

VERIFICATION REPORT AND CERTIFICATION STATEMENT

Of

**2x50 MW Orange Suvaan Solar Photovoltaic Power Project
in Maharashtra**

(GS Ref. No. 5928)

**Monitoring period #1: 16/06/2017 to 30/06/2018 (Both
days included)**

APPLUS Report No. TQC 11718 VER

Client: Orange Suvaan Energy Private Limited

DATE: 05/07/2019

Report No.	Date of first issue	Revision No.	Date of this revision
11718GS VER	01/07/2019	01	05/07/2019
Subject	GS 1 st periodic Verification		
Client	Orange Suvaan Energy Private Limited		
Project Title	2x50 MW Orange Suvaan Solar Photovoltaic Power project in Maharashtra		
Project Participants	Orange Suvaan Energy Private Limited		
Project Location	The project activity is located in the village Mhasale of Dhule District in the state of Maharashtra, India		
Contact Person	Mr. Murali Krishnam Raju		
Monitoring period:	16/06/2017 to 30/06/2018 (Both days included)		
Initial Monitoring Report (version/date)	Version 01; 26/04/2019		
Final Monitoring Report (version/date)	Version 02;02/07/2019		
Applied Methodology/Version	ACM0002 "Grid-connected electricity generation from renewable sources" Version 17.0		
Scope	1		
Technical Area	1.2		
Registered PDD:	Registered PDD, Ver.5 dated 25/10/2018		
Registered Passport	Registered Passport Ver.5 dated 25/08/2018		
Summary:			
<p>LGAI Technological Center, S.A. (hereafter referred to as Applus+ Certification) has been contracted by Orange Suvaan Energy Private Limited to perform the first periodical verification of "2x50 MW Orange Suvaan Solar Photovoltaic Power project in Maharashtra" (GS Ref. No. 5928) applying the methodology ACM0002 version 17.0. The management of Orange Suvaan Energy Private Limited is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions.</p> <p>A desk review and a site visit have been conducted to verify the data submitted in the monitoring report. Applus+ Certification confirms the following has been reviewed:</p> <ol style="list-style-type: none"> The registered PDD and Passport, including the monitoring plan and the corresponding validation report; Monitoring report(s); The applied monitoring methodology; Relevant decisions, clarifications and guidance from the CMP and the CDM Executive Board; The Gold Standard Toolkit Version 2.2 and related Annex. 			

f. All information and references relevant to the project activity's resulting in emission reductions.

The purpose of the project activity is to generate electrical power through operation of Solar photovoltaic power plant. The total installed capacity of the project activity is 100 MW comprising of poly-crystalline solar PV modules of 265/270 Wp each from a Tier I supplier.

The electricity generated by the project is exported to the Indian electricity grid. The project activity displaces an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid and thereby has resulted in reduction of the associated CO₂ emissions. The monitoring of emission reduction and sustainable development indicators has been carried out in accordance to respective registered PDD and Passport.

Applus+ Certification confirms that the project is implemented in accordance with the validated and registered PDD and Passport. The monitoring plan complies with the applied methodology ACM0002 version 17.0 and the Gold Standard Toolkit Version 2.2, 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 projects 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 198,191tCO₂e emission reductions during period 16/06/2017 to 30/06/2018(Both days included)

Assessment team	Role	Organization
Pankaj Kumar	LA/TE	True Quality Certifications private Limited-Outsourced entity
Reviewer team	Role	Organization
Simon Shen	TR	Applus+ Certification

ABBREVIATIONS

ACM	Approved Consolidated Methodology
AM	Approved Methodology
AMS	Approved Methodology Small Scale
Applus+ LGAI	LGAI Technological Center, S.A. (Applus)
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM EB	CDM Executive Board
CER	Certified Emission Reduction
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GS	Gold Standard
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
MP	Monitoring Plan
MR	Monitoring Report
NGO	Non-Governmental Organization
TAC	Gold Standard Technical Advisory Committee
OM	Operational Margin
PDD	Project Design Document
PP	Project Participant
UNFCCC	United Nations Framework Convention for Climate Change
VVS	Validation and Verification Standard

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1. INTRODUCTION

1.1.- Objective

LGAI Technological Center, S.A. (hereafter referred to as Applus+ Certification) has been contracted by "Orange Suvaan Energy Private Limited" to perform the 1st periodical verification of "2x50 MW Orange Suvaan Solar Photovoltaic Power project in Maharashtra" applying the methodology ACM0002 version 17.0 and the Gold Standard Toolkit Version 2.2/08/. 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 comply with the requirements of paragraph 62 of the CDM Modalities and Procedures as well as the Gold Standard Toolkit Version 2.2/08/. According to this assessment Applus+ Certification shall:

- Ensure that the project activity has been implemented and operated as per the registered PDD/03/ and Passport/04/ and that all physical features (technology, project equipment, monitoring and metering equipment) of the project are in place;
- ensure that the published MR and other supporting documents (3rd party documents like Commissioning certificate, invoices etc) provided are complete, verifiable and in accordance with applicable CDM VVS version 02 for the project activities and Gold Standard requirements/08/;
- 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 DOE. The verification is based on the submitted monitoring report, the validated and registered PDD/03/ and registered Passport/04/ as well as its validation report, the applied monitoring methodology, relevant decisions, clarifications and guidance from the CMP and the EB, The Gold Standard Toolkit Version 2.2 and any other information and references (3rd party public documents like commissioning certificate, JMR, Invoices etc.) 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, The Gold Standard Toolkit Version 2.2/08/ and related rules and guidance.

Based on the requirements in the CDM VVS version 02 for the project activities/07/ as well as the Gold Standard Toolkit Version 2.2 /08/, Applus+ Certification has applied a rule-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:

Project activity: 2x50 MW Orange Suvaan Solar Photovoltaic Power project in Maharashtra

Gold Standard registration number: GS5928

Project Participants: Orange Suvaan Energy Private Limited
 Location of the project: The project activity is located in the village Mhasale of Dhule District in the state of Maharashtra, India

The purpose of the project activity is to generate electrical power through operation of Solar photovoltaic power plant and to reduce the greenhouse gas emissions, which otherwise would have been emitted by the existing fossil fuel based power plants connected to the National grid in India or the addition of similar kind of fossil fuel based power plants.

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 projects 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.

Applus+ Certification used a periodical Verification Checklist which, based on the risk-based assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

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

Assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, LGAI Technological Center, S.A. (Applus+ Certification) has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of LGAI Technological Center, S.A. (Applus+ Certification).

The composition of audit team shall be approved by the LGAI Technological Center, S.A. (Applus+ Certification) ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT).
- Technical Expert (TE).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Role	SS	TA	Financial	Host country
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		Coverage	Coverage	aspect	experience
Mr. Pankaj Kumar	LA/TE	YES	YES	YES	YES
Mr. Simon Shen	TR	YES	YES	NA	NA

The curriculum vitae of the DOE's Verification team members are provided below:

- Pankaj Kumar** worked as team leader – Bihar for South Asia Climate Proofing and Growth Development (CPGD) – Climate Change Innovation Programme (CCIP) supported by DFID that seeks to mainstream climate change resilience into planning and budgeting at the national and sub-national level in India, Pakistan, Nepal, and Afghanistan. Pankaj Kumar has worked previously with IL&FS Infrastructure Development Corporation and BUIDCO (Bihar Urban Infrastructure Development Corporation), Govt. of Bihar as Environmental Specialist for WB & ADB funded projects. Prior to this, he worked with Carbon Check (UNFCCC accredited DoE), Johannesburg, RSA as Team Leader for validation, verification of around 100 GHG projects in Asia, Africa, USA, Asia Pacific & Americas. Pankaj is accredited Lead Auditor, Validator, Verifier and Technical Expert for Sectoral Scope/Technical Area – 1.1, 1.2, 3.1 & 13.1 by UNFCCC DoE (Designated Operational Entity), APPLUS, Spain. He is also member of task force on climate change & human health, Health Department, GoB.

