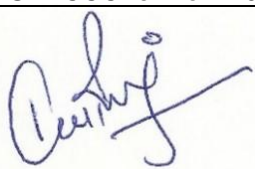




**Verification and certification report form for
CDM project activities
(Version 03.0)**

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	20 MW Solar Project in Sanwreej, Jodhpur, Rajasthan UNFCCC ref.No-10392
Scale of the project activity	<input checked="" type="checkbox"/> Large-scale <input type="checkbox"/> Small-scale
Version number of the verification and certification report	03
Completion date of the verification and certification report	14/11/2020
Monitoring period number and duration of this monitoring period	Monitoring period number-01 01/08/2018 – 29/02/2020; including first and last days of monitoring period
Version number of the monitoring report to which this report applies	05
Crediting period of the project activity corresponding to this monitoring period	Renewable crediting period Length: 07 years (01/08/2018 to 31/07/2025)
Project participants	Janardan Wind Energy Pvt. Ltd.
Host Party	India
Applied methodologies and standardized baselines	Selected Methodology: ACM0002 Version 17.0 – “Grid-connected electricity generation from renewable sources” Selected standardized baseline: N/A
Mandatory sectoral scopes	Sectoral scope : 1- Energy industries (renewable - / non-renewable sources)
Conditional sectoral scopes, if applicable	Not applicable
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	55,238 tCO ₂ e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	61,273 tCO ₂ e
Name and UNFCCC reference number of the DOE	Earthood Services Private Limited UNFCCC ref.No- E-0066
Name, position and signature of the approver of the verification and certification report	 Dr. Kaviraj Singh Managing Director

SECTION A. Executive summary

The project activity involves electricity generation by solar energy and supplying the generated electricity to the Indian Grid. The project being a renewable energy generation activity, it leads to removal of fossil fuel dominated electricity generation. The project activity results in reductions of greenhouse gas (GHG) emissions that are real, measurable, and verifiable and plays beneficial role in the mitigation of climate change.

The project activity involves electricity generation by solar power and supplying the same to the Indian grid. This is renewable energy generation which will replace the fossil fuel dominated grid connected electricity generation. The project activity involves the installation of 20 MW_{AC} (23.9976 MWp DC) solar power project Villages: Sanwreej, Teshil: Phalodi, District: Jodhpur, State: Rajasthan. in Jodhpur district of Rajasthan, India. The project activity was commissioned in two phases ,first phase commissioned on 30/03/2017 and second phase on 18/04/2017 as verified against the commissioning certificates/16/.

The project is fully functional and the assessment team verified this through the latest photographs/21/ of online monitoring system (SCADA), videos recording, generation records/15/ and interaction with site personal during the con-call. The assessment team confirms that the total emission reductions achieved under this monitoring period 01/08/2018 – 29/02/2020 (including both days) is 61,273 tCO_{2e}.

The basic details of the project activity are mentioned below:

Project title	20 MW Solar Project in Sanwreej, Jodhpur, Rajasthan
UNFCCC registration number	10392
ESPL Ref.No-	CDM.VER.20.17
Date of registration	12/10/2017
Sectoral scope	1 - Energy industries (renewable/ non-renewable sources).
Methodology/ies applied	Approved consolidated baseline methodology ACM0002, Version 17.0
Project participant	Janardan Wind Energy Pvt. Ltd.
Location of Project Activity	Jodhpur district, Indian State of Rajasthan
Geographical coordinates	Latitude: 26.98° N, Longitude: 72.25° E

Scope of verification:

The scope of the verification was limited to the monitoring period covered under the current monitoring period 01/08/2018 to 29/02/2020 of the registered CDM PA “20 MW Solar Project in Sanwreej, Jodhpur, Rajasthan” . The verification is the periodic independent review and *ex post* determination by Earthood of the monitored reductions in GHG emissions that have occurred as a result of the registered CDM project activity during the defined monitoring period.

The scope of the verification is to establish/verify that:

- The project activity has been implemented and operated as per the revised PDD, and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- The monitoring report and other supporting documents provided are complete in accordance with the latest applicable version of the completeness checklist for requests for issuance of CERs, verifiable, and in accordance with applicable CDM requirements;
- The actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan, any revised approved monitoring plan, the approved methodology including applicable tool(s) and/or, where applicable, the approved standardized baseline;
- The data recorded and stored as per the monitoring methodology including applicable tool(s) and, where applicable, the standardized baseline.

Verification Process:

The verification process involves an agreement with project participant for verification scope and defined monitoring period in accordance with latest valid CDM PS. The monitoring report was published on 14/04/2020 and verification was performed as per latest valid CDM Standards i.e., CDM PS, VVS and latest valid CDM PCP for PAs/1,2 & 3/. The desk review, interview (remotely), reporting of findings, preparation of

draft verification report followed by independent technical review (internal quality check) were performed as stated in further sections of this report.

Conclusion

Earthood has performed the first verification of the CDM project “20 MW Solar Project in Sanwreej, Jodhpur, Rajasthan” having UNFCCC Ref. Number 10392. The verification includes confirming the implementation of the project as per description in the PDD/5/, the monitoring plan of the PDD and the application of the monitoring methodology as per ACM0002. ver. 17 - Grid-connected electricity generation from renewable sources /12/. Earthood confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. The emission reductions from the CDM project activity 10392 “20 MW Solar Project in Sanwreej, Jodhpur, Rajasthan” in India during the period 01/08/2018 to 29/02/2020 (first and last days included) amount to 61,273 tCO₂e.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader and Local Expert	EI	Soni	Ravi Kant	Central office	Y	NA	Y	Y
2.	Verifier	EI	Soni	Ravi Kant	Central office	Y	NA	N	Y
3	Technical Expert and Meth Expert	EI	Soni	Ravi Kant	Central office	Y	NA	Y	Y

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Guleria	Shifali	Central Office
2.	Expert to TR	IR	Guleria	Shifali	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. Application of materiality

C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	

1.	Omissions and misstatements in data transfer from hand written data in the JMR to ER calculation sheet.	Low	Ineffective quality control of data transfer due to unclear QA/QC procedure.	<p>Quality procedure followed at site to be checked.</p> <p>It is to be demonstrated by the PP that how to transfer data and how this can be crosschecked.</p> <p>Relevant site personnel has been interviewed to confirm whether procedure is actually conducted.</p>
2.	Missing data due to failure of measurement equipment	Low	The monitoring plan defines emergency procedures in case malfunctioning or failure of meter. Further, check meters are also installed onsite.	<p>It is to be checked if related main meters are installed as per monitoring plan.</p> <p>Relevant site personnel has been interviewed to confirm whether the emergency procedure is known to them.</p> <p>To be checked if the equipment is malfunctioning and the accuracy and reliability of data for the concerned period cannot be ensured, the relevant emission reductions have been claimed or not.</p>

C.2. Consideration of materiality in conducting the verification

In accordance with CDM VVS for PAs, Version 02.0 para 326 the prescribed thresholds for materiality for CDM PAs are as under;

Emission Reductions (tCO ₂ e)/year	500,000 or more	300,001 to 499,999	300,000 or less	Small Scale CDM PAs	Micro Scale CDM PAs
Materiality Threshold (para 326)	0.5%	1.0%	2.0%	5.0%	10.0%

The applicable materiality threshold is 2% as project activity.

Particulars / Monitoring Report	MR Version (Public)	MR Version (Revised/Final)
Emission Reductions Achieved (tCO ₂ e) in this monitoring period	59,957 tCO ₂ e	61,273 tCO ₂ e
Applicable Threshold (%) as per para 326(c) of CDM VVS for PAs Version 02.0	2%	2%

The verification team has identified the impact of errors observed and those were corrected by PP during verification for all monitoring parameter at individual level. The extrapolated impact on ERs is also provided for parameters individually and in aggregated manner in the end.

Monitored Parameter (Symbol / Description)	Reporting Frequency	Number of Discrete Data (Total)	Sample selected for verification	Type of error identified	Impact on ERs	
					ERs impacted (Sample)	ERs impacted (Population based on extrapolation)
EG _{PJ,y}	Monthly	19(100%)	19 (100%)	Value of ERs achieved in the monitoring period as reported in the	No impact.	No impact

				published MR was wrongly calculated till March 2020. However in the final ER sheet the data till February 2020 is considered. Value of the parameter $EG_{PJ,y}$ for the month Jan 2020 & Feb 2020 were wrongly reported in the ER sheet.		
--	--	--	--	--	--	--

Based on the above table it can be confirmed that the applicable materiality threshold is not breached for the registered PA as per CDM VVS. Complete set of data were verified and no errors were identified during the verification of data from their respective source.

