

VERIFICATION REPORT FOR “WIND ENERGY PROJECT IN HARAPANAHALLI, KARNATAKA”



Document Prepared By Earthood Services Private Limited

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Summary:

Earthood Services Private Limited (hereafter referred to as ESPL) has performed the verification of the project “Wind Energy Project in Harapanahalli, Karnataka”, VCS ID 1482, against VCS Standard Version 3.7. The scope of verification includes confirming the implementation of the monitoring plan of the registered VCS PD (version 03) dated 26/07/2015 and the application of the monitoring methodology “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, ACM0002, Version 12.3.0.

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 ESPL internal quality procedures.

During the verification process 03 CARs, 01 CL and 00 FARs were raised. All the findings have been closed satisfactorily and the same has been discussed in Appendix 4.

ESPL confirms that the monitoring system is in place and the emission reductions are calculated without material misstatements. The emission reductions from the project activity “Wind Energy Project in Harapanahalli, Karnataka” in India during the period 02/11/2017 – 01/02/2019 (including both days) amount to 102,563 tonnes of CO₂e.

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1 INTRODUCTION

1.1 Objective

CLP Wind Farms (India) Private Limited has contracted Earthood Services Private Limited (ESPL) to perform fourth VCS Verification of the 'Wind Energy Project in Harapanahalli, Karnataka' in India (hereafter called project). This project has already been registered as a VCS project (VCS ID 1482). The objective of this verification is a thorough and independent assessment of registered project activities against the applicable VCS requirement by the DOE. The verification process shall determine whether the proposed project activity complies with the requirements of latest VCS guidelines, applicability conditions of the selected methodology, relevant host country regulations and guidance issued by the VCS Board.

1.2 Scope and Criteria

The scope of verification is to assess the claims and assumptions made in the VCS monitoring report (MR) against the VCS criteria, including but not limited to, VCS standard, applied methodology and other relevant rules and requirements established for VCS project activities.

The Verification is not meant to provide any consulting towards the project participants. However, stated requests for clarification and/or correction actions request may have provided inputs for improvement of the project design.

1.3 Level of Assurance

The verification team verified the complete monitoring data for all the parameters of the monitoring plan and confirms that the reported emission reductions are free from any type of material errors. Therefore, ESPL confirms that the verification is conducted with reasonable level of assurance.

1.4 Summary Description of the Project

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

The project activity consists of 24 WTGs (1650 kW capacity each), making the total installed capacity to be 39.6 MW at the Harakanalu, Arsanahalu, Hyarada, Dasanahalli villages of Davangere district in state of Karnataka.

Location of the project was verified through Google Map (<https://www.gps-coordinates.net/>) and found consistent with the data provided in the registered PD /01/. The WTGs generate power and it is further stepped up to 33 kV for further distribution by the state utility. This information was verified during physical site visit and found to be in line with the details provided in the registered PD /01/.

The WTGs have been commissioned between 21/01/2011 and 25/02/2011. The same was verified against the registered VCS PD/01/ and commissioning certificates/13/. The emission reductions from the project activity during the period 02/11/2017 – 01/02/2019 (including both days) amount to 102,563 tonnes of CO₂e.

2 VERIFICATION PROCESS

The registered VCS project is undergoing fourth verification under VCS, the approach adopted to ensure the quality of emission reductions is described in the following sections.

2.1 Method and Criteria

ESPL assessed and determined whether the proposed implementation and operation of the project activity, and the steps taken to report emission reductions comply with the criteria and relevant guidance provided by the VCS Board. The validation/verification process consist of the following three phases;

- A desk review of the VCS PD and VCS MR
- Site visit and follow up interviews with project stakeholders

The resolution of outstanding issues and issuance of final report and opinion.

2.2 Document Review

The verification is performed primarily as a document review of the registered VCS PD, previous MR and Verification report and associated documents as stated in details in appendix 1 of this document. The assessment is performed by a verification team using a protocol. The cross checks between information provided in the Monitoring report, VCS PD and information from sources other than those used, if available, the team's sectoral or local expertise and, if necessary, independent background investigations.

2.3 Interviews

The site visit for the project location, by the assessment team, was conducted on 08/02/2019 and the following stakeholders were interviewed.

