

VERIFICATION REPORT OF 'TEJUVA – CHANDGARH WIND PROJECT'

Document Prepared By Earthood Services Private Limited

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Summary:

Earthood has performed the VCS second verification of the project “Tejuva – Chandgarh Wind Project” (VCS Ref. Number 1560).

The scope of verification includes confirming the implementation of the monitoring plan of the registered VCS PD (version 3.0) and the application of the monitoring methodology Approved consolidated baseline and monitoring methodology ACM0002 (Version 17.0)

The verification is consisted of three phases: i) desk review of the project; ii) follow-up onsite visit and interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted following Earthood’s internal quality procedures.

The project deals with utilisation of wind energy for the generation of electricity. Electricity generated from such renewable sources of energy will help replace the energy produced from non-renewable sources of energy such as fossil fuels. Hence, it will lead to emission reductions of mainly GHGs. Benefits arising from such emission reduction will also lead to optimal usage of energy source.

During the verification process 03 CARs, 02 CL and 00 FARs were raised and are discussed in detail in Appendix 4. Therefore, the emission reductions from the project activity “Tejuva – Chandgarh Wind Project” in India during the period 01/08/2016 to 31/07/2018 (including both days) could be verified.

Vintage wise representation of the emission reductions is as follows:

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2016 (01/08/2016 to 31/12/2016)	106,922	0	0	106,922
2017 (01/01/2017 to 31/12/2017)	357,254	0	0	357,254
2018 (01/01/2018 to 31/07/2018)	253,346	0	0	253,346
Total	717,522			717,522

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1 INTRODUCTION

1.1 Objective

CLP Wind Farms (India) Private Limited has contracted Earthood Services Private Limited (Earthood) to perform second verification of “Tejuva – Chandgarh Wind Project” for the monitoring period 01/08/2016 to 31/07/2018 with VCS Ref number 1560. The objective of this verification is a thorough and independent verification for the emission reductions reported for “Tejuva – Chandgarh Wind Project” and managed by CLP Wind Farms (India) Private Limited.

The verification is the periodic independent review and ex post determination by Earthood Services private limited of the monitored reductions in GHG emissions that have occurred as a result of the registered VCS project activity during a defined monitoring period. Certification is the written assurance by Earthood that, during a specific period in time, a project activity achieved the emission reductions as verified.

1.2 Scope and Criteria

The scope of the verification is to establish and verify that;

- a) The project activity has been implemented and operated as per the registered PD or any approved revised PD, and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- b) 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 VERs, verifiable, and in accordance with applicable VCS requirements;
- c) 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;
- d) The data recorded and stored as per the monitoring methodology including applicable tool(s) and, where applicable, the standardized baseline

1.3 Level of Assurance

A draft verification report that is prepared by assessment team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by Earthood are duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable VCS requirements as appropriate. 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. The report approved by Quality Manager is endorsed by Managing Director, who is overall responsible to ensure quality, before final release. The further details of applicable procedures and responsibilities about Earthood Quality Management System (QMS) are available on its website (www.earthood.in).

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 considers 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 01/08/2016 to 31/07/2018 are fairly stated in the Monitoring Report Version 02 dated 24/08/2018. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002, Version 17.0.0, and the VCS standard.

For more information, please refer to section six of this verification report.

1.4 Summary Description of the Project

The project activity “Tejuva – Chandgarh Wind Project” has been carried out by CLP Wind Farms (India) Private Limited (CLPWFPL) to generate wind energy using a total of 94 WTGs at two separate sites- Tejuva in district Jaisalmer of Rajasthan (Phase I) and Chandgarh in district Dewas of Madhya Pradesh (Phase II). 48 WTGs are installed in Tejuva while 46 in Chandgarh. This Greenfield project activity is aimed at cleaner production of electricity by displacing coal-generated electricity, thus resulting in carbon emission reductions. This is achieved by selling the electricity produced at these wind farm sites to NEWNE (North, Eastern, Western and North Western) grid of India. Suzlon Infrastructure Services Limited and Gamesa Wind Turbines Pvt. Ltd are responsible for the operation and maintenance of the project for sites Tejuva and Chandgarh respectively.

Duration of this second periodic verification of project activity spans from 01/08/2016 to 31/07/2018 (including both days) and the total emission reductions achieved during this monitoring period is **717,522 tCO₂e**.

2 VERIFICATION PROCESS

The registered VCS project is undergoing second verification and the approach adopted to ensure the quality of emission reductions is described in the following sub-sections.