SECTION D. Means of verification

D.1. Desk/document review

A desk review was conducted by the verification team that included

- A review of the data and information presented to verify its completeness;
- A review of the registered monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- An 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;

A complete list of documents/evidences reviewed is included as Appendix 3.

D.2. On-site inspection

Due to the current situation with the global COVID-19 pandemic scenario and country wide lock down in India, an on-site inspection has not been performed by the assessment team. As per the communication received from CDM Executive Board regarding the relaxation for mandatory site visits by DOEs for a period of three months (23 March to 23 June 2020) and further communication received on 24/06/2020 to extend the relaxation till 31/12/2020, due to COVID-19 pandemic, it is recommended that site visit should be postpone as a result of the COVID-19 pandemic. It is to be noted that the MR was published at UNFCCC website on 14/04/2020, hence the site visit could have been conducted after 21 days of publication.

The assessment team had decided to suspend the physical site visit due country wide lock down in India and travel restrictions from 25/03/2020 onwards and extended up to 30/06/2020.

The DOE has determined that the physical site visit neither be postpone nor conducted in the current circumstances due to COVID-19 pandemic. As recommended by CDM EB/23/ via emails dated 20/03/2020 and 24/06/2020, justification for the approach being followed by the DoE is provided below:

- The corona virus pandemic is "accelerating" in India and the total number of cases in the country now stands at 1,004,383 and 25,605 deaths, the Worldometer indicates in its latest data update on 16/07/2020.
(Source: <https://www.worldometers.info/coronavirus/country/india/>)
- The Project participant has signed the ERPA with buyer and as per the contract the credits shall be delivered on or before 31/01/2021, hence it is not possible to postpone the site visit for indefinite period and the contract might be terminated in case if the credits not delivered as per the timeline agreed in the contract.
- The project activity is located in Jodhpur district in Rajasthan state in India and as per the state government notification, passengers arriving in Rajasthan will have to follow 14 days of home quarantine, wherein those coming for business and those with a negative COVID-19 report will be allowed to move around after seven days. (source: <https://swachhindia.ndtv.com/flying-amid-covid-19-here-are-the-quarantine-rules-in-different-states-45209/>)

4. There are post registration changes identified during the current monitoring period and combined request for approval of a post-registration change with a request for issuance of CERs (the issuance track) is being submitted. Since the on-site visit can not be conducted, hence the assessment team has risen a FAR accordance with the guidance provided under paragraph 36 of VVS for PAs version 02.0. The verifying DoE shall review the project implementation in line with the approved PDD including the post registration changes, during the next verification of the proposed CDM project activity.

Considering health and safety a top priority, it is justified to not conduct the physical site visit for verification audit. Since the site visit cannot be postponed but is not conducted due to the COVID-19 pandemic, hence the DOE has used standard auditing techniques for verification as referred to in sections 7.1.3 and 9.1.3 of the VVS for PAs version 02.0.

The source documents/alternative means of verification/validation referred by the assessment team to validate the particular aspect of verification are summarized in the below table, however detailed description of the same is provided under relevant sections of this report.

Assessment criteria	Means of verification/source documents	Assessment opinion
Description of project activity	Commissioning certificate /16/ PPA signed with NTPC /19/ Telephonic interview with site personnel on 15/06/2020.	The information's with reference to project capacity, technology, plant equipments and commissioning dates as provided in section A.2 and B.1 of MR are found consistent with the documents.
Compliance of the project implementation with the registered project design document	Monthly meter reading reports issued by RVPNL /15/. Connectivity and installation reports/24/ Geographical co-ordinates of project activity verified through website ¹ Photograph of equipments installed at site and screen shots of SCADA system /21/ Telephonic interview with site personnel on 15/06/2020	Monthly meter reading reports issued by RVPNL indicate the following information: Identification of the DISCOM substation to which the project is connected, Capacity of project, serial numbers of energy meters used for monitoring and name of project participant. Location of project is verified through Google Map and found consistent with revised PDD. Photograph of equipments and screen shots of SCADA system are verified to check the operational status of project activity. Grid connectivity of the project is confirmed through the PPA. All the information's regarding the project implementation as discuss above are further verified through revised PDD and found

¹ <https://www.gps-coordinates.net/>

		consistent.
Compliance of the registered monitoring plan with applied methodologies and standardized baselines	<p>Telephonic interview with site personnel on 15/06/2020</p> <p>PPA signed with NTPC /19/</p> <p>Monthly meter reading reports issued by RVPNL /15/.</p> <p>Invoices raised by project developer to NTPC /14/</p>	<p>The organizational structure, responsibilities and competencies of the personnel confirmed through telephonic interview.</p> <p>Frequency of monitoring of parameters listed under approved monitoring plan is verified through meter reading reports /Invoices.</p> <p>The methods used for measuring, recording, storing, aggregating, and reporting the data on monitored parameters are verified through PPA and telephonic conversations with site personnel.</p> <p>Procedure for data uncertainty, emergency preparedness, roles and responsibility, operational and management structure are mentioned in the MR is confirmed during the con-call /21/ and found satisfactory.</p>
Compliance with the calibration frequency requirements for measuring instruments	<p>Calibration certificates of meters/17/</p> <p>PPA signed with NTPC /19/.</p> <p>Photograph of energy meters indicating sr. No, accuracy class, make /21/.</p> <p>Central Electricity Authority(Installation and Operation of Meters) Regulations/22/</p>	<p>Calibration frequency and energy meter specifications (Sr.No, make accuracy class) is verified through calibration certificates and further verified through photographs and found consistent.</p> <p>Responsibility of calibration and maintenance of energy meters is solely under control of NTPC; this is verified through the PPA.</p>
Assessment of data and calculation of emission reductions or net removals	<p>Monthly meter reading reports issued by RVPNL /15/.</p> <p>Invoices raised by project developer to NTPC /14/</p> <p>CEA CO₂ Baseline Database for the Indian Power Sector /22/</p>	<p>Monthly values of monitoring parameter used in ER calculation are verified through credit reports and cross verified with the invoices.</p> <p>Methods, formulae and emission factor for calculating baseline emissions have been followed are in accordance with the applied methodology and as described in the approved CDM validation report /10/.</p>

It is noteworthy that no sampling plan for verification is applied as 100% data is verified for the current monitoring period. Most of the reference document referred by the assessment team (above table) are either issued by state utility (RVPNL), an external government agency, hence is deemed authentic.

Based on the above assessment it can be concluded that the assessment team has verified sufficient appropriate audit evidences, to reduce audit risk to an acceptably low level as requisite to achieve reasonable level of assurance for the current verification.

Duration of on-site inspection: DD/MM/YYYY to DD/MM/YYYY				
No.	Activity performed on-site	Site location	Date	Team member
1.	NA			
...				

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Kodali	Praveen	Assistant Manager (renewable) JWEPL	15/06/2020	Electricity Generation Records (monthly energy statements, Invoices and break up sheets), Reliability & accuracy of readings considered for emission reduction calculations, Calibration procedure Changes to the project design of the registered project.	Ravi Kant Soni
2.	Yadav	Vikash	Consultant (Infinite Soulution)	15/06/2020	Monitoring and measuring system, Collection of measurements, Observations of established practices and Data Verification of monitoring parameters Changes to the project design of the registered project.	Ravi Kant Soni

D.4. Sampling approach

No sampling approach has been applied by the verification team as all the monthly reported figures in the MR/06/ and the ER sheet/08/ were checked from the actual records.

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	-	-	-
Compliance of the project implementation and operation with the registered PDD	-	-	-
Post-registration changes	-	CAR #1	-
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	-	-
Compliance with the calibration frequency requirements for measuring instruments	-	CAR #2	-
Assessment of data and calculation of emission reductions or net removals	-	CAR #3	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	CL#1 (missing	-	

	documents)-		
Total	1	3	-

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	The monitoring report form used is CDM-MR-FORM version 07.0, which was the appropriate form, and the latest version available at the time of verification. All the sections of the form were filled as per the guidelines and gave all the relevant details.
Findings	No issues identified and hence finding was not raised for this section.
Conclusion	The monitoring report is found to be complying with the monitoring report form.