S N	Name	Organization
1	Mr.Dhinakar Kantharaj	CLP Wind Farms (India) Private Limited
2	Mr. Md. Rafi	Vestas Wind Technology India Private Limited
3	Mr.Rasul Pinjar	Vestas Wind Technology India Private Limited

The topics covered during interview ranges from general features and implementation of project to technical details of the project like calibration details, monitoring and measuring system and data collection, recording and archiving procedures. The assessment was drawn based on the feedback received during interview coupled with the documentation and on-site observations.

2.4 Site Inspections

A site visit was undertaken by ESPL team on 08/02/2019 to carry out the following;

- a. An assessment of the implementation and operation of the registered project activity as per the registered VCS PD and VCS MR;
- b. A review of information flows for generating, aggregating and reporting the monitoring parameters;
- c. Interviews with relevant personnel to determine whether the operational and data collection procedures are implemented in accordance with the monitoring plan in the PD;
- d. 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;
- e. 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;
- f. A review of calculations and assumptions made in determining the GHG data and emission reductions;
- g. 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.

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 non-conformities, 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;

- Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;
- 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 CDM requirements have been met. All CARs and CLs raised by the ESPL 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.

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, if provided, by the project participants and an assessment by the verification team if it was closed out or otherwise.

2.5.1 Forward Action Requests

The project activity is undergoing fourth verification; there were no FARs raised during the validation or previous verification.

2.6 Eligibility for Validation Activities

Not applicable.

3 VALIDATION FINDINGS

Not applicable.

3.1 Participation under Other GHG Programs

The project activity is registered under the VCS only (VCS Project ID 1482) and is not registered under any other emissions trading program or any other mechanism that includes GHG allowance trading. PP also confirms that net GHG emission reductions or removals generated during this monitoring period shall not be used for compliance under any such programs or mechanisms. This was confirmed through a declaration/19/ submitted by the PP and hence accepted by the assessment team.

3.2 Methodology Deviations

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

3.3 Project Description Deviations

During the current monitoring period no project deviation is identified.

However during the previous monitoring period, two changes identified in the project activity and considered as project deviation:

Deviation 01:

As per the registered PD, there are 03 metering points described for the project activity, where monthly recording of generated electricity had to be done. Meters installed at location no-HARA 02 and HARA 03 are at 33 kV side, which are cluster meters having load of 11WEGs*1650kW and 13WEGs*1650kW respectively. Both the cluster meters are further connected to 220 kV BESCOM substation where third metering point Hara 01 is located. At third metering point one set of meters (main and check meter) bidirectional tri-vector meters is provided

In actual scenario, there are only 24 WEGs connected to the Hara 01 metering point. All these 24 WEGs are owned by Project proponent and are part of the current project. Electricity export and import recorded at metering point HARA 01 at the 220 kV side shall be considered for the monitoring and billing purpose. Hence during the crediting period, ER calculations will be based on Electricity Export, Import recorded at meters connected at HARA 01 only, and not from the meters at HARA 02 and HARA 03, which are nowhere referred to by the Project proponent.

This deviation in project description is already approved and valid in the present monitoring period. Hence, readings recorded at HARA 01 are the only readings referred to for the calculation of Emission Reductions and are available in Form B which is issued by BESCOM.

Deviation 02:

The second deviation is regarding calibration frequency of the meters. The Project Proponent has proposed for the change in the frequency of calibration from once every quarter to once every six months as the calibration process is not in the purview of the Project Proponent and is completely under jurisdiction of the State Utility. This deviation in project description is already approved and valid in the present monitoring period.

The assessment team able to confirm that the deviation identified during the previous monitoring period is appropriately described and justified and the project remains in compliance with the VCS rules. Also the deviation does not have an impact on the applicability of the methodology, additionality or the appropriateness of the baseline scenario.

3.4 Grouped Project

Not applicable. The project activity is not a grouped project

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

The project activity consists of 24 WTGs installed at Harakanalu, Arsanahalu, Hyarada and Dasanahalli villages of Harapanahalli Taluk in Davangere district in state of Karnataka. The first and last machine under the project activity was commissioned on 21/01/2011 and 25/02/2011 respectively.

