BUNDLED SOLAR POWER PROJECT BY D. J. MALPANI AND GIRIRAJ ENTERPRISES

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Summary:

A brief description of the project:

The project "Bundled Solar Power Project by D.J. Malpani and Giriraj Enterprises" (hereafter will be referred as "project activity") is a proposed bundled VCS project, which involves installation, commissioning and operation of two Solar Power Projects in the states of Telangana and Tamil Nadu in India. The main purpose of this project activity is to generate clean form of electricity through renewable energy sources (solar energy). D.J. Malpani and Giriraj Enterprises are the two promoters and project proponents of the bundled project activity. The total installed capacity of the bundled project activity is 56.25 MW as below:

Project Investors	Project Capacity	Project Location	State
M/s. D. J. Malpani	16.25 MW	Village: Hoti Tehsil: Zaheerabad Mandal, District: Medak	Telangana
Giriraj Enterprises	40 MW	Village: Sengottai, Tehsil: Virudhunagar, District: Virudhunagar,	Tamilnadu

The electricity generated by the two bundles is supplied to Indian grid. As the project involves power generation through renewable sources of energy, it will result in emission reductions due to displacement of grid electricity, which is majorly fossil fuel based.

A brief description of the validation and verification:

The PP has commissioned Carbon Check (India) Private Ltd. (CCIPL), to carry out a combined validation and verification of their bundled project "Bundled Solar Power Project by D.J. Malpani and Giriraj Enterprises", with regards to the relevant requirements of VCS Standard Version 3.6 /B02/.

The purpose and scope of validation:

The purpose of the validation is to have a thorough and independent assessment of the proposed project activity against the applicable VCS requirements, in particular, the project's baseline, monitoring plan and the project's compliance with relevant VCS and host party criteria. These are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of emission reductions. CCIPL's objective is to perform a thorough, independent assessment of the validation of the project activity.

The validation scope is defined as an independent and objective review of the Joint PD & MR /2/. The Joint PD & MR /2/ is reviewed against the relevant criteria and guidance documents provided by VCS which included the following:

VCS Program Guide (v3.6, dated 09/10/2016), VCS Standard (v3.6, dated 19/10/2016, Program Definitions (v3.6, dated 09/10/2016), Registration & Issuance Process (v3.7, dated 19/10/2016) and in line with the VCS Validation and Verification Manual (v3.2, dated 19/10/2016) applicable at the time in order to confirm that the project meets the applicability conditions of the selected baseline and monitoring methodology namely ACM0002 (version 17.0) /B01/ and also assess the claims and assumptions made in the Joint PD & MR /1/ without limitation on the information provided by the project proponents.

The purpose and scope of verification:

The purpose of the verification is to review the Joint VCS PD & MR /2/ for the monitoring results and verify that monitoring methodology was implemented according to monitoring plan and monitoring data, further based on review of ER sheet /15/ confirm that the reductions in anthropogenic emissions by sources is sufficient, definitive and presented in a concise and transparent manner. In particular, monitoring plan, Joint VCS PD & MR /2/, ER sheet /4/ /15/ and the project's compliance with relevant VCS, UNFCCC and host party criteria are verified in order to confirm that the project has been implemented in accordance with design and conservative assumptions, as documented.

The scope of the verification is:

- To verify the project implementation and operation with respect to the Joint PD & MR /2/.
- To verify the implemented monitoring plan with the Joint PD & MR /2/ and applied baseline and monitoring methodology /B01/.
- To verify that the actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that the reported emission reductions are complete and accurate in order to be certified.

The method and criteria used for validation and verification:

I. A desk review of the project description documents
   - A review of data and information;
   - Cross checks between information provided in the Joint PD & MR and information from sources with all necessary means without limitations to the information provided by the project proponent;

II. On-site visit and follow-up interviews with project stakeholders
   - Interviews with relevant stakeholders in host country with personnel having knowledge with the project development via telephone, email or direct on-site visits;

III. Reference to available information relating to projects or technologies similar to project under validation and review based on the approved methodology being applied for the appropriateness of formulae and accuracy of calculations.

IV. Review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;

V. Evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions;

VI. Resolution of outstanding issues and the issuance of the final validation report and opinion.

The number of findings raised during validation and verification:

During the course of combined validation and verification, a total of 09 findings were raised, which includes:
01 Corrective Action Request (CAR);
09 Clarification Requests (CLs);
0 Forward Action requests (FARs).

The Joint PD & MR /2/, emissions reduction calculations /4/ along with the supporting documents provided are considered to be in line with the VCS requirements /B02/. The validation team has detected no further uncertainties or quality restriction.

Summary of the validation and verification conclusion:

CCIPL hereby confirms that the project is fulfilling the criteria specified by Joint PD & MR template version 3.1 /B02/, VCS Standard version 3.6 /B02/ and applied methodology ACM0002 (version 17.0) /B01/, and hence be successfully validated, verified and further certified for emission reductions under VCS. CCIPL confirms a combined positive validation and verification opinion confirming the project complies with the applicable VCS requirements, thus recommending the project for registration and issuance.

In CCIPL's opinion, the estimated emission reductions reported for the "Bundled Solar Power Project by D.J. Malpani and Giriraj Enterprises" in the Joint PD & MR are fairly and correctly stated. CCIPL is therefore able to certify that the "Bundled Solar Power Project by D.J. Malpani and Giriraj Enterprises" is expected to reduce 93,022 tCO_2e per annum during the crediting period of 10 years.

During the current monitoring period from 31/03/2015 to 25/02/2017 (including both days), the project has generated 145,393 tCO_2e.

CCIPL does not assume any responsibility towards the issuance and utilisation of VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration. The verification of reported emission reductions is based on the information made available to CCIPL and the engagement conditions detailed in this report. Hence, CCIPL cannot be held liable by any party for decisions made or not made based on this report.

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1 INTRODUCTION

1.1 Objective

The PP has commissioned the VVB, Carbon Check (India) Private Ltd. to perform a joint validation and verification of the VCS bundled Project Activity "Bundled Solar Power Project by D.J. Malpani and Giriraj Enterprises". The objective of the combined validation and verification is to have an independent third party assessment of the Joint PD & MR/2/ and supporting documentation to ensure compliance with the rules, regulations and guidelines laid out in the following CDM and VCS requirements: documents:

- VCS Program Guide (v3.6, dated 09/10/2016)
- VCS Standard (v3.6, dated 19/10/2016)
- VCS Program Definitions (v3.6, dated 09/10/2016)
- VCS Registration & Issuance Process (v3.7, dated 19/10/2016)
- VCS Validation and Verification Manual (v 3.2, dated 19/10/201)
- UNFCC CDM approved methodology ACM0002 (version 17.0)
- The project's additionality justification is assessed against "Tool for the demonstration and assessment of additionality", Version 07.0.0

Validation and verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of verified carbon units (VCUs). This report contains the findings and resolutions from the validation and verification of the project activity.

1.2 Scope and Criteria

The scope of joint validation and verification scope is defined as an independent and objective review of the Joint PD & MR/2/ against the relevant criteria and decisions of the VCS, CDM including the approved baseline and monitoring methodology. CCIPL has employed a risk-based approach in the validation, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

The validation is not meant to provide any consulting towards the project proponents. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.

The only purpose of the validation and verification is its usage during the registration /issuance process as part of the VCS project cycle. Therefore, CCIPL cannot be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

1.3 Level of Assurance

The verification and validation has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS.