E.2. Remaining forward action requests from validation and/or previous verifications

>> This is first verification of the project activity. There are no FAR(s) from validation /10 /that need to be closed during this verification.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	<p>This project activity is the generation of electricity from solar PV supplying the generated electricity to the Indian grid. The project is located in Jodhpur district of Rajasthan state in India and has an installed capacity of 20 MW_{AC} (23.9976 MW_P DC). This was confirmed from document review of commissioning certificate /16/.</p> <p>The project activity was commissioned in two phases, commercial operation of the first phase of project activity had been started on 30/03/2017 and for second phase on 18/04/2017, which was verified vide commissioning certificate/16/.</p> <p>The technical specifications of equipments (Solar PV module, Inverter, Transformers) were verified through the nameplate details (imprinted/placed at the equipment) as indicated at the photographs and videos recordings provided by the project participant and found to be consistent with the details provided in the revised PDD /09/.</p> <p>The project is located between latitude 26.98°N and longitude 72.25° E. Location of the project was verified through the website (https://www.gps-coordinates.net/) and found consistent with the same mentioned in the revised PDD and MR.</p> <p>The project activity having dedicated metering arrangement at project site. There is one set of energy meters (Main and check meter) installed for phase-1 and phase-2 at site and the electricity exported and imported by the project activity is continuously monitored through these meters.</p> <p>The project activity is further connected at 132 kV DISCOM substation where the generated electricity fed to the Indian grid. There is one set of meter (Main and Check) is installed at substation end also and known as billing meters.</p> <p>The PP has signed the power purchase agreement (PPA) with NTPC Limited, which is a government entity responsible for implementation of grid connected solar PV project under the scheme "National Solar Mission".</p> <p>The National Solar Mission is an initiative of the Government of India and State Governments to promote solar power. The mission is one of the several policies of the National Action Plan on Climate Change. Electricity generated by the project activity is being purchased by NTPC Vidyut Vyapar Nigam Limited (NVVN), which is eventually sold to state DISCOM /19/.</p> <p>The project was registered as a CDM project on 12/10/2017 /13/. The PP has considered a renewable crediting period for the project activity from 01/08/2018 to 31/07/2025. This is the first verification of the project activity covering the period from 01/08/2018 to 29/02/2020.</p> <p>The project activity is fully functional and the assessment team verified this through</p>
------------------------------	--

	<p>the monthly meter reading reports, actual photographs/video recording of online monitoring system /21/. In addition to the con-call with site personnel and consultant, the following documents have been reviewed by the assessment team to verify the project implementation:</p> <ol style="list-style-type: none"> Commissioning certificate/16/ Power Purchase Agreement/19/ Invoices raised by the PP to NTPC /14/ Testing certificates of all energy meters/17/ <p>The information relating to the project implementation, provided in the Monitoring Report/06/ is consistent with that stated in the revised PDD/09/. The data and variables provided in the monitoring report are the same as stated in the revised PDD. Total emission reductions achieved under this monitoring period 01/08/2018 to 29/02/2020 (including both days) is 61,273 tCO_{2e}.</p>
Findings	No issues identified and hence finding was not raised for this section.
Conclusion	<ul style="list-style-type: none"> In view of the information's verified during the remote audit (telephonic conversation with site personnel) and actual photographs/video recording of project site , the verification team is able to confirm that all physical features (technology, project equipment, and monitoring and metering equipment) of the registered CDM project activity are in place and that the project participants have operated the project activity as per the revised PDD. No information with regard to data and variables was identified that may surpass the estimated quantity of ERs in the revised PDD. The emission reductions achieved during the current monitoring period are (61,273 tCO_{2e}), that is more than the estimated quantity (55,238 tCO_{2e}) in the registered PDD for the comparable period and explanation for the same is provided under section E.8.6 of this report.

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents²

>> There are no temporary deviations from registered monitoring plan or applied methodology. It was verified and confirmed from the registered PDD/09/; the applied methodology/12/ and the remote audit/21/.

E.4.2. Corrections

>> There is a correction in the value of the parameter $EF_{grid,BM,y}$ as reported under section B.6.2 of the registered PDD is identified. Detailed assessment on correction is provided in the validation report on post registration changes version 03, dated 14/11/2020 (Being submitted along with issuance request).

E.4.3. Changes to the start date of the crediting period

>> The project was registered under CDM on 12/10/2017 with renewable crediting period from 12/10/2017 to 11/10/2024. The crediting period was updated to '01/08/2018 to 31/07/2025' and the same is verified and confirmed from the UNFCCC project webpage/13/.

E.4.4. Inclusion of a monitoring plan

>> Not applicable

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

>> There are no permanent changes from the registered monitoring plan/09/ or applied methodology/12/ during the current monitoring period.

² Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

E.4.6. Changes to the project design

>> Changes to the project design are identified during the current monitoring period. The registered PDD mentions that 72,960 solar PV modules are installed ,however the actual number of solar PV modules installed at site are 77,760, resulting the increase in the DC capacity of project activity. In the revised PDD the PP has updated the number of solar PV modules and corresponding DC capacity of the project. Detailed assessment on project design change is provided in the validation report on post registration changes version 03, dated 14/11/2020 (Being submitted along with issuance request).

E.4.7. Changes specific to afforestation and reforestation project activities

>> Not applicable

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	<p>The monitoring plan as contained in the revised PDD /09/ has been reviewed against the monitoring requirements of the applied methodology ACM0002 Version 17.0.</p> <p>Monitoring plan in the registered PDD includes the parameter $EG_{\text{facility},y}$ – Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh. As per the applied methodology ACM0002 version 17.0 “Quantity of net electricity generation supplied by the project plant/unit to the grid in year y” shall be measured through electricity meters.</p> <p>In accordance with the registered monitoring plan this parameter ($EG_{\text{facility},y}$) is directly monitored through the dedicated metering system installed at project site and DISCOM substation.</p> <p>This parameter “Quantity of net electricity generation supplied by the project plant/unit to the grid in year y” ($EG_{\text{facility},y}$) is being calculated as difference of Electricity exported to the state electricity board by the project activity (EG_{export}) and Electricity imported from the grid by the project activity (EG_{import}) and those are being measured by energy meters of accuracy class 0.2s located at DISCOM substation.</p> <p>These export and import parameters are measured continuously and at least monthly recording. This is in line with methodology and is accepted.</p> <p>Joint Meter Reading is being taken jointly by the officials of state utility (RVPNL) and project participant's representative and accordingly JMR Report (monthly meter reading reports) is being prepared. The monitoring methodology applies consistently the choice of the option selected for monitoring of baseline emissions. The monitoring plan provide procedures for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period.</p> <p>The final MR has been reviewed and confirmed that the procedure for data uncertainty, emergency preparedness, roles and responsibility, operational and management structure are appropriately described. The monitoring plan completely describes all measures to be implemented for monitoring of all parameters required. The monitoring plan described the positioning of the equipment. Calibration frequency for Energy meters is once in 5 years. Also CEA Notification No. 502/70/CEA/DP&D dated 17/03/2006 /22/ which is considered as national standard mentions that “All interface meters shall be tested at least once in five years.” Hence calibration frequency once in 5 years considered for the project activity is found to be appropriate.</p> <p>In view of the above discussion, it has been concluded that the PP got sufficient ability to implement the monitoring plan.</p> <p>Values of the parameter “Quantity of net electricity generation supplied by the project plant/unit to the grid in year y” is directly sourced from the “monthly meter reading” reports issued by state utility(RVPNL) /15/.</p> <p>The monthly meter reading reports are prepared and endorsed by Rajasthan Rajya Vidyut Prasaran Nigam Limited (RVPNL) , an external government agency and the PP has no influence in the entire procedure. Hence, the data issued by the state electricity board through the monthly meter reading reports is deemed authentic.</p>
------------------------------	--

	The assessment team has verified the actual photographs and videos of project site and it was observed that, the project activity is connected to the grid through an appropriate power evacuation system. Appropriate metering system and calculation procedures are transparently described in the monitoring plan to enable accurate determination of emission reductions achieved by the project activity.
Findings	No issues identified and hence finding was not raised for this section.
Conclusion	The monitoring plan outlined in the revised PDD is in accordance with the applied methodology /12/ and correctly applied by the registered CDM project activity.

