Miguel

ASSESSMENT TEAM	
Lead Auditor: Mr. Jitendra Mohan Singh	Technical Reviewer: Mr. David Lubanga
Signature: 	Signature: 
Approver: Mr. Agustín Calle de Miguel	
Signature: 	

Appendix 1: Corrective Action Request/Clarification Request/Forward Action Request resolution table

FAR from transition to GS VER

Type:	☐ CAR ☐ CL/CR ☒ FAR	Number:	01
Raised by:	Jitendra Mohan Singh	Ref. to checklist in above tables:	3.1
Description of the audit finding		Date:	01/05/2023
With reference to submitted GS Transition Review Documents: "The crediting period start date for the transitioned project will be 06/11/2017. The length of the 1 st crediting period will be 5 years which can be renewed twice".			
Project Participant's response		03/05/2023	
The crediting period start date is fixed as 06/11/2017 and end date of first CP is 05/11/2022. Project has completed Design Certification Renewal for 2 nd CP i.e. from 06/11/2022 to 05/11/2027 on 17/03/2023.			
Documentation provided as evidence by Project Participant			
Design Renewal Review Final Feedback			
Auditor's assessment comment		Date:	03/05/2023
Project participant has fixed start date of crediting period as 06/11/2017 and considered the length of 1 st crediting period of 5 years which can be renewed twice. Moreover, Design Certification Renewal has been completed for 2 nd CP i.e. from 06/11/2022 to 05/11/2027 on 17/03/2023 as verified from the validation report of design certification renewal dated 03/11/2022.			
Hence, FAR 01 closed now.			

CAR/CLs from this verification

Type:	☐ CAR ☒ CL/CR ☐ FAR	Number:	01
Raised by:	Jitendra Mohan Singh	Ref. to checklist in above tables:	3.2
Description of the audit finding		Date:	25/03/2023
<i>PP shall be requested to give clarification with along with supportive evidences.</i> - Version 03 of PDD is applied to current monitoring period i.e. 01/07/2021 to 05/11/2022. However, Project design document submitted for the assessment mentioned as version 04, whose completion date of version is 04/04/2022. Therefore, PP shall provide clarification how this PDD is feasible for current monitoring period. - Last Annual Report dated by 26/07/2022, has been given as reference however the current monitoring period is start from 01/07/2021. Therefore, PP shall clarify how this report shall be feasible for current monitoring period. Further, along with justification pp shall provide the Last Annual Report.			
Project Participant's response		Date:	12/04/2023
- The project activity completed its transition from GSCER to GSVER on 02/05/2022. Version 04 of the PDD has been approved at the time of transition review. Since this is the first verification after completion of transition review and version 04 is the latest available version of the PDD, the same has been applied to the current monitoring period. The version no of PDD applicable to this MP has been revised under Key Project Information table in MR. - As per section 5.1.39 of Principles & Requirements version 1.2 "An annual report shall be submitted for each monitoring year by end of next calendar year for which verification is not completed. If a verification is in progress but not completed, then an Annual Report is still required by the end of calendar year." For monitoring year 2021 an annual report is required to be submitted by the end of next calendar year i.e. by December 2022. Since the Annual Report was submitted on 26/07/2022, it meets the requirements under section 5.1.39 of Principles & Requirements version 1.2 and it is also relevant to the monitoring period starting from 01/07/2021.			
Documentation provided as evidence by Project Participant			

1. Transition Request Form version 02		
2. Transition Review Final Feedback		
Auditor's assessment comment	Date:	01/05/2023
1. The version no of applicable PDD (version 04 completed on dated 04/04/2022), has now been revised under the revised monitoring report which is further checked and verified by the assessment team & found consistent with furnished Transition Request Form, Version 02.0. Therefore, this observation is closed now. 2. Justification given by the project proponent for the applicability of "Annual Report" is verified by the assessment team and further found that it's consistent with para 5.1.39 of GS, "Principles & Requirements Version 1.2". However, under the furnished Annual Report for cross verification, inconsistency in date (12/07/2022) has been observed. Therefore, observation is currently open. Hence, CL 01 is currently open.		
Project Participant's response	Date:	03/05/2023
2. The Annual Report was dated 12/07/2022, however the same has been submitted to sustain CERT on 26/07/2022. Since the guideline is related to date of submission, we have mentioned the date as 26/07/2022.		
Documentation provided as evidence by Project Participant		
Auditor's assessment comment	Date:	08/05/2023
Justification provided by the project participant has been checked and verified by the assessment team with para 5.1.39 of GS requirements, version 1.2 and hence acceptable to the assessment team. Therefore, this observation is closed now. Hence, CL 01 closed.		