He is an experienced, qualified and result oriented Environment Professional having more than 14 yrs. of relevant experience in Climate Change (Mitigation & Adaptation), Environmental Due Diligence, Disaster Risk Reduction, Validation and Verification of GHG project under CDM, Verified Carbon Standard, Gold Standard & Social Carbon Standard, Brazil. He provides technical support for environmental investigative, consultative and remedial projects involving air, water and soil, Waste management, EIA, Environmental Compliance, ISO 14001, OHSAS 18001, GHG accounting (ISO 14064) and Carbon foot printing

Pankaj Kumar is Masters in Environment Management from Forest Research Institute (University), I.C.F.R.E, Dehradun, which is Centre of Excellence in South East Asia for Forestry education & research and PGDEL from National Law School of India University, Bangalore (India).

- Meng (Simon) Shen** (Master Degree in Thermal Energy Engineering, Bachelor Degree in Environmental Engineering) is a Lead Auditor appointed by Applus+ LGAI for the GHG project assessment. He is based in Shanghai. He has several years of work experience in environmental protection field. Before he joined Applus+ LGAI, he had been worked for TÜV SÜD as a GHG Validator/Assessment team and ISO 9001/14001 Lead Auditor for 3.5 years.

1.4.- Review of Documentation

The Monitoring Report version 01 was submitted to DOE 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 registered PDD/[03](#)/and Passport/[04](#)/, verify that the applied methodology was carried out. Particular attention to the frequency of measurements, the quality of the metering equipment including calibration requirements, and the quality assurance and quality control procedures of the power plant was checked by the assessment team.
- Evaluate the data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

A complete list of documents reviewed is available in Section 4 of this report.

1.5.-On-site Assessment and follow-up Interviews

As a part of the verification, the on-site inspection in the state of Maharashtra has been performed by the assessment team.

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Kamble	Vishwas	PP representative	24/06/2019	Project implementation, Baseline emissions, ER calculations, Sustainable monitoring etc.	Mr. Pankaj Kumar
2	Bilade	Kalpesh	Local stakeholder-Villager	24/06/2019	Stakeholder meeting-Employment opportunities, Standard of Livings etc.	Mr. Pankaj Kumar
2	Chavan	Amrut B.	Local stakeholder-Villager	24/06/2019	Stakeholder meeting-Employment opportunities, Standard of Livings etc.	Mr. Pankaj Kumar

The objective of the on-site assessment is to:

- Confirm the implementation and operation of the project;
- Review the data flow for generating, aggregating and reporting the monitoring parameters;
- confirm the correct implementation of procedures for operations and data collection;
- Cross-check the information provided in the MR documentation with other sources (3rd party documents like JMR, Invoices etc.);
- Check the monitoring equipment against the requirements of the PDD, Passport and the approved methodology, including calibrations, maintenance, etc.;
- Review the calculations and assumptions used to obtain the GHG data and ER;
- Identify if the quality control and quality assurance procedures are in place to prevent or correct errors or omissions in the reported parameters.
- Confirm the Sustainability monitoring plan as per the registered Passport
- To understand grievance (if any) from the villagers during the monitoring period.

Local stakeholder meeting details:

Name of the stakeholder	Subhashini Girase
Occupation	Villager
DOE QUESTION: Did PP promised employment opportunity? Answer: Yes, stakeholder said that as promised PP provided employment. DOE also like to conclude that during the site visit it was observed that local people were employed for security and operation related work like water spraying, vegetation improvement and other unskilled work. DOE also found that skilled local persons were also employed by the organization for the operation and maintenance of the power plant	

Name of the stakeholder	Vilas B. Khairnar
Occupation	Villager
DOE questions: Did the power plant discharge any harmful pollutants? Answer: NO the plant does not discharge any harmful pollutants. DOE questions: Did the power plant destroy any crop fields? Answer: The plant is implemented in barren land and there were no any fertile land or crop which is damaged.	

1.6.-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/01/. The source of the evidences will be discussed in section 3 of this report. 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.

1.7.-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:

- a) 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;
- b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;
- c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- d) 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 (CR) if information is insufficient or not clear enough to determine whether the applicable CDM/GS requirements have been met.

All CARs and CRs 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.

All CARs, CRs and FARs for this verification period are included in Section 3 of the verification report.

1.8.-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 DOE’s Technical Manager or the Deputy. In case one of these two persons is part of the assessment team, the 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.

2. VERIFICATION FINDINGS

In the following sections, the results of the verification are stated. The verification results related to the project performance as documented and described in the registered PDD (Version 05, dated 25/10/2018/03/, registered Passport (Passport Version 05 dated 25/08/2018)/04/ and Monitoring Report (Version 1, dated 26/04/2019/01/. The verification findings for each verification subject are presented below.

2.1.- FARs from Validation / Previous Verification

This is the first periodical verification, after checking validation report, there are no FARs requested.

2.2.- Project Implementation in accordance with the registered Project Design Document

The project activity was fully implemented according to the description presented in the registered PDD/03/ and registered Passport/04/. The assessment team confirms, through the visual inspection that all physical features of the proposed project activity including data collecting systems and storage have been implemented in accordance with the registered PDD/03/ and registered Passport/04/.

Total installed capacity of 100 MW_{ac}. The solar PV power plant has solar PV modules, inverters, transformers and other protection system and supporting components as under:

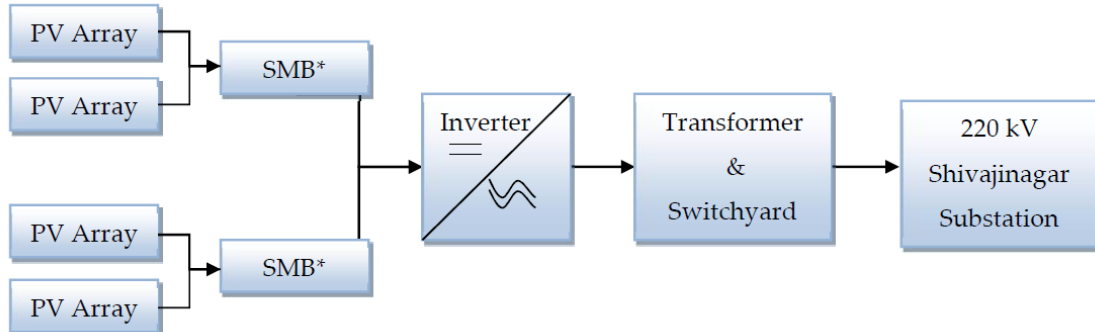
Solar PV modules (Make)	JA Solar	JA Solar
Technology	60-cell multi Crystalline	60-cell multi Crystalline
Model	JAP 6(K) 60 265 4BB	JAP 6(K) 60 270 4BB
Capacity	265 Wp	270 Wp
No. of Modules	208320	306720
Capacity, MW (DC)	55.20MWp	82.81MWp
Total Capacity, MW (DC)	138.00 MWp	
Total Capacity, MW (AC)	100 MW	