The WTGs are Vestas make with an individual capacity of 1.65 MW, summing up to 39.6 MW of total installation capacity. The installation and specification of WTGs has been check with commissioning certificates/13/ and on-site assessment/13/. The commissioning has also been duly validated in the VCS validation report of the project activity/02/. 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.

Assessment team concludes the following:

- a) The implementation status of project activity was found to be in compliance with 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) There is no increase in emission reduction from estimates made in registered PD, and no further justification for the same is required in the verification report.
- f) The project is only registered under VCS program and is not participated or rejected under any other GHG programs

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/04/. The monitoring plan laid in the registered PD is being followed at the site/13/. The assessment team has verified the information flow (from data generation, aggregation, to recording, calculation and reporting for these parameters including the values) in the MR/04/.

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. The values of the parameter $EG_{\text{facility},y}$ used in deriving the GHG emission reduction could be very well correlated between the data sets and ER spreadsheet/05/ 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 is in compliance to the methodology used i.e. ACM0002 version 12.3.0 /10/. Since project activity is a wind power project, leakage emission and project emission has been considered as zero.

4.3 Quality of Evidence to Determine GHG Emission Reductions and Removals

The below tables describe how the parameter, that is to be measured according to the monitoring plan, has been verified to confirm that the actual monitoring complies with the monitoring plan, monitoring data has been thoroughly assessed and that the calibration requirements are met.

Parameter	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y, $EG_{\text{facility},y}$ MWh	
Means of verification	Criteria/Requirements	Assessment/Observation
	Measuring /Reading /Recording frequency	The electricity exported and imported by all 24 WTGs of the project activity are continuously measured and monthly recorded at the bulk meter by the representatives of BESCOM and the Project Proponent.
	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/10/.
	Monitoring equipment	The electricity being generated by 24 wind turbines is monitored at the dedicated Haraknal substation located at Harapanahalli. In the substation, there are two meters namely- Check Meter and Main Meter (static type Trivector meter, Accuracy class: 0.2.)
	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?	Both the energy meters are two-way tri-vector meters of accuracy class 0.2s. Accuracy of the monitoring equipment's is in accordance with the monitoring plan as outlined in the registered PD.
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Yes. The accuracy of monitoring equipment is valid for the entire range.
	Calibration frequency /interval:	Calibration frequency of the

		meters is once in 6 months .
	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?	The registered monitoring plan indicates the frequency of accuracy testing/ calibration of the main and check meters as once in a quarter. However, Project Proponent has sought for deviation and has considered frequency of meters to be once in six months considering the fact that calibration of meters is taken up by testing division of BESCOM/KPTCL and Project Proponent has no control on it.
	Is the calibration of measuring equipment carried out by an accredited person or institution?	Yes the calibration is conducted by KPTCL which NABL Accredited Government institution/06/.
	Is(are) calibration(s) valid for the whole reporting period?	Yes, the calibrations of meters are 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. The calibration is carried out appropriately.
	How were the values in the monitoring report verified?	Monthly value of $EG_{\text{facility},y}$ for entire monitoring period is reported in the monitoring report and in the ER calculation sheet. The monthly values were verified from the Form-B issued by state utility and found to be consistent. Value of this parameter for the current monitoring period was verified as 109,695 MWh.
	If applicable, has the reported data been cross-checked with other available data?	The monthly reported values of $EG_{\text{facility},y}$ were further cross checked with the monthly invoices raised by the PP /07/ to state utility and found to be

		consistent.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the adequate QA/QC procedures were implemented by all the stakeholders, namely, the Grid Authority (KPTCL), the PP and the Vestas (O&M Contractor). The data transfer process for the said parameter is as follows: The Joint meter reading at all the metering points at DISCOM substation is taken by the representatives of KPTCL/HESCOM in the presence of CLPWFPL officials in the form of JMRs. Monthly Form-B issued by state utility provides the value of $EG_{facility,y}$ that is directly used for emission reduction calculations.
	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	CL #1,CAR #2,CAR #3and CAR #4 was raised and resolved	
Conclusion	The parameter has been monitored appropriately, in accordance with the registered monitoring plan (as per measurement methods and procedures to be applied) and applied methodology. The monitoring results were recorded consistently as per the approved frequency in the monitoring plan. The emission reduction calculation for the project activity is estimated based on the electricity supplied by the WTGs. Monthly values of electricity generated inserted in the ER sheet was verified with the Form-B provided by the project proponent/09/. Since 100% data was verified, the team can ascertain that the values taken for emission reduction calculation are free from material errors.	