E.6. Compliance of monitoring activities with the registered monitoring plan

E.6.1. Data and parameters fixed ex ante or at renewal of crediting period

E.6.1.1 Operating Margin CO₂ emission factor in year y ($EF_{grid,OM,y}$ tCO_{2e} /MWh)

Means of verification	The value of this parameter is considered as 0.9941. This was checked with the registered PDD /09/ and CO ₂ Baseline Database for Indian Power Sector", version 11 published by the Central Electricity Authority, Ministry of Power, Government of India /20/.
Findings	No finding was raised
Conclusion	The value in the monitoring report /06/ and corresponding emission reduction calculations spreadsheet /08/ are consistent with the registered PDD (page 24). The applied value is correct and justified.

E.6.1.2 Build Margin CO₂ emission factor in year y ($EF_{grid,BM,y}$ tCO_{2e} /MWh)

Means of verification	The value of this parameter is considered as 0.9285. This was checked with the registered PDD /09/ and CO ₂ Baseline Database for Indian Power Sector", version 11 published by the Central Electricity Authority, Ministry of Power, Government of India /20/.
Findings	CAR #1 and CAR #2 was raised and resolved.
Conclusion	The value in the monitoring report /06/ and corresponding emission reduction calculations spreadsheet /08/ are consistent with the registered PDD/09/ (page 25). The applied value is correct and justified.

E.6.1.3 Combined Margin CO₂ emission factor in year y ($EF_{grid,CM,y}$ tCO_{2e} /MWh)

Means of verification	The value of this parameter is considered as 0.9777. This was checked with the registered PDD /09/ and CO ₂ Baseline Database for Indian Power Sector", version 11 published by the Central Electricity Authority, Ministry of Power, Government of India /20/.
Findings	No finding was raised.
Conclusion	The value in the monitoring report /06/ and corresponding emission reduction calculations spreadsheet /08/ are consistent with the registered PDD/09/ (page 25). The applied value is correct and justified.

E.6.2. Data and parameters monitored

Quantity of net electricity generation supplied by the project plant/unit to the grid in year y , $EG_{facility,y}$ (MWh)

Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	The parameter is calculated as difference of $EG_{Export,y}$ and $EG_{Import,y}$ and recorded monthly basis in line with the approved monitoring plan. $EG_{facility,y} = EG_{Export} - EG_{Import}$ Where, EG_{Export} = Electricity exported by the project activity to the grid EG_{Import} = Electricity imported by the project activity to the grid

	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. In line with the approved monitoring plan, this parameter is recorded on monthly basis in the breakup sheets issued by state utility.
	Monitoring equipment	This parameter is measured through ABT meters installed at project site and DISCOM substation. The accuracy of the monitoring equipment used to measure the values is 0.2s, which is as per the revised PDD/09/ which is as per the norm defined in the PPA/19/.
	Is accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The accuracy of the monitoring equipment used to measure the input values used to calculate this parameter is 0.2s as verified from the calibration certificates and actual photographs, which is as per the revised CDM PDD/09/ and the norm defined in the PPA/19/.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes. Calibration certificates/18/ are verified and confirmed that accuracy of monitoring instruments is valid for the entire range. The details of the energy meters including validity of calibration is provided under section E.7 of this report.
	Calibration frequency /interval:	Calibration frequency of the meters is once in 5 years /09/.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes. The calibration frequency is in line with the monitoring plan as outlined in the revised PDD/09/.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes the calibration is conducted by Darsh Calibrations Private Limited (Ref: NABL:CC-2070) which is a NABL Accredited entity/17/.
	How were the values in the monitoring report verified?	The monthly values of this parameter are directly sourced from "Monthly meter reading reports" prepared by state utility /15/. The PP has correctly reported the monthly values in the emission reduction spread sheet/08/. The value of $EG_{\text{facility},y}$ for the current monitoring period is 62,670.75 MWh.

	If applicable, has the reported data been cross-checked with other available data?	Monthly reported values of $EG_{facility,y}$ for the current monitoring period were further cross-checked with the monthly invoices raised by the PP /14/ to NTPC and found to be consistent.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, all the stakeholders, namely, the Grid Authority (RVPNL)), and the PP implemented the adequate QA/QC procedures. The electricity exported and imported by project activity is recorded by main and check meters (billing meters) installed at DISCOM substation. All the energy meters have the capability of continuous measurement. Joint meter reading is taken by the officials of RRVPNL in the presence of the PPs representative at the metering points. JMR records the readings of both the main and check meter. Both values have been checked and are found to be comparable..
	In case project participants have temporarily not monitored the parameter, has either i) a deviation been approved by the CDM EB or ii) has the parameter been estimated as stipulated by Appendix 1 to the CDM Project Standard?	No such issues.
Findings	CAR #2 and CAR #3 was raised and resolved.	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan.	

E.6.3. Implementation of sampling plan

Means of verification	Not applicable
Findings	Not applicable
Conclusion	Not applicable

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	As per the monitoring plan in the registered PDD/09/ the meters are to be tested and calibrated once in 5 years. The calibration frequency has been followed in the current monitoring period. The project activity metering arrangements has been verified through actual photographs of project site/21/ and found consistent with the description as provided in the revised PDD and MR. The details of monitoring equipment involved in the project activity and their calibration dates are mentioned in Annexure- 1 of the MR/06/ and are summarised in the tables below. All the meters are of accuracy class of 0.2s and a calibration frequency of once in 5 years.				
	Item	Meter location	Meter Sr.No	Date of calibration	Delay in calibration (Y/N)
	Project phase-1	Project site	Main meter: RJB90188	19/05/2018 and 02/06/2019	N
			Check meter: RJB90189		
		Substation	Main meter:	19/05/2018	N

		end	RJB90190	and	
			Check meter: RJB90191	02/06/2019	
	Project phase-2	Project site	Main meter: RJB90193	19/05/2018	N
			Check meter: RJB90194	and 02/06/2019	
		Substation end	Main meter: RJB90195	19/05/2018	N
			Check meter: RJB90196	and 02/06/2019	
	The above meter details have been verified through the following means:				
	i. Latest photographs of the meters				
	ii. Interviewing the site personal during voice con-call				
	iii. Calibration certificates				
It is evident from the above table that calibration for all the meters has been conducted as per the calibration frequency mentioned in the revised PDD/09/. It is verified through the PPA signed by the PP with NTPC (section 7.1.1) that the solar project developer (SPD) and NTPC (buyer of generated electricity) shall follow and bound by CEA Regulations 2006 (Installation and Operation of meters) for installation and calibration of meters. The assessment team has verified the latest calibration reports of meters installed at project site & substation end and confirmed that the meters were working satisfactorily, and the errors observed within permissible limits. The assessment team has checked the monthly meter reading reports (JMRs) that mention the identification of meters whose data used to prepare JMRs. The meters are duly approved, installed, tested, sealed and in the custody of the state utility. The PP has no control over the same. CEA Notification No. 502/70/CEA/DP&D dated 17/03/2006 /22/ which is considered as national standard mentions that “All interface meters shall be tested at least once in five years.” Hence, the calibration frequency of once in 5 years, mentioned in the revised PDD for the meters is appropriate.					
Findings		CAR #2 was raised and resolved			
Conclusion		The assessment team has confirmed that the calibration is conducted at the frequency following the relevant industry standard as specified by the methodology /03/ and the monitoring plan contained in the revised PDD /09/. Therefore, the requirements of paragraph 371 of CDM-VVS for PAs, version 02.0 have been met.			