Inverters (Make)	ABB
Model	PVS800-57
Rated Capacity	1000 KW
No. of Inverters	100
Rated Input Voltage	1000 V DC

Transformers (Make)	Prolec GE	Sudhir Power	Sudhir Power
Model No.	ONAF	ONAN	ONAN
Capacity	50/60 MVA	4 MVA	2 MVA
No. of Transformers	02	24	02
Voltage Ratio	11/132 KV	4 x 380 V/ 11 kV	2x 380 V/ 11 kV

The generated power from the project is evacuated through 132 kV transmission line at 220/132 kV Shivajinagar substation located in district Dhule, Maharashtra. The cost of laying the transmission line from Project site up to the substation would be borne by the project company.

A simplified scheme of Solar PV system is shown in Figure below.



**SMB: String Monitoring Box*

The average lifetime of the project is around 25 years as per the equipment supplier specifications. The plant load factor assessed at project site is 19.25%.

In the absence of the project activity the equivalent amount of electricity sold to grid would have been generated by grid connected power plants, which is predominantly based on fossil fuels, hence baseline scenario of the project activity is the grid based electricity system, which is also the pre-project scenario.

The technology and the project do not pose any adverse threat to the environment and contribute positively in reducing GHG emissions by displacing energy generation from fossil fuel powered projects. The proposed project activity is environmentally safe to implement and operate.

The project commissioned on 16th June 2017.

Assessment team also checked the latitude and longitude of the power plant using GPS meters and also cross check the same from the Google earth software. Assessment team confirms that the details of latitude and longitude as presented in the registered passport and PDD is correct. The details of the same areas below:

GPS co-ordinates of the project activity is as below: 21° 06' 28.8"N & 74° 26' 27.6"E

The project activity was in normal operational during the monitoring period and the same has been confirmed on-site. No unusual activities 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 breakdown log details.

Assessment team also checked the Feeder details of the connected solar power project and found the same to be appropriate.

The verification team has reviewed the commissioning certificates to conclude that the capacity of the project is same as mentioned in the registered PDD/03/. The capacity of the project activity does not change after the registration of the project activity.

Also during the onsite visit it was observed that the rated capacity of the solar power project is 100 MW. As the capacity of the project is more than type I limit of small scale project activity, DOE confirms that the project is large scale project activity. Assessment team also confirmed during the discussion with PP that project will remain within the project scale for the whole crediting period.

The project is connected to National grid (as per the grid structure of India) and the same is found correct by the assessment team during the verification site visit. The grid structure as

mentioned in the PDD/03/ is still applicable for the project and ex-ante emission factor as proposed in the PDD/03/ is used for emission reduction calculation.

The commissioning details as provided in the MR Version 01/01/were checked with the commissioning certificates/13/ provided by the project participant. The commission certificates were issued by "Govt agencies" which is a third party government firm and thus the commissioning dates are acceptable to the assessment team.

The amount of GS-VERs achieved during the present monitoring period is 15.5 %higher than the estimated value in the PDD/03/. This is due to the higher PLF months during the monitoring period. As per the registered PDD, the equity IRR will reach the benchmark only when the PLF increased to 28.16% higher than estimated value based on sensitivity analysis carried out. This increase in PLF in this monitoring period is temporary and not permanent as discussed with project proponents and stakeholders at site. Nevertheless, for this monitoring period, increase in PLF by 15.5% is well below the 28.16% at which project will no longer additional. Hence, the increase in generation/PLF does not affect the additionality of the project as the actual generation is only 15.5% higher than the estimated value.

There is no any adverse impact on additionality due to this high PLF of project activity for current monitoring period.

The details are checked in emission reduction sheet and the same is also provided below:

Start date of Monitoring period	16/06/2017	
End date of Monitoring period	30/06/2018	
Total days in the Monitoring period	380	days
Estimated emission Reduction As per PDD	164,869	tCO2e
Estimated ERs for this monitoring period	171,644	tCO2e
Actual Emission Reduction	198,191	tCO2e
Difference in Emission reduction	+ 15.5 %	

Moreover, there were no changes in host country regulations which may impact either baseline or additionality of the project. Thus assessment team confirms that the project is implemented as per the registered PDD/03/ and no change in additionality/baseline is envisaged for the present monitoring period.

2.3.-Compliance of the Monitoring Plan with the Monitoring Methodology

The verification team is able to confirm that the monitoring plan is in accordance with the approved methodology ACM0002 version 17.0 /06/, applied by the proposed CDM project activity.

No deviation, correction or permanent change to the monitoring plan has been requested or observed.

2.4.-Completeness of Monitoring

The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD/03/ and Passport/04/. All parameters were monitored and determined as per the monitoring plans follows:

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

$EF_{OM,y}$, $EF_{BM,y}$, $EF_{CM,y}$ were mentioned as ex-ante fixed parameter. Assessment team checked the values, source of data, choice of data, purpose of the data mentioned in the MR from the registered PDD/03/ and confirms that the similar approach was considered for the current monitoring period also.

The values are as below:

$$EF_{OM,y} = 0.9941 \text{ tCO}_2\text{e/MWh}$$

$$EF_{BM,y} = 0.9285 \text{ tCO}_2\text{e/MWh}$$

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

The value for $EF_{OM,y}$, $EF_{BM,y}$, and $EF_{CM,y}$ was considered from the CO₂ baseline database published by Central Electricity Authority (CEA) version 11. The default value as mentioned in the registered PDD/03/ and MR /01/ are same. The value of combined margin in India is being given by CEA (= Central Electricity Authority, Govt of India) and thus assessment team concludes that the value is correct and appropriate. No further assessment of the combined margin is thus required. The default value in turn is used for baseline calculation as per the formula given in the registered PDD/03/ for the current monitoring period.

b. Data and parameters monitored

As per the registered monitoring plan and requirement of the registered methodology following parameters need to be monitored:

$EG_{\text{facility},y}$: Net electricity supplied to the grid by the project activity

The parameter is calculated by export and import.

The parameter $EG_{\text{facility},y}$ is calculated using the difference of recorded export and import from the meter. The total energy exported/imported to/from the grid by this project is measured by State electricity board energy meter (electronic tri-vector main meter which measures both export & import concurrently). There are two bays and electricity is evacuated to the GSS through two lines and each has a dedicated set of main and check meter. Power Plant connected to the in house transformers and switch yard which is connected to Govt. sub stations. For billing purpose, the meter readings are measured on monthly basis jointly by the representative of State Electricity board officials and the O&M representative. On the basis of this reading, export and import value is thus provided in the JMR sheets for project participant. The practice followed onsite is as per the registered PDD and registered Passport. The meter reading is taken during a fixed billing cycle of every month and representative of state electricity board and Operation and maintenance personal onsite present during the process. The export and import reading is continuous and recording frequency is monthly. The QA/QC procedure is as per the requirement of the registered PDD/03/ and onsite practice. Assessment team confirms the same during the project visit. Assessment team checked all the values of the electricity exported and electricity imported from the Meter reading statement/JMR issued by State electricity board. Since JMR is available only from commercial operation date i.e., 16th July 2017, the energy readings are taken from this date. Assessment team checked the calculation and found correct. The Net electricity supplied to the grid is also cross checked from the invoices and the same is found correct. The procedure is as per the requirement of registered PDD and Passport and thus the same is acceptable to the assessment team. The details are provided in the ER sheet version 02/02/ and same is checked and found correct by the assessment team.