Additionally, the emission factor was determined ex-post at the time of validation, hence following parameters are monitored:

$EF_{grid,CM,y}$; tCO₂e/MWh: The Combined margin CO₂ emission factor of integrated Indian Grid (NEWNE and Southern are now synchronized) considered for the current monitoring period is based on the CEA database version 14, which is latest version available to the project proponent during the current monitoring period. The emission factor value as 0.9350 tCO₂e/MWh is reported in the monitoring report and in the ER calculation sheet. The assessment team has verified the data used in the calculation of emission factor through the latest CEA database and found to be consistent.

$EF_{grid,OM,y}$; tCO₂e/MWh:

The Operating margin CO₂ emission factor of integrated Indian Grid (NEWNE and Southern are now synchronized) considered for the current monitoring period is based on the CEA database version 14, which is latest version available to the project proponent during the current monitoring period. Weighted average operating margin emission factor value as 0.96 tCO₂e/MWh is reported in the monitoring report and in the ER calculation sheet. The assessment team has verified the data used in the calculation of emission factor through the latest CEA database and found to be consistent.

$EF_{grid,BM,y}$; tCO₂e/MWh:

The build margin CO₂ emission factor integrated Indian Grid (NEWNE and Southern are now synchronized) considered for the current monitoring period is based on the CEA database version 14, which is latest version available to the project proponent during the current monitoring period. Weighted average operating margin emission factor value as 0.86 tCO₂e/MWh is reported in the monitoring report and in the ER calculation sheet. The assessment team has verified the data used in the calculation of emission factor through the latest CEA database and found to be consistent.

The assessment team has verified the calculation of emission factor for the current monitoring period and confirmed that it is calculated in line with the guidelines provided in the "Tool to calculate the emission factor for an electricity system", version 06. It is noted that, CEA is the sole authority for the publication of such data in India. It is a part of the Ministry of Power of the Government of India and therefore, is a source of authentic and credible data for the purpose of the determination of the grid emission factor.

Parameters fixed ex ante:

W_{OM} (%): It is the "Weightage of operating margin emissions factor" fixed at the time of project registration the value applied of 0.75 is consistent with the registered PD/01/.

W_{BM} (%): It is the "Weightage of build margin emissions factor" fixed at the time of project registration the value applied of 0.25 is consistent with the registered PD/01/.

Calibration of meters:

During the verification assessment of the project activity, accuracy of all the metering have been checked and found appropriate. The installation and working conditions of the meters were checked during the on-site inspection and were found to be satisfactory. Details of meters are provided in below table:

Meter Location	Meter Serial No	Meter Type	Meter Make/ Accuracy class	Calibration Date	Calibration delay (Y/N)
220 kV Haraknal substation	11068937	Main Meter	L&T/0.2s	27/07/2017, 22/01/2018, 24/04/2018, 18/07/2018 and 31/10/2018	N
(metering point HARA-01)	11068943	Check meter:	L&T/0.2s	27/07/2017, 22/01/2018, 24/04/2018, 18/07/2018 and 31/10/2018	N

Meters used to measure the parameters are of accuracy class 0.2s, as verified through calibration certificates/06/ and also physical inspection during the site visit. The CEA Notification No. 502/70/CEA/DP&D dated 17/03/2006 and its amendments Notified on 26/06/2010 No. 502/6/2009/DP&D/D-I /17/ which is considered as national standard, mentions that for voltage of 650 V up to 33 Kv, 0.5s accuracy class or above is recommended. Hence, the accuracy classes of 0.2s for the energy meters installed at the project activity site are found to be appropriate.

The details of monitoring equipment are involved in the project activity and their calibration details/06/ are mentioned in the table under Appendix-1 of the VCS MR/04/. The monitoring equipment consists of a main and check meter at the state utility substation. The meters have been physically inspected during the site visit and the meter details are found to be consistent with that observed during the site visit. The accuracy class of the meters are consistent with that mentioned in the registered VCS PD/01/.