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	<p>The verification team verified that</p> <ul style="list-style-type: none"> a) A complete set of data for the monitoring period was available for the monitoring period and the verification of each monitoring parameter is elaborated under Section E.6.2 of this report. The complete monitoring data is also presented in the corresponding ER sheet /08/ of final Monitoring Report /06/. b) The information provided in the monitoring report was crosschecked with other sources, wherever appropriate and available, and such information is also included under Section E.6.2 of this report. c) The calculations of baseline emissions as presented in the corresponding ER sheet of final Monitoring Report were checked and found to be consistent with the formulae and methods described in the registered monitoring plan and the applied methodology. d) All assumptions used in the emission calculations were found appropriate and therefore justified e) Appropriate emission factors and other reference values have been correctly applied. This has also been elaborated under Section E.6.1 of this
------------------------------	--

	<p>report.</p> <p>f) No standardized baseline was prescribed in the registered PDD and therefore it has not been applied.</p> <p>The baseline emissions are the product of net electricity supplied to the grid expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor. Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors.</p> $BE_y = EG_{PJ,y} * EF_{grid, CM, y}$ <p>Where:</p> <p>BE_y = Baseline emissions in year y (tCO_{2e} /yr)</p> <p>$EG_{PJ,y}$ = 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)</p> <p>$EF_{grid, CM, y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (tCO_{2e} /MWh)</p> <p>As per the applied methodology ACM0002 version 17.0, if the project activity is the installation of a new grid-connected renewable power plant/unit at a sitewhere no renewable power plant was operated prior to the implementation of the project activity, then:</p> <p>$EG_{PJ,y} = EG_{facility,y}$</p> <p>Where,</p> <p>$EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)</p> <p>As per the registered PDD, combined margin emission factor is 0.9777 tCO_{2e} /MWh. Hence the baseline emissions for the project activity for the current monitoring period are as follows.</p> <p>$BE_y = EG_{facility,y} * EF_{grid, CM, y}$</p> <p>$BE_y = 62,670.75 * 0.9777 = 61,273 \text{ tCO}_2\text{e}$ (Rounded down value)</p>
Findings	CAR #3 was raised and resolved.
Conclusion	<p>In line with the paragraph 374 of VVS for PAs version 02.0, the verification team confirms that:</p> <ul style="list-style-type: none"> a) The complete data was available and is duly reported; b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section E.6.2 of this report); c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals were followed; d) Appropriate emission factors and other reference values were correctly applied.

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	The revised PDD/09/ and applied monitoring methodology/12/ does not prescribe any project emissions to be considered. The latest photographs and video recordings of project did not reveal any potential source to be considered in this regard.
Findings	No finding was raised
Conclusion	No project emissions were required to be calculated.

E.8.3. Calculation of leakage GHG emissions

Means of verification	The revised PDD/09/ and applied monitoring methodology/12/ does not prescribe any leakage emissions to be considered. The latest photographs and video recordings of project did not reveal any potential source to be considered in this regard.
Findings	No finding was raised

Conclusion	No leakage emissions were required to be calculated.
-------------------	--

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	As elaborated above, the entire emission reductions from the project activity were based on baseline emissions. The calculations presented in this regard in the final monitoring report and corresponding ER calculation sheet were found appropriate and complying with the provisions prescribed in the monitoring plan of revised PDD/09/ and applied methodology. The verification team confirms that an audit trail that contains the evidence and records that validated the stated figures were checked and found acceptable.
Findings	No finding was raised
Conclusion	The verification team confirms that <ul style="list-style-type: none"> a) The complete data was available and is duly reported; b) As indicated above, the description with regard to cross-check of reported data is included under respective parameter (refer Section E.6.2 of this report); c) Appropriate methods and formulae for calculating baseline GHG emissions or baseline net GHG removals, project emissions and leakage emissions were followed; d) Appropriate emission factors and other reference values were correctly applied. e) There is no pro-rate approach was applied in the current monitoring period as entire monitoring period falls into period that is after the end of first commitment period of Kyoto Protocol. <p>The total number of ERs achieved during the current monitoring period is 61,273 tCO_{2e}.</p>

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	As verified and evident from the final Monitoring Report /06/ and corresponding ER sheet /08/, the actual emission reductions achieved by the project activity in the current monitoring period were found higher than (+10.93%) the estimated quantity in the revised PDD/09/ for the comparable period.	
	Estimated ERs for comparable period as per registered PDD (tCO _{2e})	Actual ERs achieved in the current monitoring period (tCO _{2e})
	55,238	61,273
Findings	CAR #3 was raised and resolved	
Conclusion	The actual emission reductions achieved by the project activity are higher than the estimated quantity of ERs in the registered PDD/18/. The explanation for increase in the achieved ERs is provided in section E.8.6 below.	

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	The actual emission reductions were 10.93% more than the estimation in the registered PDD/18/ for an equivalent length of the monitoring period, this due to higher PLF achieved during the monitoring period. It is to be noted that PLF is completely governed by the availability of solar radiation, which is natural phenomenon and same is beyond the control of PP, hence the assessment team has concluded the increase in emission reduction of the project activity is justified and acceptable
Findings	No finding was raised
Conclusion	The assessment team checked the revised PDD and verified that in the sensitivity analysis, increase in PLF is well within the threshold limit sensitivity analysis margin of 12.77% assumed in the financial calculation and does not have any impact on additionality; hence, the assessment team has concluded the increase in emission reduction of the project activity is justified and acceptable.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	Based on the assessment done in section E.8.1 to E.8.6, the verification team is able to certify that the emission reductions from the CDM project activity 10392 “20 MW Solar Project in Sanwreej, Jodhpur, Rajasthan” in India during the period 01/08/2018 to 29/02/2020 (including both days) is 61,273 tCO _{2e} .		
		First commitment period (up to 31 Dec 2012) (tCO _{2e})	01 Jan 2013 onwards (tCO _{2e})
	Emission Reductions	NA	61,273
Findings	No finding was raised		
Conclusion	Actual GHG emission reductions achieved during period starting from 1 st January 2013 onwards was verified as 61,273 tCO _{2e} .		

E.9. Assessment of reported sustainable development co-benefits

Means of verification	Not applicable
Findings	Not applicable
Conclusion	Not applicable

E.10. Global stakeholder consultation

Means of verification	Not applicable
Findings	Not applicable
Conclusion	Not applicable

SECTION F. Internal quality control

The draft verification report that is prepared by verification team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Earthood were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements. The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope the project activity relates to. All team members of technical review team are independent of the verification team.

During the technical review process additional findings may be identified or the closed out findings may be opened, which needs to be satisfactorily resolved before the request for issuance is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same in such case providing the comments/findings/issues that needs to be resolved by the verification team. The decision taken by the Technical Reviewer is final and is authorized on behalf of Earthood Services Private Limited.

SECTION G. Verification opinion

Earthood Services Private Limited (ESPL), contracted by Janardan Wind Energy Pvt. Ltd, has performed the independent verification of the emission reductions for the CDM project activity 10392 “20 MW Solar Project in Sanwreej, Jodhpur, Rajasthan” in India for the monitoring period 01/08/2018 to 29/02/2020 (including both days) as reported in the Monitoring Report (public) Version 01 dated 05/04/2020. The Janardan Wind Energy Pvt. Ltd. is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

ESPL commenced the verification based on the baseline and monitoring methodology ACM0002 Version 17.0, the monitoring plan contained in the registered PDD Version 03 dated 11/07/2017, revised PDD version 07, dated 13/10/2020 and Monitoring Report (public) Version 01 dated 05/04/2020.

ESPL verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

The verification team confirms that:

- The project activity was found completely implemented as per the description given in the revised PDD.

- The actual operation conforms to the description in the revised PDD.

SECTION H. Certification statement

>> Earthood Services Private Limited (ESPL), contracted Janardan Wind Energy Pvt. Ltd., has performed the independent verification of the emission reductions for the CDM project activity 10392 “20 MW Solar Project in Sanwreej, Jodhpur, Rajasthan” in India for the monitoring period 01/08/2018-29/02/2020(including both days) as reported in the Monitoring Report (Final) Version 05 dated 13/10/2020. The Janardan Wind Energy Pvt. Ltd.is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity. It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity.

ESPL commenced the verification on the basis of the baseline and monitoring methodology ACM0002 Version 17.0, the monitoring plan contained in the PDD Version 07 dated 13/10/2020, Monitoring Report (public) Version 01 dated 05/04/2020 as per the methodology described under Section D of this report.

ESPL verification approach is based on the understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In our opinion, the GHG emissions reductions reported for the project activity for the period 01/08/2018-29/02/2020 are fairly stated in the Monitoring Report (final) Version 05 dated 13/10/2020. The GHG emission reductions were calculated correctly based on the approved baseline and monitoring methodology ACM0002 Version 17.0 and the monitoring plan contained in the PDD Version 07 dated 13/10/2020.

Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity 10392 “20 MW Solar Project in Sanwreej, Jodhpur, Rajasthan” in India during the period 01/08/2018 – 29/02/2020 (including both days) amount to 61,273 tCO_{2e} .

Verified and certified emission reductions as per commitment period:

Commitment period	Amount
Upto 31/12/2012 (1 st commitment period)	Not Applicable/Nil
From 01/01/2013 onwards	61,273 tCO _{2e}

Appendix 1. Abbreviations

Abbreviations	Full texts
General	
ACM	Approved Consolidated Methodology
AM	Approved Methodology
AMS	Approved Methodology for SSC Projects
BE	Baseline Emission
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CH ₄	Methane
CL	Clarification Request
CM	Combined Margin
CME	Coordinating/Managing Entity
CO ₂	Carbon di oxide
CP	Crediting Period
CPA DD	Component Project Activity Design Document
DNA	Designated National Authority
DR	Desk Review
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Green House Gas
GSC/GSP	Global Stakeholder Consultation Process
GW	Giga Watt
GWh	Giga Watt hour
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
Kw	kilo Watt
kWh	kilo Watt hour
LoA	Letter of Approval/Authorization
LSC	Local Stakeholder Consultation Process
MoC	Modalities of Communication
MoV	Means of Validation
MP	Monitoring Plan
MW	Mega Watt
MWh	Mega Watt hour
N ₂ O	Nitrous Oxide
OM	Operating Margin
PCP	Project Cycle Procedure
PDD	Project Design Document
PE	Project Emission
PLF	Plant Load Factor
PoA DD	Programme of Activities Design Document
PP	Project Participant
PS	Project Standard
RFR	Request for Registration
Tco _{2e}	Tonnes of Carbon di oxide equivalent
TPH	Tonnes Per Hour
UNFCCC	United Nations Framework Convention on Climate Change
V	Version
VVS	Validation and Verification Standard
Project Specific	

ABT	Availability Based Tariff
DISCOM	Distribution Company
EPC	Engineering and Procurement Contractor
GOI	Government of India
JMR	Joint Meter Reading
JWEPL	Janardan Wind Energy Pvt. Ltd.
L&T	Larsen & Toubro
NTPC	National Thermal Power Corporation Limited
NVVN	NTPC Vidyut Vyapar Nigam
O&M	Operation and Maintenance
PPA	Power Purchase Agreement
QA/QC	Quality Assurance/Quality Control
RMP	Revision in Monitoring Plan
RRECL	Rajasthan Renewable Energy Corporation Limited
RVPNL	Rajasthan Rajya Vidyut Prasaran Nigam Ltd.

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Ravi Kant Soni		
Country	India		
Education	B. Tech. (Mechanical Engineering) M. Tech. (Energy Management)		
Experience	8 Years +		
Field	Energy and Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.C., ACM0002		
Local expert	YES (India)		
Financial Expert	No		
Technical Reviewer	No		
TA Expert	YES (TA 1.2)		
Reviewed by	Shreya Garg	Date	04/06/2019
Approved by	Anshika Gupta	Date	04/06/2019

Competence Statement	
Name	Shifali Guleria
Education	M.Sc. (Environmental Studies and Resource Management), TERI University
Experience	2+ year
Field	Climate Change
Approved Roles	
Team Leader	YES
Validator	YES

Verifier	YES		
Methodology Expert	YES (AMS-I.A., AMS-II.G., AMS-III.A.V., AMS-I.D, ACM0002)		
Local expert	YES		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (1.2, 3.1)		
Reviewed by	Shreya Garg	Date	09/07/2020
Approved by	Ashok Gautam	Date	09/07/2020

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	UNFCCC	Standard: CDM PS for PAs	Ver. 02.0	Others
2	UNFCCC	Standard: CDM PCP for PAs	Ver. 02.0	Others
3	UNFCCC	Standard: CDM VVS for PAs	Ver. 02.0	Others
4	UNFCCC	Form: CDM-MR-FORM	Ver. 07.0	Others
5	JWEPL	Monitoring Report (published)	Ver.01,dated 05/04/2020	PP
5.1	JWEPL	Monitoring Report	Ver.02,dated 19/05/2020	
5.2	JWEPL	Monitoring Report	Ver.03,dated 20/07/2020	PP
5.3	JWEPL	Monitoring Report	Ver.04,dated 03/09/2020	PP
6	JWEPL	Monitoring Report (revised/final)	Ver.05,dated 13/10/2020	PP
7	JWEPL	ER Spread sheet (draft)	Ver.01,dated 05/04/2020	PP
7.1	JWEPL	ER Spread sheet	Ver.02,dated 19/05/2020	PP
7.2	JWEPL	ER Spread sheet	Ver.03,dated 03/09/2020	PP
8	JWEPL	ER Spread sheet (revised/final)	Ver.04,dated 13/10/2020	PP
9	JWEPL	Revised PDD	Ver.04,dated 21/05/2020	PP
			Ver.05, dated 20/07/2020	
			Ver.06,dated 03/09/2020	
			Ver.07,dated 13/10/2020	
10	DOE(Applus+Certification)	Validation report	Version 02,dated 11/07/2017	Others
11	UNFCCC	Form: CDM-MR-FORM	Ver. 07.0	Others
12	UNFCCC	ACM0002	Version 17.0 dated 13/05/2016	Others
13	UNFCCC	Project Webpage	https://cdm.unfccc.int/Projects/DB/Applus1501572247.73/view	Others
14	JWEPL	Monthly Invoices raised by the PP to state	For the period 01/08/2018 to 29/02/2020	PP

		NTPC		
15	RVPNL	Monthly meter reading reports (JMRs) issued by state utility	For the period 01/08/2018 to 29/02/2020	PP
16	RRECL	Commissioning certificate	Phase -1 ,Dated 12/04/2017 Phase -2 ,Dated 18/04/2017	PP
17	Darsh Calibrations Private Limited	Calibration certificates for all the meters	NABL accreditation ref: NABL:- CC-2070	PP
18	JWEPL	Registered PDD	Ver.03,dated 11/07/2017	Others
19	GOI	Power Purchase Agreement between NTPC and JWEPL	Dated 15/06/2016	PP
20	CEA	CO ₂ Baseline Database for Indian Power Sector	Ver.11	Others
21	ESPL	<ul style="list-style-type: none"> Remote audit (Voice con-call with consultant and site personal) Latest photographs of all the equipments Video recording of project site including online monitoring system 	Dated 15/06/2020	PP
22	CEA	CEA Notification No. 502/70/CEA/DP&D	Dated 17/03/2006	Others
23	CDM EB	<p>(a) Email received from CDM Executive Board regarding the relaxation for mandatory site visits by DOEs for a period of three months (23 March to 23 June 2020) due to COVID-19 pandemic</p> <p>(b) Second email received from CDM Executive Board regarding the relaxation for mandatory site visits by DOEs till 31/12/2020</p>	<p>Dated 20/03/2020</p> <p>Dated 24/06/2020</p>	Other
24	RRECL	Connectivity and installation reports	For Phase-1, dated 30/03/2017 For Phase-2, dated 18/04/2017	PP
25.	Confidential	Emission reductions Purchase Agreement (ERPA)	Dated 12/04/2020	PP

Appendix 4. Clarification requests, corrective action requests and forward action requests

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

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

Table 2. CL from this verification

CL ID	01	Section no.	D.1	Date: 18/05/2020
Description of CL				
Please submit the following documents:				
1. Monthly meter reading reports issued by DISCOM				
2. Monthly invoices raised to NTPC by the PP				
3. Power Purchase Agreement (PPA) signed for project activity				
4. Commissioning certificate of the project				
Project participant response				Date : 19/05/2020
<i>PP is hereby submitting the following documents:</i>				
<i>1. Monthly meter reading reports issued by DOSCOM</i>				
<i>2. Monthly invoices raised to NTPC by the PP</i>				
<i>3. Power Purchase Agreement (PPA) signed for project activity</i>				
<i>4. Commissioning certificate of the project</i>				
Documentation provided by project participant				
<i>1. Monthly meter reading reports issued by DOSCOM</i>				
<i>2. Monthly invoices raised to NTPC by the PP</i>				
<i>3. Power Purchase Agreement (PPA) signed for project activity</i>				
<i>4. Commissioning certificate of the project</i>				
DOE assessment				Date: 10/07/2020
The PP has submitted the monthly JMRs and invoices raised to NTPC for the current monitoring period. Copy of PPA and commissioning certificate for project activity is submitted and found to be satisfactory. CL #1 is closed.				

Table 3. CAR from this verification

CAR ID	01	Section no.	E.4	Date: 18/05/2020
Description of CAR				

1. Number of modules and DC capacity (MW_p) of the project activity reported in section B.1 of the MR is not consistent with the same reported in the registered PDD. Please clarify the reason for the same.
2. Please submit the supporting evidences with reference to the actual number of modules installed at project site.
3. As per the information provided in section B.2.2 of the MR, changes in the number of modules installed at site is considered as corrections to the PDD, however the same occurrence is also described as project design change in section B.2.6 of the MR, kindly clarify the ambiguity observed.
4. Please clarify why the revised PDD in track change mode, describing the changes is not submitted (ref: paragraph 229 PS for PAs v02.0).

Project participant response	Date : 19/05/2020
<p>1. PP would like to clarify that during project conception phase, the total 72,960 No. of Module was planned to achieve 20 MW_{AC} capacity. However, actually 77,760 No. of Module have been commissioned to achieve 20 MW_{AC} Capacity. Same can be cross-checked from the installation report and connectivity report in the name of project owner "Janardan Wind Energy Pvt. Ltd.", submitted along with this submission.</p> <p>2. PP is submitting the installation report and connectivity report in the name of project owner "Janardan Wind Energy Pvt. Ltd.", with reference to the actual number of PV modules installed at project site as a supporting evidence.</p> <p>3. PP has revised the MR to report the corrections in reporting the number of PV modules of 312 Wp & 315 Wp capacity under the section B.2.2 of the MR. The correction in the total number of modules reported in the registered PDD does not alter the allowable AC installation capacity of project which is 20 MW_{AC}. As the number of installed Inverter capacity and number of Inverter reported in the registered PDD does not changed. Hence there is no change in the Project overall output inverter capacity. Thus, the project design capacity remains the same i.e. $2 \times 10 \text{ MWac} = 20 \text{ MWac}$.</p> <p>Therefore, PP has revised MR section B.2.6 to explicitly mention that "There are no changes to the project design has happened since commissioning and during this crediting period."</p> <p>4. PP is submitting the revised PDD in track change mode, describing the corrections in the reported PV modules.</p>	
Documentation provided by project participant	
MR Version 02 Installation report and connectivity report Revised PDD in track Change	
DOE assessment	Date: 10/07/2020

The PP has described the changes with reference to number of solar modules in the MR; however appropriate reason for the same is not mentioned and it is not discussed whether the changes would have been known prior to the registration of the CDM project activity, how the changes would impact on the overall operation/ability of the CDM project activity to deliver emission reductions or net anthropogenic removals as stated in the PDD, and whether the revised estimation of emission reductions due to the change takes into account the applicable limits in accordance with the "CDM project standard for project activities

Appendix-7 of revised PDD: Impacts of the actual changes to the registered CDM project activity are not discussed, in accordance with the criteria outlined under paragraph 242 point (a) to (e) of CDM PS for PAs version 02.0.

It is noted that due to increase in the number of solar panels, DC capacity of the project activity is increased. Kindly clarify why this change is not considered as project design change in line with the guidance provided under paragraph 241 (c) of CDM PS version 02.0.

The PP has submitted the installation report and connectivity report, that indicates the actual number of solar modules installed at site, found satisfactory, hence accepted.

CAR #1 is open

Project participant response

Date : 20/07/2020

PP has revised MR to consider the changes in the number of PV modules under "Project design Change" in line with Para 241(C) of the project standard version 02 and explained the reason for the same as well in the MR. PP would like to clarify that the change in the number of PV modules changes the DC capacity of the Project activity from 22.4928 MWp to 23.9976 MWp but the overall output capacity of inverters i.e. the Project AC capacity has not been changed from 20MWac. Thus, there is no revision in estimations of emission reduction as there is no change in the scale of the project activity. The above changes in number of modules was done at the time of commissioning of the project just to ensure the reliability of delivered power to the grid in line with the PPA contracted capacity.

Furthermore, PP hereby clarifies that the project was not commissioned fully at the time of CDM validation site visit of the project activity. The overall commissioning certificate of project activity was received in the month of April 2017 and therefore, the changes were missed to update before submission of PDD for registration. Hence, PP is requesting for the changes in the PDD during the first monitoring period.

Also, PP has revised Appendix 7 of the PRC PDD Version 5 in line with the paragraph 242 point (a) to (e) of CDM PS for PAs version 02.0. to discuss the impacts of the actual changes to the registered CDM project activity transparently.

Documentation provided by project participant

MR Version 03

MR Version 05

DOE assessment

Date: 31/07/2020

The PP has discussed the reasons for the design change appropriately in the revised MR. In accordance with the section 4.4.1 of PPA, the solar project developer has to generate minimum energy 16.21 MU (Million kWh) per year corresponding to a CUF of 18.5% i.e. (23.5%-5%) on account of reasons solely attributable to project developer and in case of non-compliance, the project developer shall be liable to pay compensation to DISCOM. Hence in order to ensure the minimum energy generation as per PPA, the project developer has increased the number of solar PV modules.

It is noted that due to installation of additional solar PV modules, DC capacity of the project increased from 22.4928 MWp to 23.9976 MWp. This change is considered as project design change in line with the guidance provided under paragraph 241 (c) of CDM PS version 02.0.

Since at the time of validation the emission reductions were calculated considering the AC capacity (20MWac), that is remain unchanged, hence no impact on the overall operation/ability of the CDM project activity to deliver emission reductions or net anthropogenic removals as stated in the PDD. Furthermore the changes don't have impact on scale of the project or applicability of methodology or additionality of the project activity.

CAR #1 is closed.

CAR#1 re-opened

Date: 31/08/2020

1. Value of the parameter $EF_{grid,BM,y}$ is changed in the revised, please clarify how this change is not described under Appendix-7 of the revised PDD.
2. The project activity consists of two parts Project-I and Project-II. It is not clear how many solar modules were added to project -I or Project-II.
3. Please clarify about effective date(s) for applied project design change.
4. ER sheet (Tab-ER calculation, H24) Please clarify why the generation of the month Jan 2020 & February 2020 (Project –II) is not added while calculating total generation for current monitoring period.

Project participant response**Date : 03/09/2020**

1. Please be clarified that this was a typo error in the registered PDD under section 6.2, as the Value of the parameter $EF_{grid,BM,y}$ was determined 0.9285 tCO_{2e}/MWh. Please refer the section 6.1 of the registered PDD under step 5 the value of $EF_{grid,BM,y}$ has been transparently determined as 0.9285 tCO_{2e}/MWh, same can be verified from the registered ER sheet as well. PP has mentioned this typo error correction in build margin under Appendix-7 of the revised PDD version 06.

2. Please be clarified that the number of PV module for the model TP 312 series & TP 315 Series were reported 16,960 and 7,360 in the registered PDD but actual number of PV module commissioned for the model TP 312 series & TP 315 Series are 19,360 and 9,760 respectively in line with the commissioning certificate. Thus, the total number of PV modules reported in the registered PDD was 72,960 but the number of actual commissioned PV modules is 77,760. Total 4800 number of PV modules has been increased. However, there is no change in the inverters i.e the project AC capacity (20 MWac) remains the same. PP has explicitly provided the details under Section A.3 and Appendix 7 of the PRC PDD version 6.

3. PP would like to confirm that the effective date of the change in number of modules is 18/04/2017 i.e the commissioning date of the Phase 2.

4. PP has corrected the ER sheet (Tab-ER calculation, H24) to consider the generation from the month of Jan & Feb 2020. However, PP has already considered the generation from the month of Jan & Feb 2020 in column I & J 24. Hence, there will not be any change in the ER values as the same was not impacted due to Cell no H24.

Documentation provided by project participant

MR Version 04
ER Version 03
PDD Version 06

DOE assessment**Date : 10/09/2020**

The PP has rectified the typo error in section B.6.2 of the revised PDD and made the value of build margin emission factor ($EF_{grid,BM,y}$) consistent within the PDD and also with registered ER calculation sheet. It is noted that values of fixed parameters are not changed due this amendment, hence considered as correction to the parameter fixed at registration of the CDM project activity as described in the registered PDD in line with the paragraph 232 of PS for PAs v02.0. This correction is appropriately described under Appendix-7 of the revised PDD.

Number of solar PV modules to be commissioned for the project activity was considered as 72,960, there was no segregation with reference to the number of modules specific to project-I or project-II. Hence the project design changes are assessed considering the change in the solar PV modules actually commissioned at site.

The project design change is applicable from date of commissioning of project-II as 18/04/2017, since the project was completely commissioned on this date, hence found to be appropriate and correct.

The PP has corrected the formula in the ER calculation sheet, including the generation of the month Jan 2020 & February 2020 (Project –II) while calculating total generation for current monitoring period.

CAR #1 is closed.

CAR#1 re-opened**Date: 04/10/2020**

The project design change is related to increase in the DC capacity of the project activity, please clarify why the change is not considered as project design change in line with the guidance provided under paragraph 241 (a) of CDM PS version 02.0 and the assessment of the change is not described in the revised PDD accordingly.	
Project participant response	Date : 13/10/2020
<p>We would like to clarify that the increase in the number of PV modules, it is to be noted that as per para 241 (a.) of the project standard version 02, same has been considered under "Changes to the project design". The total number of PV modules reported in the registered PDD was 72,960 but the number of actual commissioned PV modules are 77,760. Due to this change, the project DC capacity has been changed to 23.9976 MWp from 22.4928 MWp reported in the registered PDD. Thus, PP wishes to correct the number of PV modules reported in the registered PDD in line with the commissioned PV modules. PP has the revised information in the PDD with respect to the number of PV modules and the DC capacity of the project activity. However, project Installed AC capacity i.e. 20 MWac remains the same. PP has updated the PRC PDD Appendix 7 to transparently discuss the change and the reason in line with the project standard para 241 a.</p>	
Documentation provided by project participant	
PRC PDD version 07 Revised MR v05	
DOE assessment	Date: 31/10/2020
Since the project design change involves the increase in the D.C capacity of the project activity, hence this change is considered in line with the paragraph 241(a) of the CDM PS for PAs v02.0. The PP has corrected that reference of CDM PS paragraph relevant to the project design change in the revised PDD, found to be satisfactory, hence accepted. CAR #1 is closed.	

CAR ID	02	Section no.	E.6	Date: 18/05/2020
Description of CAR				
Please clarify why the calibration details of energy meters covering the current monitoring period are not provided in the MR. Please clarify why the single line diagram of the project activity, showing the monitoring points is not provided in section C of the MR. Value of the parameter $EF_{grid,BM,y}$ reported in section D.1 of the MR is not consistent with the registered PDD. Value of the parameter $EG_{facility,y}$ reported in section D.2 of the Webhosted MR is not consistent with the ER calculation sheet value.				
Project participant response				Date : 19/05/2020
PP has revised MR to report the following details transparently: 1. Calibration details of energy meters covering the current monitoring period is provided under Section C of MR. 2. The single line diagram of the project activity, showing the monitoring points is provided under Section C of MR. 3. PP has revised MR to report the Value of the parameter $EF_{grid,BM,y}$ reported in section D.1 of the MR is now consistent with the registered PDD. 4. PP has revised MR to correctly report the value of parameter $EG_{facility,y}$ in line with the ER calculation sheet. PP has corrected the typographical error while reporting the value of parameter.				
Documentation provided by project participant				
MR Version 2 ER Version 2				
DOE assessment				Date: 10/07/2020
The PP has provided the calibration details of energy meters covering the current monitoring period in section C of the MR, the same is verified through calibration certificates, found consistent, hence accepted. Single line diagram indicating all the metering points is provided in section C of the revised MR, found to be appropriate, hence accepted. Value of the parameter $EF_{grid,BM,y}$ is corrected in section D.1 of the MR and found consistent with the registered PDD, hence accepted. CAR #2 is closed.				

CAR ID	03	Section no.	E.8.1	Date: 18/05/2020
---------------	----	--------------------	-------	-------------------------

Description of CAR	
<p>1. Please submit the ER calculation sheet for the current monitoring period.</p> <p>2. Estimated ERs per year as reported in section E.5.1 of the MR is not consistent with the registered PDD.</p> <p>3. Actual ERs achieved for the current monitoring period are more than the estimated ERs in the registered PDD for comparable period. Kindly clarify the appropriate reasons for the same.</p>	
Project participant response	Date : 19/05/2020
<p>1. PP is hereby submitting the ER Calculation Sheet for the current monitoring period.</p> <p>2. Estimated ERs per year as reported in section E.5.1 is 34,882 tCO_{2e}/annum which is reported consistently with the registered PDD. Please refer the registered PDD attached herewith the response.</p> <p>3. The actual emission reductions achieved during the current monitoring period is 58,149 tCO_{2e} which is 5.27%, slightly more than the estimated emission reduction. The difference is due to the variation in the Solar radiation's availability during the current monitoring period, which is a natural uncontrolled phenomenon and may vary. Moreover, PP has already covered the impact of variation of +/- 10% in the PLF and thereby generation at the time of project registration.</p>	
Documentation provided by project participant	
Registered PDD MR Version 02 ER Version 02	
DOE assessment	Date: 10/07/2020
<p>The PP has submitted the ER calculation sheet for current monitoring period and the data reported in the ER sheet is verified with the JMRs & invoices, found consistent, hence accepted.</p> <p>The PP has corrected the value of estimated annual generation, the estimated ERs/year is found consistent with the registered PDD, hence accepted.</p> <p>The actual emission reduction achieved during the current monitoring period are 5.27 % higher than the estimated amount of emission reductions as determined in the registered PDD for comparable period, which is due to the high PLF achieved by the project activity during the monitoring period.</p> <p>It is to be noted that PLF is completely governed by the availability of sunlight, which is natural phenomenon and same is beyond the control of PP, hence the assessment team has concluded the increase in emission reduction of the project activity is reasonable and acceptable.</p> <p>CAR #3 is closed.</p>	
CAR #3 re-opened	Date: 04/10/2020
<p>The electricity generation in the month Jan 2020 & Feb 2020 is reasonably lower as compared to the same achieved during previous year for same months. Kindly clarify the reason.</p> <p>CAR #3 open</p>	
Project participant response	Date : 13/10/2020
<p>PP has corrected the typo error in reporting the "Export & Import" values in the ER sheet for the month of Jan 2020 and Feb 2020 from the JMR. Furthermore, it is to be clarified that the solar power generation depends on many factors like "Less Solar Insolation due to Cloudy weather", grid availability, maintenance breakdown etc. But, majorly depend upon the solar radiations & climatic conditions which is beyond PP control. Due to the fog and other climatic conditions solar insolation was less in comparison to peak seasons hence the energy generation was less in the month of Jan & Feb 2020.</p> <p>However, as per the revised ER sheet version 04, the actual emission reductions achieved during the current monitoring period is 61,273 tCO_{2e} which is 10.93%, more than the estimated emission reduction. This means that the actual annualized PLF achieved during the current monitoring period is 22.59% which is little higher than the expected PLF considered in the registered PDD which is 20.53%. The variation in actual & estimated PLF is 10%. The difference is due to the variation in the Solar radiation's availability during the current monitoring period, which is a natural uncontrolled phenomenon and may vary.</p>	
Documentation provided by project participant	
MR & ER sheet version 05 PRC PDD version 07	
DOE assessment	Date : 31/10/2020

Values of the monitored parameter (export & import) for the month Jan 2020 & Feb 2020 were wrongly reported in the ER sheet, the PP has rectified the error in the ER sheet and values are corrected consistent with the JMRs. The electricity generation in both the months are slightly lower as compared to other months because it depends on the availability of solar radiation which is natural phenomenon and not under control of PP.

It is noted that, the actual achieved emission reductions in the current monitoring period are 10.93% higher than the estimated ERs in the revised PDD for comparable period. This is largely due to the high PLF achieved by the project activity during the monitoring period. The Plant Load Factor (PLF) achieved for the monitoring period has been calculated and is found to be 22.59% against 20.53% assumed in the revised PDD. Thus, the actual PLF achieved is marginally higher by 10%, that is equal to the sensitivity analysis margin of 10% assumed in the financial calculation presented in the registered PDD and hence acceptable. CAR #3 is closed.

Table 4. FAR from this verification

FAR ID	01	Section No.	E.4.6	Date : 31/08/2020
Description of FAR				
During the verification process physical site visit is not conducted, since the project is undergoing first verification and involves project design change. Hence in accordance with the guidance provided under paragraph 36 of VVS for PAs version 02.0, the verifying DOE shall check/review the project implementation (including project design change) in accordance with the approved PDD, during next verification of the project activity.				
Project participant response				Date : DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none">• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN);• Make structural and editorial improvements.
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		