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 JMR issued by

MSEDCL/Invoices/[11](#)/etc. 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 metering arrangement is tri-vector bi-directional energy meters (main and check) at the substation. These meters record several parameters including electricity exported & imported. These electricity meters are being used by state officials to obtain the value of export and import and hence Net electricity supplied is calculated based on these values.

The calibration details/[12](#)/ such as make, accuracy class serial number is as per the meter available onsite and checked during verification site visit.

The metering arrangement for the project activity is energy meters (main and check) at the substation. These meters record several parameters including electricity exported & imported. These electricity meters are being used by state officials to obtain the value of export and import and hence Net electricity supplied is calculated based on these values.

All the energy meters is calibrated as per the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, (Published in the Gazette of India, Extraordinary, Part III, section iv), and thus calibrated once in five years by the State officials, as per the provisions of the PPA, signed between the PP and the State electricity board. PP has no control whatsoever over the processes related to state Board meters calibration as the meters are under the purview of State Board. The joint meter reading can be cross checked against the invoice on energy generation from the Plant, issued monthly by the State Board. During the monitoring period the meters have been calibrated and there has been no error or fault in the meters identified during the latest calibration as well. The first charging of the plant happened on 9th May 2017 and all check, main and standby meters were installed at that time. At the time of installation, meters were pre calibrated and as per registered PDD, calibration to be done once in five years, however itson discretion of state utility to decide on frequency of calibration. The 1st calibration done covers the monitoring period and next due is after 5 years. However, it is to be noted that state board may decide to carryout calibration as suited and deemed appropriate in the coming years. However, the assessment team confirms while interviewing the PP that it will ensure that at-least the frequency mentioned in registered PDD is met which is once in a five year.

The Calibration details are as follows:

Line 1:

Details	Main Meter	Check meter	Standby meter
Meter Number	2831505	2831506	2831507
Make	Elster	Elster	Elster
Accuracy Class	0.2S	0.2S	0.2S
Calibration dates	08/01/2018 25/01/2019	08/01/2018 25/01/2019	08/01/2018 25/01/2019
Calibration due date*	25/01/2024	25/01/2024	25/01/2024

Line 2:

Details	Main Meter	Check meter	Standby meter
Meter Number	2831508	2831509	2831510
Make	Elster	Elster	Elster
Accuracy Class	0.2S	0.2S	0.2S
Calibration dates	08/01/2018 25/01/2019	08/01/2018 25/01/2019	08/01/2018 25/01/2019
Calibration due date*	25/01/2024	25/01/2024	25/01/2024

All the meters are of Elster make with 0.2s accuracy class.

The calibration is done by MSEDCL which is state utility and no delay in calibration is observed. Assessment team checked the same and found that the calibration is appropriate and correct as traceability is ensured. The meters were calibrated as per the National metering guidelines and meters are within the permissible error limit

2.5.-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 01 & Monitoring report Version 02/01/ and corresponding ER calculation spreadsheets and are consistent with the applied methodology ACM002 version 17.0/06/ and the monitoring plan contained in the registered PDD/03/. The parameters are complete in this monitoring period.

After verifying the reported figures with the raw data sources, it's confirmed that the values of the parameters from the raw data sources are consistent with those quoted in the Monitoring report Version 01 & Monitoring report Version 02/01/ and corresponding ER calculation spreadsheets/02/.

As per the approved methodology ACM002 version 17.0 baseline emissions for the project activity are calculated by multiplying the net quantity of electricity supplied by this project activity ($EG_{\text{facility}, y}$) with the CO₂ baseline emission factor for the electricity displaced due to the project ($EF_{\text{CM}, y}$) as follows:

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

$$BE_y = EG_{\text{facility}, y} \cdot EF_{\text{CM}, y} \dots\dots\dots (1)$$

Where,

BE_y = Baseline emissions in year y (tCO₂/yr)

$EG_{\text{facility}, y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr).

$EF_{CM,y}$ = 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" (tCO₂/MWh)

For this monitoring period, the emission reduction is calculated as below:

$$= 202,712(\text{MWh}) * 0.9777 (\text{tCO}_2/\text{MWh})$$

$$= 198,191\text{tCO}_2 \text{ (rounded down)}$$

Project emissions:

The project is a solar power project, no fossil fuel will be consumed according to the methodology ACM0002 version 17/06/ & according to registered PDD/03/, $PE_y = 0 \text{ tCO}_2\text{e}$

Leakage:

As per registered PDD, passport and methodology leakage emission is negligible for renewables projects.

Emission reductions:

Thus the emission reductions are:

$$ER_y = BE_y - PE_y$$

$$= \mathbf{198,191-0} (\text{tCO}_{2e})$$

$$= \mathbf{198,191}(\text{tCO}_{2e})$$

For the current monitoring period the vintage wise break down of GS VERs has been calculated and are as below

Vintage wise Emission reductions (GS VERs)

Vintage	Emission Reduction (tCO _{2e})- Actual for the Monitoring period	Estimated ERs as per PDD	Difference in Emission reduction
Year 2017	84,100	171,644	15.5%
Year 2018	114,091		
Total	198,191		

2.6.- Management and Operational System

The responsibilities of data measurement, collection, verifying, archiving etc. have been clearly defined in the PDD/03/. The same practice is followed onsite and it is confirmed by the assessment team during the verification 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 registered PDD/03/.

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

It's verified during the on-site verification, the monitoring procedure as well as the internal quality management and control procedures are stipulated in the PDD/03/. 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 record has been checked by the assessment team and it is confirmed that the monitoring personnel are get sufficient training 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.

2.7.-Assessment of Sustainable Monitoring

In the Registered Passport Version 05 indicators are chosen for the monitoring of sustainable monitoring:

Meth/tool	Passport	MR	Compliance?
Air quality	Air quality	Air quality	Yes
Quality of employment	Quality of employment	Quality of employment	Yes
Livelihood of the poor	Livelihood of the poor	Livelihood of the poor	Yes
Access to affordable and clean energy services	Access to affordable and clean energy services	Access to affordable and clean energy services	Yes
Quantitative employment and income generation	Quantitative employment and income generation	Quantitative employment and income generation	Yes
Human and Institutional capacity	Human and Institutional capacity	Human and Institutional capacity	Yes

The verification of the parameters required by the monitoring plan is provided as follows:

Indicator:	Air quality
Chosen parameter 1:	Electricity generation and equivalent of PM, NOx and SOx avoided.
Parameter value:	Not applicable
Mitigation Measures:	<p>In order to reduce dust emissions during the construction phase, the following dust suppression measures stipulated and implemented as confirmed by the assessment team with the interview with PP</p> <ul style="list-style-type: none"> - Spraying water and covering material trucks’ body to minimize dust; - Reuse of water for sprinkling of unpaved roads. - Imposition of speed controls for vehicles and unpaved site roads; - Well-maintained diesel-powered mechanical equipment to avoid black smoke emissions; - Shut-down of diesel-powered mechanical equipment or trucks inside the worksites when they are not in operation. <p>During the operational phase (monitoring period) the scope of dust emission is none to minimal. Vehicles are run under controlled speed to avoid any dust generation.</p>
Data Source:	Project Log book and interview with O&M team/Locals/21/ on yearly basis. The interview with the O&M team/Locals and cross check in the project log book revealed that the project operation has minimalistic ground activities which does not result in any dust emissions.
Baseline situation of parameter 1:	In the baseline, equivalent electricity supplied by Indian grid which is generated by the operation of grid-connected power plants and by the

	addition of new generation sources into the grid.
Target achieved?	The project achieved to reduce the amount of CO ₂ in the atmosphere for the current monitoring period. No data for SO _x and NO _x . During the operational phase (monitoring period) the scope of dust emission is none to minimal. Vehicles are run under controlled speed to avoid any dust generation.
Procedure monitoring:	of Energy meters records (JMRs) /11/, Project logbook (for vehicle maintenance), or interview with maintenance staff /21/. Grievance register/17/ and interview with stakeholders (For Dust emission)
Means of verification:	<p>The emission reduction sheet is checked and found correct. To avoid dust emission during construction stage following measures are taken:</p> <ul style="list-style-type: none"> - Spraying water and covering material trucks' body to minimize dust; - Reuse of water for sprinkling of unpaved roads. - Imposition of speed controls for vehicles and unpaved site roads; - Well-maintained diesel-powered mechanical equipment to avoid black smoke emissions; - Shut-down of diesel-powered mechanical equipment or trucks inside the worksites when they are not in operation <p>During the operational phase (monitoring period) the scope of dust emission is none to minimal. Vehicles are run under controlled speed to avoid any dust generation.</p> <p>Assessment team also checked the detail regarding SO_x and NO_x data and found that in the host country there is no data available for the calculation of equivalent electricity calculation for SO_x and NO_x. To confirm the same PP has taken a clarification from GS team via email dated 07/12/2018 for project GS 4962. GS clarified in their email dated 02/01/2019 "<i>Please note since there is no data available for SO_x and NO_x for India, hence it is acceptable to us for this case, please make sure that you are armed enough to justify the parameters which you have chosen to report in future.</i>"</p> <p>Hence, with the clarification from GS assessment team confirm that the parameter monitoring for the current monitoring period is correct.</p>
Cross-check:	Not applicable

Indicator :	Quality of employment
Chosen parameter 2:	Details of Trainings & workshops conducted for employees and O&M staffs on yearly basis.
Parameter value:	Not applicable
Mitigation Measures:	Not applicable as indicator scored positive as per the registered Passport
Data Source:	Training Record and attendance sheets /09/
Baseline situation of parameter 2:	No trainings or workshops are conducted and local people have no such opportunities to be trained on the technology and the monitoring of the plant operation, and the emergency and safety procedures.
Target	Yes, the staffs have accepted a series of training on the technology and the monitoring of

achieved?	the plant operation, and the emergency and safety procedures. The safe and healthy working condition was provided to the staffs.																														
Procedure of monitoring :	Checked training record and the attendance sheets as well/09/																														
Means of verification :	<p>By checking all the training records and attendance sheets on yearly basis/09/, it is confirmed that the project proponent provided sufficient training for the employee/local people for skill and operation of the power plant. The Training on safety procedures, O&M, Plant operations etc. were also provided to the O&M staffs and local people. Also some interviews were made with employee/local people and they confirmed that they are receiving a lot of trainings. The training not only improves the operation level of the Project, and also enhances the technical skill of the staff. The detail regarding training conducted and checked by assessment team is given below:</p> <table border="1"> <thead> <tr> <th>Sl.No .</th> <th>Name of Training</th> <th>Training date</th> <th>Trainer /Institute</th> <th>No.of Participants</th> <th>Type of Participants</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>EHS Training</td> <td>29-01-2018</td> <td>Internal training</td> <td>11</td> <td>Orange Site Employees</td> </tr> <tr> <td>2</td> <td>HSE training on work permit system and fire prevention</td> <td>29-01-2018 & 02-02-2018</td> <td>Internal Training</td> <td>12</td> <td>Orange Site Employees</td> </tr> <tr> <td>3</td> <td>O&M training for inverter</td> <td>14-10-2017</td> <td>ABB</td> <td>12</td> <td>Orange Site Employees</td> </tr> <tr> <td>4</td> <td>Training on SCADA system & trouble shooting on</td> <td>02-11-2017</td> <td>Internal training</td> <td>10</td> <td>Orange Site Employees</td> </tr> </tbody> </table> <p>The safe and healthy working condition was provided to the staffs of the Project confirmed by site visit.</p>	Sl.No .	Name of Training	Training date	Trainer /Institute	No.of Participants	Type of Participants	1	EHS Training	29-01-2018	Internal training	11	Orange Site Employees	2	HSE training on work permit system and fire prevention	29-01-2018 & 02-02-2018	Internal Training	12	Orange Site Employees	3	O&M training for inverter	14-10-2017	ABB	12	Orange Site Employees	4	Training on SCADA system & trouble shooting on	02-11-2017	Internal training	10	Orange Site Employees
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4	Training on SCADA system & trouble shooting on	02-11-2017	Internal training	10	Orange Site Employees																										
Cross-check:	Not applicable																														

Indicator:	Livelihood of the poor
Chosen parameter 3:	CSR activities done in project area (like Health Camps, educational toolkit supply to local schools, Knowledge and information dissemination regarding natural disasters etc)
Parameter value:	Not applicable

Mitigation Measures:	Not applicable as indicator scored positive as per the registered Passport
Data Source:	CSR records and photographic evidence
Baseline situation of parameter 3:	No activity except Government facilities
Target achieved?	<p>PP conducted survey during construction phase of the project in the villages near project locations to check the requirement of facilities by the villages. From the survey, PP has identified several scope of developmental activities such as health camps, furniture, sports kits and toilet requirements in government schools, drinking water requirements etc.</p> <p>PP has started implementing the CSR activities. During the monitoring period the CSR activities like:</p> <ol style="list-style-type: none"> 1) Water purification plant installed at 20 locations including villages panchayat, schools & temples 2) Distribution of notebooks in Primary School, Village- Mhasale Taluka- SakriDist- Dhule, Maharashtra <p>The activities also carried out are focused to up hold the livelihood of the poor as, it the poor in the project region who are mostly deprived of the basic facilities such as sanitation, education and medical attention.</p> <p>The project will have positive impact on this parameter as there were no socially oriented CSR activities before the project activity. Thus the project has positive impact on the indicator. The detail date wise CSR activity is included in the revised MR for the current monitoring period which is found to be correct.</p>
Procedure of monitoring:	Checked CSR records and photographic evidence/18/
Means of verification:	<p>Assessment team checked the CSR report /18/ of the organization and with the photographic evidence confirm that many basic facilities were provided to the local people/villagers which were not available in baseline scenario. PP made a detailed study during the construction phase and systematically implemented following facilities during construction and operation of the project activity. The details are as below:</p> <ol style="list-style-type: none"> 1) Water purification plant installed at 20 locations including villages panchayat, schools & temples 2) Distribution of notebooks in Primary School, Village- Mhasale Taluka- Sakri, Dist- Dhule, Maharashtra <p>The facilities helped to improve the livelihood of local people/villagers and their families and thus assessment team confirms that the monitoring parameter Target is achieved for the current verification.</p>
Cross-check:	Not applicable

Indicator:	Access to affordable and clean energy services
Chosen parameter 4:	Net electricity supplied to grid
Parameter value:	202,712 MWh of electricity supplied to grid by the project activity
Data Source:	Monitored through energy meter. Net electricity will be calculated from the recorded export value recorded import value by DISCOM on monthly basis.
Mitigation Measures:	Not applicable
Baseline situation of parameter 4:	No electricity is generated as the power was generally drawn from fossil fuel dominated grid.