2.1 Method and Criteria

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Earthood internal procedures. The Project was verified against the latest requirements and guidance set out in VCS and CDM standards.

The sampling was done using Raosoft (<http://www.raosoft.com/samplesize.html>), where the sample size was calculated using 90/10 confidence level and a response rate of 95%. The recommended sample size was 12. Therefore, the verification team visited 11 WTGs at Tejuva site and 8 WTGs at Chandgarh site, thus meeting the minimum recommended sample size.

All the monthly reported figures within the monitoring period in the MR/02/ and the ER sheet/03/ were verified from the actual records/05,06/.

2.2 Document Review

The verification is performed primarily as a document review of the documents submitted at various stages of assessments. The review is performed by assessment team using dedicated protocols.

The assessment team cross checks the information provided in the documents (PD, MR, validation report) and information from sources other than those used, if available, and also conducts independent background investigations. Earthood conducted a desk review as under;

- a) A review of the data and information presented to verify their completeness.
- b) 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.
- c) 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.

2.3 Interviews

No.	Interviews			Date	Subject	Team Member
	Last Name	First Name	Affiliation			
1.	Raeem	Nambi	Engineer	20/08/2018	Implementation and operation of project activity	Ashok Gautam
2.	Tada	Ranjeet	Asset Manager (CLP)	20/08/2018	Management and monitoring procedures followed	Ashok Gautam
3.	Vel	Kathir	Jr. Engineer (SGSL)	20/08/2018	Operations and Electrical	Ashok Gautam
4.	Prasad	Ravi Shankar	Sr. Executive (SGSL)	20/08/2018	Management and Operational Systems	Ashok Gautam
5.	Bundan	R. Shunmuga	Jr. Engineer (SGSL)	20/08/2018	Maintenance	Ashok Gautam
6.	Panara	Dipak	GSS in-charge	20/08/2018	Grid Sub-station functioning (operations)	Ashok Gautam
7.	Singh	Nirmal Kumar	Technician (RRVPL)	20/08/2018	Technical specifications	Ashok Gautam
8.	Naruka	Pushpendra	Sr. Engineer (SGRP)	21/08/2018	Operations and maintenance	Chirag Luthra
9.	Yadav	Gopal Singh	Jr. Engineer (SGRP)	21/08/2018	Operations and maintenance	Chirag Luthra
10.	Rout	Kajal	Executive (CLP)	21/08/2018	Implementation and operation of project activity	Chirag Luthra
11.	Soni	Vivek	Executive (CLP)	21/08/2018	Management and monitoring	Chirag Luthra

No.	Interviews			Date	Subject	Team Member
	Last Name	First Name	Affiliation			
					procedures followed	

2.4 Site Inspections

A site visit was undertaken by Earthood on 20/08/2018 and 21/08/2018 to carry out following;

- An assessment of the implementation and operation of the registered project activity as per the registered PD/01/.
- 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 PD.
- A cross check between information provided in the monitoring report and data from other sources such as invoices.
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PD, the applied methodology including applicable tool(s), and, where applicable, the applied standardized baseline.
- A review of calculations and assumptions made in determining the GHG data and emission reductions.
- 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.

Site visit was conducted where random sampling was applied- 90/10 precision and confidence level. A total of 11 WTGs from Tejuva site and 8 from Chandgarh site were visited. The approach was found to be justified as per VCS standards/14,15/. Technical descriptions as seen on site was found to be in line with the registered monitoring plan/01/. The WTGs were visited by the DOE and their location was recorded through the android app “get geo-coordinates”.

2.5 Resolution of Findings

The objective of this step is to identify, discuss and conclude on the issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions. This is done based on the desk review and onsite assessment. The verification team prepares and/or updates a verification protocol (internal document) that records the conformities and nonconformities, which may be of following types;

CAR (Corrective Action Request) is raised if one of the following occurs:

- Non-compliance with the monitoring plan, the methodology or the standardized baseline are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient
- Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants

- c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions
- d) Change to the key sustainable development indicators
- e) Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

Clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable requirements have been met. All CARs and CLs raised by the Earthhood during verification shall be resolved prior to submitting a request for issuance.

FAR (Forward Action Request) is raised during verification if the monitoring and reporting require attention and/or adjustment for the next verification period.

A total of 03 CAR and 02 CL were raised in the current verification. All the findings that are raised and communicated to project participant during the verification are included under Appendix 4. The section also includes the response by the project participants and an assessment by the verification team if it was closed out or otherwise.