Type:	☐ CAR ☒ CL/CR ☐ FAR	Number:	02
Raised by:	Jitendra Mohan Singh	Ref. to checklist in above tables:	3.2
Description of the audit finding	Date:	25/03/2023	
PP shall be requested to give clarification with along with supportive evidences - For section A.3 of the submitted monitoring report, the reference web link for applied methodology observed to invalid or not working. - For section A.4 of the submitted monitoring report, the details for crediting period observed to be inconsistent with information mentioned under FAR – 02 (Section B.1.1)			
Project Participant's response	Date:	12/04/2023	
1. The reference web link for applied methodology has been revised under section A.3 of the MR. 2. The details of crediting period under section A.4 have been revised and made consistent with the information mentioned under FAR#02 of section B.1.1 of the MR.			
Documentation provided as evidence by Project Participant			
1. Transition Review Final Feedback			
Auditor's assessment comment	Date:	01/05/2023	
Under Section A of the Revised Monitoring Report: - The referenced weblink for the applied Methodology, ACM0002, Version 17.0 has now been revised which is further checked and acceptable to the assessment team. - The inconsistency in the crediting period has now been eliminated which is later checked and found consistent with the detail provided under section B.1.1 of the revised monitoring report. Hence, CL 02 closed.			

Type:	☐ CAR ☒ CL/CR ☐ FAR	Number:	03
Raised by:	Jitendra Mohan Singh	Ref. to checklist in above tables:	3.2
Description of the audit finding	Date:	25/03/2023	

<i>For section B.1 of the submitted monitoring report, During the physical site visit it was observed that the DC capacity is 87.5 MWp instead of 88.2 MWp. Clarification required along with plant as built drawings (Solar Module layout).</i>		
Project Participant's response	Date:	12/04/2023
<i>Total installed DC capacity is 87.5MWp. Section B.1 of the MR has been revised to correct the same. Technical specifications have been submitted to the assessment team for review.</i>		
Documentation provided as evidence by Project Participant		
1. Technical Specifications 2. Module Ratings		
Auditor's assessment comment	Date:	01/05/2023
<i>The DC capacity of the plant has been revised under section B.1 of the monitoring report, However, the number of modules and their mentioned capacity constitute 87.5 MWp capacity.</i>		
Hence, CL 03 closed.		

Type:	☐ CAR ☒ CL/CR ☐ FAR	Number:	04
Raised by:	Jitendra Mohan Singh	Ref. to checklist in above tables:	3.4
Description of the audit finding		Date:	25/03/2023
For section C, of the submitted monitoring report, During the physical visit, Calibration certificates were checked & observed that calibration was done on "yearly basis" and same was mentioned on the calibration certificates as well. However, 5 years of calibration frequency are incorporated under the section C. Therefore, Clarification required with supportive.			
Project Participant's response		Date:	12/04/2023
As per the registered PDD version 04 "The frequency of calibration is once in 5 years. The same has been incorporated under section C of the MR. PP is conducting the calibration yearly on voluntary basis. Also, the 5-year calibration frequency is in line with the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006 "(b) All Interface Meters shall be tested on-site using accredited test laboratory for routine accuracy testing at least once in five years and recalibrated if required."			
Documentation provided as evidence by Project Participant			
Revised MR			
Auditor's assessment comment		Date:	01/05/2023
The registered & applicable PDD, version 4.0 has now been furnished by the project proponent, the calibration frequency of the energy meter observed to be consistent with section B.7.1 and hence acceptable to the assessment team.			
Hence, CL04 closed.			

Type:	☒ CAR ☐ CL/CR ☐ FAR	Number:	01
Raised by:	Jitendra Mohan Singh	Ref. to checklist in above tables:	3.2
Description of the audit finding		Date:	25/03/2023
Under section A.1 of submitted monitoring report, "General Description of Project", PP shall be requested to add information pertaining "Contribution to Sustainable Development" observed to be missing from the section. Corrective Action Required.			
Project Participant's response		Date:	12/04/2023
Section A.1 of the Monitoring report has been revised to include information pertaining to contribution to sustainable development.			
Documentation provided as evidence by Project Participant			
1. Revised MR version 2			
Auditor's assessment comment		Date:	01/05/2023

Information pertaining to claimed SDG's contribution under the current project activity has now been encapsulated under section A.1 of the revised monitoring report which is further checked and verified by the assessment team and found consistent with GS Template Filling Instructions Version 1.1.