The CEA Notification No. 502/70/CEA/DP&D dated 17/03/2006/17/ which is considered as national standard mentions that “All interface meters shall be tested at least once in five years.” Hence, the stipulated calibration frequency once in 6 months is appropriate. As indicated through the dates of calibration mentioned in the table under Appendix-1 of the VCS MR, all meters are calibrated within 6 months. The date of calibration has been verified against the calibration certificates/06/. The registered VCS PD & MR /04/ and site visit observations confirm that the metering equipment are sealed and calibrated by the state utility.

In view of the above discussion the assessment team able to confirm that evidence used to determine the GHG reductions and removals are sufficient and appropriate with respect to quality and quantity.

GHG Calculations

The emission reduction as per the applied methodology equals the baseline emissions (project emissions and leakage emissions for such project activities is considered zero).

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

Where:

ER_y = Emission reductions in year y (tCO₂e/yr)

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

PE_y = Project emissions in year y (tCO₂e/yr)

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 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" (tCO₂/MWh)

If the project activity is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the project activity, then:

$$EG_{PJ, y} = EG_{facility, y}$$

$$\text{Thus, } BE_y = EG_{facility, y} * EF_{grid, CM, y}$$

$$\text{Thus, } BE_y = 109,695 \text{ MWh} * 0.9350 \text{ tCO}_2\text{e/MWh}$$

$$= 102,563 \text{ tCO}_2$$

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. The actual emission reduction achieved during the current monitoring period are 12.47% higher than the estimated amount of emission reductions at the time of validation, which is due to the high PLF achieved by the project activity during the monitoring period.

It is to be noted that PLF is completely governed by the availability of wind, which is natural phenomenon and same is beyond the control of PP, hence the assessment team has concluded the increase in emission reduction of the project activity is justified and acceptable.

All the data were made available and have monitored as per required monitoring frequency. The means of verification for the values of parameters, used for baseline emission calculation, is described above.

4.4 Non-Permanence Risk Analysis

Not applicable for the project activity.

5 SAFEGUARDS

5.1 No Net Harm

Not applicable for this verification.

5.2 Local Stakeholder Consultation

Not applicable for this verification.

6 VERIFICATION CONCLUSION

Earthood Services Private Limited (ESPL), contracted by CLP Wind Farms (India) Private Limited, has performed the independent verification of the emission reductions for the VCS project activity (VCS ID- 1482) "Wind Energy Project in Harapanahalli, Karnataka " in India for the monitoring period 02/11/2017 – 01/02/2019 as reported in the Monitoring Report Version 03 dated 15/03/2019. The CLP Wind Farms (India) 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.

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

ESPL commenced the verification on the basis of the baseline and monitoring methodology ACM0002 version 12.3.0, the monitoring plan contained in the registered VCS PD Version 03 and VCS guidelines version 3.7, Monitoring Report Version 03 dated 15/03/2019 as per the process described under Section 2 of this report.

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

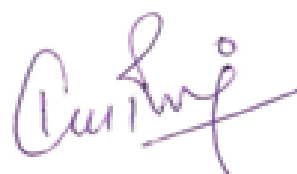
In our opinion the GHG emissions reductions reported for the project activity for the period 02/11/2017 – 01/02/2019 are fairly stated in the Monitoring Report Version 03 dated 15/03/2019. The GHG emission reductions were calculated correctly on the basis of the approved baseline and monitoring methodology ACM0002, Version 12.3.0, and the VCS standard.