2.5.1 Forward Action Requests

There are no FARs raised during this verification.

2.6 Eligibility for Validation Activities

Not applicable

3 VALIDATION FINDINGS

Not applicable.

3.1 Participation under Other GHG Programs

The project activity has been verified to not been registered under any GHG programme other than VCS/13/.

3.2 Methodology Deviations

There is no methodology deviation identified during the current monitoring period.

3.3 Project Description Deviations

At the Chandgarh site of Madhya Pradesh, the Madhya Pradesh Power Transmission Company Limited replaced the main meter for feeder-2 on 18/06/2018 (due to error in display of time and date) and check meter for feeder-1 on 08/12/2017. This replacement of meters was observed during on-site visit and verified later from monthly JMR reports/06/ and meter replacement report/11/. Since, the specifications of new meters/04/ are comparable to that of replaced meters, the project activity is not affected. Therefore, the project deviations don't have any adverse impact on the applicability of methodology, additionality and appropriateness of the baseline scenario and the project remains in compliance with the VCS rules. The replacement of interface meters in the grid substation was found acceptable as the meters installed at the project metering point are under the custody of state DISCOM and PP has no control over it.

3.4 Grouped Project

Not applicable

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

This project activity involves installation of WTG's to generate electricity from wind energy. The installed capacity of the project activity is 192.8 MW consisting of 94 WTG's (48 WTGs of capacity 2.1 MW and 46 WTGs of capacity 2.0 each) in the states of Rajasthan and Madhya Pradesh, which was verified on site/09/ and through commissioning certificates/10/.

Total capacities at both sites are given below:

Site Location	Phase	WTG Model	WTG Capacity	No. of WTGs	Total Capacity at each Site
Tejuva (Jaisalmer)	Phase-I	Suzlon S97	2.1 MW	48	100.8 MW
Chandgarh (Dewas)	Phase-II	Gamesa G97	2 MW	46	92 MW
TOTAL				94	192.8 MW

The installation and specification of WTGs have been checked with commissioning certificates/10/ and during on-site assessments/09/. There was no major breakdown or shut downs during the monitoring period which might affect the applicability of methodology or might cause material errors in emission reductions, as verified from the reported monthly readings/06/, where all readings were checked to be reported regularly.

Assessment team concludes the following:

- a) The implementation status of project activity was found to be in compliance with the registered PD
- b) DOE has conducted the on-site visit to confirm the implementation status of the project.
- c) The commissioning date of the project activity was found to be accurately and consistently recorded.
- d) The actual operation of project activity was found to be in compliance with the flow diagram provided in registered PD.
- e) The emission reductions achieved during the current monitoring period are **717,522 tCO₂e**.

The project activity contributes to the sustainable development by utilising wind energy for generating electricity which otherwise would have been generated through fossil fuels. Thereby reduction in usage of non-renewable sources used to generate energy.

Further the GHG emission reductions generated by the project activity have not been included by any other an emissions trading program or any other mechanism that includes GHG allowance trading; neither has the project activity been rejected by any other emission trading programme/13/.

Sustainable Development- The project will contribute to the sustainable development in the following ways

1. Environmental: Since the project activity leads to cleaner production of energy, it is leading to displacement of fossil fuel-based energy and thus contributing to resource conservation.
2. Social Well Being: Setting up of the project activity has generated employment and helped develop supporting infrastructure, thus providing jobs and improved access to local people around. It has also helped reduce dependence of locals on fossil fuels and the associated price variations.
3. Economic Well Being: The project has created employment opportunities for skilled and semi-skilled manpower, thus alleviating the people from poverty and making them economically stronger.
4. Technological well-being: The project activity has created more general interest in wind energy projects for research and development.

The project has been implemented as described in the project description/01/.

The total emission reductions achieved in this monitoring period i.e. from 01/08/2016 to 31/07/2018 are **717,522 tCO₂e**.

4.2 Accuracy of GHG Emission Reduction and Removal Calculations

The project monitoring has been carried in accordance with the registered VCS PD/01/ and the monitoring report/02/. The monitoring plan laid in the registered PD/01/ is being followed at the site, as confirmed by the on-site assessment/09/. The assessment team has verified the information flow (from data generation, aggregation, to recording, calculation and reporting for these parameters including the values) reported in the MR/02/.