1.4 Summary Description of the Project

The purpose of the bundled project activity is the installation, commissioning and operation of Solar Power Projects at two locations in the Indian states of Telangana and Tamil Nadu. The electricity generated by the solar projects will be supplied to the Indian grid. As the project involves power generation through renewable sources of energy, it will result in emission reductions due to displacement of grid electricity, which is majorly fossil fuel based.

The implementation status of the bunded project as s below:

Project Investors and PPs	Project Capacity	Project Location	COD
M/s. D. J. Malpani	16.25 MW	Village: Hoti Tehsil: Zaheerabad Mandal, District: Medak	31/03/2015
Giriraj Enterprises	40 MW	Village: Sengottai, Tehsil: Virudhunagar, District: Virudhunagar,	23/09/2015

The bundled project activity promotes environmental and social well being as it results in zero GHG emissions due to installation and operation of clean, renewable energy technology for electricity generation. The design lifetime of the entire solar project is 25 years, which is based on the DPRs and deemed acceptable to the validation team.

The total estimated GHG emission reductions expected for the bundled project is 930,220 tCO_2e for the entire crediting period (of ten years). Thus, the estimated annual average emission reductions will be 93,022 tCO_2e.

The total actual GHG emission reduction for the bundled project is 145,393 tCO_2e for the current monitoring period ranging from 31/03/2015 to 25/02/2017.

This was confirmed based on review of Joint PD & MR /2/, ER verification spreadsheet /15/, Joint Metering Reading reports/16/ and Invoices issued to state DISCOMs /17/.

2 VALIDATION AND VERIFICATION PROCESS

2.1 Method and Criteria

The PPs have commissioned Carbon Check (India) Private Ltd., to carry out joint validation and verification of the bundled project "Bundled Solar Power Project by D.J. Malpani and Giriraj Enterprises", with regards to the relevant requirements of VCS Standard Version 3.6 (dated 19/10/2016)/B04/.

The method and criteria used for validation and verification consists of the following three phases:

1. Completeness check and desk review of the Joint PD & MR, baseline and monitoring methodology, applicable tools and other relevant documents;
2. On-site visit (including follow-up interviews with project stakeholders, when deemed necessary).
3. Resolution of outstanding issues and the issuance of the final Joint Validation & Verification report and if applicable the VCS Validation and Verification Deeds of Representation.

Validation Process:

The validation process includes thorough and independent assessment of the proposed project activity against the applicable VCS requirements, in particular, the project's baseline, additionality, monitoring plan and the project's compliance with relevant VCS and host party criteria. The joint assessment of the project and to confirm that the project meets the applicability conditions of the selected baseline and monitoring methodology, ACM0002 (version 17.0)/B01/ and assess the claims and assumptions made in the joint Joint PD & MR /2/ without limitation on the information provided by the project proponents. The overall validation was conducted using CCIPL's internal procedures.

Verification Process:

The verification process involves thorough review of the monitoring results and confirming that the monitoring methodology was implemented according to the monitoring plan and monitoring data which is used to confirm the reductions in anthropogenic emissions by sources, is sufficient, definitive and presented in a concise and transparent manner.

In particular, the monitoring plan, emission reduction calculations and the project's compliance with relevant VCS and host Party criteria are verified in order to confirm that the bundled project has been implemented in accordance with the Joint PD & MR/2/ and conservative assumptions, as documented. It is also confirmed if the monitoring plan is in compliance with the Joint PD & MR/2/ and approved monitoring methodology/B01/.

2.2 Document Review

During the document review, CCIPL has applied standard auditing techniques to assess the quality of information provided. The joint validation and verification was performed primarily based on the review of the Joint PD & MR /2/ and the supporting documentation.

For validation, this process includes:

- A review of data and information presented to verify completeness and consistency in accordance with VCS Standard (version 3.6) /B04/ requirements;
- A review of the project description and monitoring methodology, paying particular attention to the applicability conditions of the methodology and baseline and additionality related requirements
- A review of the monitoring plan and the project's compliance with relevant VCS criteria.

For verification, this process includes:

- A review of data and information presented by the PP to verify their completeness
- A review of the MP and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the QA/QC procedures, and
- An evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of ERs.

The Joint PD & MR /1/ (version 1 dated 18/03/2016) was initially reviewed and CCIPL requested the PP to present the supporting information and documents. The documents were reviewed by CCIPL. Through the assessment process, the revised Joint PD & MR /2/ and the supporting documents were evaluated to confirm the actions taken by the PP to the CARs and CLs issued by the assessment team.

The following table outlines the documentation reviewed during the verification:

Category A documents (documents from the PP)

Sl. No.	List of pertinent documents
/1/	Joint PD & MR, version 1, dated 18/03/2017
/2/	Final Joint PD & MR, version 2, dated 27/03/2017
/3/	Emission reduction spreadsheet corresponding to /1/
/4/	Emission reduction spreadsheet corresponding to /2/
/5/	Prior consideration evidence of VCUs for the project activity
/6/	Detailed Project Reports for D J Malpani and Giriraj Enterprises
/7/	Offer letters from the equipment supplier / EPC contractor
/8/	Copy of EPC contract(s) / Purchase orders for the project activity
/9/	Commissioning certificates issued by respective state electricity board. (proof of start date of project)
/10/	Evidence for the Technical specifications of the projects
/11/	Copy of PPAs / Tariff order
/12/	IRR spreadsheets
/13/	Statutory clearances
/14/	Company registration certificate for both the PPs
/15/	ER spreadsheet for the monitoring period
/16/	Share certificates/Credit Notes/Monthly Joint Meter Reading (JMR) statements for the monitoring period
/17/	Invoices raised by the PPs to the respective state electricity boards for the monitoring period
/18/	Calibration certificates for the electricity meters used during the monitoring period
/19/	Evidence for project ownerships
/20/	Declaration(s) from Project proponent on the following (for section 1.12 of the Joint PD & MR): a) Project not registered or under process of registration in any other Emissions Trading Programs and Other Binding Limits. b) Project not registered or under process of getting and Other Forms of Environmental Credit c) The project has not been registered and is not seeking registration under any other GHG program. d) Projects not Rejected by Other GHG Programs
/21/	Declaration from PPs for: • No Generation based incentives are claimed by the projects • No ODA funding is used in the projects from any Annex 1 country

Category B documents (other documents referenced)

Sl. No.	List of pertinent documents
/B01/	Approved CDM monitoring methodology: ACM0002: Grid-connected electricity generation from renewable sources - Version 17.0
/B02/	VCS Requirements: • Verified Carbon Standard Program Guide, v3.6; • Verified Carbon Standard, v3.6; • VCS Program Definitions, Ver. 3.6 • VCS Registration and Issuance Process, v3.7 • VCS Validation and Verification Manual, v3.2 • VCS Joint Project Description & Monitoring Report Template, v3.1 • VCS Joint Validation & Verification Report Template, v3.1
/B03/	CDM Validation and Verification Standard, version 09.0 CDM Project Standard, version 09.0
/B04/	Tool to calculate the emission factor for an electricity system, version 05.0
/B05/	Baseline CO2 Emission Database, Version 11.0 published by Central Electricity Authority (CEA), Government of India.
/B06/	Methodological Tool: Tool for the demonstration and assessment of additionality, version 07.0
/B07/	Methodological Tool: Investment analysis, version 07.0
/B08/	Methodological Tool: Common practice, version 03.1

2.3 Interviews

The key personnel interviewed and the main topics of the interviews are summarized in the table below:

During Site visit:

	Date	Name	Organization	Topic
/i/	28/03/2017	Jagganath Patil	Enrich / Senior Engineer	• Project Design and technical specifications • Project Implementation status • Project start date • Project Location(s) • Environmental Impacts
/ii/	28/03/2017	Prashant Kumar	Enrich / Engineer	• Project Design and technical specifications • Project Implementation status • Project start date • Project Location(s) • Environmental Impacts
/iii/	28/03/2017	Vishal Gadilkar	Enrich / Engineer	• Electricity metering and calibration requirements • Transmission and distribution of generated electricity
/iv/	22/03/2017 25/03/2017 26/03/2017 (Through Skype)	Ramkrishna Patil	EKI Energy Services Ltd.	• Project Design and technical specifications • Project Implementation status • Project start date • Project Location(s) • Baseline Scenario • Baseline Identification and Additionality • Estimated ER calculations • Qualification and Training • Monitoring and reporting documentation • Quality Assurance-Management and operating system • Environmental Impacts • Compliance with relevant national and state laws • Roles and responsibility • Actual ER calculations

2.4 Site Inspections

A site visit was undertaken on 28/03/2017 to confirm the project description as provided in the Joint PD & MR /2/. During the OSV, topics as outlined in the tables in the section 2.3 were discussed/ focused on. The site visit was conducted to assess the implementation and operation of the project activity and to review evidence and interview key personnel to confirm the project design, implementation, operations, monitoring plan, QA/QC procedures, environmental impacts and stakeholders of the project.

2.5 Resolution of Findings

This section summarises the findings from the joint validation and verification of the bundled project activity. In this section, the findings from the document review, site visit, assessments and interviews are provided. Material discrepancies identified during the joint validation and verification process are addressed either as CARs or CLs. Carbon Check has identified, discussed these issues within the Joint Validation & Verification report in Appendix 2.

Clarification requests (CLs): Project reporting lacks transparency and further information is needed to determine if a material discrepancy is present.

Corrective action requests (CARs): The VVB has identified a material discrepancy or non-conformance that the project proponent must address.

The final Joint PD & MR/2/ submitted by PP serves as the basis for the final assessment presented. Additional changes to the project during the validation and verification process are not considered to be significant with respect to the main VCS objectives. The two VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

A total of 01 CAR and 09 CLs had been raised for the joint validation and verification of the bundled project activity and have been resolved.

2.6 Forward Action Requests

Forward Action Request (FAR) is to be raised when the monitoring and reporting require attention and/or adjustment for the next verification period. FARs does not relate to VCS requirements for issuance of ERs achieved during subject monitoring.

CCIPL has not raised any FAR during this joint validation and verification.

3 VALIDATION FINDINGS

3.1 Project Details

The main purpose of the proposed bundled project activity is to generate clean energy through renewable energy sources. The proposed project activity is a bundled solar power project owned by D J Malpani and Giriraj Enterprises, who are also the project proponents for the project activity. The proposed total installed capacity of the solar power plant would be 56.25 MW (16.25 for D J Malpani and 40 MW for Giriraj Enterprises). The electricity produced from the project activity shall be supplied to the regional electrical grids of India.

Technical specifications of the two bundles of the project as stated in section 1.8 of the Joint PD & MR were verified from the technical specification supporting documents submitted by the PP /10/.
The bundled project is located within the states of Telangana and Tamilnadu in India and the geographical boundary is within the country of India.

The start date of the bundled project activity is 31/03/2015 and is the earliest date of commissioning of solar project for D J Malpani in Telangana. The start date of the project activity has been confirmed through review of Commissioning certificates of currently operating power projects /9/.

The project crediting period starts on 31/03/2015 and ends on 30/03/2025 with a total crediting period of 10 years (renewable two times).

The project scale is Project as the expected ERs from the grouped project activity is less than 300,000 tCO2e/year.

The total estimated GHG emission reductions expected for the bundled project is 930,220 tCO2e for the entire crediting period (of ten years). Thus, the estimated annual average emission reductions will be 93,022 tCO2e. This was confirmed based on the review of ER validation spreadsheet /4/ and other supporting documents like DPRs /6/.

The total actual GHG emission reductions expected for the bundled project is 145,393 tCO2e for the current monitoring period ranging from 31/03/2015 to 25/02/2017. This was confirmed based on the review of ER verification spreadsheet /15/.

Prior to the project initiation, the entire electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

The above scenario is also the respective baseline scenario and was confirmed to be accurate during on site assessment and interviews with representatives of PP /i/,/ii/,/iv/.

The project is in compliance with the applicable regulatory framework on solar power projects in targeted country of India.

It has been confirmed in the Joint PD & MR /2/ that the project or any of its components are not seeking registration and has not been registered under any GHG program.

Based on its assessment through review of relevant documentation (as cited above), the assessment team confirms that the description given in the Joint PD & MR /2/ is accurate, complete, and provides an understanding of the nature of the project, and the project has been implemented as described in the Joint PD & MR /2/.

3.2 Participation under Other GHG Programs

Not applicable

3.3 Application of Methodology

3.3.1 Title and Reference

The bundled project uses the following approved large-scale CDM methodology:

ACM0002: Grid-connected electricity generation from renewable sources (version 17.0) /B01/.

In addition, the project activity also uses the following tools:

- Tool to calculate the emission factor for an electricity system --- Version 05.0, /B04/
- Tool for the demonstration and assessment of additionality --- Version 07.0.0 /B06/

The methodologies and the tools referenced are valid at the time of joint validation and verification of the bundled project activity have been checked and confirmed by the assessment team.

3.3.2 Applicability

The bundled project activity applies the approved large-scale CDM methodology; ACM0002, version 17.0 /B01/. Applicability criteria for the baseline line methodologies are assessed by the validation team by means of document review and interview. Validation team confirms that the project activity meets the criteria of the applied methodologies.

Applicability criteria as per methodology /B01/	Justification from PP /2/	Means of validation
1. This methodology is applicable to grid-connected renewable energy power generation project activities that: a. Install a Greenfield power plant; b. Involve a capacity addition to (an) existing plant(s); c. Involve a retrofit of (an) existing operating plants/units; d. Involve a rehabilitation of (an) existing plant(s)/unit(s);or e. Involve a replacement of (an) existing plant(s)/unit(s).	The project activity is installation of a new grid connected solar power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant) and hence this criterion is applicable.	The validation team reviewed the Joint PD & MR /2/, DPRs /6/, Equipment purchase orders / EPC contract /8/, Power purchase agreements /11/ and conducting physical inspections during OSV combined with interviewing representatives of PP/i/,/ii/,/iv/ confirms that the current bundled grouped project activity involves generation of electricity through renewable energy by operation of green field solar PV power plants that supply electricity to the Indian grid. Thus, based on the above, the assessment team concludes that the bundled project activity has successfully complied with requirements of the current applicability criteria of the

		applied methodology ACM0002, (version 17.0) /B01/.
2. The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit;	The proposed project activity is an installation of a new grid connected solar power plant. Hence this condition is met.	The validation team reviewed the Joint PD & MR /2/ and by conducting physical inspections during OSV combined with interviewing representatives of PP /i/,/ii/,/iv/ confirms that the current bundled grouped project activity involves installation and operation of solar PV power plants thereby resulting in generation of electricity through renewable energy. Thus, based on the above, the assessment team concludes that the bundled project activity has successfully complied with requirements of the current applicability criteria of the applied methodology ACM0002, (version 17.0) /B01/.
3. In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	The proposed project activity is the installation of a Greenfield solar power plant/unit. Therefore, the said criterion is not applicable.	Criterion not applicable as the project is a Greenfield project.
4. In case of hydro power plants, one of the following conditions shall apply: a. The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or	The proposed project activity is the installation of a Greenfield solar power plant/unit. Therefore, the said criterion is not applicable	Criterion not applicable as the project is a Greenfield project.

b. The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density calculated using equation (3), is greater than 4 W/m2; or c. The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m2; or d. The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3),is lower than or equal to 4 W/m2, all of the following conditions shall apply: (i) The power density calculated using the total installed capacity of the integrated project, as per equation (4),is greater than 4 W/m2; (ii) Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m2 shall be: a) Lower than or equal to 15 MW; and b) Less than 10 per cent of the total installed capacity of integrated hydro power project.		
5. In the case of integrated hydro power projects, project proponent shall: • Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or	The proposed project activity is the installation of a Greenfield solar power plant/unit. Therefore, the said criterion is not applicable	Criterion not applicable as the project is a Greenfield project.

• Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.		
6. The methodology is not applicable to: • Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; • Biomass fired power plants/units.	The proposed project activity is the installation of a Greenfield solar power plant/unit. Therefore, the said criterion is not applicable	Criterion not applicable as the project is a Greenfield project solar PV power project.
7. In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”.	The project activity involves a new grid connected solar power plant and not a retrofit, replacement or capacity additions and therefore this criterion is not applicable to the project activity.	Criterion not applicable as the project is a Greenfield project..

8. In addition, the applicability conditions included in the tools referred to below apply.	The project applies the following tools and is in compliance to the same; • "Tool to calculate the emission factor for an electricity system"; • "Tool for the demonstration and assessment of additionality";	The validation team reviewed the Joint PD & MR /2/ and confirms that the current bundled project activity complies with the applicability conditions included in the referred tools. Thus, based on the above, the assessment team concludes that the bundled project activity has successfully complied with requirements of the current applicability criteria of the applied methodology ACM0002, (version 17.0) /B01/.

3.3.3 Project Boundary

As per §22 of the applied methodology /B01/ the project boundary is defined as:

"*The spatial extent of the project boundary includes the project power plant/unit and all power plants/units connected physically to the electricity system that the CDM project power plant is connected to*."

The information regarding the project boundary has been also correctly given in the Joint PD & MR /2/.

The assessment team confirms that the project boundary for the project instances is based on the applied methodologies /B01/ and that there are no sources and gases within the boundary.

The physical delineation of the project boundary and the description of the emission sources and GHGs that are included in the boundary are appropriate for the purpose of calculating project and baseline emissions for the bundled project.

3.3.4 Baseline Scenario

To describe the baseline scenario the PP has employed the requirements listed under §24 of the applied methodology /B01/ which states that:

"If the project activity is the installation of a Greenfield power plant, the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system."

As that the current bundled project involves installation and operation of greenfield, grid-connected solar power plants, the above assigned baseline scenario is deemed to be consistent. This was confirmed based sectoral expertise of the assessment team and further by reviewing the Joint PD & MR /2/, DPRs /6/, Power purchase agreements /11/ and conducting physical inspections during OSV combined with interviewing representatives of PP /i/,/ii/,/iv/.

Thus, the baseline scenario has been identified in line with the requirements of the applied methodology ACM0002 (version 17.0) /B01/ and is deemed to be appropriate and justified.

3.3.5 Additionality

The project is large scale project. Therefore, in accordance with ACM0002, the additionality of the project has been demonstrated based on the valid version of the "Tool for demonstration and assessment of additionality" (Ver 07) /B06/ and the "Methodological Tool: Investment analysis" (Ver 06) /B07/. For the above reasons, this approach has been assessed to be appropriate for the assessment of additionality for this project activity.

Prior consideration:

During conceptualization of the project activity, board of directors of the project proponents considered the GHG revenue to improve the project financials. During the board meetings dated 05/06/2014 and 05/06/2015 for D J Malpani and Giriraj Enterprises respectively /5/, board of Directors decided that they would consider GHG revenue for their project activity. In continuation to the board decision, PP received offer letters and then after subsequent decision with the manufacturer placed the purchase orders for the solar projects. In the above background, the Validation Team concludes that the additionality justification regarding the serious CDM/VCS consideration given by the project developer is in accordance with the requirements derived from CDM VVS version 09 /B03/.

Alternatives:

This is a solar PV power project and is based on the Methodology ACM0002 Ver. 17.0 The methodology states, "If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following: Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

Since the approved methodology ACM0002 used by the project activity prescribes the baseline scenario, no further analysis of alternatives is required for the project activity.

Investment analysis:

a) Suitability of investment analysis, financial indicator and benchmark:

PP had demonstrated that the financial returns of the proposed VCS project activity would be insufficient to justify the required capital investment as per VVS version 09. PP has adopted a conservative approach to identify the benchmark for the project activity. The project is earning revenue from the installation of the project activity. Thus simple cost analysis is not appropriate. Also in the absence of the project activity grid electricity would have been the obvious choice for the project, which requires no investment. Hence investment analysis is also not appropriate for the project activity. Therefore, benchmark analysis is used for the project activity as per project type and decision making context. The choice of post-tax equity IRR and the corresponding benchmark is considered appropriate by the validation team.

PP identified the benchmark using the guideline vide "Methodological Tool: Investment analysis", version 06.0 /B07/, "*The values in the table in Appendix A may also be used, as a simple default option*". However, since RBI (Reserve Bank of India, India Central Bank) provides forecast inflation for both 5 & 10 years, the project investor has calculated benchmark using 10 years duration and the calculated value is considered as benchmark for the project activity. The WPI mean inflation forecast for 10 years are added to the default values for the project participants as below:

Project participant	Default value (in real terms) /B07/[1]	Inflation forecast (WPI Mean) as per RBI for 10yrs	Final benchmark (in nominal terms)
D J Malpani	11.75%	5.1%	17.45%
Giriraj Enterprises	11.75%	3.8%	16.00%

b) Parameters and assumptions used:

The project involves installation of grid connected Solar PV power plants with an installed capacities of 16.25 MW for D J Malpani and 40 MW for Giriraj Enterprises. The important parameters, which determine the equity IRR of the project, are project cost, plf, financing pattern and profitability estimates.

The project cost is based on the offer letters submitted by solar project suppliers based on which DPRs were made. The offer letters were available during decision making and financial profitability of the project was decided based on these offer letters. Validation team checked all the offer letters of the project activity and found that consideration of the project cost is correct and justified. Further, signed purchase orders have been checked by the assessment team as the actual cost is available during the validation. The

[1] Although the latest version of the Methodological Tool: Investment analysis, is version 06.0, but PPs have adopted the default value of the benchmark from version 05.0 of the tool which was available at the time of decision making which is deemed acceptable.

validation team noted that even after taking the actual cost in the financial analysis, the equity IRR does not breach the benchmark for both the projects.

In India, infrastructure projects are generally entitled to a debt equity ratio of 70:30 and the same has been considered for the both the projects in the financial analysis which is deemed appropriate by the validation team.