Target achieved?	202,712MWh of electricity supplied to grid by the project activity
Procedure monitoring:	of Monitored through energy meter. Net electricity will be calculated from the recorded export value recorded import value by DISCOM on monthly basis. The JMR forms the basis for this value. PP has no control over this procedure of calculation.
Means of verification:	<p>The calculation of Net electricity supplied to the grid is checked and found correct.</p> <p>The parameter $EG_{\text{facility}, y}$ is calculated using the difference of recorded export and import from the meter. The total energy exported/imported to/from the grid by this plant is measured by State electricity board energy meter (electronic tri-vector main meter which measures both export & import concurrently) connected to internal transformers which connected to state utility grid . For billing purpose, the meter readings are measured on monthly basis jointly by the representative of State Electricity board officials and the O&M representative. On the basis of this reading, export and import value is thus provided in the JMR sheets for individual project participant. The practice followed onsite is as per the registered PDD and registered Passport. The meter reading is taken during a fixed billing cycle of every month and representative of state electricity board and Operation and maintenance personal onsite present during the process. The export and import reading is continuous and recording frequency is monthly. The QA/QC procedure is as per the requirement of the registered PDD/03/and onsite practice. Assessment team confirms the same during the project visit. Assessment team checked all the values of the electricity exported and electricity imported from the Meter reading statement/JMR issued by State electricity board. The Net electricity supplied to the grid is also cross checked from the invoices and the same is found correct. The procedure is as per the requirement of registered PDD and Passport and thus the same is acceptable to the assessment team. The details are provided in the ER sheet version 02 and same is checked and found correct by the assessment team.</p> <p>Assessment team confirms that the monitoring parameter target is achieved for the present monitoring period.</p>
Cross-check:	As per the registered PDD and passport, invoices are used to cross check the value of Net electricity supplied to the grid and the same is conducted for present verification. The procedure is as per the requirement of applied methodology and registered PDD and thus acceptable to the assessment team.

Indicator:	Human and Institutional Capacity
Chosen parameter 5:	Welfare activities, Training or workshops conducted to PP Awareness programs conducted to local public
Parameter value:	Not applicable
Mitigation Measures:	Not applicable
Data Source:	Welfare activity, Training/program records
Baseline situation of parameter 5:	In baseline situation, welfare activities, trainings or workshops, programs are not conducted.
Target achieved?	Yes.
Procedure monitoring:	of Checked CSR records and record of training/ workshop conducted
Means of verification:	After checking records of workshop/19/ conducted during the monitoring period, team confirms that PP conducted Water conservation awareness

	workshop at the Mhasale Village on 3 rd February 2018. In this workshop around 18 local villagers participated. In the workshop, people were taught about the need of energy conservation and different ways of energy conservation techniques. PP also installed water purification plants at 20 different places that will encourage people to use clean drinking water. PP also planned to conduct additional welfare activities and workshops in the future. During interview with villagers and other stakeholders at site, they confirmed that the PP are involved in series of activities through CSR aims to enhance skills of local community and improve their living standards.
Cross-check:	Not applicable

Indicator:	Quantitative employment and income generation																					
Chosen parameter 6:	Number of jobs created due to project/ income opportunities																					
Parameter value:	<p>The project created over 80 jobs for over a span of 9 months during construction and during the operational phase is generating employment in rural areas to the extent of 100 people at any given point of time.</p> <p>About 278 lakh INR has been spent in the operation and maintenance of the power plant during the monitoring period.</p> <p>The O&M service provider maintains a healthy number of employees at the site, and also hires locally for unskilled workers; which helps in creating service based jobs in the project region. Below table reflects cost of O&M and number of staff:</p> <table border="1" data-bbox="507 1191 1353 1469"> <thead> <tr> <th rowspan="2">Year</th> <th colspan="3">Number of Staff</th> <th rowspan="2">Total</th> </tr> <tr> <th>Security (third party)</th> <th>Cleaning (third party)</th> <th>O&M (Orange Suvaan)</th> </tr> </thead> <tbody> <tr> <td>2017</td> <td>32</td> <td>15</td> <td>50</td> <td>97</td> </tr> <tr> <td>2018</td> <td>32</td> <td>15</td> <td>48</td> <td>95</td> </tr> </tbody> </table>				Year	Number of Staff			Total	Security (third party)	Cleaning (third party)	O&M (Orange Suvaan)	2017	32	15	50	97	2018	32	15	48	95
Year	Number of Staff			Total																		
	Security (third party)	Cleaning (third party)	O&M (Orange Suvaan)																			
2017	32	15	50	97																		
2018	32	15	48	95																		
Data Source:	Plant employment records/ 20/10/																					
Mitigation Measures:	Not applicable																					
Baseline situation of parameter 6:	No jobs created in baseline as no activity due to the project would take place in the remote village area.																					
Target achieved?	Yes. Continued employment of O&M staff and security																					
Procedure of monitoring:	PP has employment records for the people working in skilled O&M team and also local villagers working as non- skilled jobs like Security guards, peon etc.																					
Means of verification:	After EPF Challans / 10/ and contract with security agency /16/and employment records, assessment team confirms the below: <table border="1" data-bbox="507 1845 1185 2024"> <thead> <tr> <th></th> <th>2017</th> <th>2018</th> </tr> </thead> <tbody> <tr> <td>Module cleaning (3rd party)</td> <td>15</td> <td>15</td> </tr> <tr> <td>Security</td> <td>32</td> <td>32</td> </tr> <tr> <td>Orange (O&M)</td> <td>50</td> <td>48</td> </tr> </tbody> </table>					2017	2018	Module cleaning (3 rd party)	15	15	Security	32	32	Orange (O&M)	50	48						
	2017	2018																				
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	<p>About 278 lakh INR has been spent in the operation and maintenance of the power plant during the monitoring period. DoE checked copies of O&M contracts and found information provided to be correct.</p> <p>The same is checked by the assessment team from the O&M agreements/15/. The O&M service provider maintains a healthy number of employees at the site, and also hires locally for unskilled workers; which helps in creating service based jobs in the project region. The parameter has a positive impact as the project results in direct employment and income generation.</p> <p>Assessment team confirms that the monitoring parameter target is achieved for the present monitoring period.</p>
Cross-check:	Not applicable

During the site visit, the verification team confirmed that there is a grievance book with GS contact information in project owner’s office. By checking grievance book, it was able to confirm there are no comments received from the local people for the present monitoring period. Local people are happy with the implementation of the project activity as it entrust employment and improve living standard of local people and villagers.