The emission reductions are purely based on the net electricity generated and exported from the machines. PP has provided all the sufficient data for current monitoring period. Parameters fixed at the time of validation are $EF_{grid,OM,y}$, $EF_{grid,BM,y}$ and $EF_{grid,CM,y}$; meanwhile, parameters $EG_{BL,Tejuva,y}$ and $EG_{BL,Chadgad,y}$ are monitored. The values of total net electricity export used in deriving the GHG emission reduction could be very well correlated between the data sets and ER spreadsheet/03/ provided by PP. The verification of each monitoring parameter has been discussed later in section 4.3.

The calculation method and formulae used in calculating baseline emission are complying to the methodology used i.e. ACM0002 version 17.0.0 /07/. Since project activity is a wind power project, leakage emissions and project emissions have been considered as zero.

The assessment concludes that GHG emission reductions have been quantified correctly in accordance with project description/01/ and applied methodology/07/.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

4.3.1 Monitored Parameters

Parameter	EG_{BL,Tejuva,y} (MWh) Quantity of net electricity supplied to the grid by phase-1 (Tejuva) site to the grid in year y			
Means of verification	Criteria/Requirements	Assessment/Observation		
	Measuring /Reading /Recording frequency	The parameter is monitored continuously, measured hourly and recorded monthly.		
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The measuring and reporting frequency is in line with the monitoring plan as outlined in the registered PD/01/ and monitoring methodology/07/.		
	Monitoring equipment	Energy meters:		
		Meter Identification No	Meter Make	Accuracy Class
	RJB85058 (Main Meter)	Secure Meter	0.2s	

		RJB85059 (Check Meter)	Secure Meter	0.2s	
	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?	Yes, accuracy class of meter is in line with registered monitoring plan/01/.			
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Accuracy is valid for the entire measuring range.			
	Calibration frequency /interval:	The meters are calibrated every 5 years in line with notification by Central Electricity Authority, Govt. of India/8/.			
	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, Pending until the findings are closed or as per the manufacturer's specifications?	Yes, calibration interval of meters is 5 years, which is in line with the monitoring plan/01/ and national standards/8/.			
	Is the calibration of measuring equipment carried out by an	Yes, the calibration is carried out by NABL accredited institution/04/.			

	accredited person or institution?	Meter Identification No	Calibration Date	Calibration Validity Date
		RJB85058 (Main Meter)	23/01/2015	22/01/2020
		RJB85059 (Check Meter)	23/01/2015	22/01/2020
	Is(are) calibration(s) valid for the whole reporting period?	Yes, the calibration is valid for entire monitoring period.		
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes, calibration has been carried out for a comparable measuring range for which measurements have been carried out/04/.		
	How were the values in the monitoring report verified?	The values in the monitoring report were verified from the monthly data reported by Suzlon Energy Limited in 'Monthly Generation Record'/06/. Final electricity generated by the project activity is 365,960.27 MWh.		
	If applicable, has the reported data been cross-checked with other available data?	Yes, the data has been cross-checked with invoices raised by CLP India Pvt. Ltd./05/		
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management. QA/QC processes are in place.		
	In case project participants have temporarily not monitored the parameter, has either i)	Not Applicable		

	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?	
Findings	No findings raised	
Conclusion	The parameter has been monitored appropriately in accordance with the registered monitoring plan/01/ and applied methodology/07/. The monitored data was recorded consistently as per the approved frequency in monitoring plan/01/. Since 100% data has been monitored and verified, the verification team can ascertain that the values used for calculation of emission reduction are free from material errors. Implementation of the project is as per the registered monitoring plan/01/.	

Parameter	EG_{BL,Chadgarh,y} (MWh) Quantity of net electricity supplied to the grid by phase-2 (Chandgarh) site to the grid in year y	
Means of verification	Criteria/ Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	The parameter is monitored continuously, measured hourly and recorded monthly.
	Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes. The reporting frequency is in line with the monitoring plan as outlined in the registered PD/01/ and monitoring methodology/07/.

	Monitoring equipment	Electronic tri-vector meters:		
		Meters in Feeder-1		
		Meter Identification No	Meter Make	Accuracy Class
		XB587800 (Main Meter)	Secure Meter	0.2s
		XB587799 (Check Meter-replaced on 08/12/2017)	Secure Meter	0.2s
		XD528043 (Check Meter)	Secure Meter	0.2s
		Meters in Feeder-2		
		Meter Identification No	Meter Make	Accuracy Class
		XB587797 (Main Meter-replaced on 18/06/2018)	Secure Meter	0.2s
		XE565677 (Main Meter)	Secure Meter	0.2s
		XB587798 (Check Meter)	Secure Meter	0.2s
	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	Yes, accuracy class of meter is 0.2 s, which is in line with register monitoring plan/01/.		