The profitability of the project, which forms the basis for IRR calculation is based on installed capacity, PLF, electricity tariff, O&M cost, depreciation and taxation. The installed capacity is based on the capacity of solar projects, which is evidenced by the Offer letters and purchase orders issued subsequently.

c) Assessment of PLF:

PP considered the Plant load factors from third party prepared DPRs /6/. PP has submitted the copies of the PLFs estimation report to the assessment team. This is deemed acceptable.

d) Assessment of Electricity Tariff:

The tariffs for the projects were taken from the DPRs / Offer letters available at the time of decision making. The tariff was further cross checked from the PPA / Tariif order and found to be appropriate.

e) Assessment of O & M Cost:

PP considered the O&M cost from the offer letters / DPRs. The offer value has been used in the financial calculation as same was available during decision making and hence applicable.

f) Assessment of Tax computation:

The project developers have adopted book depreciation rates as per Schedule XIV of the Companies Act, 1956 for computing book profit and Income Tax Act 1961 stipulated for income tax calculation, which are in conformity with the accepted accounting principles adopted by the company and income tax laws in the host country. The block of assets has been computed for depreciation purpose as per the accepted accounting principles. Tax liability has been calculated as per the income tax rules and the rulings given. In computing the income tax liability, the project developers have considered Tax holiday (u/s 80IA of the Income Tax Act, 1961). Accelerated depreciation on plant and machinery is also sourced from IT act. The tax rates assumed corresponds to the tax rate prevailing at the time of taking decision. Hence, these assumptions are appropriate during decision making context.

g) Cross checking of the parameters:

The cost of solar projects, electricity tariff, O&M cost, depreciation, salvage value and tax rate have been checked with offer letters, tariff order, Income Tax Act, power purchase agreements / tariff orders. The offer value has been used in the financial calculation as same was available during decision making and hence applicable. The same is acceptable to the assessment team. The project developer has adopted book depreciation rates as per Schedule XIV of the Companies Act, 1956 for computing book profit and Income Tax Act 1961 stipulated for income tax calculation, which are in conformity with the accepted accounting principles adopted by the company and income tax laws in the host country.

The documents supporting the financial calculations, in the opinion of Validation Team, are therefore authentic and conform to the guidance given by CDM EB. All the input parameters considered in computation, the basis, correctness and appropriateness thereof are checked and found correct.

h) Assessment of correctness of computation:

The assessment involved checking the data input taken from offer letters, power purchase agreement / tariff order, adoption of correct accounting principle and arithmetical accuracy. Validation Team checked

the documents and ensured that appropriate input has been taken in the project cost and projections. The arithmetical accuracy was also found to be correct. The equity IRR has been computed for a period of 25 years, which is the life time of the project and is in conformity with the Methodological Tool: Investment Analysis, version 07.0. In computing the IRR, the project developer has taken into account profit after tax, depreciation tax shield and salvage value (in the terminal year). The principle adopted conforms to the accepted accounting and taxation principles. Validation team also confirms that rest of the input parameters are considered appropriately and are in line with the Methodological Tool: Investment Analysis, version 07.0.

Sensitivity analysis:

The Methodological Tool: Investment Analysis, version 07.0 requires the robustness of the conclusion arrived at to be proved through a sensitivity analysis by varying the critical assumptions to a reasonable variation. The project developers have identified Plant Load Factor (PLF), Project cost, Electricity tariff and O&M cost as critical assumptions. These critical parameters constitute more than 20% of either total project costs or total project revenues. The sensitivity analysis reveals that even under more favorable conditions, the IRR without VCUs revenue would not cross the benchmark return as given in the following tables:

D J Malpani

Input Parameters	-10%	Base IRR	+10%
PLF	6.56%	9.30%	12.17%
O&M cost	9.69%	9.30%	8.93%
Project Cost	11.95%	9.30%	7.30%
Tariff	6.56%	9.30%	12.17%

Giriraj Enterprises

Input Parameters	-10%	Base IRR	+10%
PLF	6.69%	9.39%	12.11%
O&M cost	9.70%	9.39%	9.03%
Project Cost	11.91%	9.39%	7.31%
Tariff	6.69%	9.39%	12.11%

Validation Team further carried out its own independent assessment, which reveals that the project would become *non additional* if

For D J Malpani:

- Generation goes up by 28.3%
- Project cost goes down by 25.39%
- O&M cost goes down by -237%
- Tariff goes up by 28.3%

For Giriraj Enterprises:

- Generation goes up by 23.33%
- Project cost goes down by 21.7%
- O&M cost goes down by -203.6%
- Tariff goes up by 23.33%

PP has submitted that such a reduction in project cost (considering the actual cost incurred) or increase in PLF or tariff is highly unrealistic and unlikely to happen considering that the firm PPA has already been signed (and invoices being raised based on the PPA), actual PLFs being achieved by the project is lower than the considered PLFs in the financial analysis. Decrease in O & M cost is such an extent is impossible.

Having regard to the assessment of conformity of additionality demonstration and benchmark selection to the latest version of the guidance issued by CEM EB on the assessment of investment analysis, plausibility and appropriateness of parameters used and correctness of financial calculations, Validation Team concludes that the project scenario is not economically feasible without benefits from VCUs sales.

Common practice analysis:

For the purpose of common practice analysis, project developer has chosen all power generating projects under operation as on the start date of the projects with a capacity ranging from 8.13 MW to 24.38 MW for D J Malpani and 20 MW to 60 MW for Giriraj Enterprises in the respective states. No any projects of different tehnology were identified for the respective bundle in the respective state.

For D J Malpani:

N_{all} = 1 and N_{diff} = 0. Thus F = 1

Thus,
i. F = 1;
ii. $N_{all} – N_{diff}$ = 1 which is less than 3

For Giriraj Enterprises,

N_{all} = 2 and N_{diff} = 0. Thus F = 1

Thus,
i. F = 1;
ii. $N_{all} – N_{diff}$ = 2 which is less than 3
Hence it is concluded that the project activity is not a common practice in the country. The details of the projects, the source of data and the calculations are given in the Joint PD & MR.

In the above background, Validation Team concludes that the project is not a business-as-usual scenario and is additional. The VCS benefits would enable the project to become financially attractive.

3.3.6 Quantification of GHG Emission Reductions and Removals

The equations and choices provided in the applied methodology ACM0002 (version 17.0) /B01/ and all other methodological tools are correctly quoted in the Joint PD & MR /2/. The emission reductions of the bundled project would be calculated using the formulae mentioned in the applied methodology /B01/.

Validation team based on the review of the Joint PD & MR /2/, confirms that the formulae are correctly presented for the determination of emissions reductions. The parameters and equations presented in the Joint PD & MR /2/, as well as other applicable documents, have been compared with the information and requirements presented in the applied methodology /B01/. An equation comparison has also been made to ensure consistency between all the formulae presented in the Joint PD & MR /2/ and ER validation spreadsheet /4/ and the applied methodology /B01/.

Baseline Emissions:

The baseline emissions associated with the applied methodology are calculated as:

$$BEy = EG_{PJ,\,y} * EF_{grid,\,CM,\,y} \quad (1)$$

Where:

BEy= Baseline emissions in year y (tCO_2e/yr)

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

$EF_{grid,\,CM,\,y}$= Combined margin CO_2 emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_2e/MWh)

The estimation of the baseline energy generation was done by using the total installed capacity of the project activity, yearly generation hour and plant load factor. The project activity involves installation of 56.25 MW grid connected power plants in the states of Telangana and Tamilnadu. This was confirmed based on assessment of Joint PD & MR /2/ and ER validation spreadsheet /4/.

Assessment for calculating the value of grid emission factor:

Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors according to the procedure prescribed in the "Tool to calculate the emission factor for an electricity system" version 05.0 /B04/. The data for calculation of the grid emission factor is sourced from CEA data base version 11.0, Govt. of India /B05/ which is the latest available data. The baseline emission factor calculation is checked by the validation team and found that the calculation is transparent and conservative.