Verification period: From 02/11/2017 – 01/02/2019 (including both days)

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)
2017(02/11/2017 to 01/01/2018)	12,463.00	0.00	0.00	12,463.00
2018 (02/01/2018 to 01/01/2019)	84,131.00	0.00	0.00	84,131.00
2019 (02/01/2019 to 01/02/2019)	5,969.00	0.00	0.00	5,969.00
Total	102,563.00	0.00	0.00	102,563.00

Approved by



Dr. Kaviraj Singh
Managing Director

Earthood Services Privated Limited

Date: 15/03/2019

Place: Gurgaon, Haryana

APPENDIX 1: References

S.No	Title of Document	Version	Date
1.	Registered VCS PD	3.0	26/07/2015
2.	VCS Validation Report (ref no CDMMUM-0061741)	4.1	11/06/2012
3.	VCS Monitoring Report	01	06/02/2019
3.1	VCS Monitoring Report	02	05/03/2019
4.	VCS Monitoring Report (Final)	03	15/03/2019
5.	ER spread sheet (corresponding to the final monitoring report)	03	15/03/2019
6.	Certificates of Calibration for all the meters belongs to project activity	-	-
7.	Invoice issued by PP to state DISCOM for the period 02/11/2017 to 01/02/2019	-	-
8.	Monthly Credit Breakup Sheet issued by state DISCOM for the period 02/11/2017 to 01/02/2019	-	-
9.	VCS Verification Report for MP03, issued by LGAI Technological Center, S.A. (Applus+)	02	29/11/2017
10	"Consolidated baseline methodology for grid-connected electricity generation from renewable sources", ACM0002,	12.3.0	-
11	CEA Database	version 14	December 2018
12	On-site assessment, interviews of plant staff	-	08/02/2019
13	Commissioning certificate for all the WTGs of the project activity issued by KPTCL	-	-
14	Power Purchase Agreements signed between Project Proponent and KPTCL	-	-
15	VCS webpage for the project, VCS ID 1482; https://www.vcsprojectdatabase.org/#/project_details/1482	-	Last accessed on 21/02/2019
16	Central Electricity Authority (Installation and Operation of Meters) Regulations Notified on 17/03/2006 No. 502/70/CEA/DP&D Amendments Notified on 26/06/2010 No. 502/6/2009/DP&D/D-I	-	-
17	VCS Standard	Version 3.7	21/06/2017
18	VCS Program Guide	Version 3.7	21/06/2017
19	Letter of declaration dated from PP regarding not having created or sought any other form of environmental credit for the same period	-	05/03/2019

APPENDIX 2: Competency Statement

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, AMS.II.G		
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 Kumar Gautam	Date	01/03/2018

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

APPENDIX 3: Abbreviations

BEF	Baseline Emission Factor
BM	Build Margin
BESCOM	Bangalore Electricity Supply Company
CAR	Corrective Action Request
CEA	Central Electricity Authority
CERC	Central Electricity Regulatory Commission
CL	Clarification Request
CMP	Conference of Parties Serving as Meeting of Parties
CO ₂	Carbon dioxide
DISCOM	Distribution Company
EB	Executive Board
FAR	Forward Action Request
GHG	Green House Gas
ISO	International Standards Organization
JMR	Joint Meter Reading
KPTCL	Karnataka Power Transport Company Limited
kW	Kilowatt
kWh	Kilowatt hour
MFR	Multi-Function Relay
MR	Monitoring Report
MW	Megawatt
MWh	Megawatt-hour
O&M	Operation and Maintenance
PD	Project Description
PLF	Plant Load Factor
PP	Project Proponent
PPA	Power Purchase Agreement
CMS	Central Monitoring System
QA/QC	Quality Assurance and Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
WTG	Wind Turbine Generator
VCS	Voluntary Carbon Standard
VCSA	Voluntary Carbon Standard Association
VCS PD	VCS Project Description
VCUs	Voluntary Carbon Units

APPENDIX 4: Findings Overview

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

FAR ID	xx	Section no.	E.2	Date :DD/MM/YYYY
Description of FAR				
No FAR from validation				
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	01	Section no.	4.1	Date : 20/02/2019
Description of CL				
- Value of total electricity exported by the project activity in the current monitoring period as reported under section 3.2 of the MR is not consistent with ER calculation sheet. - Monitoring period number mentioned under section 2.4.2 is not correct.				
Project participant response				Date : 01/03/2019
- Total net electricity exported by the project activity in this current monitoring period is 109,695 MWh. Same is now updated consistently in revised monitoring period. - Monitoring period number mentioned under section 2.4.2 is now corrected to fourth periodic verification				
Documentation provided by project participant				
Revised monitoring period version 02, dated 05/03/2019				
Revised ER sheet version 02, dated 05/03/2019				
DOE assessment				Date: 10/03/2019
Value of total electricity exported by the project activity in the current monitoring period is corrected under section 3.2 of the MR and found consistent with ER calculation sheet. Monitoring period number is corrected in section 2.4.2 of the revised MR. CL #1 is closed.				