Hence, CAR 01 closed.

Type:	☒ CAR ☐ CL/CR ☐ FAR	Number:	02
Raised by:	Jitendra Mohan Singh	Ref. to checklist in above tables:	3.4
Description of the audit finding		Date:	25/03/2023
Under section C of submitted monitoring report, PP shall be requested to encapsulate information pertaining to the connected substation name along with their capacity and mention where the billing meters are installed. (In terms of line capacity).			
Project Participant's response		Date:	12/04/2023
The billing meters i.e. main and check meters are installed at 220kV pooling substation (GSS – II) at Bhadla village. Section C of the MR has been revised to include the information pertaining to energy meters and substation.			
Documentation provided as evidence by Project Participant			
1. Single Line Diagram			
Auditor's assessment comment		Date:	01/05/2023
Section C of the revised monitoring report, has now been incorporating the details of billing meters which are installed at 220 KV substation which is checked and found consistent with furnished Single Line Diagram.			
Hence, CAR 02 closed.			

Type:	☒ CAR ☐ CL/CR ☐ FAR	Number:	03				
Raised by:	Jitendra Mohan Singh	Ref. to checklist in above tables:	3.4				
Description of the audit finding		Date:	25/03/2023				
Under section D.2 of submitted monitoring report, "Data and parameters monitored",							
- For parameter "EG_{pj,y}", PP shall be requested to incorporate the details of monitoring equipment for both main and check meters such as make, type, accuracy class, serial number, calibration details including calibration date and due date of calibration. Observed to be missing from the section. Corrective action required. Also, furnish the agreement between vendors and Project proponent as they are responsible for providing indirect employment records. - For the applied value of energy generation, PP shall provide the vintage wise generation data for the year 2021 and 2022 respectively.							
Project Participant's response		12/04/2023					
Under section D.2 of the monitoring report parameter EG_{pj,y} has been revised. The details of monitoring equipment i.e. energy meters are included under Measurement methods and procedures of parameter EG_{pj,y}. The details of Energy Meters are as follows:							
Meter	Serial Number	Type	Make	Model	Accuracy Class	Date of calibration	Due Date of calibration
Main Meter	16195106	3phase 4wire	L&T	ER300P	0.2s	01/03/2021	28/02/2026
Check meter	16195107	3phase 4wire	L&T	ER300P	0.2s	01/03/2021	28/02/2026
Standby meter	16195098	3phase 4wire	L&T	ER300P	0.2s	01/03/2021	28/02/2026
Parameter EG_{pj,y} under section D.2 of the MR has been revised to include vintage wise values.							
Documentation provided as evidence by Project Participant							
1. Calibration Certificates							
2. Pictures of energy meters							

Auditor's assessment comment	Date:	01/05/2023
Under section D.2 of the revised monitoring table: - The details of monitoring equipment has now been included under section D.2, for parameter, "EGpj,y", which is further checked with registered documents (previous verification from 01/01/2021 to 30/06/2021) and found consistent. However, PP shall furnish the previous calibration certificates to cross verify the same, observed to be missing from the section. Therefore, this observation is currently open. - Vintage wise ER demonstration has now been included under section D.2 of revised monitoring report which is further checked and verified by the assessment team and found acceptable to the assessment team. Therefore, this observation is closed now. Hence, CAR is currently open		
Project Participant's response	Date:	03/05/2023
Meter Calibration certificates have been submitted to the assessment team for review.		
Documentation provided as evidence by Project Participant		
Meter Calibration Certificates		
Auditor's assessment comment	Date:	08/05/2023
Under the section D.2 of the revised monitoring report: Latest meter calibration report dated by 01/03/2021, has now been furnished which further checked by the assessment team and found consistent with registered PDD, Version 4.0. Therefore, this observation is closed now. Hence, CAR 03 closed.		