For estimating the operating margin emission factor, PP calculated ex-ante Simple Operating Margin (OM). As per the "Tool to calculate the emission factor for an electricity system": for grid power plants, use a 3-year generation-weighted average, based on the most recent data available at the time of submission to the DOE for validation. Hence, PP considered the weighted average of latest net electricity generation and import of electricity and associated emission from CEA data base version 11. The value of operating margin considered as 0.9941 tCO2 /MWh and the value of build margin as 0.9285 tCO2 /MWh (based on the latest one year data). The weighting for both operating margin is taken as 0.75 and build margin as 0.25 for solar power generation projects. Validation team checked the estimation procedure and considered data and found transparent and conservative. Thus, the emission factor for the project is calculated to be EFy = 0.9777 tCO2e/MWh and it is fixed ex ante for the crediting period. Considering this process, combined margin emission factor has been considered and same value is confirmed correct.

Project Emissions:

The current bundled project involves solar technology which is a renewable energy source. Thus, as per §36 the ACM002 (version 17) /B01/ there are no project related emissions associated with the current project.

Thus, PEy = 0.

Leakage Emissions:

As per the section 5.6 of the applied methodology ACM0002 (version 17) /B01/, no other leakage emissions are considered. Thus, the leakage is considered as zero, therefore

LEy = 0

Emission Reductions:

The emissions reductions associated with the applied methodology are calculated as:

ERy = BEy – PEy

ERy = Emission reductions in year y (t CO2e/yr)
BEy = Baseline emissions in year y (t CO2/yr)
PEy = Project emissions in year y (t CO2e/yr)

As PEy = 0

ERy = BEy

The assessment team confirms that the applied methodology and the referenced tools have been applied correctly to calculate baseline emissions and net GHG emission reductions the project crediting period.

3.3.7 Methodology Deviations

Not applicable

3.3.8 Monitoring Plan

The bundled project employs the large-scale approved CDM methodology namely ACM0002 (version 17.0) /B01/ and in accordance with the same, the parameters to be monitored ex-post are given below:

Parameters to be monitored:

Sl. No.	Parameter(s)	Units	Description	Source of monitoring data
1	$EG_{PJ,y}$	MWh	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y	Joint meter readings

Thus, the parameter to be monitored ex-post involves monitoring of net electricity supplied to the grid (calculated from electricity exported and imported) to the grid by the bundled project activity.

As mentioned in the Joint PD & MR /2/, Joint Meter Readings (JMRs) will serve as source of monthly values of net electricity supplied by the bundled project. The electricity generation data recorded in the JMRs shall form the basis of the emission reductions calculations. The assessment team shall review the same for verification of emission reduction results.

In order to measure the net export electricity supplied to the grid two bi-directional tri-vector electricity meters (main meter and check meter) are installed at the respective substations of the two projects and the meters are sealed and under the control of the state electricity boards. The main meter reading is taken jointly on a fixed day of every month for the preceding month at the delivery point (sub-station) and signed by the representatives of state utility and O&M personnel of the power plant. In the event of failure of main meter, the check meter will be used in monitoring the electricity data.

The calibration of all electricity meters is under the jurisdiction of the state electricity board and shall be conducted as per the existing industry standards. The calibration frequency for the electricity meters installed under the current bundled project is 5 years.

Based on the review of the Joint PD & MR /2/, the assessment team confirms that detailed monitoring procedures, monitoring structure, management team, monitoring items and functions have been clearly demonstrated.

All electricity data will be archived electronically and further maintained for the entire crediting period plus two years.

Based on the above assessment the validation team concludes that the PP is capable to implement the monitoring plan and hence confirms compliance of VCS guidelines /B02/ and the applied methodology /B01/.

3.4 Non-Permanence Risk Analysis

Not applicable

4 SAFEGUARDS

4.1 No Net Harm

No potential negative environmental and socio-economic impacts have been identified by the project proponent. The bundled project activity promotes environmental and socio-economic well-being as it results in zero GHG emissions due to installation and operation of clean, renewable energy technology for electricity generation.

Moreover, No Net Harm analysis has not been carried out as is not mandatory due to the fact that the date of contract signing for validation is prior to 19/04/2017. The assessment team reviewed the joint validation and verification contract to confirm the same.

This is as per the requirements laid out in Appendix-1 of the VCS Standard (version 3.6) /B02/ and deemed acceptable to the validation team.

4.2 Environmental Impact

The current bundled project activity is the installation and operation of solar power plants which would result in generation of clean, renewable energy. Thus, the project activity is not expected to have any significant adverse environmental impacts. Moreover, the project activity would help promote environmental and socio-economic well-being in the region. Also, there is no mandatory legal requirement in the host country to carry out environmental impact assessment of such projects types. The assessment team reviewed the official government notification in the form of 'Schedule I of the EIA notification S.O.1533 (E)' dated 14th September 2006 and further affirmation provided by MOEF in the form of 'OM J-11013/41/2006 - IA II (I)' dated 13th May 2011 to confirm that solar power projects are not included in the list of project activities for which EIA in mandatory.

Thus, no EIA has been carried out by the PP which is deemed acceptable to the validation team.

4.3 Local Stakeholder Consultation

No Local Stakeholder Consultation has been carried out as is not mandatory due to the fact that the date of contract signing for validation is prior to 19/04/2017. The assessment team reviewed the joint validation and verification contract to confirm the same.

This is as per the requirements laid out in Appendix-1 of the VCS Standard (version 3.6) /B02/ and deemed acceptable to the validation team.

4.4 Public Comments

The current bundled project has not undergone Public Comment period as is not mandatory due to the fact that the date of contract signing for validation is prior to 19/04/2017. The assessment team reviewed the joint validation and verification contract// to confirm the same.

This is as per the requirements laid out in Appendix-1 of the VCS Standard (version 3.6) /B02/ and deemed acceptable to the validation team.

5 VERIFICATION FINDINGS

5.1 Accuracy of GHG Emission Reduction and Removal Calculations

The data and parameters used to calculate the GHG emission reductions and removals have been listed below:

Parameters with Default Values (ex-ante parameters):

Parameter/01/	Description/01/	Value/01/	Unit/01/	Source/01/
$EF_{grid,OM,y}$	Operating Margin CO_2 emission factor in year y	0.9941	tCO_2/MWh	Calculated as per "Tool to calculate the emission factor for an electricity system (version 05.0.0)//"
$EF_{grid,BM,y}$	Build Margin CO_2 emission factor in year y	0.9285	tCO_2/MWh	Calculated as per "Tool to calculate the emission factor for an electricity system (version 05.0.0)//"
$EF_{grid,CM,y}$	Combined Margin CO_2 emission factor in year y	0.9777	tCO_2/MWh	Calculated as per "Tool to calculate the emission factor for an electricity system (version 05.0.0)//"

Parameter(s) monitored ex-post:

Monitoring Parameter Requirement	Assessment by the DOE
Data / Parameter:	$EG_{PJ,y}$
Measuring frequency/Time Interval:	Continuous monitoring, hourly measurement and at least monthly recording
Reporting value:	D J Malpani: 51471.02 MWh Giriraj Enterprises: 97239 MWh Total: 148710.02 MWh
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	The monitoring of this parameter has been done through recording of electricity (import and export) data by bi-directional electricity meters at the respective local sub-stations. The electricity data has been recorded in monthly JMR reports /16/ and Invoices issued to state utility /17/. The same are maintained by PP and the state utility. The generation data has been exported and collated in excel spreadsheets /15/ provided to the assessment team.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Yes, the accuracy of the electricity meters (monitoring equipment) is as stated in the Joint PD & MR /2/.
Calibration frequency /interval: Is it monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Yes, the calibration frequency is 5 years which is in conformance with national standards.
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Yes, the calibration interval is in line with the monitoring plan provided in the Joint PD & MR /2/.
Company performing the calibration (internal or external calibration):	External calibration. The calibration of all electricity meters is under the jurisdiction of the state electricity board and shall be conducted as per the existing industry standards.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is (are) calibration(s) valid for the whole reporting period?	Yes, calibration is valid for the whole reporting period.
If applicable, has the reported data been cross-checked with other available data?	Yes, the assessment team cross-checked the electricity data provided in the ER verification spreadsheets// with the monthly JMR reports /16/ and Invoices issued to state utility /17/.
How were the values in the monitoring report verified?	Through review of the ER verification spreadsheets /15/ provided by PP. In addition, the verification team performed further cross checks with monthly JMR reports /16/ and Invoices issued to state utility /17/.

Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures correct transfer of data and reporting of emission reductions and all necessary QA/QC procedures are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

The equations for calculation of emission reduction as provided in the Joint PD & MR /2/ and confirmed with the applied methodology ACM0002 (version 17.0) /B01/ have been checked and found to be correct. The values as provided in the Joint PD & MR /2/ have been compared with ER verification sheet /15/ and raw values from monthly Joint Meter Reading reports /16/ and Invoices issued to state utility /17/ to ensure that no manual transposition errors between data sets have occurred. The assessment team confirms that that all electricity generation values are matching between the above three documents. Moreover, the formulae applied in the ER spreadsheet /15/ were also reviewed and found to be consistent with the applied methodologies.

The assessment team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence and calculations are done in accordance with the formulae laid out in the applied methodology ACM0002 (version 17.0) /B02/ and requirements of the monitoring plan.

The total number of emission reductions for the monitoring period is 145,393 tCO_2e.

5.2 Quality of Evidence to Determine GHG Emission Reductions and Removals

The quality of supporting documents that are provided by the PP as evidence is adequate. Raw values from Joint Meter Reading reports /16/ and Invoices issued to state utility /17/ are provided, which tallies with the data provided in the ER verification spreadsheet /15/.

Competent employees are recruited for the management and operation of the project. The quality of supporting evidences submitted to DOE for verification is adequate and found to be verifiable. Joint Meter Reading reports /16/, Invoices issued to state utility /17/ and other supporting documents related to quality and maintenance were checked by the assessment team to confirm the authenticity of the documents and to check the correctness of the calculations. The assessment team for the records and future reference also obtains copies of these documents. The detailed information flow with the roles and responsibilities of the individuals and the monitoring system have been discussed and found to be appropriate.

Based on the above, the assessment team confirms the sufficiency and appropriateness of the quality of evidence provided by the PP to determine the GHG reductions and further deems them to be acceptable.

6 VALIDATION AND VERIFICATION CONCLUSION

CCIPL has performed a joint validation and verification of the VCS bundled project activity “Bundled Solar Power Project by D.J. Malpani and Giriraj Enterprises” in India.

The joint validation and verification process was performed on the basis of all guidance and criteria as provided in VCS Standard (version 3.6), VCS Program Guide (version 3.6), VCS Validation and Verification Manual (version 3.2) and Registration & Issuance Process (version 3.7) /B02/.

The conclusions of validation and verification process can be individually summarised as follows:

Validation Conclusion:

The bundled project activity provides the information in Joint PD & MR /2/ as required by VCS Standard, version 3.6 /B02/ and Validation and Verification Manual, version 3.2 /B02/ and in CCIPL’s opinion meets the requirements of the applied baseline and monitoring methodology, ACM002 (version 17.0) /B01/ and is likely to achieve the estimated emission reductions. The validation has been performed using a risk-based approach, as described above. The expected emission reductions from the project activity during the course of its crediting period (ten years) will be 930,220 tCO2e.

CCIPL concludes the validation with a positive opinion and confirms that the VCS Project Activity "Bundled Solar Power Project by D.J. Malpani and Giriraj Enterprises" in India, as described in the Joint PD & MR /2/ meets all applicable VCS requirements, including those specified in the CDM Project Standard /B03/, relevant methodologies, tools and guidelines.

The selected baseline and monitoring methodology ACM002 (version 17.0) /B01/ is applicable to the project and correctly applied. CCIPL therefore requests the registration of the project as a VCS project activity.

Verification Conclusion:

- All components of the project are implemented and installed as planned and described in the Joint PD & MR /2/ and the project activity conforms with the verification and validation criteria for project and their GHG emission reductions or removals set out in the VCS Standard (version 3.6) /B02/.
- The monitoring plan is in accordance with the applied approved methodology, i.e. ACM002 (version 17.0) /B01/ and monitoring plan as sought out in the Joint PD & MR /2/.
- The monitoring system is in place and functional. The project has generated verifiable GHG emission reductions.

As the result of the verification of VCS VERs, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. CCIPL herewith confirms that the project has achieved emission reductions in the below mentioned reporting period. The project complies with the verification criteria for projects and their GHG emissions reductions or removals set out in VCS Standard (version 3.6) /B02/.

Verification period: From 31st March 2015 to 25th Feb 2017 (both days included)

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

Year	Baseline emissions or removals (tCO_2e)	Project emissions or removals (tCO_2e)	Leakage emissions (tCO_2e)	Net GHG emission reductions or removals (tCO_2e)
2015	34,012	0	0	34,012
2016	93,647	0	0	93,647
2017	17,734	0	0	17,734
Total	145,393			**145,393**

CCIPL confirms a positive verification opinion confirming that the bundled project complies with the applicable VCS requirements, thus recommending the project for issuance.

APPENDIX 1: ABBREVIATIONS

BE	Baseline emissions
CAR	Corrective action request
CCIPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification
DOE	Designated Operational Entity
ERs	Emission reductions
FAR	Forward action request
GHG	Greenhouse gas
kW	Kilo Watt
kWh	Kilo Watt hour
MP	Monitoring plan
MR	Monitoring Report
MW	Mega Watt
MWh	Mega Watt hour
NA	Not applicable
O&M	Operation & Maintenance
PD	Project Description
PD	Project description
PP	Project proponent
PS	Project Standard
QA/QC	Quality Assurance / Quality Control
tCO_2e	Tonne of carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	VCS Association
VCU	Verified Carbon Unit
VVM	Validation and Verification Manual
VVS	Validation and Verification Standard

.

APPENDIX 2: FINDINGS LOG

Finding	**CAR 01**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *(DOE)*	The following findings are raised for compliance with the Joint PD & MR completing template: 1. In section 1.2 PP has not stated whether the project is a grouped project. 2. In section 1.4, the roles and responsibility of the entity has not been stated.		
Corrective Action or clarification #1 *(PP shall write a detailed and clear corrective action or further information for clarification as per finding)*	1. Section 1.2 of revised PD has mentioned that project activity is not a grouped project activity. 2. Section 1.4 of revised PD is completed as per VCS Template.		
DOE Assessment #1 *The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	PP has submitted revised Joint PD & MR in compliance with the template. Hence the CAR is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed		

Finding	**CL 01**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *(DOE)*	In section 1.6 of the Joint PD & MR, date of commissioning for Giriraj Enterprises does not match with the commissioning certificate submitted.		
Corrective Action or clarification #1 *(PP shall write a detailed and clear corrective action or further information for clarification as per finding)*	The section 1.6 of revised VCS PD has mentioned correct commissioning date for Giriraj Enterprises as per commissioning certificate.		
DOE Assessment #1 *The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	COD has been corrected in the revised PD & MR for Giriraj as 23/09/2015. CL is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed		

Finding	**CL 02**		
Classification	☐ CAR	☒ CL	☐ FAR

Finding	CL 02
Description of finding *(DOE)*	PP is requested to provide the break-up of the emission reductions for both the bundles in the Joint PD & MR.
Corrective Action or clarification #1 *(PP shall write a detailed and clear corrective action or further information for clarification as per finding)*	The section 1.7 of VCS PD has mentioned the ER estimation for both projects separately and total estimated ERs for both projects are mentioned in table. Also section 3.1 of VCS PD has mentioned both sites estimated ER separately.
DOE Assessment #1 *The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	In the revised Joint PD & MR PP has provided the break up of the ERs for both the bundles. CL is cloed.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	CL 03		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *(DOE)*	In section 1.8 of the Joint PD & MR, PP needs to provide further details of the technologies used in both the bundles along with evidence.		
Corrective Action or clarification #1 *(PP shall write a detailed and clear corrective action or further information for clarification as per finding)*	The technical specifications for both bundles like solar module configuration, capacity is mentioned in revised VCS PD.		
DOE Assessment #1 *The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	PP has provided the technical details of the project in the revised document. CL is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed		

Finding	CL 04		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *(DOE)*	The methodological tool “Investment Analysis” referred in the Joint PD & MR is not the latest version available on UNFCCC website.		