Table 3. CAR from this verification

CAR ID	02	Section no.	3.3	Date : 20/02/2019
Description of CAR				
It is not clear whether the project deviations reported under section 2.2.2 of the MR are considered in the current monitoring period.				
Project participant response				Date : 01/03/2019
Project deviations mentioned in section 2.2.2 had considered in previous verifications. Same is now clarified appropriately.				
Documentation provided by project participant				
Revised monitoring period, version 02, dated 05/03/2019				
DOE assessment				Date: 10/03/2019
Project deviations discussed under section 2.2.2 of the MR were considered during previous monitoring period. Project proponent has included this information under section 2.2.2 of the MR. CAR #2 is closed.				

CAR ID	03	Section no.	3.1	Date : 20/02/2019
Description of CAR				

Please submit declaration confirming that the GHG Emission reductions or removals generated by the project activity will not be used for compliance with an emission trading program or to meet binding limits on GHG Emissions.	
Project participant response	Date : 01/03/2019
Declaration confirming that the GHG Emission reductions or removals generated by the project activity will not be used for compliance with an emission trading program or to meet binding limits on GHG Emissions is now enclosed with this submission.	
Documentation provided by project participant	
Declaration letter dated 05/03/2019	
DOE assessment	Date: 10/03/2019
Project proponent has submitted, declaration confirming that the GHG Emission reductions or removals generated by the project activity will not be used for compliance with an emission trading program or to meet binding limits on GHG Emissions, found appropriate, hence accepted. CAR #3 is closed.	

CAR ID	04	Section no.	4.3	Date : 20/02/2019
Description of CAR				
1. It is not clear which version of CEA CO2 Baseline database is used to calculate emission factor for current monitoring period. 2. Calculation of emission factor is not provided in the ER calculation sheet. 3. Value of net electricity exported to grid in the current monitoring period is not consistent within the ER calculation sheet (cell G23 and E29).				
Project participant response				Date : 01/03/2019
1. In line with registered PD, Combined margin CO2 emission factor for grid connected power generation for the year y needs to be calculated using the latest version of the "Tool to calculate the emission factor for an electricity system". Thus, CO2 Baseline Database for Indian Power Sector" version 14.0 has been considered for this verification project which is the latest version of database issued by Central Electricity Authority, Govt. of India for the duration of FY 2017-2018. However, in absence of emission factors for the period of 01-Apr-18 to 01-Feb-19, same version of CO2 database has been considered for estimation of emission reduction. 2. Calculation of emission factor is now provided in the ER calculation sheet 3. Value of net electricity exported to grid in the current monitoring period is now revised appropriately in the ER calculation sheet				
Documentation provided by project participant				
Revised monitoring report ,version 02, dated 05/03/2019				
Revised Emission Reduction Sheet, version 02, dated 05/03/2019				
DOE assessment				Date: 10/03/2019
The project proponent has referred version 14 of CEA CO2 Baseline database to calculate emission factor for current monitoring period in line with the guidelines provided in "Tool to calculate the emission factor for an electricity system". Calculation of emission factor is provided in the ER calculation sheet, found to be acceptable. Value of net electricity exported to grid in the current monitoring period is corrected in the ER calculation sheet. CAR #4 is closed.				
CAR #4 is re-opened				Date: 14/03/2019
Description of CAR				
Period from 02/12/2017 to 01/01/2018 is not reported under the table in section 4.1 & 4.4 of the MR. Also the issue is identified in the ER calculation sheet.				
Project participant response				Date: 15/03/2019
Dates are updated now consistently in revised monitoring report				
Documentation provided by project participant				

Revised monitoring report, version 03 ,dated 15/03/2019
DOE assessment
End date for the vintage 2017 is updated in the MR and ER sheet, found to be satisfactory, hence accepted. CAR #4 is closed.

Table 4. FAR from this verification

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