Verification and certification report form for CDM project activities

(Version 03.0)

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION	
Title and UNFCCC reference number of the project activity	70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL-16-01) UNFCCC Reference Number: 10403
Scale of the project activity	☒ Large-scale ☐ Small-scale
Version number of the verification and certification report	1.0
Completion date of the verification and certification report	04/09/2019
Monitoring period number and duration of this monitoring period	First, 06/11/2017 to 01/04/2019 (inclusive of both days)
Version number of the monitoring report to which this report applies	02
Crediting period of the project activity corresponding to this monitoring period	06/11/2017 - 05/11/2024 (Renewable)
Project participants	Fortum FinnSurya Energy Private Limited
Host Party	India
Applied methodologies and standardized baselines	ACM0002: Grid-connected electricity generation from renewable sources Version 17.0 Standardized baseline: Not applicable
Mandatory sectoral scopes	01 - Energy industries (renewable / non-renewable sources)
Conditional sectoral scopes, if applicable	NA
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	167,465 tCO_2e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	201,309 tCO_2e
Name and UNFCCC reference number of the DOE	Earthood Services Private Limited E-0066
Name, position and signature of the approver of the verification and certification report	Dr. Kaviraj Singh Managing Director

SECTION A. Executive summary

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The main purpose of this project activity is to generate clean form of electricity through renewable solar energy source. Fortum Finnsurya Energy Private Limited is the promoter of the project activity. The project activity has an installed capacity of 70 MW (AC) (88.2 MWp) solar power project at Bhadla, Jodhpur, Rajasthan. The annual average of electricity generation and emission reduction over 7 years of crediting period is 122,108 MWh/year and 119,384 tCO2e per year.

Project is operational, and the assessment team verified this during the site visit. The assessment team confirms that the total emission reduction achieved under this monitoring period 06/11/2017 to 01/04/2019 (including both days) is 201,309 tCO_2e.

Scope of verification

The scope of the verification was limited to the monitoring period covered under the current monitoring period 06/11/2017 to 01/04/2019 of the registered CDM PA "*70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL-16-01)*" to determine whether;

The project activity has been implemented and operated as per the registered PDD or any approved 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 registered 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 involved following;

- Publication of monitoring report
- Desk review
- Physical on-site inspection
- Issuance of verification findings
- Reporting, calculation checks, QA/QC and resolution of findings
- Issuance of draft verification report
- Independent technical review of the project documentation
- Issuance of the final verification report
- Submission of the request for issuance, as appropriate

Conclusion

ESPL has performed the verification of the CDM PA "70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL-16-01)" having UNFCCC Ref. Number 10403 for the monitoring period 06/11/2017 to 01/04/2019. The verified emission reductions amount to 201,309 tCO_2e in the aforesaid monitoring period.

The verification concluded that the registered CDM PA complies with all relevant CDM procedures/standards/guidance and therefore request for issuance is being submitted in accordance with the CDM procedures.

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/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader	EI	Takarkhede	Atul	Central Office	Y	Y	Y	Y
2.	Technical Expert (TA1.2)	EI	Takarkhede	Atul	Central Office	Y	Y	Y	Y
3.	Methodology Expert	IR	Garg	Shreya	Central Office	Y	N	N	Y
4.	Local Expert	EI	Garg	Shreya	Central Office	Y	Y	Y	Y
5.	Verifier	IR	Garg	Shreya	Central Office	Y	N	N	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	Gupta	Anshika	Central Office
2.	TA expert to TR	IR	Gupta	Anshika	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.	Human error in recording monitored data in JMR sheets	Low	The reading of JMR is being recorded in the presence of representatives of State Electricity Board and O&M contractor. Hence, it is highly unlikely of occurrence of human error while recording the readings.	The practice on site for recording data was confirmed from the responsible team members for compliance with the standard procedure. The JMR data/09/ for the project activity was cross checked against the controller readings/10/Invoices/11/.
2.	Transfer of recorded data to break up sheets and invoices	Low	A dedicated Team is appointed for transfer of recorded data and calculations related to generation by each Feeder. These calculations are performed in excel templates which have adequate control measures to prevent any manual or calculation	The practice on site for data transfer was confirmed from the responsible team members for compliance with the standard procedure.

			error. These sheets are further reviewed for errors by the Electricity Board.	
3.	Error in transferring the recorded data to ER sheet	Medium	The procedure for transferring the recorded break-up sheet readings to the spreadsheet is manual in nature thus increasing the chances of error. However, PP has Implemented internal quality checks to ensure prevention of any such potential error in the prepared ER sheet/8/.	All the monthly reported values in ER sheet/7/ were verified with JMR/9/.

C.2. Consideration of materiality in conducting the verification

In line with Guidelines for Application of materiality in verifications, the verification team has conducted a complete verification of all the information presented in the monitoring report and data monitored as presented in the emission reduction calculation spread sheet. There are no material errors, overestimation of ER, omission or misstatement.

SECTION D. Means of verification

D.1. Desk/document review

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Earthood conducted a desk review as under;

- A review of the data and information presented to verify their completeness;
- A review of the 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;

In addition to the monitoring documentation, Earthood has reviewed;

- The registered PDD, Version 02 dated 04/08/2017 and the monitoring plan, including any approved revised monitoring plan and/or changes from the registered PDD, and the corresponding validation opinion;
- The Validation Report Version 01 dated 16/08/2017;
- The applied monitoring methodology (ACM0002, Version 17.0);
- The monitoring report (all versions) to verify that it is as per the standardized format;
- Any other information and references relevant to the project activity's emission reductions (e.g. IPCC reports, data on electricity generation in the national grid or laboratory analysis/calibration and national regulations).

The complete list of documents reviewed is included under Appendix 3.

D.2. On-site inspection

Duration of on-site inspection: 19/06/2019				
No.	**Activity performed on-site**	**Site location**	**Date**	**Team member**
1.	An assessment of the implementation and operation of the registered project activity as per the registered PDD or any approved revised PDD;	Bhadla, Jodhpur, Rajasthan, India	19/06/2019	Dr. Atul Takarkhede
2.	A review of information flows for generating, aggregating and reporting the monitoring parameters; Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD;	Bhadla, Jodhpur, Rajasthan, India	19/06/2019	Dr. Atul Takarkhede
3.	A cross check between information provided in the monitoring report and data from other sources such as plant logbooks, inventories, purchase records or similar data sources;	Bhadla, Jodhpur, Rajasthan, India	19/06/2019	Dr. Atul Takarkhede
4.	A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD, the applied methodology including applicable tool(s), and, where applicable, the applied standardized baseline;	Bhadla, Jodhpur, Rajasthan, India	19/06/2019	Dr. Atul Takarkhede
5.	A review of calculations and assumptions made in determining the GHG data and emission reductions;	Bhadla, Jodhpur, Rajasthan, India	19/06/2019	Dr. Atul Takarkhede
6.	An identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters	Bhadla, Jodhpur, Rajasthan, India	19/06/2019	Dr. Atul Takarkhede

D.3. Interviews

No.	**Interviewee**			**Date**	**Subject**	**Team member**
	Last name	**First name**	**Affiliation**			
1.	Kumar	Hemant	Principal Manager, Fortum	19/06/2019	Project implementation, ER calculation, monitoring plan, Operation and maintenance Procedures, Calibration, JMR etc.	Dr. Atul Takarkhede
2.	Paliwal	Dilip	Manager (Electrical), Fortum	19/06/2019	Operation and maintenance	Dr. Atul Takarkhede
3.	Khan	Kasam	Driver, Fortum	19/06/2019	LSC	Dr. Atul Takarkhede
4.	Jatav	Prakash	Substation Operator	19/06/2019	Substation monitoring & metering arrangement,	Dr. Atul Takarkhede

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
					calibration	
5.	Sen	Bharat	Ascent Electrification	19/06/2019	O&M practices at site	Dr. Atul Takarkhede

D.4. Sampling approach

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No sampling approach was followed by the assessment team. All reported figures in the MR/6/ and ER sheet/7/ 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	-	CAR 03 CAR 04 CAR 05	-
Post-registration changes	-	-	-
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 07	-
Assessment of data and calculation of emission reductions or net removals	-	CAR 06	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
Total	**0**	**5**	**0**

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 7.0/13/which was the appropriate form and the latest version available at the time of verification, as verified through UNFCCC webpage.
Findings	CAR 03 was raised and resolved.
Conclusion	All the sections of the form were filled as per the guidelines and gave all the relevant details. CAR 03 was raised for the inconsistent PP name in the MR. PP have submitted revised MR with consistent PP name. The revised final monitoring report/6/ was found to be in compliance with the applicable latest monitoring report form and instructions therein/13/.

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

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This is the first verification of the project activity, there are no FARs from last validation report/02/.

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

Means of verification	Physical on-site inspection was carried out by the verification team to check the implementation status of the project activity and the instrumentation installed for the project activity.

The commissioning date of the Solar Power plant was verified from the commissioning certificates/8/ and found that project was commissioned on 31/03/2017. Through validation report/2/ and PPA/18/ it was confirmed that PP is in agreement NTPC Ltd. for the sale of electricity to the grid.

The verified geographical coordinates of the Solar Power plant have been mentioned below. The same were checked during on-site inspection by using a hand-held GPS instrument.

Project Investor	Location	Latitude	Longitude
Fortum Finnsurya Energy Private Limited	Village Bhadla, Tehsil Bap, District Jodhpur, Rajasthan, India.	N 27° 28' 7.00"	E 71° 58' 17.00"

The locations of SPV plant was verified using a hand held Get-Geo Coordinates app for mobile phones and the data obtained was verified against geo-locations of the plant given in the registered PDD/1/. The geo-coordinates reported in the registered PDD/1/ was not found consistent with the readings of the GPS instrument and hence CAR 04 was raised and closed subsequently.

The installation and specification of the SPV installed were checked with the commissioning certificate/8/, name-plates and physical inspection.

The technical specification of the equipment are tabulated below:

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

The single line diagram available at the sub-station and the interviews with the site engineers confirmed that the configuration of the project activity and the location of monitoring instruments is in accordance with the description provided in the registered PDD/1/.

In addition to physical inspection, interviews of the personnel were conducted by the verification team which revealed that all the QA/QC procedures listed in the registered PDD/1/ have been followed while operating the project activity.

As per para 34 of PS for PA version 2.0/4/, project activity is type-I activity of Large scale. The emission reduction achieved in this monitoring period are 201,309 tCO2e/6/, against the estimated ERs – 167,465 tCO2e as per approved PDD/1/.

The monitoring and metering system, and its compliance with the monitoring

	plan has been discussed in later sections of the report For the purpose of verification of implementation of project activity, audit team conducted following activities onsite: • An inspection of operational state of Solar Power Plant • Interviews of personnel employed in the functioning of project activity to gauge if the monitoring personnel were well verse of their role and responsibilities • Review of documentation for the monitored data and to cross-check their correct transfer to ER sheet[/8/]. The information relating to the project implementation, provided in the Monitoring Report[/6/] is consistent with that stated in the registered PDD[/1/]. The data and variables provided in the monitoring report are the same as stated in the registered PDD[/1/].
Findings	CAR 04 & CAR 05 was raised and resolved.
Conclusion	DOE, inline to para 354-356 of VVS for PA Version 02[/5/], confirms that: • Implementation and operation of project activity has been conducted in accordance with the description contained in registered PDD[/1/]. • Physical features of the registered project activity specified in registered PDD[/1/] are in place and PP have operated the project activity as per the registered PDD[/1/]. The emission reductions achieved during the current monitoring period are 201,309 tCO_2e which is higher than the estimated ERs as per registered PDD[/1/] 167,465 tCO_2e.

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents[1]

Not applicable for present Monitoring period.

E.4.2. Corrections

The geo-coordinates of the project site mentioned in the registered PDD[/1/] and MR[/6/] submitted was found incorrect during onsite visit of verification team. CAR 04 was raised in this regard. PP submitted revised PDD with correct geo-coordinates of the. Verification team checked the same and found correct. Revised MR was also submitted by PP with correct geo-coordinates. This editorial permanent change does not have any impact on project design, baseline, scale of project and additionally assumptions and hence accepted by verification team.

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

Not applicable for present Monitoring period.

E.4.4. Inclusion of a monitoring plan

Not applicable for present Monitoring period.

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

Not applicable for present Monitoring period.

[1] 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

Not applicable for present Monitoring period.

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	The review of applied methodology ACM0002: Grid-connected electricity generation from renewable sources Version 17.0[/3/] and approved monitoring plan establishes that the plan is consistent with the applied methodology[/3/]. Based on this review it was found the monitoring plan includes all the required parameters to be monitored in the context of project design and description and allows proper determination of emission reductions in accordance with the applied methodology[/3/].
Findings	No findings
Conclusion	The approved monitoring plan is in accordance with the applied methodology[/3/] 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

Means of verification	The values considered ex-ante for this monitoring period were cross-checked with registered PDD[/1/] and their respective sources. The summary of all the ex-ante parameters has been given below:

Parameter/ Description	Value applied	MoV
EFgrid,OM,y Operating Margin CO2 emission factor in year y	0.9941 tCO_2/MWh	The value of the parameter was checked from registered PDD[/1/]. The value of the parameter was sourced from CEA database version 11[/14/].
EFgrid,BM Build Margin CO2 emission factor in year y	0.9285 tCO2/MWh	The value of the parameter was checked from registered PDD[/1/]. The value of the parameter was sourced from CEA database version 11[/14/].
EFgrid,CM,y Combined Margin CO2 emission factor in year y	0.9777 tCO2/MWh	The value of the parameter was checked from registered PDD[/1/]. The value of the parameter was sourced from CEA database version 11[/14/].

Findings	None
Conclusion	The value in the monitoring report[/6/] and corresponding emission reduction calculations spreadsheet[/7/] are consistent with the registered PDD[/1/]. The applied value is correct and justified.

E.6.2. Data and parameters monitored

Means of verification	**$EG_{PJ,y}$**: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y in MWh

Measuring/Reading/Recording Frequency	Measured continuously and recorded monthly

	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes, the monitoring frequency is in accordance to the monitoring plan/1/ and monitoring methodology/3/.
	Monitoring equipment	The parameter is monitored with a bi-directional energy meter. Details of monitoring meters are provided in Appendix 5 of the report.
	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?	Accuracy class of the equipment is 0.2s, which is in line to registered PDD/1/ and consistent with calibration certificate/15/ as well. Information was found consistent onsite.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Accuracy class is valid for entire range.
	Calibration frequency /interval:	The meters are calibrated by State Utility i.e. RRVPNL and accredited/State Utility approved external third parties once in five years/1/. Details of the calibration are provided in FVR and revised MR.
	Is the calibration interval in line with the monitoring plan and/or methodology? If the monitoring plan does not specify the frequency of calibration, is the selected frequency in accordance with the local/national standards, or as per the manufacturer's specifications?	Yes
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes, The meters are calibrated by State Utility i.e. RRVPNL and accredited/State Utility approved external third parties once in five years/15/.
	Is(are) calibration(s) valid for the whole reporting period?	The calibration dates are presented in appendix 5 of this report. The dates have been checked from the calibration certificates. Thus, it is valid for the whole monitoring period.
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes
	How were the values in the monitoring report verified?	A value of Net Electricity export by the project activity for the monitoring period verified from monthly joint meter reading issued by State Utility/9/. The value was found to be consistently reported in MR/6/ and ER sheet/7/.
	If applicable, has the reported data been cross-checked with other available data?	The readings were cross checked with the monthly bills raised by PP to NTPC Vidyut Vyapar Nigam Ltd./10/.
	Does the data management ensure	Yes, The calibration of the monitoring

	correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	meters is done by state utility periodically. Check meters also help in verifying main meter readings.
	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#06 was raised and resolved.	
Conclusion	The DOE confirms that: • The registered monitoring plan has been properly implemented and followed by the project participants • Monitoring of parameter is implemented in accordance with registered monitoring plan/1/. • The equipment used for monitoring the parameter is controlled and calibrated in accordance with registered monitoring plan and applied methodology/3/. • Monitoring results are consistently recorded as per approved frequency. • Quality assurance and quality control procedures have been applied in accordance with the registered monitoring plan/1/.	

E.6.3. Implementation of sampling plan

Means of verification	The verification assessed whether the compliance of the sampling efforts and surveys with the registered sampling plan in accordance with the "Standard for sampling and surveys for CDM project activities and programme of activities" if PP had applied a sampling approach to determine data and parameters monitored.
Findings	There is no CAR/CL raised in this section.
Conclusion	PP did not apply sampling plan to determine data and parameters monitored during this monitoring period. The verification team has checked all the documents such as JMR (Monthly meter) report/9/ etc. and hence sampling plan was not required. The verification team hereby confirms that are checked all the documents.

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

Means of verification	The energy generation is measured through a tri-vector electronic meters installed on the Pooling sub-station 132/220 KV RSDCL GSS II and 220/400 KV RRVPNL GSS substation. A back up meter is also installed to measure the data, which can be used as a source of data if the main meter is found to exceed the maximum permissible limit of error during calibration. The calibration frequency for both meters was set as once in five year/1/. The details of meters and the dates on which calibration has been conducted are given in appendix 5 of this report. The calibration certificates/15/ submitted by the PP confirmed the dates listed in appendix 5 and, also revealed that the process has been carried out by State Utility. Calibration and meter arrangement are not in the purview of Project participants and is controlled by the State Utility. To ensure that the readings were accurate, calibration certificates of all meters were checked and were found satisfactory. The verification team observed that there is no delay in calibration for all the meters.
Findings	CAR 07 raised and resolved
Conclusion	The DOE confirms that the calibration is conducted at the frequency as specified by the methodology and the registered monitoring plan.

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	The baseline emissions are calculated as per provisions indicated in the registered PDD[/1/] and applied methodology[/3/]. Baseline emissions are calculated as follows: $BE_y = EG_{PJ,y} \times EF_{grid,CM,y}$ Where, $EG_{PJ,y}$ = Total quantity of net electricity delivered to the INDIAN grid $EF_{grid,CM,y}$ = Baseline emission factor = 0.9777 tCO_2/MWh BE_y = 205901.33 x 0.9777 = 201,309 tCO_2 The value of baseline emission achieved after applying the formulae is 201,309 tCO_2e (Rounddown value). All the data was made available and have monitored as per required monitoring frequency. The baseline emissions are calculated as per provisions indicated in the registered PDD[/1/] and applied methodology[/3/]. The means of verification for the values of parameters, used for baseline emission calculation, is described in the section E.6.2 of this report. The expressions given in this regard under section E.1 of MR[/6/] were found consistent with the registered PDD[/1/] and applied methodology[/3/]. The explanation of formulae in the MR[/6/] and ER sheet[/7/] is adequate and consistent.
Findings	CAR 06 raised and resolved.
Conclusion	The verification team confirms that appropriate methods and formulae for calculating baseline emissions have been followed. The assumptions, emission factors and default values that were applied in the calculations are justified.

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

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the registered CDM project activity. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan[/7/].
Findings	No findings raised
Conclusion	Project emission is zero as per the requirement of the methodology and registered PDD[/1/].

E.8.3. Calculation of leakage GHG emissions

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the registered CDM project activity. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan.
Findings	No findings were raised.
Conclusion	The leakage emissions are regarded as zero according to the applied methodology[/3/] and registered PDD[/1/].

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

Means of verification	The final verified Emission Reductions in the current monitoring period are as under; Monitoring Period: 06/11/2017 to 01/04/2019 (Inclusive of both days) Baseline Emissions: 201,309 tCO2e Project Emissions: 0 tCO2e Leakage Emissions: 0 tCO2e **Emission Reductions: 201,309 tCO2e** The value of baseline emission obtained by applying the equations provided in the registered PDD/1/ are 201,309 tCO_2e. The project emissions and leakages for the project activity are considered as zero. Therefore, the final value of net GHG emission reductions obtained is **201,309** tCO_2e.
Findings	No findings
Conclusion	a) A complete set of data for the specified monitoring period was available, on all occasions based on the activity level of the parameters; b) The information provided in the monitoring report/6/ and corresponding spreadsheet/7/ has been cross checked; c) The assessment team confirms that the formulae for calculating baseline and project emissions (BE and PE) are in accordance with monitoring plan contained in the registered PDD/1/ and applied methodology/3/. d) There are no leakages in accordance with applied methodology and registered PDD/1/. e) The assumptions/emission factors used in emission calculations have been correctly applied and are justified.

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

Means of verification	The actual emission reduction achieved in the monitoring period is 201,309 tCO_2e, whereas the estimated ERs in the registered PDD/1/ is 167,465 tCO2e. Actual emission reduction is 20.21% higher than the emission reductions for the considered monitoring period.
Findings	No findings.
Conclusion	Justification of higher emission reductions have been provided in the section E.6 of the MR/6/. The explanation was found satisfactory. Thus, the comparison between the actual GHG emission reductions and the estimated GHG emission reductions was found to be ok.

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

Means of verification	According to the Project participant, the emission reductions have increased from the estimated emission reduction. The increase in ER is due to higher PLF (=Plant Load Factor) & more number of higher sunny days which is evident from the JMR sheets/9/. Further, increased PLF during this monitoring period is lower than the benchmark breaching value for the PLF is 23.94% and revised IRR sheet with increased PLF is submitted by PP & found that it does not cross the benchmark value. Hence accepted by verification team.
Findings	No findings
Conclusion	The explanation provided by the project participant for the increased emission reductions than estimated was found 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	The verification team has determined the GHG emission reductions achieved during first commitment period and second commitment period
Findings	There is no CAR/CL raised in this section.

Conclusion	1. GHG emission reductions or net GHG removals by sinks reported up to 31 December 2012: 0 tCO_2e 2. GHG emission reductions or net GHG removals by sinks reported from 1 January 2013 onwards: 201,309 tCO_2e (Monitoring period starting from 01/01/2013)

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

Means of verification	NA
Findings	NA
Conclusion	NA

E.10. Global stakeholder consultation

Means of verification	NA
Findings	NA
Conclusion	NA

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 (Earthood), contracted by Fortum FinnSurya Energy Private Limited, has performed the independent verification of the emission reductions for the CDM project activity 10403 “70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL-16-01)” in India for the monitoring period 06/11/2017 to 01/04/2019 (including both days) as reported in the Monitoring Report (public) Version 1 dated 26/04/0219 and Monitoring Report (Final) Version 02 dated 23/08/2019. Fortum FinnSurya Energy Private Limited is responsible for the collection of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

Earthood commenced the verification on the basis of the baseline and monitoring methodology ACM0002: Grid-connected electricity generation from renewable sources Version 17.0, the monitoring plan contained in the PDD Version 2 dated 04/08/2017, Monitoring Report (public) Version 1 dated 26/04/0219.

Earthood’s 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. Earthood planned and performed the verification by obtaining evidence and other information and explanations that Earthood 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 registered PDD and the actual operation conforms to the description in the registered PDD.

SECTION H. Certification statement

It is our responsibility to express an independent verification statement on the reported GHG emission reductions from the project activity.

In our opinion the GHG emissions reductions reported for the project activity for the period 06/11/2017 to 01/04/2019 (including both days) are fairly stated in the Monitoring Report (final) Version 02 dated 23/08/2019. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002: Grid-connected electricity generation from renewable sources Version 17.0 and the monitoring plan contained in the PDD Version 2 dated 04/08/2017.

Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity 10403 “70 MW Bhadla Solar power plant by Fortum Finnsurya Energy Pvt Ltd (EKIESL-CDM-APRIL-16-01)” in India during the period 06/11/2017 to 01/04/2019 (including both days) amount to 201,309 tCO_2e.

Verified and certified emission reductions (for current monitoring period) as per commitment period:

Commitment period	**Amount**
Upto 31/12/2012 (1st commitment period)	Nil
From 01/01/2013	201,309 tCO_2e

Appendix 1. Abbreviations

Abbreviations	Full texts
AS	Accreditation Standard
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM PCP for PA	Clean Development Mechanism Project Cycle Procedure for Project Activities
CDM PS for PA	Clean Development Mechanism Project Standard for Project Activities
CDM VVS for PA	Clean Development Mechanism Validation and Verification Standard for Project Activities
CER	Certified Emission Reduction(s)
CL	Clarification Request
CPCB	Central Pollution Control Board
DOE	Designated Operational Entity
DNA	Designated National Authority
EB	Executive Board
Earthood	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GOI	Government Of India
IR	Internal Resource
IPCC	Intergovernmental Panel on Climate Change
MOEF	Ministry of Environment and Forests
MR	Monitoring Report
MW	Mega Watt
NTPC	National Thermal Power Corporation
PDD	Project Design Document
PP	Project Participants
PPA	Power Purchase Agreement
QA/QC	Quality Assurance / Quality Control
MP	Monitoring Plan
RVPN	Rajasthan Vidyut Prasaran Nigam
SEB	State Electricity Board
tCO2e	tonnes of Carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VCR	Verification and Certification Report

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Atul Takarkhede		
Education	Ph.D. Environmental Science		
Experience	12 years		
Field	Climate Change and environment		
Approved Roles			
Team Leader	YES		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert	YES (1.2)		
Reviewed by	Shreya Garg	**Date**	24/04/2019
Approved by	Anshika Gupta	**Date**	25/04/2019

Competence Statement			
Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	6 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	**Date**	01/03/2018
Approved by	Ashok Gautam	**Date**	01/03/2018

Competence Statement	
Name	Kaviraj Singh
Country	India
Education	Ph.D. (Environmental Engineering), IIT Delhi Masters (Energy & Environmental), DAVV Indore

Experience	15 Years +		
Field	Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-II.D., ACM0006, AMS-I.A., AMS-I.C., AMS-II.B., AMS-III.H, ACM0002, ACM0001, AM0080		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 13.1, 13.2)		
Reviewed by	Abhishek Mahawar	**Date**	01/03/2018
Approved by	Ashok Gautam	**Date**	01/03/2018

Competence Statement			
Name	Anshika Gupta		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	4 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.A., AMS-II.G., ACM0002, AMS-III.A.V.		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	Yes (TA 1.2, TA 3.1)		
Reviewed by	Shreya Garg	**Date**	12/03/2019
Approved by	Kaviraj Singh	**Date**	12/03/2019

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	Project Proponent	Registered CDM PDD	Version 2 dated 04/08/2017	Others
2.	Applus Certification	Validation report	Version 2, 16/08/2017	Others
3.	UNFCCC	ACM0002: Grid-connected electricity generation from renewable sources	Version 17.0	Others
4.	UNFCCC	CDM project standard for project activities	Version 02	Others
5.	UNFCCC	CDM Validation and Verification Standard for project activities	version 02	Others
6.	Project Proponent	Monitoring Report (Published) Monitoring Report (Final)	Version: 01 Dated: 26/04/2019 Version: 02 Dated: 23/08/2019	PP
7.	Project Proponent	ER sheet ER sheet (Final)	Version: 01 Dated: 17/07/2019 Version: 02 Dated: 23/08/2019	PP
8.	Rajasthan Renewable Energy Corporation Limited	Commissioning certificates	12/04/2017	PP
9.	Rajasthan Vidyut Prasaran Nigam (RVPN)	JMR (monthly credit notes) covering monitoring period	-	PP
10.	Project Proponent	Invoices covering monitoring period	-	PP
11.	Project Proponent	O&M reports for controller meter readings (DGR)	-	PP
12.	Rajasthan Vidyut Prasaran Nigam (RVPN)	Approval Letter for metering arrangement for Fortum Solar Project	11/01/2017	PP
13.	UNFCCC	CDM-MR-FORM	version 7.0	Others
14.	CEA	CEA database	Version 11	Others
15.	Darsh Calibration Pvt. Ltd.	Calibration certificates for meters of 220 KV GSS Calibration certificates for meters of 400 KV GSS-II, Badla	13/03/2018 23/10/2017	PP
16.	Project Proponent	Training records for year 2018 & 2019	-	PP
17.	Project Proponent	Breakdown record for the monitoring period	-	PP
18.	NTPC Ltd. (First Party)	Power Purchase Agreement	25/04/2016	PP

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

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

FAR ID	01	**Section no.**	E.2	**Date :** 24/06/2019
Description of FAR				
There is no FAR from the validation 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				

Table 2. CL from this verification

CL ID	02	**Section no.**		**Date :** 24/06/2019
Description of CL				
NA				
Project participant response				**Date :** DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				**Date:** DD/MM/YYYY
NA				

Table 3. CAR from this verification

CAR ID	03	**Section no.**	E.1	**Date:** 24/06/2019
Description of CAR				
Name of the Project Proponent is not consistent inline with HCA throughout MR. Corrections requested.				
Project participant response				**Date:** 17/07/2019
Corrections are made in the MR V2				
Documentation provided by project participant				
CDM MR V2				
DOE assessment				**Date:** 25/07/2019
Name of the PP has been now made consistent with HCA as “Fortum FinnSurya Energy Private Limited”. CAR claosed.				

CAR ID	04	**Section no.**	E.3 & E.4.2	**Date :** 24/06/2019
Description of CAR				
Latitude & longitude mentioned in the registered PDD and MR are not matching with actual Latitude & longitude of the project activity. Post registration changes inline with the applicable guidelines shall be proposed. *Also correction in the actual aerial photograph of the project activity is requested.*				
Project participant response				**Date :** 17/07/2019
The correct Latitude and longitude along with the correct aerial photograph of the site is now provided in the MR. Also, the required corrections has been done in the CDM PDD and the same is now provided to the assessment team.				
Documentation provided by project participant				
CDM MR V2 *PDD V3*				
DOE assessment				**Date:** 25/07/2019
PP submitted revised PDD with correct geo-coordinates of the. Verification team checked the same and found correct. Revised MR was also submitted by PP with correct geo-coordinates. This editorial permanent change does not have any impact on project design, baseline, scale of project and additionally assumptions and hence accepted by verification team.				

CAR ID	05	Section no.	E.3	Date : 24/06/2019
Description of CAR				
Corrections requested in the module capacity provided in Section B.1 of the MR.				
Project participant response				**Date :** 17/07/2019
The section B.1 of the MR has been updated with the requested corrections.				
Documentation provided by project participant				
MR V2				
DOE assessment				**Date:** 25/07/2019
Module capacity is corrected in the revised MR. CAR closed.				

CAR ID	06	Section no.	E.8.1	Date : 24/06/2019
Description of CAR				
PP requested to submit Emission reduction calculation sheet for the monitoring period.				
Project participant response				**Date :** 17/07/2019
Emission reduction calculation sheet with respective JMRs and invoices are being provided with this submission.				
Documentation provided by project participant				
ER sheet, JMR and invoices.				
DOE assessment				**Date:** 25/07/2019
PP has submitted ER sheet. JMR values has been checked with the ER sheet and found correct. CAR closed.				

CAR ID	07	Section no.	E.7	Date : 24/06/2019
Description of CAR				
PP requested to submit calibration certificates for the 220/400 KV RRVPNL substation meters.				
Project participant response				**Date :** 17/07/2019
The calibration details are now added in MR V2 and the calibration certificates for the 220/400 KV RRVPNL substation meters are being provided with this submission.				
Documentation provided by project participant				
MR V2 and calibration reports.				
DOE assessment				**Date:** 25/07/2019
PP has submitted calibration certificate for 220/400 KV RRVPNL substation meters and found consistent with revised MR. CAR this closed.				

Table 4. FAR from this verification

FAR ID	08	Section No.		Date : DD/MM/YYYY
Description of FAR				
There is no FAR from this verification				
Project participant response				**Date :** DD/MM/YYYY
NA				
Project participant response				
NA				
Project participant response				**Date:** DD/MM/YYYY
NA				
Project participant response				

Appendix 5. Calibration Details

Calibration details for 132/220 KV RSDCL GSS II:

Meter Details (Main Meter)	
Sr. No.	16195106
Make	L&T
Accuracy Class	0.2s
Initial Meter Calibration Date	12/01/2017
Calibration Date	13/03/2018
Due date of Calibration Date	13/03/2023

Meter Details (Check Meter)	
Sr. No.	16195107
Make	L&T
Accuracy Class	0.2s
Initial Meter Calibration Date	12/01/2017
Calibration Date	13/03/2018
Due date of Calibration Date	13/03/2023

Calibration details for 220/400 KV RRVPNL GSS:

Meter Details (Bay 5)		
Sr. No.	16195149 (Main Meter)	16195153 (Check Meter)
Make	L&T	L&T
Accuracy Class	0.2s	0.2s
Calibration Date	23/10/2017	23/10/2017
Due date of Calibration Date	22/10/2022	22/10/2022

Meter Details (Bay 6)		
Sr. No.	16195151 (Main Meter)	16195243 (Check Meter)
Make	L&T	L&T
Accuracy Class	0.2s	0.2s
Calibration Date	23/10/2017	23/10/2017
Due date of Calibration Date	22/10/2022	22/10/2022

Document information

Version	*Date*	*Description*
03.0	31 May 2019	Revision to: • 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.

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Version	Date of issue	Nature of Revision	Prepared by		Reviewed by	
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2.0	11/06/2019	Adoption of latest forms	Shreya Garg	11/06/2019	Anshika Gupta	13/06/2019
1.0	04/05/2018	Guidelines updated	Shreya Garg	04/05/2018	Anshika Gupta	04/05/2018
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