Finding	CL 04
Corrective Action or clarification #1 *(PP shall write a detailed and clear corrective action or further information for clarification as per finding)*	The latest version of methodological Tool "Investment Analysis" version 7 has been used in VCS PD. However the default values for cost of equity has been taken from the guidance on investment analysis available at the time of decision made.
DOE Assessment #1 *The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	PP has adopted the latest version of the methodolofical tool Investment Analysis, verson 7. However, the default value for return on equity has been adopted from version 5 of the tool which was available at the time of decision making for the project activity which is deemed acceptable. CL is closed.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	CL 05		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *(DOE)*	PP is requested to provide all the supporting for the financial analysis in line with the methodological tool "Investment Analysis" version 07.0. Also evidence for PLF is to be provided in line with the PLF guideline.		
Corrective Action or clarification #1 *(PP shall write a detailed and clear corrective action or further information for clarification as per finding)*	The supporting for all input assumption has been submitted to DOE. Also third party DPR for each plant is submitted for PLF in line with PLF guideline.		
DOE Assessment #1 *The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	PP has submitted the required supporting documents for financial analysis. CL is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed		

Finding	CL 06		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *(DOE)*	PP is requested to provide the common practice analysis in line with the methodological tool "Common practice" version 03.1 in a transparent manner along with evidence.		
Corrective Action or clarification #1 *(PP shall write a detailed and clear corrective action or further information for clarification as per finding)*	The common practise analysis has been revised in VCS PD in transparent manner.		

Finding	**CL 06**
DOE Assessment #1 *The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Common practice analysis has been revised in line with the methodological tool "Common practice" version 03.1. The CL is closed.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed

Finding	**CL 07**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *(DOE)*	PP is requested to provide the energy meter details in the Joint PD & MR used during the monitoring period.		
Corrective Action or clarification #1 *(PP shall write a detailed and clear corrective action or further information for clarification as per finding)*	The energy meter details are provided in VCS PD and MR.		
DOE Assessment #1 *The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Energy meter details have been provide in the Joint PD & MR. CL is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed		

Finding	**CL 08**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *(DOE)*	In the "ER spread sheet" for the monitoring period, the annual ex-ante estimated emission reductions values for the two bundles do not match with the "EF and ER Estimation" spread sheet.		
Corrective Action or clarification #1 *(PP shall write a detailed and clear corrective action or further information for clarification as per finding)*	In revised ER spreadsheet, the ex-ante estimated emission reductions are correctly mentioned and actual ERs are compared with estimated ERs.		
DOE Assessment #1 *The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	PP has submitted revised spread sheets with consistent values. CL is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed		

Finding	CL 09		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *(DOE)*	In the IRR sheets provided for the two bundles, following clarifications are requested: 1. PP is requested to provide the basis of land cost consideration. 2. PP is requested to provide the basis and correctness of usage of the degradation rate. 3. PP to confirm whether the tariff considered is taking accelerated depreciation benefit into consideration? 4. PP is requested to provide the basis of interest rate 13% on the loan amount/ 5. Repayment of principal on loan amount has not been considered for the full amount.		
Corrective Action or clarification #1 *(PP shall write a detailed and clear corrective action or further information for clarification as per finding)*	1. The Land cost is considered as 0.5 million INR per hectare which is too lower side as compared with CERC commission which states 2.5 million per MW. 2. The degradation is taken as 0.3% which is as per performance guarantee of Solar manufacturers. They guarantee of 80% generation at the end of 25 years, thus 20% reduction over 25 years of time. Thus 0.3% degradation per year is appropriate. 3. PP has considered accelerated depreciation for the IRR sheets. 4. The interest rate is BPLR of bank of Baroda as PP have tie up with Bank of Baroda for all their renewable projects and they are taking loan from Bank of Baroda bank only. Thus BPLR of bank of Baroda is considered as interest rate for the project activity. 5. Loan repayment schedule has been corrected in revised IRR sheets.		
DOE Assessment #1 *The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	1. The project cost is inclusive of the land cost. PP has bifurcated the land cost just for the estimation of depreciable project cost and salvage value. The explanation provided by the PP for the land cost is acceptable. 2. Ok. Validation team considers the consideration of 0.3% degradation rate as conservative. 3. PP has adopted accelerated depreciation in the revised financial analysis submitted. 4. The interest rate considered by PP is acceptable. 5. Loan repayment has been revised in the IRR sheets. The CL is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the next periodic verification ☐ Outstanding finding (not closed) ☒ The finding is closed		

APPENDIX 3: COMPETENCE CERTIFICATES

Carbon Check

Carbon Check (India) Private Ltd.

Sanjay Agarwalla

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

Validator	☒	**Team Leader**	☒	**Technical reviewer**	☒
Verifier	☒	**Technical Expert**	☒	**Local Expert**[1]	☒

In the following Technical Areas:

TA 1.1	☒	**TA 3.1**	☒	**TA 5.2**	☒	**TA 9.2**	☒	**TA 13.2**	☐
TA 1.2	☒	**TA 4.1**	☒	**TA 8.1**	☐	**TA 10.1**	☐	**TA 14.1**	☐
TA 2.1	☒	**TA 5.1**	☒	**TA 9.1**	☒	**TA 13.1**	☒		

Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
CEO

Date of Approval
23/12/2016

Valid Till
22/12/2017

Revision History of the Document

26/12/2014	Initial Adoption
24/12/2015	Annual Revision
20/01/2016	Interim Revision for office address change
23/12/2016	Annual Revision

[1]India

CARBON CHECK (INDIA) PRIVATE LIMITED
Registered in India: U74930DL2012PTC232495
Regd. Off: 2071/38, 2nd Floor, Naiwala, Karol Bagh, New Delhi - 110005
Corporate off: G 49 & 50, 3rd Floor, Sector – 3, NOIDA (Uttar Pradesh) – 201301
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Kranav Sharma

has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 06.0):

For following functions:

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Verifier	☐	**Technical Expert**	☒	**Local Expert**[1]	☒

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TA 1.2	☒	**TA 4.1**	☐	**TA 8.1**	☐	**TA 10.1**	☐	**TA 14.1**	☐
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Mr. Vikash Kumar Singh
Compliance Officer

Mr. Amit Anand
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Carbon Check (India) Private Ltd.

Amit Anand

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TA 2.1	☐	**TA 5.1**	☐	**TA 9.1**	☐	**TA 13.1**	☒		

Vikash

Mr. Vikash Kumar Singh
Compliance Officer

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[1]India, South Africa

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