The grievance register is made available by the project participant for the locals in the project site for any kind of grievances felt by the people during the monitoring period. In case any grievance is received by the PP, a corrective action is considered for the same and closed accordingly if any for the monitoring period. For the current monitoring period no such grievance is received from the local’s people. After the implementation of the project activity many locals got permanent jobs as mentioned in the FVR against the parameter “Quantitative employment opportunities and income generation”. Thus the assessment team concluded that project activity helped to improve the lifestyle of the locals and also provided them job opportunity.

Moreover, assessment team also had a discussion with some of the villagers the name of the same were given in section 1.5 of the FVR and conclude that locals are happy with the implementation of the 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>. Thus double counting for the current monitoring period is ruled out.

Also during the site visit, Applus+Certification conducted an interview with the project owner and local stakeholders please find the summary of the interview as below:

Sections	Debriefing
Trainings & salaries of the employees	During site visit Mr.Vishwas Kamble,PP representative was interviewed. It was noted that regular technical & nontechnical 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 Gold Standard Toolkit Version 2.2.

3. SUMMARY OF FINDINGS

The assessment team can confirm that the Initial MR /01/and related documents are complete and verifiable in accordance with the GS requirements. All the findings that were raised by the assessment team, the responses by the PPs and the conclusion from the team are presented below. The means of verification and resulting changes in the MR/01/ or related documents are identified in the following tables:

Compilation and Resolutions of CARs, CRs and FARs

Type:	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL/CR <input type="checkbox"/> FAR	Number:	01
Raised by:	Pankaj Kumar	Ref. to checklist in above tables:	NA
Description of the audit finding	Date:		01/07/2019
<p>PP is requested to provide registered PDD and GS passport for consistency check with MR</p> <p>Moreover, following CARs are raised regarding Sustainability parameter as mentioned in registered PDD:</p> <ol style="list-style-type: none"> 1. Air Quality: PP has provided a web link of press notification regarding PM 10, SOx,, NOx removal due to project activity by quantifying the value using total electricity generation. Press notification actually suggests notification of new standard aimed at reducing emissions of PM 10 (0.98 KG/MWh), Sox (7.3kg/MWh) and NOx (4.8 kg/ MWh). This is incorrect interpretation of the notification and electricity generation figure is also incorrect. PP shall provide explicit justification along with calculation for SOX,NOX, PM10 removal 2. For parameter "Quality of employment" will be monitored through Training Records (HSE & HR), Regular drill record, handling of equipment training and soft skill training record. The documents are not submitted to the assessment team. Corrective action is sought. 3. As per registered passport the parameter "Livelihood of the poor will be monitored through CSR records and photographic evidence. The documents are not submitted to the assessment team. Corrective action is sought. 4. For parameter, "Human & Institutional capacity", PP shall provide evidence of seminars conducted on education, hygiene and gender. 5. As per the registered PDD "Access to affordable and clean energy services" is monitored through energy meter. Net electricity will be calculated by DISCOM and O&M operator on monthly basis. No definitive conclusion can be drawn and thus Corrective action is sought in both MR and ER sheet as electricity generation value in MR is not consistent with ER sheet. 6. As per registered passport Quantitative employment and income generation will be monitored through Plant employment records. PP shall provide the records. <p>Based on the above observation corrective action is sought in MR and ER sheet</p>			
Project Participant'sresponse	Date:		02/07/2019
<ol style="list-style-type: none"> 1. As VVB rightly pointed out these are the new standard set by Ministry of Environment and Forest and Climate Change. Since there is no historical PM 10, SOx, NOx emission data of grid connected power plants are available publically, the figures are calculated based on the MoEF&CC standard which gives an idea about approximate PM 10, SOx, NOx emission that is avoided due to the project activity. In MR, it is already mentioned the estimation is approximate. Moreover it shall be noted that the calculation is just to justify the positive impact on the parameter Air quality and this does not affect the CO₂ emission reduction estimation. The Electricity figures were wrongly mentioned which are now corrected in the revised MR. 			

2. The Training records are now submitted to VVB.
3. The CSR records and photographic evidence are now submitted in support of parameter "Livelihood of the poor"
4. No Training or workshop is conducted during the monitoring period. However, PP is planning to conduct the trainings & workshops to the local public in the coming days.
5. The electricity generation data provided for the parameter "Access to affordable and clean energy services" is corrected to be consistent with the ER calculation sheet.
6. The plant employment records are now submitted to VVB

Documentation provided as evidence by Project Participant

- Training Records
- CSR Records
- Evidence of seminars conducted
- Plant employment records
- Revised MR

Auditor's assessment comment	Date:	03/07/2019
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1. Justification provided by PP that figures of PM10, Sox &NOx removal due to electricity generation from this project activity are just approximation based on new emission guidelines by Ministry of Environment, Forest and Climate Change, Govt. of India. Overall being a renewable energy project, it will not contribute to GHG gas emission and replace fossil fuel burning of which results into release of PM10, SOx and NOx. Hence justification can be accepted.

Net electricity export figure also corrected in revised MR, Ver. 2. **Comment closed.**
2. PP has submitted some photos of training and regular drill conducted but not submitted attendance sheets of all training conducted. **Comment open**
3. PP has submitted evidence of CSR activities conducted in which Water Treatment Plant (UF +RO) of 100 LPH capacity installed in 20 villages during the monitoring period. Copy of agreement with implementing agency confirm that all these installation completed by 29/06/2018. **Comment closed**
4. For parameter, "Human & Institutional capacity, PP submitted that no training, workshops conducted during the monitoring period to build / enhance human and institutional capacity. Though PP has submitted that evidences provided for parameter "Quality of employment" to be considered. Please note that this parameter pertains to awareness, welfare and capacity building of public, not employees, hence justification provided is not accepted.**Comment open**
5. The electricity generation data provided for the parameter "Access to affordable and clean energy services" in the table under emergency preparedness section of the MR is still not consistent with ER sheet. **Comment open.**
6. PP has submitted contract signed with security agency signed on 14/02/2019 and work order with Mauli Services for module cleaning signed on 17/04/2019 along with EPF challan of May, 2019. None of the documents suggest employment generation during this monitoring period. PP shall provide evidence for employment generated during the period of 16/06/2017 to 30/06/2018. **Comment open.**

Project Participant's response	Date:	03/07/2019
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2. The attendance sheets of the training records are submitted.
4. PP conducted water conservation awareness workshop during the monitoring period. The details of the same is given in the MR. The minutes of meeting is submitted for verification.

