



**Verification and certification report form for  
CDM project activities  
(Version 04.0)**

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

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the project activity</b>	Grid connected electricity generation from renewable source: Windfarm Complex Santa Vitória do Palmar and Chuí UNFCCC Ref #: 8012		
<b>Scale of the project activity</b>	<input checked="" type="checkbox"/> Large-scale <input type="checkbox"/> Small-scale		
<b>Version number of the verification and certification report</b>	1		
<b>Completion date of the verification and certification report</b>	21/09/2021		
<b>Monitoring period number and duration of this monitoring period</b>	2 <sup>nd</sup> Monitoring period 16/04/2016 to 31/12/2020 (both days included)		
<b>Version number of the monitoring report to which this report applies</b>	06.0		
<b>Crediting period of the project activity corresponding to this monitoring period</b>	Type: Renewable Start date: 01/01/2015, Length: 7 years		
<b>Project participants</b>	Santa Vitória do Palmar Holding S.A. Chuí Holding S.A. WayCarbon Soluções Ambientais e Projetos de Carbono Ltda.		
<b>Host Party</b>	Brazil		
<b>Applied methodologies and standardized baselines</b>	ACM0002 ver. 12.2.0 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources		
<b>Mandatory sectoral scopes</b>	1 : Energy industries (renewable - / non-renewable sources)		
<b>Conditional sectoral scopes, if applicable</b>	N/A		
<b>Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD</b>	2,902,222 tCO <sub>2</sub> e		
<b>Certified amount of GHG emission reductions or GHG removals for this monitoring period</b>	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
	0 tCO <sub>2</sub> e	2,477,517 tCO <sub>2</sub> e	0 tCO <sub>2</sub> e
<b>Name and UNFCCC reference number of the DOE</b>	Earthood Services Private Limited (ESPL) (ref E- 0066)		

Name, position and signature of the approver  
of the verification and certification report



Dr. Kaviraj Singh  
Managing Director

## SECTION A. Executive summary

### Brief summary of the project activity

The project activity consists in the installation and operation a Wind power Complex Santa Vitoria do Palmar and Chuí. This complex aggregates sixteen (16) wind power plants, totalizing 402 MW of installed capacity.

The wind power plants are distributed as follows:

Wind power plant	Location (municipality)	Aeroregenerator Model / Capacity	Turbines quantity	Installed capacity (MW)
Chuí I	Chuí	Gamesa G97 / 2MW	12	24
Chuí II			11	22
Chuí IV			11	22
Chuí V			15	30
Minuano I			11	22
Minuano II			12	24
Verace I	Santa Vitória do Palmar		10	20
Verace II			10	20
Verace III			13	26
Verace IV			15	30
Verace V			15	30
Verace VI			9	18
Verace VII			15	30
Verace VIII			13	26
Verace IX			15	30
Verace X			14	28
TOTAL	-	-	201	402

All wind farms are located in Chuí and Santa Vitória do Palmar Municipalities, State of Rio Grande do Sul, Brazil, as detailed in table above.

The plants are connected to the Brazilian National Interconnected System (SIN) by Santa Vitória do Palmar Substation.

The project activity reduces the GHG emissions through dispatching GHG-free electricity to the Brazilian National Interconnected System.

The operation start date of the 1<sup>st</sup> wind power plants (Verace I to Verace X) included in the project activity was on 24/02/2015<sup>17/</sup> (Liberation of operation by ANEEL).

### Scope of verification

WayCarbon Soluções Ambientais e Projetos de Carbono Ltda. has contracted Earthood Services Private Limited to conduct the verification and certification of emission reductions reported for the CDM project activity "Grid connected electricity generation from renewable source: Windfarm Complex Santa Vitória do Palmar and Chuí", for the period from 16/04/2016 to 31/12/2020 (including both days).

The verification is the periodic independent review and ex post determination of the monitored reductions in GHG emissions that have occurred due to the registered CDM project activity during the defined monitoring period.

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

- the project activity has been implemented and operated as per the 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 revised approved monitoring plan, the approved methodology including applicable tool(s) and/or, where applicable, the approved standardized baseline;
- the data recorded and stored as per the monitoring methodology including applicable tool(s) and, where applicable, the standardized baseline.

### Verification process

The verification process involved following:

- Contract with WayCarbon for the scope of verification;
- publication of monitoring report;
- desk review;
- 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

Earthood Services Private Limited has performed the verification of the CDM PA Grid connected electricity generation from renewable source: Windfarm Complex Santa Vitória do Palmar and Chui", having UNFCCC Ref. Number 8012 for the monitoring period from 16/04/2016 to 31/12/2020". The verification team has confirmed the implementation of the project as per description in the PDD, the monitoring plan of the PDD and the application of the monitoring methodology (ACM0002. ver. 12.2.0). In addition, it was confirmed that the monitoring system is in place and the emission reductions are calculated without material misstatements.

The verified emission reductions amount to 2,477,517 tCO<sub>2</sub>e in the above mentioned monitoring period.

The verification team 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	OR	Sebben	Marcelo	Verifit	Y	Y	Y	Y

2.	Local Expert	OR	Sebben	Marcelo	Verifit	Y	Y	Y	Y
3.	Methodological Expert	OR	Sebben	Marcelo	Verifit	Y	Y	Y	Y
4.	Technical Expert	OR	Sebben	Marcelo	Verifit	Y	Y	Y	Y

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

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Garg	Shreya	Central Office
2.	Technical Expert	IR	Garg	Shreya	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.	Download of raw data not to be duly transferred to ER calculation spreadsheet	Low	The hourly raw data is directly downloaded from the system and then transferred to ER calculations spreadsheet	No sampling has been carried out as 100% of data has been checked.
2.	Download of cross-check data	Low	The cross-check data is directly obtained from official sources and therefore the risk is very low	No sampling has been carried out as 100% of data has been checked.
3.	Download of EF data	Low	The EF is directly calculated by Brazilian DNA and therefore the risk of transferring the data is very low	No sampling has been carried out as 100% of data has been checked.

### C.2. Consideration of materiality in conducting the verification

The concept of materiality has not been applied during this verification as no sampling was conducted. All data (100%) could be checked during the verification process.

## SECTION D. Means of verification

### D.1. Desk/document review

A desk review was conducted by the verification team that included:

- a review of the data and information presented to verify its completeness;
- a review of the registered monitoring plan, the monitoring methodology including applicable tool(s) and, where applicable, the applied standardized baseline, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
- an evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