Type:	☒ CAR ☐ CL/CR ☐ FAR	Number:	04
Raised by:	Jitendra Mohan Singh	Ref. to checklist in above tables:	3.6
Description of the audit finding		Date:	25/03/2023
<i>Under section E of submitted monitoring report,</i> <i>For section E.2, With reference to GS template filling instructions, PP shall be requested to demonstrate the project value or estimation of project situation of each SDG impact for the current project activity.</i> <i>For section E.6, With reference to GS template filling instructions.</i>			
Project Participant's response			12/04/2023
<i>Section E.2 of the MR has been revised to demonstrate the project value for each SDG impact for the current Monitoring Period as per GS4GG template filing instructions.</i> <i>Section E.6 of the MR has been revised as per GS4GG template filing instructions.</i>			
Documentation provided as evidence by Project Participant			
1. Revised MR version 2			
Auditor's assessment comment		Date:	01/05/2023
<i>Under section E of the revised monitoring report:</i> <i>Section E.2 of the revised Monitoring Report now encapsulating the demonstration of project values for each SDG claimed under the project activity which is further checked and verified by the assessment team and found consistent with GS4GG Template Filling Instructions, Version 1.1.</i> <i>Section E.6 of the revised monitoring report has now been updated, with the "Reason of increase in plant load factor during current monitoring period which is observed to be consistent with registered PDD details and hence accepted to the verification team.</i>			
Hence, CAR 04 closed,			

Appendix 2: Calibration details of monitoring meters

Meter	Serial Number	Type	Make	Accuracy Class	Date of calibration	Validity of calibration
Main Meter	16195106	3phase 4wire	L&T	0.2s	01/03/2021	28/02/2026
Check Meter	16195107	3phase 4wire	L&T	0.2s	01/03/2021	28/02/2026
Standby meter	16195098	3phase 4wire	L&T	0.2s	01/03/2021	28/02/2026

Appendix 3: Audit Team CVs

Name	SHORT CVERSION BACKGROUND INFORMATION
Mr. Jitendra Mohan Singh	Mr. Jitendra Mohan Singh has done Advanced MSc in Sustainable Energy Systems and Management from International Institute of Management, University of Flensburg, Germany and B.Tech. in Agricultural Engineering from Allahabad University, India. He has more than (18) years of working experience in different organizations like IARI, IIT Delhi, ICAR, IRADe, CAPART, SMEC and Perenia Carbon and M B Power (Madhya Pradesh) Ltd. in the area of Agriculture, Energy & Environment and Climate Change. He also worked on contract basis (adhoc) as a RIT expert in UNFCCC from 2010 to 2013. Currently, he is empanelled with Applus+ Certification since 2020 and has been involved Verifications of PAs as Lead Auditor and Technical Expert for Renewable and non-Renewable as well as Energy Demand. He has also completed Lead Auditor Trainings on GHG accounting (ISO 14064).
Mr. Amit Rai	Mr. Amit Rai, has done Bachelor of Technology in Electrical & Electronics Engineering from Dr. A.P.J. Abdul Kalam Technical University, India and Government Certified Competency Class – I, Electrical Supervisor from Government of National Capital Territory of Delhi, India. He has more than (6) years of working experience in different organizations like Sunrator Technologies, Sun Source Energy Private Ltd. (SHV Energy Group, Singapore) & KBS Certification Services Private Ltd. (UNFCCC's – DOE), In the area of Renewable Project Management, Execution, Designing & Climate Change Services. Currently, he is associated with applus+ Certification to carry out validation & Verification activity related to GHG reduction projects as Auditor in Trainee & Technical Expert in Trainee. Mr. Amit Rai is based in Delhi, India
Mr. David Lubanga	Mr. David Lubanga is a trained engineer with over 10 years' experience as a GHG auditor. His experience in the field includes assessment of renewable energy projects, energy efficiency, energy audits and waste management and waste to energy. He is a certified auditor for ISO 50001 and 14064-2. He has successfully audited more than 300 GHG (CDM/VCS/GS) projects in different countries around the world. David holds a BSc. in Biochemical Engineering from Jacobs University Bremen (Germany), and a MSc in Environmental Resource Management from Brandenburg Technical University Cottbus (Germany), and Sheffield Hallam University (England). He has undergone additional professional training in Renewable energies, Renewable Energy and Finance, Energy Efficiency and waste management in Scotland, Germany and Austria. Mr. David Lubanga is based in Nairobi, Kenya. Mr. David Lubanga participate in the project's technical review team.