5.Necessary correction made in emergency preparedness section of MR. Now electricity generation figure is consistent with ER sheet		
6. Employment records pertaining to the monitoring period is submitted now.		
Documentation provided as evidence by Project Participant		
<ul style="list-style-type: none"> • Training Attendance sheets • Plant employment records 		
Auditor's assessment comment	Date:	05/07/2019
2. The attendance sheets submitted by PP checked and found to be appropriate. Comment closed.		
4. Minutes of meeting of water conservation workshop conducted on 03/02/2018 submitted by PP checked and found to be ok and in line. Corresponding details included in revised MR also checked and found to be appropriate. Comment closed.		
5. Electricity generation figure in revised MR is now consistent with ER sheet. Comment closed.		
6. PP has submitted work orders (PO- 131,161,163 & 205) with M/s Mauli Services for module cleaning signed on different dates within this monitoring period. PP also submitted contract with security services agency (PO No. 60,107, 175 and 208) falls in the monitoring period. All these contracts checked and can be confirmed that PP provided employment to local people. To further substantiate this PP also submitted copy of EP challans for its employees. Comment closed		

Type:	<input checked="" type="checkbox"/> CAR FAR	<input type="checkbox"/> CL/CR	<input type="checkbox"/>	Number:	02
Raised by:	Pankaj Kumar			Ref. to checklist in above tables:	NA
Description of the audit finding	Date:	01/07/2019			
Following discrepancies are observed by the assessment team:					
<ol style="list-style-type: none"> 1. Calibration details for the measuring device for the monitoring period is missing. The calibration agency name and due date of calibration is also missing for the energy meters. Calibration certificate is also not provided to the assessment team. Corrective action is sought in the MR. 2. JMR and invoices are missing for the complete monitoring period is missing. 3. The estimated ER value for this monitoring period is incorrect on the front page of MR. 4. In Section D.2 and table of sustainability parameter, value of total electricity generation of this monitoring period is incorrect. Corrective action is sought in the MR. 					
Based on the above observation corrective action is sought in MR and ER sheet					
Project Participant's response	Date:	02/07/2019			
<ol style="list-style-type: none"> 1. The calibration details of the energy meter is now provided in the MR. The calibration agency name, date of calibration due date of calibration are included in the MR. Also the calibration certificate is now submitted to VVB assessment team for verification. 2. JMR & Invoices are now submitted to VVB. 3. The estimated ER value for this monitoring period is corrected now on the front page of MR. 					

4. In Section D.2 and table of sustainability parameter, value of total electricity generation of this monitoring period is corrected.		
Documentation provided as evidence by Project Participant		
1. Calibration records. 2. JMR & Invoices 3. Revised MR		
Auditor's assessment comment	Date:	03/07/2019
Following are the observation of the DOE:		
1. Calibration details of main, check and standby meters in both the bay provided in revised MR which found to be ok and also cross checked with calibration certificates. As per PDD, calibration to be done in every 5 years, hence calibration frequency is in line with registered PDD. Comment closed. 2. PP has submitted monthly JMRs for entire monitoring period. As per registered PDD, JMRs need to be cross checked with the invoice which has not been submitted. Comment open 3. The estimated as well as actual ER values on front page of MR are still not consistent with ER sheet. In sec. A.1, actual ER value is not consistent with ER sheet. Comment open 4. In sec. D.2 of revised MR Ver. 2, total electricity generation value is now corrected and in line with ER sheet. Comment closed		
Project Participant's response 2	Date:	02/07/2019
2. The invoices are submitted for crosschecking 3. The estimated & actual ER values on front page of MR are now corrected. In sec. A.1, also the actual ER value is corrected		
Documentation provided as evidence by Project Participant		
<ul style="list-style-type: none"> Invoices 		
Auditor's assessment comment	Date:	05/07/2019
2. The invoices submitted by PP checked and verified with JMRs and records were matching. Comment closed. 3. The estimated ER values in revised MR is now consistent with ER sheet. Comment closed.		

Type:	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL/CR <input type="checkbox"/> FAR	Number:	03
Raised by:	Pankaj Kumar	Ref. to checklist in above tables:	NA
Description of the audit finding	Date:	01/07/2019	
The grievance register records are missing and not submitted to the assessment team. Discussion on grievance received during this monitoring period also not discussed in MR. Corrective action sought.			
Project Participant's response	Date:	02/07/2019	
There is no grievance received during the monitoring period. The same is included in the MR. The copy of grievance register is submitted to VVB for verification.			
Documentation provided as evidence by Project Participant			

1. Grievance register		
2. Revised MR		
Auditor's assessment comment	Date:	03/07/2019
Copy of grievance register not submitted. Comment open		
Project Participant's response 2	Date:	03/07/2019
The copy of grievance register is submitted to VVB for verification.		
Documentation provided as evidence by Project Participant		
<ul style="list-style-type: none"> Grievance register 		
Auditor's assessment comment	Date:	05/07/2019
Grievance register submitted by PP checked and based on description provided in revised MR, verification team confirm that no grievance received during this monitoring period , hence no action required at PP's end. Comment closed.		

4. REFERENCE

/01/	Monitoring Report Version 01 dated 26/04/2019, Monitoring Report Version 02 dated 02/07/2019
/02/	ER sheets version 01 corresponding to MR version 01 dated 26/04/2019 ER Sheets version 02 corresponding to the MR version 02 dated 02/07/2019
/03/	Registered PDD Version 05 dated 25/10/2018
/04/	Registered Passport Version 05 dated 25/08/2018
/05/	GS registered Validation Report
/06/	ACM 0002 version 17.0
/07/	CDM VVS version 01 for the project activities
/08/	The Gold Standard Toolkit Version 2.2
/09/	Training records (communication skills, safety Training, environment norms Training) of the employees (both skilled/non skilled)
/10/	EPF Challans
/11/	Monthly JMR reports issued by state utility and invoices raised by PP for the complete monitoring period
/12/	Calibration certificates of the complete monitoring period Calibration Details <u>*All the meters are of "Elster Make: with 0.2s Accuracy class.</u>
/13/	Commissioning certificates for the power plant
/14/	Log book records for scheduled maintenance of the power plant for the complete monitoring period
/15/	Module cleaning agreement
/16/	Contract with security agency
/17/	Grievance register
/18/	CSR records and photographic evidence.
/19/	Photographic evidence of Seminars conducted about Education, Hygiene and gender equality.
/20/	Plant employment records for the employees
/21/	Project O&M HSE logbook, or interview with maintenance staff.

5. VERIFICATION STATEMENT

Applus+ Certification has been engaged by Orange Suvaan Energy Private Limited to perform the first periodical verification of the "2x50 MW Orange Suvaan Solar Photovoltaic Power Project in Maharashtra" (GS Ref. No. 5928).

The management of Orange Suvaan 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, registered Passport 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 project design document and passport approved by the EB and GS;
- the monitoring plan is as per the applied methodology;
- the monitoring in Monitoring Report is as per the PDD and Passport and the monitoring plan approved by the EB and GS;
- 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 "2x 50 MW Orange Suvaan Solar Photovoltaic Power Project in Maharashtra" for the monitoring period 16/06/2017 to 30/06/2018 (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: 16/06/2017 to 30/06/2018 (Both days included)

Verified emissions in the above reporting period:

<i>Leakage emissions</i>	<i>0 tCO₂ equivalents</i>
<i>Project emissions</i>	<i>0 tCO₂ equivalents</i>
<i>Baseline emissions</i>	<i>198,191 tCO₂ equivalents</i>
<i>Emission reductions</i>	<i>198,191 tCO₂ equivalents</i>

Date: 05/07/2019

Assessment team: Mr. Pankaj Kumar (Team Leader / Leader Auditor)

Pankaj K.

Technical Reviewer: Mr. Simon Shen

Meng SHEN.

DOE Representative Applus+ Certification BU Managing Director: Mr. Juan Sendín Caballero

Juan Sendín Caballero