	manufacturer's specification?	
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes, accuracy is valid for the entire measuring range.
	Calibration frequency /interval:	The meters are calibrated every 5 years in line with notification by Central Electricity Authority, Govt. of India/08/.
	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, Pending untill the findings are closed or as per the manufacturer's specifications?	Yes, calibration interval of meters is 5 years, which is in line with the monitoring plan/01/ and national standards/08/.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes, the calibration is carried out by Madhya Pradesh Power Transmission Company for the meters in Chandgarh/04/ which is accredited by NABL.
	Is(are) calibration(s) valid	Yes, the calibration is valid throughout the

	for the whole reporting period?	reporting period.			
		Feeder No	Meter Identification No	Calibration Date	Calibration Validity Date
		Feeder-1 (Main Meter)	XB587800	26/03/2015 , 19/06/2018	25/03/2020 , 18/06/2023
		Feeder-1 (Check Meter)	XB587799	26/03/2015	25/03/2020
		Feeder-1 (Check Meter)	XD528043 (installed on 08/12/2017)	19/06/2018	18/06/2023
		Feeder-2 (Main Meter)	XB587797	26/03/2015	25/03/2020
		Feeder-2 (Main Meter)	XE565677 (Installed on 18/06/2018)	18/06/2018	17/06/2023
		Feeder-2 (Check Meter)	XB587798	26/03/2015 , 18/06/2018	25/03/2020 , 17/06/2023
		There was no delay in calibration of main-meter XE565677 after its installation on 18/06/2018, as verified from monthly generation records/06/ against the calibration reports/04/.			
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	Yes, the calibration carried out for the measuring range are comparable with the range for which measurements have been carried out.			

	How were the values in the monitoring report verified?	The values in the monitoring report were verified from the monthly data reported by Gamesa Wind Turbines Pvt. Ltd in 'Monthly Generation Record'/06/. Final electricity generated by the project activity is 358,811.33 MWh .
	If applicable, has the reported data been cross-checked with other available data?	Yes, the data has been cross-checked with invoices raised by CLP India Pvt. Ltd./05/
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data ensure correct transfer of data and reporting of emission reductions management. QA/QC processes are in place.
	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?	Not applicable
Findings	CAR#05 raised and resolved	
Conclusion	The parameter has been monitored appropriately in accordance with the registered monitoring plan/01/ and applied methodology/07/. The monitored data was recorded consistently as per the approved frequency in monitoring plan/01/. Since 100% data has been monitored and verified, the verification team	

	can ascertain that the values used for calculation of emission reduction are free from material errors.
	Implementation of the project is as per the registered monitoring plan/01/

4.3.2 Parameters Fixed ex-ante

- EF_{grid,OM,y}: The parameter is described as operating margin CO₂ emission factor of NEWNE Grid and is measured in unit tCO₂/MWh. The value provided in MR i.e. 1.00 has been verified from PD/01/ and CO₂ Baseline Database for Indian Power Sector by Central Electricity Authority (version10)/08/.
- EF_{grid,BM,y}: The parameter is described as build margin CO₂ emission factor of NEWNE grid which is measured in units tCO₂/MWh. The value provided in MR i.e. 0.95 has been verified from PD/01/ and CO₂ Baseline Database for Indian Power Sector by Central Electricity Authority (version10)/08/.
- EF_{grid,CM,y}: The parameter is described as combined margin CO₂ emission factor of NEWNE grid which is measured in units tCO₂/MWh. The value provided in MR i.e. 0.99 has been verified from PD/01/.

Calibration Details:

During the assessment of the project activity, installation and working of the meters was checked during on-site inspection while their calibration was verified during the desk review. The meters used and their calibration details are mentioned below, as verified from calibration reports/04/:

Meter ID	Project Activity Site	Date of calibration	Calibration valid till	Calibration valid for the MP (Yes/No)
RJB85058 (Main Meter)	Tejuva	23/01/2015	22/01/2020	Yes
RJB85059 (Check Meter)	Tejuva	23/01/2015	22/01/2020	Yes
XB587800 (Main Meter)	Chandgarh	26/03/2015, 19/06/2018	22/01/2020, 18/06/2023	Yes
XB587799 (Check Meter)	Chandgarh	26/03/2015,	25/03/2020	Yes
XD528043 (Check Meter)	Chandgarh	19/06/2018	18/06/2023	Yes
XB587797 (Main Meter)	Chandgarh	26/03/2015	25/03/2020	Yes
XE565677 (Main Meter)	Chandgarh	18/06/2018	17/06/2023	Yes
XB587798	Chandgarh	26/03/2015,	25/03/2020,	Yes