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

## D.2. On-site inspection

Duration of on-site inspection: 06/08/2021 (on-site inspection) and 09/08/2021 (videoconference)				
No.	Activity performed on-site	Site location	Date	Team member
1.	Opening Meeting: Introduction, scope and objective of work, roles and responsibilities of audit team, resources required, and timetable of the onsite audit including venue for closing meeting and any concerns from PP.	Santa Vitória do Palmar Office	06/08/2021	Marcelo Sebben
2.	<ul style="list-style-type: none"> <li>- Implementation and operation of project activity (project boundary, technology, project equipment, monitoring and metering equipment) as per registered PDD</li> <li>- Verification checklist: compliance of monitoring procedures followed at project site with registered PDD and monitoring methodology.</li> </ul>	Santa Vitória do Palmar Office	06/08/2021	Marcelo Sebben
3.	Physical inspection of the project activity: Site visit and interview of monitoring personnel <u>Santa Vitória do Palmar</u> <ul style="list-style-type: none"> <li>- Check of installed electricity meters (Main substation)</li> <li>- Check of installed electricity meters (Gross electricity meters of Verace)</li> <li>- Walk around wind complex</li> </ul>	Santa Vitória do Palmar Office	06/08/2021	Marcelo Sebben
4.	Physical inspection of the project activity: Site visit and interview of monitoring personnel  <u>Chuí</u> <ul style="list-style-type: none"> <li>- Check of installed electricity meters (Gross electricity meters of Chuí)</li> <li>- Check of installed electricity meters (Gross electricity meters of Minuano)</li> <li>- Walk around wind complex</li> </ul>	Santa Vitória do Palmar Office	06/08/2021	Marcelo Sebben
5.	Verification checklist: compliance of monitoring procedures followed at project site with registered PDD and monitoring methodology.	Santa Vitória do Palmar Office	06/08/2021	Marcelo Sebben
6.	Compilation of the audit findings from on site visit and end of on-site visit	Santa Vitória do Palmar Office	06/08/2021	Marcelo Sebben
7.	Extraction of Raw data and CCEE data from Wind power complex	Omega Office (virtual means)	09/08/2021	Marcelo Sebben
8.	Review of ER calculations in accordance with monitoring plan, applied methodology and relevant tools.	Omega Office (virtual means)	09/08/2021	Marcelo Sebben
9.	Closing Meeting: Submission of the audit findings to the client and agreement on the issues raised and agreement on timelines.	Omega Office (virtual means)	09/08/2021	Marcelo Sebben

**D.3. Interviews**

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Schrom	Odair	Omega Energia (company owner of power plants)	06/08/2021	Installed capacity Operation and maintenance of Wind Complex On-site inspection	Marcelo Sebben
2.	Cardoso	Paula	Omega Energia	06/08/2021	Environmental licensing	Marcelo Sebben
3.	Galdino	Stephannie	WayCarbon	09/08/2021	CDM aspects of project activity Monitoring parameters ER calculations	Marcelo Sebben
4.	Dal Mas	Giulia	Omega Energia	09/08/2021	Design of project activity	Marcelo Sebben
5.	Almeida	Ingrid	Omega Energia	09/08/2021	Extraction of electricity raw data Cross-check measures	Marcelo Sebben

**D.4. Sampling approach**

Not applicable as no sampling has been used during the verification

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

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	-	-	-
Compliance of the project implementation and operation with the registered PDD	-	-	-
Post-registration changes	-	-	-
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	-	-	-
Assessment of data and calculation of emission reductions or net removals	CL 01 CL 02	CAR 01	-
Assessment of reported sustainable development co-benefits	-	-	-
Global stakeholder consultation	-	-	-
Others (please specify)	-	-	-
<b>Total</b>	<b>2</b>	<b>1</b>	<b>-</b>

## SECTION E. Verification findings

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

<b>Means of verification</b>	The MR was crosschecked with the CDM-MR-FORM template available at the UNFCCC website and with the instructions for filling it out. No inconsistencies were found.
<b>Findings</b>	N/A
<b>Conclusion</b>	A valid version of the verification template (CDM-MR-FORM – version 08.0) available at the UNFCCC website has been used. It has been filled out in accordance with the “Instructions for filling out the monitoring report form”.

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

<b>Means of verification</b>	The validation report <sup>/12/</sup> , the validation report on PRC <sup>/13/</sup> and the previous verification report <sup>/14/</sup> have been reviewed and it was observed that no FARs were open during these phases.
<b>Findings</b>	N/A
<b>Conclusion</b>	No FARs were opened during validation, verification and validation of PRC processes.

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

Means of verification	The project activity consists in the installation and operation a Wind power Complex Santa Vitoria do Palmar and Chuí. This complex aggregates sixteen (16) wind power plants, totalizing 402 MW of installed capacity. They are located in Santa Vitória do Palmar and Chuí Municipalities, in the State of Rio Grande do Sul, Brazil.		
	The geographical location <sup>/15/</sup> of each wind farm is described below:		
	Wind farm	Latitude (S)	Longitude (W)
	Chuí I	33°39'35.8261"	53°23'34.2523"
	Chuí II	33°39'46.3286"	53°24'01.7541"
	Chuí IV	33°40'07.2966"	53°24'56.7231"
	Chuí V	33°40'17.7945"	53°25'24.1914"
	Minuano I	33°43'22.0991"	53°24'07.5259"
	Minuano II	33°42'59.6211"	53°24'36.6908"
	Verace I	33°29'42.5793"	53°16'15.7864"
	Verace II	33°30'20.7380"	53°16'51.9279"
	Verace III	33°31'19.7952"	53°16'44.2549"
	Verace IV	33°33'07.6087"	53°13'34.5595"
	Verace V	33°32'03.3882"	53°17'51.0596"
	Verace VI	33°32'35.5107"	53°16'36.2414"
	Verace VII	33°34'03.8931"	53°14'44.7545"
	Verace VIII	33°33'08.0836"	53°18'25.8421"
Verace IX	33°34'25.1257"	53°18'00.6700"	
Verace X	33°35'39.3113"	53°15'08.8325"	
The technical description of the plants are described below:			



	Wind farm	Number of turbines	Turbine/generator model <sup>/16/</sup>	Installed capacity (MW)		
	Chuí I	12	Turbine: - Gamesa G97 - Power: 2 MW - Wind class IEC IIIA - Speed: 9.6 to 17.8 rpm  Generator: - Gamesa - ASYNC DF - Voltage: 690V	24		
	Chuí II	11		22		
	Chuí IV	11		22		
	Chuí V	15		30		
	Minuano I	11		22		
	Minuano II	12		24		
	Verace I	10		20		
	Verace II	10		20		
	Verace III	13		26		
	Verace IV	15		30		
	Verace V	15		30		
	Verace VI	9		18		
	Verace VII	15		30		
	Verace VIII	13		26		
	Verace IX	15		30		
	Verace X	14		28		
	Total	201		402		
	The plants are connected to the Brazilian National Interconnected System (SIN) by Santa Vitória do Palmar Substation. The project activity reduces the GHG emissions through dispatching GHG-free electricity to the Brazilian National Interconnected System.  The operation start date of the 1 <sup>st</sup> wind farms in the Wind Power Complex is on 24/02/2015 (Operation release by ANEEL) <sup>/17/</sup> .					
	Findings	N/A				
Conclusion	The verification team confirms that all physical features (technology, project equipment, and monitoring and metering equipment) of the wind power complex were in place and are in accordance with the PDD.  The wind farms are operated as per PDD.					

#### E.4. Post-registration changes

##### E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents<sup>1</sup>

No temporary deviations have been identified for the present monitoring period.

##### E.4.2. Corrections

No corrections have been identified for the present monitoring period.

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

The start date of CP has been change prior the start of this monitoring period. It has changed from 01/01/2014 to 01/01/2015.

<sup>1</sup> 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.4.4. Inclusion of a monitoring plan**

Not applicable as monitoring plan is part of the registered PDD.

**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**

Permanent changes from registered monitoring plan have been requested and approved prior to this verification period. The ref# is PRC-8012-001 which has been approved on 07/12/2017

**E.4.6. Changes to the project design**

Changes of project design have been requested and approved prior to this verification period. The ref# is PRC-8012-001 which has been approved on 07/12/2017

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

Not applied as this project does not consist in afforestation and reforestation PAs.