Meter ID	Project Activity Site	Date of calibration	Calibration valid till	Calibration valid for the MP (Yes/No)
(Check Meter)		18/06/2018	17/06/2023	

The meter replacement took place at Chandgarh site which has also been reported as deviation in the section 3.3 of this report;

GHG Calculations:

The emission reduction as per the applied methodology/07/ equals the baseline emissions since project emissions and leakage emissions for such project activities is considered zero. The formula provided for the calculation of baseline emissions is:

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

Where:

BE_y: Baseline emissions in year y (tCO₂e/yr)

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

EF_{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" (tCO₂e/MWh)

Baseline Emissions:

Year	Total Net Electricity Export by the Project (MWh)	Emission Factor (tCO ₂ /MWh)	Baseline Emissions (tCO ₂)
2016 (01/08/2016 to 31/12/2016)	108,002.67	0.99	106,922
2017 (01/01/2017 to 31/12/2017)	360,863.40	0.99	357,254
2018 (01/01/2018 to 31/07/2018)	255,905.53	0.99	253,346
Total	724,771.60		717,522

Total Emission Reductions:

Year	Baseline emissions	Project emissions or	Leakage emissions	Net GHG emission
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	or removals (tCO ₂ e)	removals (tCO ₂ e)	(tCO ₂ e)	reductions or removals (tCO ₂ e)
2016 (01/08/2016 to 31/12/2016)	106,922	0	0	106,922
2017 (01/01/2017 to 31/12/2017)	357,254	0	0	357,254
2018 (01/01/2018 to 31/07/2018)	253,346	0	0	253,346
Total	717,522	0	0	717,522

4.4 Non-Permanence Risk Analysis

Not applicable

5 SAFEGUARDS

5.1 No Net Harm

Not applicable

5.2 Local Stakeholder Consultation

Local stakeholder consultation has been conducted at the time of project registration hence not applicable in the current monitoring period.

6 VERIFICATION CONCLUSION

Earthood Services Private Limited (Earthood), contracted by CLP Wind Farms (India) Private Limited, has performed the independent verification of the emission reductions for the VCS project activity reference number 1560 “Tejuva – Chandgarh Wind Project” in India for the monitoring period 01/08/2016 – 31/07/2018 reported in the Monitoring Report Version 02 dated 24/08/2018.

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

Earthood commenced the verification on the basis of the baseline and monitoring methodology ACM0002 (Version 17.0.0), the monitoring plan contained in the PD Version 03, VCS Programme Guide version 3.7 and VCS Standard version 3.7, Monitoring Report Version 02 dated 24/08/2018 as per the process described under Section 2 of this report.

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.

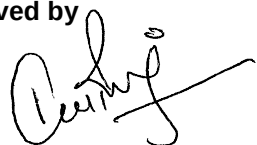
In our opinion the GHG emissions reductions reported for the project activity for the period 01/08/2016 – 31/07/2018 are fairly stated in the Monitoring Report Version 2 dated 24/08/2018. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002, Version 17.0, and the VCS standard.

Verification period: From 01/08/2016 to 31/07/2018 (both days inclusive)

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2016 (01/08/2016 to 31/12/2016)	106,922	0	0	106,922
2017 (01/01/2017 to 31/12/2017)	357,254	0	0	357,254
2018 (01/01/2018 to 31/07/2018)	253,346	0	0	253,346
Total	717,522	0	0	717,522

Approved by



Dr. Kaviraj Singh
Managing Director
Earthood Services Privated Limited

Date: 04/09/2018
Place: Gurgaon, Haryana

APPENDIX 1: REFERENCES

S.No	Title of Document	Version	Date
1.	Registered VCS PD	Version 3	23/09/2016
2.	VCS Monitoring Report	Version 2	24/08/2018
3.	ER spreadsheet (corresponding to the final monitoring report)	-	-
4.	Calibration report for all the meters linked to project activity	-	-
5.	Invoice issued by PP for the duration of 01/08/2016 to 31/07/2018	-	-
6.	Joint Meter Readings for the duration of 01/08/2016 to 31/07/2018	-	-
7.	"Consolidated baseline methodology for grid-connected electricity generation from renewable sources", ACM0002	Version 17	13/05/2016
8.	CO2 Baseline Database for the Indian Power Sector published by the Central Electricity Authority (CEA), Ministry of Power, Govt.	Version 10	Dec, 2014
9.	On-site assessment, interviews of plant staff	-	20/08/2018 21/08/2018
10.	Commissioning certificate for all the meters of the project activity	-	-
11.	Meter replacement report	-	-
12.	VCS webpage for the project, VCS ID 1560; http://vcsprojectdatabase.org/#!/project_details/1560	-	-
13.	Letter of declaration dated from PP regarding not having created or sought any other form of emission credit for the same period and double counting	-	27/08/2018
14.	VCS Standard	Version 3.7	21/06/2017
15.	VCS Program Guide	Version 3.7	21/06/2017