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

<b>Means of verification</b>	The MP of the registered PDD was reviewed against the monitoring requirements of the applied methodology and applicable tools. The methodologies and tools have been duly applied in the monitoring of this project activity.
<b>Findings</b>	N/A
<b>Conclusion</b>	It has been observed that the MP of the project activity is totally in accordance with the applied versions of methodology (ACM0002 <sup>/10/</sup> - Consolidated baseline methodology for grid-connected electricity generation from renewable sources) and applicable TOOL07 - Tool to calculate the emission factor for an electricity system <sup>/11/</sup> .

**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**

<b>Means of verification</b>	According to the registered PDD <sup>/09/</sup> , the following parameters are fixed for the crediting period: - W <sub>OM</sub> - Weighting of operating margin emissions factor: 75%. - W <sub>BM</sub> - Weighting of build margin emissions factor: 25%
<b>Findings</b>	N/A
<b>Conclusion</b>	All fixed parameters were included in the MR section D.1 and are in accordance with registered PDD.

**E.6.2. Data and parameters monitored**

<b>Means of verification</b>	All monitored parameters listed in MR used to calculate baseline GHG emissions of the PA were checked against the registered/revised PDD. No project or leakage emissions are due as per applied methodology and registered PDD. The parameters of the registered PDD were verified in order to check its consistency with CDM tools and guidance to ER calculations.	
	1. <b><i>EG<sub>facility,y</sub>: Quantity of net electricity generation supplied by the project plant to the grid in year y</i></b>	
	<b>Criteria/Requirements</b>	<b>Assessment Observation</b>
	Measuring / Reading / Recording frequency	The parameter is calculated based on data provided from several electricity meters where the electricity generated is continuously read, measured and recorded every one hour automatically. The parameter corresponds to the

		<p>generation of 16 wind power plants as detailed in section E.3. Nevertheless, the boundary electricity meters (connection point to the SIN, measured in 545 kV) ads up 17 wind power plants (Chuí IX is also measured but not included in the PA). In order to calculate the amount of electricity dispatched to the grid by the 16 power plants, a proportional calculation is carried out as described in the PDD and as detailed in section E.8.1 below.</p> <p>The final measurement point (net electricity measurement) is located in Santa Vitória do Palmar Substation. The individual measurement points are located in Chuí Substation or Geribatú Substation, for the plants located in the municipalities of Chuí and Santa Vitória do Palmar, respectively.</p>
	Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
	Monitoring equipment	<p>All measurement points present two bi-directional electricity meters (main and backup) each were used for the calculating the net electricity dispatched by project activity.</p> <p>Electricity Meter: Power logic ION 8650</p> <p>Accuracy class: 0.2</p> <p>For details on serial number and calibration dates, refer to section E.7 below.</p>
	Is the accuracy of the monitoring equipment as stated in the monitoring plan? If the monitoring plan does not specify the accuracy of the monitoring equipment, does the accuracy of the monitoring equipment comply with local/national standards, or as per the manufacturer's specification?	The accuracy of the equipment is 0.2 as required by Brazilian Regulations <sup>/15/</sup>
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	Accuracy class is valid for the entire range.
	Calibration frequency / interval	2 years until 31/12/2016 <sup>/18-2/</sup> and from 01/01/2017 onwards it is every 5 years as per National resolution <sup>/18-3/</sup>
	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	The calibration interval is in line with the monitoring plan as it is set as per national regulations <sup>/18/</sup> .

	local/national standards, or as per the manufacturer's specifications?	
	Is the calibration of measuring equipment carried out by an accredited person or institution?	An accredited institution has carried out calibration of equipment <sup>/22/</sup> .
	Is(are) the calibration(s) valid for the entire reporting period?	Yes. The calibration is valid for the whole MP
	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?	The values of the MR were verified through the comparison between the raw data <sup>/19/</sup> and values applied in the Excel spreadsheets. Moreover, the calculations have been checked for consistency against information presented in the PDD.
	If applicable, has the reported data been crosschecked with other available data?	The monitored values are to be reviewed by crosschecking 100% of the data with reports from DRICCEE which is the Government Chamber of Electricity Commercialization (Official Source) <sup>/20/</sup> . The most conservative values between the DRI (cross-check) and the calculated were used in the ER Calculations spreadsheet.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Data management system was found to be reliable and appropriate. All data is in accordance with evidences provided.
	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 paragraph 231 b) the CDM Project Standard for PA-version 02.0?	Not applied

  

<b>2. <math>EF_{grid,CM,y}</math>: Combined margin CO2 emission factor for the project electricity system in year y</b>	
<b>Criteria/Requirements</b>	<b>Assessment Observation</b>
Measuring / Reading / Recording frequency	The parameter is calculated yearly based on the hourly values of $EF_{OM-DD}$ and yearly values of $EF_{BM}$ provided by the Brazilian DNA <sup>/21/</sup> as per registered PDD and applied version of the TOOL07 "Tool for calculating emission factor for an electricity system".

	Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
	Monitoring equipment	N/A
	Is the 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?	N/A
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
	Calibration frequency / interval	N/A
	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?	N/A
	Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
	Is(are) the calibration(s) valid for the entire reporting period?	N/A
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
	How were the values in the monitoring report verified?	The calculation is checked in the ER calculations spreadsheet and their parameters $EF_{OM-DD,h}$ and $EF_{BM,y}$ are checked in the Brazilian DNA website <sup>/21/</sup> . The parameter $EG_{facility}$ is also used in the determination of this parameter and was assessed above.
If applicable, has the reported data been crosschecked with other available data?	Not applied as no cross-check is done in this parameter. It is determined based on public available parameters and electricity generated by the project activity.	
Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Correct data has been transferred from DNA database to the ER calculation spreadsheet. Correct QA/QC procedures 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	N/A	

	as stipulated by paragraph 231 b) the CDM Project Standard for PA-version 02.0?	
	<b>3. <math>EF_{grid,OM,y}</math>: CO<sub>2</sub> Operating margin emission factor of the grid, in a year y</b>	
	<b>Criteria/Requirements</b>	<b>Assessment Observation</b>
	Measuring / Reading / Recording frequency	According to the applied tool for calculating emission factor for an electricity system, "For the dispatch data analysis OM, use the year in which the project activity displaces grid electricity and update the emission factor annually during monitoring". The parameter was determined for all monitoring period as per applied tool. The parameter was calculated hourly by the Brazilian DNA. The yearly value was then calculated by the Project Participants for the application in the calculations. This application can be seen in the ER calculations spreadsheet <sup>t/08/</sup> .
	Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
	Monitoring equipment	N/A
	Is the 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?	N/A
	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
	Calibration frequency / interval	N/A
	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?	N/A
	Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
	Is(are) the calibration(s) valid for the entire reporting period?	N/A
Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A	

	How were the values in the monitoring report verified?	The hourly data was directly checked in the DNA website <sup>21/</sup> then, the calculations of the $EF_{OM-DD,y}$ for the whole period was checked in the ER calculations spreadsheet. The yearly parameter is a weighted average value of hourly data based on the parameter $EG_{facility}$ . It has been observed that all values were correctly used in the ER calculations as per evidences provided by Brazilian DNA
	If applicable, has the reported data been crosschecked with other available data?	Not applied as no cross-check is done in this parameter. It is determined based on public available parameters and electricity generated by the project activity.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	It has been observed that correct data has been transferred from DNA database to the ER calculation spreadsheet. Correct QA/QC procedures 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 paragraph 231 b) the CDM Project Standard for PA-version 02.0?	N/A

  

4. $EF_{grid,BM,y}$ : CO2 Build margin emission factor of the grid, in a year y	
Criteria/Requirements	Assessment Observation
Measuring / Reading / Recording frequency	According the registered PDD the parameter is determined ex-post. Thus, as per applied tool for calculating emission factor for an electricity system, the data available for each year have been used. Nevertheless, it has been observed that not the most recent data has been applied in the ER calculations as per information provided by Brazilian DNA. Refer to CAR 02 in section E.8.1 below.
Is the measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology?	Yes
Monitoring equipment	N/A
Is the 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?	N/A

	Is the accuracy valid for the entire measuring range or do different accuracy levels apply to different measuring ranges?	N/A
	Calibration frequency / interval	N/A
	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?	N/A
	Is the calibration of measuring equipment carried out by an accredited person or institution?	N/A
	Is(are) the calibration(s) valid for the entire reporting period?	N/A
	Is the calibration carried out for a measuring range comparable with the range for which measurements have been carried out?	N/A
	How were the values in the monitoring report verified?	The data was directly checked in the DNA website <sup>/21/</sup> and compared to the data used in the ER calculations.
	If applicable, has the reported data been crosschecked with other available data?	Not applied as no cross-check is done in this parameter. It is determined based on calculated values by the Brazilian DNA.
	Does the data management ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Data management system was found to be reliable and appropriate.
	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 paragraph 231 b) the CDM Project Standard for PA–version 02.0?	N/A
<b>Findings</b>	N/A	
<b>Conclusion</b>	All parameters were determined in a conservative manner and in accordance with requirements of applied tools, methodology and monitoring plan. The data used for the parameter EG <sub>facility</sub> were the one measured by meters installed in the grid connection point (Santa Vitória do Palmar Substation for net electricity generation and intermediary substations – Chuí and Geribatú Substations – for pro-rata calculation) and cross-checked with values from DRI CCEE <sup>/20/</sup> (official source). The smaller value between both sources was applied, which is a conservative measure as less ERs were achieved with it. The verification team carried out the same calculation <sup>/29/</sup> provided by CCEE procedures <sup>/18-4/</sup> in order to attest the conservativeness and the correctness of the calculations.	



## E.6.3. Implementation of sampling plan

<b>Means of verification</b>	The project participants have not applied sampling approach in the monitoring period. All parameters were fully checked as described in the monitoring plan during the operational period of the wind farms. Documents were checked and interviews with PP's representatives and personnel were performed in order check this information.
<b>Findings</b>	-
<b>Conclusion</b>	No sampling plan was used.

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

Means of verification	Manuals of equipment, national regulations registered monitoring plan and calibration certificates were checked in order to verify the compliance and frequency of the calibrations/inspections requirements of measuring equipment. In this project activity, the only equipment used are electricity meters that measure the parameters <b>EG<sub>facility</sub></b> . These equipment comprehend the following electricity meters (Electricity meter Type ION 8650, accuracy class 0.2):				
	Facility	Main/ Backup	Electricity meter S/N	Calibration dates <sup>2</sup>	Delays
	Chuí I	Main	MW-1310A364-01	29/09/2015 20/09/2017 29/10/2019	No
		Back-up	MW-1309A508-01	01/10/2015 22/09/2017 30/10/2019	No
	Chuí II	Main	MW-1310A504-01	30/09/2015 20/09/2017 29/10/2019	No
		Back-up	MW-1309A723-01	30/09/2015 20/09/2017 30/10/2019	No
	Chuí IV	Main	MW-1308A359-01	30/09/2015 21/09/2017 30/10/2019	No
		Back-up	MW-1309A281-01	02/10 /2015 23/09/2017 30/10/2019	No
	Chuí IX	Main	MW-1309A718-01	30/09/2015 20/09/2017 29/10/2019	No
		Back-up	MW-1310A189-01	30/09/2015 22/09/2017 31/10/2019	No
	Chuí V	Main	MW-1309A564-01	02/10/2015 23/09/2017 31/10/2019	No
		Back-up	MW-1310A182-01	03/10/2015 24/09/2017 31/10/2019	No
	Minuano I	Main	MW-1310A568-01	02/10/2015 23/09/2017 31/10/2019	No
		Back-up	MW-1309A056-01	04/10/2015 24/09/2017 01/11/2019	No

<sup>2</sup> Frequency required every 2 years until 31/12/2016 and every 5 years<sup>15/</sup> from 01/01/2017 onwards

	Minuano II	Main	MW-1310A344-01	03/10/2015 23/09/2017 31/10/2019	No
		Back-up	MW-1310A402-01	03/10/2015 24/09/2017 01/11/2019	No
	Verace I	Main	MW-1310A191-01	11/11/2015 09/06/2017 02/10/2019	No
		Back-up	MW-1310A184-01	12/11/2015 10/06/2017 03/10/2019	No
	Verace II	Main	MW-1310A572-01	11/11/2015 10/06/2017 02/10/2019	No
		Back-up	MW-1309A372-01	12/11/2015 11/06/2017 03/10/2019	No
	Verace III	Main	MW-1310A398-01	11/11/2015 10/06/2017 02/10/2019	No
		Back-up	MW-1310A526-01	12/11/2015 11/06/2017 03/10/2019	No
	Verace IV	Main	MW-1310A401-01	12/11/2015 10/06/2017 02/10/2019	No
		Back-up	MW-1309A552-01	13/11/2015 11/06/2017 03/10/2019	No
	Verace IX	Main	MW-1310A026-01	16/11/2015 08/06/2017 05/10/2019	No
		Back-up	MW-1310A174-01	17/11/2015 09/06/2017 06/10/2019	No
	Verace V	Main	MW-1309A457-01	13/11/2015 06/06/2017 04/10/2019	No
		Back-up	MW-1309A332-01	14/11/2015 07/06/2017 05/10/2019	No
	Verace VI	Main	MW-1310A390-01	13/11/2015 07/06/2017 04/10/2019	No
		Back-up	MW-1310A181-01	15/11/2015 07/06/2017 05/10/2019	No
	Verace VII	Main	MW-1309A418-01	14/11/2015 07/06/2017 04/10/2019	No
		Back-up	MW-1309A290-01	15/11/2015 08/06/2017 06/10/2019	No

	Verace VIII	Main	MW-1309A327-01	14/11/2015 07/06/2017 04/10/2019	No	
		Back-up	MW-1309A422-01	15/11/2015 08/06/2017 06/10/2019	No	
	Verace X	Main	MW-1310A396-01	16/11/2015 08/06/2017 05/10/2019	No	
		Back-up	MW-1310A372-01	18/11/2015 09/06/2017 06/10/2019	No	
	SPA TF3	Main	MW-1309A114-01	05/10/2015 30/08/2016 19/04/2018	No	
		Back-up	MW-1309A444-01	05/10/2015 30/08/2016 19/04/2018	No	
	The calibration certificates that cover the whole monitoring period were provided to the verification team. Therefore, no delays have been observed					
	Findings	N/A				
	Conclusion	<p>Calibration certificates were provided for the whole monitoring period to the verification team.</p> <p>Therefore, the measured values were reported in the ER calculations spreadsheet. In order to be conservative, the PPs compared the measured electricity values to the cross-check values<sup>/20</sup> and applied the smallest value to the calculations. The smallest values correspond to the calculated values and therefore these were applied in the calculations.</p> <p>Moreover, regarding the calibration frequency stated in the MR, it has been determined in accordance with National regulations<sup>/15/</sup></p> <p>Therefore, the measure is considered accurate and conservative by the verification team.</p>				

## 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

<b>Means of verification</b>	<p>The calculations of baseline emission have been done in accordance with registered monitoring plan and applied methodology. The equation used is the follow:</p> $BE_y = EF_{grid,CM,y} \times EG_y$ <p>Where:</p> <p><math>BE_y</math> = Baseline emissions in the year y</p> <p><math>EF_{grid,CM,y}</math> = Combined Margin Emission factor of the grid in the year y</p> <p><math>EG_y</math> = Net electricity of the all wind farms delivered to grid in the year y ( value aggregated for each year)</p> <p>As the meters that measure the net electricity dispatched to the grid take into account 17 wind farms whereas the project activity corresponds to the electricity generated by 16 wind farms, a proportional calculation has to be carried out in order to determine the net electricity dispatched by project activity. From the 17 wind power plants, the one called Chuí IX is not included in the project activity. Therefore, the following proportional calculation is carried out (calculation already approved by EB)</p> $EG_{PJ,y} = \sum_h EG_{SPA\ TF3,h} \times \sum_{project\ facility} \frac{EG_{project\ facility,h}}{EG_{project\ facility,h} + EG_{Chu\acute{I}\ IX,h}}$
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	<p>Where:</p> <p><math>EG_{SPA\ TF3,h}</math> = net electricity dispatched to the grid by all wind farm complex in the connection point in hour h (this includes Chuí IX) measured at 525 kV.</p> <p><math>EG_{project\ facility,h}</math> = sum of generation of all wind farms included in the project activity measured at 34.5 kV</p> <p><math>EG_{Chuí\ IX,h}</math> = electricity generated by wind farm Chuí IX at 34.5kV (not part of project activity), measured at 34.5 kV, in hour h</p> <p>The calculations have been revised by verification team/ which confirmed that they resulted in conservative calculations when compared to the public available data (DRI CCEE)<sup>/20/</sup></p> <p>The Combined margin emission factor of the grid (<math>EF_{grid,CM,y}</math>) was calculated as follows:</p> $EF_{grid,CM,y} = EF_{OM} \times w_{OM} + EF_{BM} \times w_{BM}$ <p>Where <math>w_{OM}</math> and <math>w_{BM}</math> are the Operating margin weight is fixed as 0.75 and the build margin weight is fixed as 0.25 as per applied tool for calculating emission factor for an electricity system.</p> <p>For the determination of <math>EF_{OM-DD,y}</math> and <math>EF_{BM,y}</math> the PP applied the parameters provided by the Brazilian DNA. The <math>EF_{OM-DD,y}</math> was calculated with the hourly dispatch emission factor of the grid and with the hourly electricity generation of the project activity as follows:</p> $EF_{OM-DD,y} = \frac{\sum EF_{EL-DD,h} \times EG_{PJ,h}}{EG_{PJ,y}}$ <p>Where:</p> <p><math>EF_{OM-DD,y}</math> = Dispatch data analysis operating margin CO2 emission factor in year y</p> <p><math>EF_{EL-DD,h}</math> = CO2 emission factor for power units in the top of the dispatch order in hour h in year y</p> <p><math>EG_{PJ,h}</math> = Electricity displaced by the project activity in hour h of year y</p> <p><math>EG_{PJ,y}</math> = Total electricity displaced by the project activity in year y.</p> <p>As issues were observed in the ER calculations, a CAR has been raised..</p>
<b>Findings</b>	<p><b>CAR 01</b></p> <p>The following issues were found in the ER calculations</p> <ol style="list-style-type: none"> <li>1. The value presented as final ER calculation in the ER spreadsheet is not been calculated conservatively, considering that it has not been rounded down.</li> <li>2. The calculations provided in the section E.5.1 were not included in the excel spreadsheet. Moreover, in the section E.5.1: the quantity of days of 2016 considered in the calculations is not correct;</li> <li>3. The values of CCEE were not presented in the ER calculations, which does not allow the possibility to check the conservativeness of values used in the calculations;</li> <li>4. The value of <math>EF_{BM,2020}</math> is not the latest one available at DNA's website;</li> </ol>
<b>Conclusion</b>	<p>The verification team confirms that:</p> <ol style="list-style-type: none"> <li>a. the monitored data was available in accordance with the registered monitoring plan for the operational period of the wind farm complex;</li> <li>b. the reported data were crosschecked, as prescribed in the revised approved PDD, with the relevant supporting and were found consistent;</li> <li>c. appropriate methods and formulae for calculating baseline GHG emissions have been followed;</li> <li>d. the assumptions, emission factors and default values that were applied in the calculations are correct and evidenced;</li> <li>e. the calculations are transparent, consistent, correct and complete.</li> </ol>

	Baseline emissions for the whole monitoring period are:  $BE = 2,477,517 \text{ tCO}_2\text{e}$
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#### E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

<b>Means of verification</b>	According to the applied methodology, no project emissions are due for wind energy generation. Therefore $PE = 0$ for this PA.
<b>Findings</b>	N/A
<b>Conclusion</b>	No project emissions are to be accounted for wind energy generation as per applied methodology. Therefore $PE = 0$ . The monitoring report correctly states this situation.

#### E.8.3. Calculation of leakage GHG emissions

<b>Means of verification</b>	As this correspond to a greenfield project and no energy is generated from transferred equipment, leakage are considered to be equal to zero. $LE_y = 0$
<b>Findings</b>	
<b>Conclusion</b>	No leakage emissions are to be accounted

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

<b>Means of verification</b>	The emission reductions from the project activity are based on baseline emission only. The calculations presented at the final MR and corresponding ER calculation spreadsheet were found to be appropriate. Nevertheless, the example of all formulae applied has not been included in the MR and therefore a CL has been raised.
<b>Findings</b>	CL 01  MR section E.1: sample calculations for all formulae used to calculate baseline GHG emissions or baseline net GHG removals, applying actual values has not been included in the MR unlike required by instructions for completing the MR
<b>Conclusion</b>	The verification team confirms an audit trail that contains the evidences and records of validated figures. Moreover, the verification team confirms that appropriate methods and formulae for calculating baseline GHG emissions reductions have been followed. The summary table has been correctly presented at the MR and the figures are correct and justified. $ER = BE - PE - LE$ $PE = LE = 0$ Thus, $ER = BE = 2,477,517 \text{ tCO}_2\text{e}$

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

<b>Means of verification</b>	The actual emission reductions were checked against the estimates of the registered PDD. Nevertheless, clear calculation has not been provided in the MR and therefore a CL has been raised.
<b>Findings</b>	CL 02  MR section E.5.1: the determination of amount of ex-ante calculations estimated for the period equivalent to this monitoring period has not been clearly demonstrated in the MR, unlike required by instructions for completing the MR
<b>Conclusion</b>	The comparison of actual values of the monitoring period with the estimates in the registered PDD is properly presented at the MR.

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

<b>Means of verification</b>	The verification team has compared the actual ER calculated and the estimated ERs reported in the PDD for the same period and it was observed that the actual ERs obtained are lower than the estimated values.
<b>Findings</b>	N/A
<b>Conclusion</b>	The actual ERs are lower than the estimated emission reductions reported in the revised PDD, thus, no justification is needed

**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	Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity “Grid connected electricity generation from renewable source: Windfarm Complex Santa Vitória do Palmar and Chui” for the monitoring period from 16/04/2016 to 31/12/2020 (including both days) is as follows:	
	Verified and certified emission reductions as per commitment period:	
	Commitment period	Amount
	Up to 31/12/2012 (1 <sup>st</sup> commitment period)	0 tCO <sub>2</sub> e
	From 01/01/2013 until 31/12/2020	2,477,517 tCO <sub>2</sub>
	From 01/01/2021 onwards	0 tCO <sub>2</sub> e
Findings	-	
Conclusion	The GHG emissions reductions have been totally generated from between 01/01/2013 and 31/12/2020	

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

<b>Means of verification</b>	Not applicable
<b>Findings</b>	-
<b>Conclusion</b>	The PPs have not requested the DOE to verify the sustainable development co-benefits for this project activity

**E.10. Global stakeholder consultation**

<b>Means of verification</b>	<p>As per PCP paragraph 186, "The DOE shall make the monitoring report publicly available through a dedicated interface on the UNFCCC CDM website, at the latest 21 days prior to undertaking the on-site inspection for the verification, if to be conducted."</p> <p>The MR was made publicly available on 13/07/2021 whereas the verification process was conducted from 06/08/2021, thus fulfilling the above requirement. The verification team checked the UNFCCC CDM website and observed that no comments have been made public during the comments period.</p>
<b>Findings</b>	-
<b>Conclusion</b>	The assessment was made in accordance with VVS para. 391 and PCP paras 186 and 187. No comments were received.

**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 ESPL 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 to which the project activity is related. All 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 ESPL

## SECTION G. Verification opinion

Earthood Services Private Limited, contracted by WayCarbon Soluções Ambientais e Projetos de Carbono Ltda, has performed the independent verification of the emission reductions for the CDM project activity “Grid connected electricity generation from renewable source: Windfarm Complex Santa Vitória do Palmar and Chuí” – Ref.: 8012 – in Brazil, for the monitoring period from 16/04/2016 to 31/12/2020 (including both days) as reported in the Monitoring Report (public). WayCarbon is also responsible for the compilation of data in accordance with the monitoring plan and the reporting of GHG emissions reductions from the project activity.

ESPL commenced the verification based on the baseline and monitoring methodology ACM0002. ver. 12.2.0, the monitoring plan contained in the registered PDD, Monitoring Report (public).

ESPL’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. ESPL planned and performed the verification by obtaining evidence and other information and explanations that ESPL considered necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

The verification team confirms that:

- the project activity was found completely implemented as per the description given in the registered PDD for the operational period of the PA; and
- the actual operation conforms to the description in the revised PDD.

## SECTION H. Certification statement

Earthood Services Private Limited, contracted by WayCarbon Soluções Ambientais e Projetos de Carbono Ltda., has performed the independent verification of the emission reductions for the CDM project activity “Grid connected electricity generation from renewable source: Windfarm Complex Santa Vitória do Palmar and Chuí”, in Brazil, for the monitoring period from 16/04/2016 to 31/12/2020 (including both days) as reported in the Monitoring Report (public).

ESPL commenced the verification based on the baseline and monitoring methodology ACM0002. ver. 12.2.0, the monitoring plan contained in the registered PDD, Monitoring Report (public).

ESPL’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. 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 this monitoring period are fairly stated in the Monitoring Report (final). The GHG emission reductions were calculated correctly based on the baseline and monitoring methodology and the monitoring plan contained in the Registered PDD.

Earthood Services Private Limited is able to certify that the emission reductions from the CDM project activity “Grid connected electricity generation from renewable source: Windfarm Complex Santa Vitória do Palmar and Chuí”, in Brazil, for the period above mentioned is equal to:

### Verified and certified emission reductions as per commitment period:

Commitment period	Amount
Up to 31/12/2012 (1 <sup>st</sup> commitment period)	0 tCO <sub>2</sub> e
From 01/01/2013 to 31/12/2020	2,477,517 tCO <sub>2</sub> e
From 01/01/2021 onwards	0 tCO <sub>2</sub> e
<b>Total</b>	<b>2,477,517 tCO<sub>2</sub>e</b>

## Appendix 1. Abbreviations

Abbreviations	Full texts
ABNT	Brazilian Association of Technical Regulation
ANEEL	National Agency of Electric Energy (Government agency)
BE	Baseline Emission
BM	Build Margin
CAR	Corrective Action Request
CCEE	Electric Energy Commercialization Chamber (Government Agency)
CDM	Clean Development Mechanism
CL	Clarification Request
CM	Combined Margin
CME	Coordinating/Managing Entity
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
CP	Crediting Period
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
EPE	Energy Research Company of the Ministry of Mines and Energy – Brazil
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
FEPAM	Foundation of Environmental Research of State of Rio Grande do Sul
GHG	Green House Gas
GSC/GSP	Global Stakeholder Consultation Process
GW	Giga Watt
GWh	Giga Watt hour
IBAMA	National Institute of Environment
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
kW	kilo Watt
kWh	kilo Watt hour
LoA	Letter of Approval/Authorization
MoC	Modalities of Communication
MoV	Means of Validation
MP	Monitoring Plan
MW	Mega Watt
MWh	Mega Watt hour
N <sub>2</sub> O	Nitrous Oxide
OM	Operating Margin
ONS	National System Operator (from Portuguese – Operador Nacional do Sistema)
PA	Project Activity
PCP	Project Cycle Procedure
PDD	Project Design Document
PE	Project Emission
PP	Project Participant
PS	Project Standard
tCO <sub>2</sub> e	Tonnes of Carbon di oxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VT	Verification Team
VVS	Validation and Verification Standard



## Appendix 2. Competence of team members and technical reviewers

Competence Statement			
<b>Name</b>	Marcelo Sebben		
<b>Country</b>	Brazil		
<b>Education</b>	BE(Chemical Engineering) M.Sc(Sustainable Energy Systems)		
<b>Experience</b>	9+ years		
<b>Field</b>	CDM Audit, Energy, Climate Change		
Approved Roles			
<b>Team Leader</b>	Yes		
<b>Validator</b>	Yes		
<b>Verifier</b>	Yes		
<b>Methodology Expert</b>	Yes (ACM0001, ACM0002, ACM0006, AM0065, AMS.I.D, AMS.I.C, AMS.I.E, AM0026, AMS.I.A, AMS.I.F, AMS. IIIE. AMS.IIIH, AMS.III.I, AMS.III.J.)		
<b>Local expert</b>	Brazil, Chile, Colombia		
<b>Financial Expert</b>	Yes		
<b>Technical Reviewer</b>	No		
<b>TA Expert</b>	Yes (TA 1.1, 1.2, 5.1, 9.1,13.1)		
<b>Reviewed by</b>	Shreya Garg	<b>Date</b>	29/07/2020
<b>Approved by</b>	Anshika Gupta	<b>Date</b>	29/07/2020

Competence Statement			
<b>Name</b>	Shreya Garg		
<b>Country</b>	India		
<b>Education</b>	M.Sc. (Climate Science & Policy), TERI University		
<b>Experience</b>	6 Years +		
<b>Field</b>	Climate Change		
Approved Roles			
<b>Team Leader</b>	YES		
<b>Validator</b>	YES		
<b>Verifier</b>	YES		
<b>Methodology Expert</b>	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		
<b>Local expert</b>	YES (India)		
<b>Financial Expert</b>	NO		
<b>Technical Reviewer</b>	YES		
<b>TA Expert</b>	YES (TA 1.2, TA 3.1)		
<b>Reviewed by</b>	Abhishek Mahawar	<b>Date</b>	01/03/2018
<b>Approved by</b>	Ashok Gautam	<b>Date</b>	01/03/2018

## Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	UNFCCC	Standard: CDM PS for PA	version 02.0	Others
2.	UNFCCC	Standard: CDM PCP for PA	version 02.0	Others
3.	UNFCCC	Standard: CDM VVS for PA	version 02.0	Others
4.	UNFCCC	Form: CDM-MR-FORM	version 8.0	Others
5.	PP	Monitoring Report (draft)	version 01.0 – 08/07/2021	PP
6.	PP	Monitoring Report (revised/final)	Version 02.0 – 13/08/2021 Version 06.0 - 13/09/2021 (final)	PP
7.	PP	<u>ER Spreadsheet (draft)</u> - CER_calculation	Ver.1	PP
8.	PP	ER Spreadsheet (revised/final) - CER_calculation	Ver 3	PP
9.	PP	Registered PDD (current valid version valid as of 07/12/2017)	version 4 – 24/09/2017	Others
10.	UNFCCC	<u>Methodology</u> : ACM0002: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”	version 12.2.0	Others
11.	UNFCCC	- TOOL07 Tool to calculate the emission factor for an electricity system	version 02.2.1	Others
12.	TUV-NORD	- Validation Report “Grid connected electricity generation from renewable source: Windfarm Complex Santa Vitória do Palmar and Chuí” issued by TUV-NORD, report # 8624 – 12/023	Revision 0.1 – 26/10/2012	Other
13.	ERM	- Validation opinion on Post registration changes, issued by ERM Certification and Verification Services	Version 02 – 28/09/2017	Other
14.	ERM	Last Verification Report from project activity “Grid connected electricity generation from renewable source: Windfarm Complex Santa Vitória do Palmar and Chuí” issued by ERM	Version 01 – 28/09/2017	Other
15.	Google Maps	<u>Geographical Coordinates of Project Activity</u> In order to confirm the project location, a plot in Google Maps has been made for all wind power plants. Chuí I (located in municipality of Chuí) and Verace X (located in Municipality of Santa Vitória do Palmar) were	Chuí I <a href="https://www.google.com.br/maps/place/33%C2%B039'35.8%22S+53%C2%B023'34.3%22W/@-33.6599399,-53.3950498,776m/data">https://www.google.com.br/maps/place/33%C2%B039'35.8%22S+53%C2%B023'34.3%22W/@-33.6599399,-53.3950498,776m/data</a>	

		demonstrated in the links on the side respectively	<a href="https://www.google.com/maps/place/33%C2%B035'39.3%22S+53%C2%B015'08.8%22W/@-33.5942455,-53.2546331,776m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d-33.6599517!4d-53.3928479">=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d-33.6599517!4d-53.3928479</a>  Verace X <a href="https://www.google.com/maps/place/33%C2%B035'39.3%22S+53%C2%B015'08.8%22W/@-33.5942455,-53.2546331,776m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d-33.5942531!4d-53.2524535">https://www.google.com.br/maps/place/33%C2%B035'39.3%22S+53%C2%B015'08.8%22W/@-33.5942455,-53.2546331,776m/data=!3m2!1e3!4b1!4m5!3m4!1s0x0:0x0!8m2!3d-33.5942531!4d-53.2524535</a>	
16.	Gamesa	<u>Technical specification</u>  1. General Characteristics Manual # GD176380-pb  2. Gamesa Technical specification website	Rev.0 – 05/03/2013  <a href="https://www.thewindpower.net/turbine_en_692_gamesa_g97-2000.php">https://www.thewindpower.net/turbine_en_692_gamesa_g97-2000.php</a>	
17.	CCEE	<u>Start date of Operation:</u> - Spreadsheet called “InfoMercado Dados Individuais-Jun2021” tab “USINAS”, which is a public information provided by CCEE where it is stated information on start date of commercial operation of all Power plants connected to SIN (National Interconnected System)  <b>Steps taken</b> - Access link on the side - Select “Selecione o Boletim”\”Infomercado Mensal” - Select “Infomercado dados individuais 2020 .xlsx”	Jun/2021  <a href="https://www.ccee.org.br/portal/faces/pages_publico/o-que-fazemos/infomercado?_adf.ctrl-state=1myeruq5r_1&amp;_afLoop=221552131200835#!%40%40%3F_afrLooop%3D221552131200835%26_adf.ctrl-state%3D1myeruq5r_5">https://www.ccee.org.br/portal/faces/pages_publico/o-que-fazemos/infomercado?_adf.ctrl-state=1myeruq5r_1&amp;_afLoop=221552131200835#!%40%40%3F_afrLooop%3D221552131200835%26_adf.ctrl-state%3D1myeruq5r_5</a>	
18.	ONS (National Electric System Operator)	1. Procedure 12.2 from ONS (National Electric System Operator) regulating the accuracy class of the electricity meters  2. Procedure Submodule 12.3 from ONS (National Electric System Operator) regulating	-	Other

		the frequency of calibration (2 years calibration frequency)  3. New regulation (ONS Grid Procedure, submodule 12.3) issued on 01/01/2017 revision 2016/12 stating that from this date on 5 years calibration frequency is to be applied to electricity meters		
19.	PP	Reports of electricity generated by the project activity (E-Meter) for all period for the complex	Downloaded on 09/08/2021	
20.	CCEE	DRI CCEE reports – Official source of electric data used for cross-check electricity measurements	<a href="https://dri.ccee.org.br">https://dri.ccee.org.br</a> (website protected by password)	
21.	MCTIC	<u>Grid emission factor</u> Data provided by the Brazilian DNA website regarding the $EF_{OM-DD,h}$ and $EF_{BM,y}$	<a href="https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/textogeral/emissao_despacho.html">https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/textogeral/emissao_despacho.html</a> (last visited on 21/09/2021)	
22.	LAMED	<u>Calibration Certificates:</u>  Calibration certificates of all electricity meters as informed in section E.7 above issued by LAMED – Eletrobras Eletrosul	-	Others
23.	FEPAM – Foundation of Environmental Research of Rio Grande do Sul  IBAMA – National Institute of Environment	<u>Operational licensing</u>  1. Chuí I: renewal protocol of Environmental License DOP740_LO3730_issued on 27/05/2019 by FEPAM  2. Chuí II - renewal protocol of Environmental License DOP741_LO3731_issued on 27/05/2019 by FEPAM  3. CHuí IV - renewal protocol of Environmental License DOP744_LO3739_issued on 27/05/2019 by FEPAM  4. Chuí V - renewal protocol of Environmental License DOP745_LO3742_issued on 27/05/2019 by FEPAM  5. Minuano I and Minuano II - Environmental License LO1275 issued on 26/11/2014	Renewal protocol have no expiring date.	PP

		<p>by IBAMA valid until 25/11/2022</p> <p>6. Verace I - renewal protocol of Environmental License DOP795_LO6040 _issued on 14/05/2019 by FEPAM</p> <p>7. Verace II - renewal protocol of Environmental License DOP793_LO6036 _issued on 14/05/2019 by FEPAM</p> <p>8. Verace III - renewal protocol of Environmental License DOP424_LO6042 _issued on 14/05/2019 by FEPAM</p> <p>9. Verace IV - renewal protocol of Environmental License DOP581_LO4246 _issued on 14/05/2019 by FEPAM</p> <p>10. Verace V - renewal protocol of Environmental License SOL43977_RLO6430 _issued on 19/09/2019 by FEPAM</p> <p>11. Verace VI - renewal protocol of Environmental License DOP582_LO4248 _issued on 14/05/2019 by FEPAM</p> <p>12. Verace VII - renewal protocol of Environmental License DOP740_LO3730 _issued on 27/05/2019 by FEPAM</p> <p>13. Verace VIII - renewal protocol of Environmental License DOP423_LO3321 _issued on 14/05/2019 by FEPAM</p> <p>14. Verace IX - renewal protocol of Environmental License DOP425_LO3327 _issued on 14/05/2019 by FEPAM</p> <p>15. Verace X - renewal protocol of Environmental License DOP426_LO3329 _issued on 14/05/2019 by FEPAM</p>		
24.	PP	<u>Technical description:</u> 1. Pictures of plant 2. Pictures wind turbines	08/2021 08/2021	PP
25.		<u>Installed capacity evidences</u>	-	PP

	ANEEL FEPAM IBAMA	Technical specification sheet of all wind parks (information also presented in environmental licenses of all parks)		
26.	PP	<u>Trainings and Duties of Personnel:</u>  1. Ingrid Almeida	-	PP
27.	-	DNA of Brazil	<a href="https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/cimgc/Comissao_Interministerial_de_Mudanca_Globa_l_do_Clima_CIMGC.html">https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/cimgc/Comissao_Interministerial_de_Mudanca_Globa_l_do_Clima_CIMGC.html</a>	Other
28.	ANEEL	ANEEL – National Agency of Electric Energy	<a href="http://www.aneel.gov.br">www.aneel.gov.br</a>	
29.	ESPL	Cross-check calculations of pro-rata calculations carried out by project participants	08/2021	-
30.	IPCC	IPCC publications	<a href="http://www.ipcc-nggip.iges.or.jp">www.ipcc-nggip.iges.or.jp</a>	Other
31.	UNFCCC	UNFCCC	<a href="http://cdm.unfccc.int">http://cdm.unfccc.int</a>	Other

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

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

<b>FAR ID</b>	xx	<b>Section no.</b>	E.2	<b>Date:</b> DD/MM/YYYY
<b>Description of FAR</b>				
N/A				
<b>Project participant response</b>				<b>Date:</b> DD/MM/YYYY
<b>Documentation provided by project participant</b>				
<b>DOE assessment</b>				<b>Date:</b> DD/MM/YYYY

Table 2. CL from this verification

<b>CL ID</b>	01	<b>Section no.</b>	E.8.4	<b>Date :</b> 01/09/2021
<b>Description of CL</b>				
MR section E.1: sample calculations for all formulae used to calculate baseline GHG emissions or baseline net GHG removals, applying actual values has not been included in the MR unlike required by instructions for completing the MR				
<b>Project participant response</b>				<b>Date :</b> 03/09/2021
Sample calculations for all formulae used to calculate baseline GHG emissions or baseline net GHG removals, applying actual values were included in the MR				
<b>Documentation provided by project participant</b>				
Monitoring Report (Version 08.0)				
<b>DOE assessment</b>				<b>Date:</b> 11/09/2021
The value estimated in the ex-ante calculations referred to the same period as the monitoring period is now duly demonstrated in the MR.				
<b>CL is closed</b>				

<b>CL ID</b>	02	<b>Section no.</b>	E.8.5	<b>Date :</b> 12/08/2021
<b>Description of CL</b>				
MR section E.5.1: the determination of amount of ex-ante calculations estimated for the period equivalent to this monitoring period has not been clearly demonstrated in the MR, unlike required by instructions for completing the MR				
<b>Project participant response</b>				<b>Date :</b> 13/08/2021
The demonstration and some corrections has been made.				
<b>Documentation provided by project participant</b>				
Monitoring Report (Version 08.0)				
<b>DOE assessment</b>				<b>Date:</b> 16/08/2021
The value estimated in the ex-ante calculations referred to the same period as the monitoring period is now duly demonstrated in the MR.				
<b>CL is closed</b>				

Table 3. CAR from this verification

<b>CAR ID</b>	01	<b>Section no.</b>	E.6.2	<b>Date :</b> 01/09/2021
<b>Description of CAR</b>				

The following issues were found in the ER calculations	
<ol style="list-style-type: none"> <li>1. The value presented as final ER calculation in the ER spreadsheet is not been calculated conservatively, considering that it has not been rounded down.</li> <li>2. The calculations provided in the section E.5.1 were not included in the excel spreadsheet. Moreover, in the section E.5.1: the quantity of days of 2016 considered in the calculations is not correct;</li> <li>3. The values of CCEE were not presented in the ER calculations, which does not allow the possibility to check the conservativeness of values used in the calculations;</li> <li>4. The value of EFBM,2020 is not the latest one available at DNA's website;</li> </ol>	
<b>Project participant response</b>	<b>Date : 03/09/2021</b>
<ol style="list-style-type: none"> <li>1. Calculations of BEy (<math>= EG_{PJ,y} * EF_{GRID,CM,y}</math>) were rounded down (zero digits) for conservativeness. CER calculations spreadsheet was revised accordingly (CER calculation_v02.xlsx)- Please refer to sheet "ER calculations", range B13:I13. Emissions reductions figures throughout the MR were revised accordingly in order to reflect this revision;</li> <li>2. CER calculations spreadsheet was revised accordingly (CER calculation_v02.xlsx) in order to include transparent calculations of the expected emissions reductions that should have been observed during the monitoring period and its comparison to the actually obtained emissions reductions figures - Please refer to sheet "Ex-ante versus MR". Moreover, the quantity of days of 2016 was also corrected;</li> <li>3. CER calculations spreadsheet was revised (CER calculation_v02.xlsx) in order to depict the cross check analysis between monitored electricity generation values and those obtained from CCEE. It is noteworthy the fact that overall differences between monitored and CCEE values account to as little as 0.16%. Please refer to sheet "CCEE CrossCheck". The most conservative values between both sources were applied in the ER calculations spreadsheet</li> <li>4. The value of <math>EF_{BM, 2020}</math> is now up to date. The data available in the spreadsheet was cross checked with the latest version available at DNA's website (<a href="https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/textogeral/emissao_despacho.html">https://antigo.mctic.gov.br/mctic/opencms/ciencia/SEPED/clima/textogeral/emissao_despacho.html</a>) . Access on: September 03.</li> </ol>	
<b>Documentation provided by project participant</b>	
<i>CER calculation_v02.xlsx</i> <i>Monitoring Report.v05</i>	
<b>DOE assessment</b>	<b>Date: 11/09/2021</b>
<ol style="list-style-type: none"> <li>1. The results of the ER calculations are now conservative</li> <li>2. The estimated calculations ex-ante calculated for corresponding monitoring period are now duly demonstrated and traceable in the ER calculations spreadsheet</li> <li>3. The cross-check between monitored data and provided by public source (CCEE) have been duly compared and the most conservative values have been applied in the ER calculations spreadsheet</li> <li>4. The EFBM 2020 value has been updated as per data provided by Brazilian DNA.</li> </ol>	
<b>CAR is closed</b>	

Table 4. FAR from this verification

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



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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
04.0	6 April 2021	Revision to: <ul style="list-style-type: none"><li>• Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).</li></ul>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none"><li>• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN);</li><li>• Make structural and editorial improvements.</li></ul>
02.1	11 January 2018	Editorial revision to correct the numbering of appendices in the instructions.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		