APPENDIX 2: Competency Statement

Competence Statement			
Name	Ashok Gautam		
Country	India		
Education	M. Sc. (Environmental Sciences) M. Tech. (Energy & Environmental Management)		
Experience	16 Years +		
Field	Energy, Climate Change & Environment		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS-I.D., AMS-I.A., AMS-I.C., AMS-I.E, AMS-II.D., AMS-II.G., AMS-III.E., AMS-III.H., AMS-III.Q, AMS-III.Z., AMS-III.AV., AM0029, AM0025, AM0056, ACM0001, ACM0002, ACM0004, ACM0012, ACM0006, AM0018, ACM0009		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.1, TA 1.2, TA 3.1, TA 13.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Kaviraj Singh	Date	01/03/2018

Competence Statement	
Name	Shifali Guleria
Education	M.Sc. (Environmental Studies and Resource Management), TERI University
Experience	9 months
Field	Climate Change
Approved Roles	
Team Leader	NO
Validator	NO
Verifier	NO
Methodology Expert	NO
Local expert	NO
Financial Expert	NO
Technical Reviewer	NO
TA Expert (X.X)	NO
Trainee	Validator/ Verifier

Reviewed by	Shreya Garg (Quality Manager)	Date	01/07/2018
Approved by	Anshika Gupta (Technical Manager)	Date	01/07/2018

Competence Statement			
Name	Chirag Luthra		
Education	B.Tech in Environmental Engineering, Delhi Technological University		
Experience	4 months		
Field	Environment Engineering		
Approved Roles			
Team Leader	NO		
Validator	NO		
Verifier	NO		
Methodology Expert	NO		
Local expert	NO		
Financial Expert	NO		
Technical Reviewer	NO		
TA Expert (X.X)	NO		
Trainee	Validator/ Verifier		
Reviewed by	Shreya Garg (Quality Manager)	Date	01/07/2018
Approved by	Anshika Gupta (Technical Manager)	Date	01/07/2018

Competence Statement			
Name	Amit Ranjan Mandal		
Country	India		
Education	Master of Science (Energy Management)		
Experience	9.5 yrs		
Field	Environmental, Energy, CDM		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	ACM0002, AMS.I.D		
Local expert	YES (India)		
Financial Expert	YES		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Kumar Gautam	Date	01/03/2018

APPENDIX 3: ABBREVIATIONS

BEF	Baseline Emission Factor
BM	Build Margin
CAR	Corrective Action Request
CEA	Central Electricity Authority
CL	Clarification Request
CMS	Central Monitoring System
CMP	Conference of Parties Serving as Meeting of Parties
CO ₂	Carbon dioxide
FAR	Forward Action Request
GHG	Green House Gas
JMR	Joint Meter Reading
kW	Kilowatt
kWh	Kilowatt hour
MR	Monitoring Report
MW	Megawatt
MWh	Megawatt-hour
NEWNE	Northern Eastern Western Northern-Eastern
PD	Project Description
PP	Project Proponent
PPA	Power Purchase Agreement
QA/QC	Quality Assurance and Quality Control
RRVNL	Rajasthan Rajya Vidyutt Programme Nigam Limited
SEL	Suzlon Energy Limited
WTG	Wind Turbine Generator
VCS	Voluntary Carbon Standard
VCS PD	VCS Project Description
VCUs	Voluntary Carbon Units

APPENDIX 4: VERIFICATION FINDINGS

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

FAR ID	Section No.	Date : DD/MM/YYYY
Description of FAR		
There is no finding from validation or previous verification report		
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	Section no.	Date : DD/MM/YYYY
01	-	23/08/2018
Description of CL		
Invoices and Monthly Generation Record for July 2018 were found missing (for both sites- Tejuva and Chandgarh) among the documents submitted by the PP. PP is requested to submit these documents.		
Project participant response		Date : 24/08/2018
Invoices and Monthly Generation data for July 2018 are now attached with this submission.		
Documentation provided by project participant		
Invoices Record for July 2018 Monthly Generation Record for July 2018		
DOE assessment		Date: 28/08/2018
Invoices and monthly generation data for July 2018 has been submitted by the PP and the data was found to be consistent with MR and ER sheet. Closed.		

CL ID	Section no.	Date : DD/MM/YYYY
02	-	23/08/2018
Description of CL		
During the assessment of evidences, it was observed that for site Tejuva, electricity export has only been reported for 9 days in November 2016 in the JMR report. Meter records for dates 11/11/2016 to 1/12/2016 were found missing. PP is requested to address this.		
Project participant response		Date : 24/08/2018
Electricity generation from 10/11/2016 to 01/12/2016 in already mentioned on the same JMR sheet (right hand side).		
Documentation provided by project participant		
-		
DOE assessment		Date: 28/08/2018
Electricity generation from 10/11/2016 to 01/12/2016 was found to be mentioned in the JMR sheet. The finding is closed.		

Table 3. CAR from this verification

CAR ID	Section no.	Date : DD/MM/YYYY
03	1.4, 3.2	23/08/2018
Description of CAR		
Monitoring Report:		
- Detailed information regarding the metering system and feeders at both the sites is not found in the MR. PP is requested to provide this information along with information on monitoring points. - PP is requested to provide technical specifications of WTGs in the MR. - In section 2.2, the monitoring period is erroneously mentioned with the dates pertaining to previous monitoring period. PP is requested to address this.		
Project participant response		Date : 24/08/2018

1. Information regarding the metering system and monitoring points are not mandatory in line with VCS Monitoring Report template version 3.4. Necessary information in line with template are already provided in monitoring report.
2. Information pertaining to technical specifications of WTGs are not mandatory in line with VCS Monitoring Report template version 3.4. Necessary information in line with template are already provided in monitoring report.
3. At Chandgarh site, Madhya Pradesh Power Transmission Company Limited has replaced the billing meters on 18/06/2018 for feeder -2 and check meter on 08/12/2017 for feeder-1 to maintain the appropriateness in electricity monitoring in line. Thus, deviation has been proposed.
Documentation provided by project participant
<i>Revised monitoring report</i> <i>Meter replacement report</i>
DOE assessment Date: 28/08/2018
1. The explanation provided by the PP was found to be agreeable. Therefore, this finding is closed.
2. The explanation provided by the PP was found to be agreeable. Therefore, this finding is closed.
3. A deviation has been proposed as a result of meters replacement in Phase-2 (Chandgarh) in the new version of MR. Closed.

CAR ID	04	Section no.	-	Date : 23/08/2018
Description of CL				
In ER sheet 'Chandgarh Generation' cell C19, the punched in value '8756827' is inconsistent with the JMR report and invoice provided by PP as evidence, where the value is '8756837'. PP is requested to resolve this.				
Project participant response				Date : 24/08/2018
Value in cell C19 of "Chandgarh Generation" has been corrected now.				
Documentation provided by project participant				
<i>Revised MR and ER sheet</i>				
DOE assessment				Date: 28/08/2018
The value in cell C19 of sheet "Chandgarh Generation" has been verified to be updated in line with JMR report and invoice. Closed.				

CAR ID	05	Section no.	4.3.1	Date : 23/08/2018
Description of CAR				
During on-site visit in Chandgarh it was observed that meter identification no. of main meter in Feeder-II (XE565677) and Check Meter in Feeder-I (XD528043) is not consistent with the identification number provided in the MR-XB587797 and XB587799 respectively. PP is requested to justify the reason for these inconsistencies and provide evidences for the same.				
Project participant response				Date : 24/08/2018
In this project, the meters installed at the project metering point are under the custody of state DISCOM. At Chandgarh site, Madhya Pradesh Power Transmission Company Limited has replaced the billing meters on 18/06/2018 for feeder -2 and check meter on 08/12/2017 for feeder-1 to maintain the appropriateness in electricity monitoring in line with section 4.3 of registered PD. Thus, monitoring report has been revised accordingly.				
Documentation provided by project participant				
<i>Revised monitoring report</i>				
DOE assessment				Date: 28/08/2018
The information regarding replacement of meters has been appropriately revised in the latest version of MR. The finding is therefore closed				

Table 4. FAR from this verification

FAR ID		Section No.		Date : DD/MM/YYYY
Description of FAR				
<i>There is no FAR raised from this verification</i>				
Project participant response				Date : DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY