




Validation report form for CDM project activities

(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the validation report form for CDM project activities" at the end of this form.

VALIDATION REPORT

Title of the project activity	Energia dos Ventos I, II, III, IV and X CDM Project (JUN1184), Brazil
Version number of the validation report	1.1* Reference – TN P-No.: 15/157 – 12266
Completion date of the validation report	15/06/2016
Version number of PDD to which this report applies	2.1
Date when PDD was uploaded for global stakeholder consultation	22/09/2015 ¹
Project participant(s)	Energia dos Ventos I S.A. Energia dos Ventos II S.A. Energia dos Ventos III S.A. Energia dos Ventos IV S.A. Energia dos Ventos X S.A.
Host Party	Brazil
Estimated annual average GHG emission reductions or net removals in the crediting period (tCO₂e)	233,752 tCO ₂ e
Sectoral scope(s) and selected methodology(ies)	Scope: 1 / Technical Area: 1.2 CDM Methodology: ACM0002 – "Grid-connected electricity generation from renewable sources" – version 16.0
Name of DOE	TÜV NORD CERT GmbH
Name, position and signature of the approver of the validation report	 Stefan Winter Final Approver

* Changes from the validation report revision 1.0 to this revision 1.1 are only made to applicable UNFCCC requirements and LoA assessment. The changes do not impact the project activity content.

¹ Available on UNFCCC website from 2015-09-23.

SECTION A. Executive summary

Energia dos Ventos IV S.A. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project:

“Energia dos Ventos I, II, III, IV and X CDM Project (JUN1184), Brazil”

with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board.

The project activity consists in the construction of five new wind power plants in the municipality of Aracati, State of Ceará, Brazil. The plants are Goiabeira, Ubatuba, Santa Catarina, Pitombeira and Ventos de Horizonte with installed capacity of 23.1 MW, 12.6 MW, 18.9 MW, 27.3 MW and 16.8 MW respectively.

The following parties to the Kyoto Protocol and project participants are involved in this project activity (Table A-1).

Table A-1: Project Parties and project participants

Characteristic	Party	Project Participant
Non-Annex 1 Country	Brazil	Energia dos Ventos I S.A.
		Energia dos Ventos II S.A.
		Energia dos Ventos IV S.A.
		Energia dos Ventos III S.A.
		Energia dos Ventos X S.A.

Details of the project location are given in table A-2 below:

Table A-2: Project Location

No.	Project Location	
Host Country	Brazil	
Region:	State of Ceará – Northeast Region	
City:	City of Aracati	
Geographical Coordinates:	Latitude	Longitude
- WPP Goiabeira	4°34'57.1" S	37°42'55.8" W
- WPP Ubatuba	4°39'1.3" S	37°37'4.7" W
- WPP Santa Catarina	4°35'4.4" S	37°40'34.9" W
- WPP Pitombeira	4°35'16.7" S	37°38'53.1" W
- WPP Ventos de Horizonte	4°36'27" S	37°41'42.6" W

Basic technical details of the project are summarized in tables A-3.

Table A-3.1: Technical data of the project activity

Parameter	Unit	Value
Wind Turbine (for all WPPs)		
Model	-	WEG AGW110 – 2.1MW

Parameter	Unit	Value
Manufacturer	-	WEG
Power Capacity	MW	2.1
Rotor Blade Diameter	m	110
Loftiness	m	120
Maximum Spin	rpm	14
Minimum Spin	rpm	6.5
Nominal wind speed	m/s	11
Noise on the base	dBA	104

Table A-3.2: Technical data of the project activity – WPP Goiabeira

Parameter	Unit	Value
Installed capacity	MW	23.1
Number of turbines	-	11
Assured energy ²	MWavg	11.957
Area	ha	393.86

Table A-3.3: Technical data of the project activity – WPP Ubatuba

Parameter	Unit	Value
Installed capacity	MW	12.6
Number of turbines	-	6
Assured energy	MWavg	6.8766
Area	ha	89.91

Table A-3.4: Technical data of the project activity – WPP Santa Catarina

Parameter	Unit	Value
Installed capacity	MW	18.9
Number of turbines	-	9
Assured energy	MWavg	9.5746
Area	ha	147.92

Table A-3.5: Technical data of the project activity – WPP Pitombeira

Parameter	Unit	Value
Installed capacity	MW	27.3
Number of turbines	-	13
Assured energy	MWavg	15.475
Area	ha	310.17

Table A-3.6: Technical data of the project activity – WPP Ventos de Horizonte

Parameter	Unit	Value
Installed capacity	MW	16.8

² Assured energy = PLF x Installed capacity x 8760 hours

Parameter	Unit	Value
Number of turbines	-	8
Assured energy	MWavg	8.2544
Area	ha	197.11

In detail the conclusions can be summarized as follows:

- the project is in line with all relevant host country criteria (Brazil) and all relevant UNFCCC requirements for CDM. Project activity approval has been obtained from DNA of Brazil, vide the Letter of Approval issued on 2016-06-13. Changes from the validation report revision 1.0 to this revision 1.1 are only made to applicable UNFCCC requirements and LoA assessment. The changes do not impact the project activity content.
- the project additionality is sufficiently justified in the PDD;
- the monitoring plan is transparent and adequate;
- the calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 1,636,264 t CO₂e are most likely to be achieved within the (1st renewable) crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

SECTION B. Validation team, technical reviewer and approver**B.1. Validation team member**

No.	Role	Type of resource*	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Validation findings
1.	Team Leader	EI	Cruz	Sergio	BRTUV – Brazil	x	x	x	x
2.	Validator	EI	Lopes	Ricardo	BRTUV – Brazil	x		x	x

* EI: External individual

B.2. Technical reviewer and approver of the validation 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	EI	Sebben	Marcelo	BRTUV – Brazil
2.	Approver	IR	Stefan	Winter	TÜV NORD CERT

* EI: External individual

IR: Internal resource

SECTION C. Means of validation**C.1. Desk review**

During the desk review all documents initially provided by the client and publicly available documents relevant for the validation were reviewed. The main documents are listed below:

- draft PDD^{/PDD/};
- documents of CDM prior consideration and starting date^{/PSD/};
- regulations and approval of project activity^{/EIA/LIC/};
- technical details of the project^{/TD/LIFE/};
- Host Government approval^{/LOA/} (if available);
- financial analysis^{/IRR/BENCH/};
- plant load factor^{/PLF/};
- supporting documents demonstrating the additionality^{/FD/};
- expected emission reductions^{/XLS/};
- local stakeholders' consultations^{/SHCP/};
- National legislation^{/LEGIS/}.

Other supporting documents, such as publicly available information on the UNFCCC website and background information were also reviewed.

C.2. On-site inspection

Duration of on-site inspection: 06/10/2015 to 09/10/2015				
No.	Activity performed on-site	Site location	Date	Team member ¹⁾
1.	Opening meeting	Aracati office	06/10/2015	SC
2.	On-site inspection (building site)	WPP Goiabeira	06/10/2015	SC
3.	On-site inspection (building site)	WPP Ubatuba	06/10/2015	SC
4.	On-site inspection (building site)	WPP Santa Catarina	06/10/2015	SC
5.	On-site inspection (building site)	WPP Pitombeira	06/10/2015	SC
6.	On-site inspection (building site)	WPP Ventos de Horizonte	06/10/2015	SC
7.	Interview with personnel	Aracati office	06/10/2015	SC
8.	Evidence assessment (feasibility studies, PLF studies, etc.)	Aracati office	06/10/2015	SC
9.	Site inspection of future Pitombeira substation	Pitombeira substation	07/10/2015	SC
10.	Evidence assessment (licenses, manuals, etc.)	Aracati office	07/10/2015	SC
11.	Interview with personnel	São Paulo office	08/10/2015	SC / RL
12.	Assessment of prior consideration documents, stakeholder invitations and additional documentation	São Paulo office	08/10/2015	SC
13.	Assessment of financial investment analysis	São Paulo office	08/10/2015	RL
14.	Preparation of the report	São Paulo office	09/10/2015	SC / RL
15.	Presentation of findings	São Paulo office	09/10/2015	SC / RL
16.	Closing meeting	São Paulo office	09/10/2015	SC / RL

¹⁾ Team Member:

- SC = Sergio Cruz
- RL = Ricardo Lopes

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Nogueira	Davi	Energia dos Ventos	06	General aspects of the plants	SC
2.	Moraes	Arthur	Carbotrader	06/10/2015 and 08/10/2015	General aspects of the plants / Financial Analysis	SC / RL
3.	Bacellar	Maurício	Energia dos Ventos	08/10/2015	Financial Analysis	SC / RL

¹⁾ Team Member:

- SC = Sergio Cruz
- RL = Ricardo Lopes

C.4. Sampling approach**C.4.1. Sampling approaches during validation**

<input checked="" type="checkbox"/>	No sampling approach has been used by the VT to validate any parameter				
<input type="checkbox"/>	A sampling approach has been applied by the VT for the following parameter(s):				
	Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population	Sample Size
	-	-	-	-	-

¹⁾ Sampling Approaches:

- SiRS: Simple Random Sampling
- StRS: Stratified Random Sampling
- SS: Systematic Sampling
- CS: Cluster Sampling
- MSS: Multi-stage Sampling

²⁾ Sampling Types:

PS: Parameter Sampling

C.4.2. Sampling approaches during on-site inspection

<input checked="" type="checkbox"/>	No sampling approach has been used by the VT at on-site inspection				
<input type="checkbox"/>	A sampling approach has been applied by the VT for field check of the following parameter(s):				
	Parameter	Sampling approach ¹⁾	Sampling Type ²⁾	Population	Sample Size
	-	-	-	-	-

¹⁾ Sampling Approaches:

SiRS: Simple Random Sampling
 StRS: Stratified Random Sampling
 SS: Systematic Sampling
 CS: Cluster Sampling
 MSS: Multi-stage Sampling

²⁾ Sampling Types:

AS: Acceptance Sampling
 PS: Parameter Sampling
 COM: Full data check at higher data aggregation levels and sampling at original data levels

C.5. Clarification requests, corrective action requests and forward action requests raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Global stakeholder consultation	-	-	-
Approval	-	-	-
Authorization	-	-	-
Contribution to sustainable development	-	-	-
Modalities of communication	-	-	-
Project design document	1	-	-
Description of project activity	-	-	-
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline	-	-	-
- Deviation from methodology	-	-	-
- Clarification on applicability of methodology, tool and/or standardized baseline	-	-	-
- Project boundary	-	-	-
- Establishment and description of baseline scenario	-	-	-
- Demonstration of additionality	4	7	-
- Emission reductions	-	2	-
- Monitoring plan	-	-	-
Duration and crediting period	-	-	-
Environmental impacts	-	-	-
Local stakeholder consultation	-	1	-
Others (please specify)	-	-	-
Total	5	10	-

SECTION D. Validation findings**D.1. Global stakeholder consultation**

Means of validation	<p>By means of the draft PDD submitted to the validation team by the project participants, the DOE has made the PDD publicly available prior to the start of the validation activities through a dedicated interface on the UNFCCC CDM website in accordance with applicable validation requirements related to the global stakeholder consultation in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /unfccc/ 												
Findings	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>The PDD was made publicly available through a dedicated interface on the UNFCCC CDM website for global stakeholder consultation.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>No comments were received during the global stakeholder consultation period.</td></tr> <tr> <td><input type="checkbox"/></td><td>Comments were received during the global stakeholder consultation period. The comments (in unedited form) and the consideration/response of the validation team are presented below:</td></tr> <tr> <td></td><td>-</td></tr> <tr> <td><input type="checkbox"/></td><td>The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:</td></tr> <tr> <td></td><td>-</td></tr> </table>	<input checked="" type="checkbox"/>	The PDD was made publicly available through a dedicated interface on the UNFCCC CDM website for global stakeholder consultation.	<input checked="" type="checkbox"/>	No comments were received during the global stakeholder consultation period.	<input type="checkbox"/>	Comments were received during the global stakeholder consultation period. The comments (in unedited form) and the consideration/response of the validation team are presented below:		-	<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:		-
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	-												
<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:												
	-												
Conclusion	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</td></tr> <tr> <td><input type="checkbox"/></td><td>The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</td></tr> </table> <p>The DOE has made the draft PDD submitted to the validation team by the project participants publicly available prior to the start of the validation activities on 2015-09-23.</p> <p>No comments were received.</p>	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.								
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D.2. Approval

Means of validation	<p>By means of the LoA issued by the DNA of Brazil, the validation team will be able to assess the approval from the DNA in accordance with related applicable validation requirements in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /LOA/ • /dna/ • /unfccc/ 										
Findings	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>All DNAs from each party involved in the PA issued a LoA.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>The LoA(s) confirms: <ul style="list-style-type: none"> - that the party is a party to the Kyoto Protocol; - that participation is voluntary; - that the project contributes to sustainable development (only host party LoA); - the precise project activity title in the PDD intended for submission for registration. </td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>The LoA is authentic.</td></tr> <tr> <td><input type="checkbox"/></td><td>The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:</td></tr> <tr> <td></td><td>-</td></tr> </table>	<input checked="" type="checkbox"/>	All DNAs from each party involved in the PA issued a LoA.	<input checked="" type="checkbox"/>	The LoA(s) confirms: <ul style="list-style-type: none"> - that the party is a party to the Kyoto Protocol; - that participation is voluntary; - that the project contributes to sustainable development (only host party LoA); - the precise project activity title in the PDD intended for submission for registration. 	<input checked="" type="checkbox"/>	The LoA is authentic.	<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:		-
<input checked="" type="checkbox"/>	All DNAs from each party involved in the PA issued a LoA.										
<input checked="" type="checkbox"/>	The LoA(s) confirms: <ul style="list-style-type: none"> - that the party is a party to the Kyoto Protocol; - that participation is voluntary; - that the project contributes to sustainable development (only host party LoA); - the precise project activity title in the PDD intended for submission for registration. 										
<input checked="" type="checkbox"/>	The LoA is authentic.										
<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:										
	-										
Conclusion	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</td></tr> <tr> <td><input type="checkbox"/></td><td>The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</td></tr> </table> <p>At the time of the completion of this report, the LoA of the Brazilian DNA (host country) was pending. For the Brazilian DNA, a positive validation opinion is a</p>	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.						
<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.										
<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.										

	<p>prerequisite for the host government approval and thus, the LoA could not be considered at that time.</p> <p>According to CDM requirements, at the validation stage, a party may or may not have provided its approval by the time of making the PDD public. The approval of the involved parties is required at the time of registration request.</p> <p>Hence, the Request for Registration was not submitted before the LoA was issued by the Brazilian DNA and its authenticity verified and confirmed that it complies with all CDM requirements.</p> <p>After the issuance of the LoA^{/LOA/} on 2016-06-13 by the DNA, it can be confirmed that the project activity has been approved by the Brazilian DNA, in accordance with related applicable validation requirements in the VVS. The LoA was presented to the DOE by the project participant.</p>
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D.3. Authorization

Means of validation	<p>By means of the LoA issued by the Brazilian DNA, the validation team will be able to assess the authorization from the DNA in accordance with related applicable validation requirements in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /LOA/ • /dna/ • /unfccc/
Findings	<p><input checked="" type="checkbox"/> The host Party has authorized the project participant(s) of the project activity in accordance with applicable validation requirements related to the authorization in the VVS.</p> <p><input type="checkbox"/> The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:</p> <p>-</p>
Conclusion	<p><input checked="" type="checkbox"/> No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</p> <p><input type="checkbox"/> The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p> <p>At the time of the completion of this report, the LoA of the Brazilian DNA (host country) was pending. For the Brazilian DNA, a positive validation opinion is a prerequisite for the host government approval and thus, the LoA could not be considered at that time.</p> <p>According to CDM requirements, at the validation stage, a party may or may not have provided its approval by the time of making the PDD public. The approval of the involved parties is required at the time of registration request.</p> <p>Hence, the Request for Registration was not submitted before a LoA is issued by the Brazilian DNA and its authenticity verified and confirmed that it complies with all CDM requirements.</p> <p>After the issuance of the LoA^{/LOA/} on 2016-06-13 by the DNA, it can be confirmed that the project participants of the project activity have been authorized by the DNA of Brazil (which is a Party of the Kyoto Protocol), in accordance with related applicable validation requirements in the VVS.</p>

D.4. Contribution to sustainable development

Means of validation	<p>By means of the PDD submitted by the project participants, site visit to project location and interviews with project participant representatives, the validation team has assessed the contribution of the project activity to the sustainable development of the host Country in accordance with applicable related validation requirements in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /LOA/ • /dna/ • /unfccc/
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Findings	<input checked="" type="checkbox"/>	The PDD clearly states that the project contributes to sustainable development of the host country and evidences were presented to the validation team to confirm this information.
	<input checked="" type="checkbox"/>	The LoA confirms that the project contributes to sustainable development of the host country.
	<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context: -
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		<p>The PDD clearly states at Section A.1 of the PDD how the project activity will contribute to the sustainable development of the host country. The contribution can be viewed on:</p> <ul style="list-style-type: none"> - Local environmental sustainability: <ul style="list-style-type: none"> o the project activity uses renewable energy resources for electricity generation contributing to a reduction of GHG emissions. - Diversification of the electric mix and energetic security: <ul style="list-style-type: none"> o efficient use of natural resources avoiding environmental and social liabilities caused by natural resources exploitation through low efficiency approaches; o increase of the renewable energy share in relation to total electricity consumption in Brazil. - Increases local employment opportunities. - Reduces the local pollution into the atmosphere, reducing associated social costs. <p>In addition, after the issuance of the LoA^{/LOA/} on 2016-06-13 by the Brazilian DNA, it can be confirmed that the project activity assists the host country in achieving sustainable development, in accordance with related applicable validation requirements in the VVS.</p>

D.5. Modalities of communication

Means of validation		<p>By means of comparison of the Modalities of Communication (MoC) submitted by the project participants and the contract among the PP and TÜV Nord, the validation team has assessed the MoC in accordance with applicable related validation requirements in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /MoC/ • /CON/ • /unfccc/
Findings	<input checked="" type="checkbox"/>	A valid Modalities of Communication (MoC) was provided to the validation team from a project participant with whom the DOE has a contractual relationship.
	<input checked="" type="checkbox"/>	The MoC was signed by a duly authorized person on behalf of the respective project participant.
	<input checked="" type="checkbox"/>	The MoC statement was correctly completed.
	<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context: -
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		All project participants and focal points are included in the presented Modalities of Communication statement, as well as the personal identities, including specimen signatures and employment status.

	<p>The MoC has been received from Energia dos Ventos IV S.A. which is the PP with contractual relationship with TÜV Nord.</p> <p>The representatives who submitted the MoC statement to the DOE are duly authorized to do so, on behalf of the respective project participant.</p>
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D.6. Project design document

Means of validation	<p>A draft PDD was submitted to the validation team by the project participants. By means of the UNFCCC website it has been checked whether the latest applicable PDD template CDM-PDD-FORM has been used.</p> <p>Further it has been checked whether the latest instructions for filling out the PDD template have been followed. Every section has been checked against the respective guidance.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /PDD-T/ • /unfccc/
Findings	<p><input checked="" type="checkbox"/> The latest reporting template CDM-PDD-FORM as listed on the UNFCCC website has been used for the Project Design Document to be uploaded.</p> <p><input checked="" type="checkbox"/> The latest instructions for filling out the PDD have been followed. All raised findings have been correctly solved.</p> <p><input checked="" type="checkbox"/> The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:</p> <p>CL A1: According to the "Instructions for filling out the project design document form for CDM project activities" it is missing:</p> <ol style="list-style-type: none"> 1. at Section B.1, the reference to the UNFCCC CDM website for the methodological tools and not all used tools were included; 2. at the Appendix 1, the contact information of responsible person according with Section B.8.
Conclusion	<p><input type="checkbox"/> No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</p> <p><input checked="" type="checkbox"/> The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p> <p>The latest applicable PDD template (CDM-PDD-FORM – version 06.0) has been used and correctly filled out.</p>

D.7. Description of project activity

Means of validation	<p>By means of comparison of the PDD submitted by the project participants, site visit to project location and interviews with project participant representatives, the validation team has assessed the description of the proposed CDM project activity in accordance with applicable related validation requirements.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /TD/
Findings	<p><input checked="" type="checkbox"/> The PDD contains a clear, accurate and complete project description.</p> <p><input checked="" type="checkbox"/> The information regarding the project participant is listed at the PDD and it is consistent with Appendix 1 that contains the contact information.</p> <p><input checked="" type="checkbox"/> This description is in accordance with the real situation or (in case of greenfield projects) is it most likely that the project will be implemented according to the project description.</p> <p><input type="checkbox"/> The project involves an alteration of the existing installation or process and there is a clear description available regarding the differences between the project and the pre-project situation.</p> <p><input type="checkbox"/> The project qualifies as a small scale CDM project activity as defined in decision 4 / CMP.1 annex II.</p> <p><input type="checkbox"/> The project qualifies as an afforestation and reforestation (A/R) CDM project activity.</p> <p><input checked="" type="checkbox"/> The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:</p>

		<p>CAR B5: In section A.3 of PDD it is stated a total installed capacity of 109.2MW in the first paragraph, which is in accordance with Installation licenses granted by the project activity. However, at the table of Section A.3, it is stated a total capacity of 98.7MW. In addition, in the investment analysis, the total capacity considered is 89.2MW as per the table at Section B.5, which is the data approved by EPE and considered for the auction.</p> <p>Further, the financial analysis was done considering wind generators of 1.6 and 1.8MW and the wind farms are being installed using 2.1MW wind generators.</p> <p>So, it is not clear in the PDD whether the final capacity will be 98.7MW or 109.2MW; and in either case, there is an increase of total capacity in relation to the one considered at the moment of investment decision (89.2MW).</p> <p>Thus, it is not justified that the project additionality is not affected by the capacity increase.</p>
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		<p>The involved party is Brazil (host party) and respective PPs are:</p> <ul style="list-style-type: none"> - Energia dos Ventos I S.A.; - Energia dos Ventos II S.A.; - Energia dos Ventos III S.A.; - Energia dos Ventos IV S.A.; - Energia dos Ventos X S.A. <p>The project activity was described at the PDD in accordance with VVS requirements. The description of the project is complete and accurate and provides an understanding of the proposed project activity.</p> <p>The project activity is the implementation of 5 new wind farms in the municipality of Aracati, State of Ceará, Brazil. The plants are Goiabeira, Ubatuba, Santa Catarina, Pitombeira and Ventos de Horizonte with installed capacity of 23.1 MW, 12.6 MW, 18.9 MW, 27.3 MW and 16.8 MW respectively.</p> <p>As a greenfield project, it is most likely that the project will be implemented according to the project description.</p> <p>The plant will be interconnected to the Brazilian National Interconnected Grid at ICG Aracati III Substation delivering 456,726 MWh on renewable electricity per year.</p> <p>The employed technology is environmentally safe and sound as well as state of the art. The turbines are WEG AGW110 – 2.1 MW manufactured by WEG.</p> <p>For details of technical features of the project activity, refer to Tables A-3 above at Section A of this Report.</p>

D.8. Application of selected baseline and monitoring methodology and selected standardized baseline

D.8.1. Applicability of methodology and standardized baseline

Means of validation		<p>By means of comparison of the PDD with</p> <ul style="list-style-type: none"> (i) the applied CDM methodology, (ii) all applicable CDM Meth tools, and (iii) if applicable, a standardized baseline <p>the validation team has checked whether the project activity is in compliance with the related requirements of the applied methodology/tools/SB.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /METH/ • /MT/
Findings	<input checked="" type="checkbox"/>	The project applies a valid version of a CDM Methodology.
	<input checked="" type="checkbox"/>	All applied methodological tools are valid and approved.
	<input checked="" type="checkbox"/>	The applied methodology and methodological tools derived from UNFCCC CDM website.

	<input checked="" type="checkbox"/>	All methodology applicability conditions are met.
	<input checked="" type="checkbox"/>	The project is in line with all requirements and stipulations mentioned in all sections of the applied methodology.
	<input type="checkbox"/>	The project activity is expected to result in significant emissions, related both to project and leakage, other than those listed in the methodology.
	<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context: -
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		<p>The project activity applies approved methodology <i>ACM0002 – Grid-connected electricity generation from renewable sources – version 16.0</i> which is valid at the moment of the validation process.</p> <p>All applicability conditions of the applied methodology are met (refer to Appendix 6 for details).</p> <p>The project activity also applies the following methodological tools:</p> <ul style="list-style-type: none"> - <i>Tool to calculate the emission factor for an electricity system – version 05.0;</i> - <i>Tool for the demonstration and assessment of additionality – version 07.0.0;</i> - <i>Methodological Tool Investment Analysis – Version 06.0;</i> - <i>Methodological Tool Common Practice – Version 03.1.</i> <p>which are the last ones available.</p> <p>Methodology and tools are derived from UNFCCC CDM website.</p> <p>Hence, the PA is in line with all requirements and stipulations mentioned in all sections of the applied methodology.</p>

D.8.2. Deviation from methodology

Means of validation	By means of comparison of the PDD with the applied CDM methodology and methodological tools, it has been checked whether any deviation from applied methodologies, including standardized baselines have been verified.	
	<p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /METH/ • /MT/ • /unfccc/ 	
Findings	<input checked="" type="checkbox"/>	No deviation from or revision of the methodology is necessary.
	<input type="checkbox"/>	A deviation from or revision of the methodology is to be requested and approved.
	<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context: -
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		<p>The project activity applies approved methodology <i>ACM0002 – Grid-connected electricity generation from renewable sources – version 16.0</i> which is valid at the moment of the validation process.</p> <p>No deviation or revision of the methodology was requested during the validation period.</p>

D.8.3. Clarification on applicability of methodology, tool and/or standardized baseline

Means of validation	By means of verification of the proposed CDM project activity with (i) the applied CDM methodology, (ii) all applicable CDM Meth tools, and
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	<p>(iii) if applicable, a standardized baseline the validation team has checked whether if any clarification on applicability of methodology, tool and/or standardized baseline to the proposed CDM project activity has been issued.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /METH/ • /MT/ • /unfccc/
Findings	<input checked="" type="checkbox"/> No clarification on applicability of methodology, tool and/or standardized baseline to the proposed CDM project activity has been issued.
	<input type="checkbox"/> A clarification on applicability of methodology, tool and/or standardized baseline to the proposed CDM project activity has been issued.
	<input type="checkbox"/> The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context: -
Conclusion	<input checked="" type="checkbox"/> No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/> The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<p>The project activity applies approved methodology <i>ACM0002 – Grid-connected electricity generation from renewable sources – version 16.0</i> which is valid at the moment of the validation process.</p> <p>There is no clarification on applicability of methodology, tool and/or standardized baseline to the proposed CDM project activity.</p>

D.8.4. Project boundary

Means of validation	<p>By means of comparison of the PDD with the applied CDM methodology, the validation team has assessed the project boundary in accordance with applicable related validation requirements in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /METH/ • /MT/
Findings	<input checked="" type="checkbox"/> The spatial (geographical) boundaries of the project are clearly defined at the PDD.
	<input checked="" type="checkbox"/> All sources and GHGs are included in the project boundary as required in the applied methodology.
	<input type="checkbox"/> The methodology allows choosing whether a source and/or gas is to be included. The choice is sufficiently explained and justified.
	<input type="checkbox"/> Emission sources that are expected to contribute more than 1% of the overall expected average annual emissions reductions and which are not addressed by the selected approved methodology have been identified
	<input type="checkbox"/> The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context: -
Conclusion	<input checked="" type="checkbox"/> No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/> The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
	<p>The monitoring plan in the PDD covers all parameters, which have to be monitored w.r.t. the project boundary, in line with the applied monitoring methodology. In addition, all sources and GHGs are included in the project boundary as required by the monitoring methodology.</p> <p>The spatial (geographical) boundaries of the project are described at the PDD.</p>

D.8.5. Establishment and description of baseline scenario

Means of validation	<p>By means of comparison of the PDD with the applied CDM methodology, the validation team has assessed the baseline scenario in accordance with applicable related validation requirements in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /METH/
Findings	<input checked="" type="checkbox"/> The baseline scenario is given by the applied methodology. <input type="checkbox"/> All possible baseline scenarios have been considered. <input type="checkbox"/> The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context: -
Conclusion	<input checked="" type="checkbox"/> No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements. <input type="checkbox"/> The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4. <p>The baseline scenario is the one given by the applied methodology ACM0002 – v. 16.0 for the installation of a Greenfield power plant which is: <i>“electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.</i>”</p>

D.8.6. Demonstration of additionality

Means of validation	<p>By means of comparison of the PDD with the applied CDM methodology and “Tool for the demonstration and assessment of additionality” – version 07.0.0, the validation team has assessed the additionality of the project activity in accordance with applicable related validation requirements in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /METH/ • /MT/ • /FD/ • /FD_CROSS/ • /IRR/ • /LIFE/ • /PLF/ • /LEGIS/ • /COMMON/ • /PSD/ • /TD/ <p>For the assessment of financial parameters, refer to Appendix 7.</p>
Findings	<input checked="" type="checkbox"/> The PDD describes how the project is additional in accordance with the requirements of the applied methodology and methodological tools <i>Consideration of CDM before project start</i> <input checked="" type="checkbox"/> The project starting date is reported in accordance with the CDM glossary of terms. <input checked="" type="checkbox"/> The project starting date is on or after 2008-08-02 and the PP has informed the DNA and UNFCCC about the intension to seek CDM status within 6 months. <input type="checkbox"/> The project starting date is before 2008-08-02 and the CDM was seriously considered. <input type="checkbox"/> The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context: - <i>Identification if the project activity is the first-of-its-kind Step 0</i> <input type="checkbox"/> The project activity is the first-of-its-kind.

<input checked="" type="checkbox"/>	Not applicable to the project activity.
<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:
	-
Identification of alternatives Step 1	
<input type="checkbox"/>	The project activity is a SSC project.
<input checked="" type="checkbox"/>	The baseline scenario is given by the applied methodology and alternatives to the project activity are not necessary.
<input type="checkbox"/>	The list of alternatives contains the current situation, the project not undertaken as a CDM project as well as all other viable means of supplying the outputs or services that are to be supplied by the proposed CDM project activity.
<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:
	-
Investment analysis Step 2	
<input checked="" type="checkbox"/>	The PDD provides evidences that the project is not be the most economically or financially attractive alternative or economically / financially feasible without the revenues from the sale of CERs.
<input checked="" type="checkbox"/>	An appropriate analysis method was chosen for the project activity.
<input checked="" type="checkbox"/>	The input values used in the investment analysis were valid and applicable at the time of the investment decision.
<input checked="" type="checkbox"/>	The plant load factor was chosen in a conservative manner.
<input checked="" type="checkbox"/>	The benchmark value is suitable for the project activity and it is reasonable to assume that no investment would be made at a rate of a lower return than the benchmark.
<input checked="" type="checkbox"/>	A correct Sensitivity Analysis has been performed which contains variation of parameters which may vary throughout the project lifetime.
<input checked="" type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:
	CL B1: It is not indicated the legal basis for the depreciation considered in the financial model.
	CL B2: In the tab "Assumptions" of the financial model, it is not indicated the detailed loan conditions and respective sources.
	CL B3: The source given for TUSDg in line 21, tab "assumptions" of Financial Model does not clearly lead to value of R\$ 2,003 considered in the calculations.
	CL B4: It is not found in ANEEL dispatch 4080, the justification for the application of 0.5% given in cell 27B of tab "assumptions" of the Financial Model.
	CAR B5: In section A.3 of PDD it is stated a total installed capacity of 109.2MW in the first paragraph, which is in accordance with Installation licenses granted by the project activity. However, at the table of Section A.3, it is stated a total capacity of 98.7MW. In addition, in the investment analysis, the total capacity considered is 89.2MW as per the table at Section B.5, which is the data approved by EPE and considered for the auction. Further, the financial analysis was done considering wind generators of 1.6 and 1.8MW and the wind farms are being installed using 2.1MW wind generators. So, it is not clear in the PDD whether the final capacity will be 98.7MW or 109.2MW; and in either case, there is an increase of total capacity in relation to the one considered at the moment of investment decision (89.2MW). Thus, it is not justified that the project additionality is not affected by the capacity increase.
	CAR B6: The values of total investment considered by EPE were used in the financial analysis. They are based on the average investment by installed MW. However, no proposals from suppliers for wind generators, civil works, BOP, etc. have been presented to justify the conservativeness of EPE values.
	CAR B7: The ratio of Equity considered in the financial model is 50%. However, BNDES is virtually the only financing institution for wind projects in the auction scheme in Brazil and its rules allow up to 70% debt, i.e. up to 100% of equipment.

		<i>There is no justification in the PDD for the use of the rate of 50% for Equity applied at the financial analysis.</i>
		CAR B8: <i>The debt interest was calculated using BNDES current financing conditions instead of financing conditions at the moment of investment decision. In addition, the considered credit risk of the company of 2% is not justified.</i>
		CAR B9: <i>The calculation of the base for income tax in the financial model is not correct, as it has been considered the operational profit, but in fact the applicable tax regime for the projects is assumed profit, by which a percentage of gross revenues is the basis for calculation of income tax, additional income tax and social contribution.</i>
		CAR B10: <i>The value of cell F2 in tab "OPEX" is not in accordance with the value of 5% considered in the "Cash Flow" tab.</i>
		CAR B11: <i>As the Common Practice Analysis is part of the Investment Analysis, the same value of the installed capacity shall be used for both assessments.</i>
		Barrier analysis Step 3 or SSC additionality assessment
	<input checked="" type="checkbox"/>	Not applicable.
	<input type="checkbox"/>	There are barriers which have a clear and direct impact on the financial returns of the project.
	<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:
		-
		Common practice analysis Step 4
	<input checked="" type="checkbox"/>	The defined region for the common practice analysis is appropriate for the technology/industry type.
	<input checked="" type="checkbox"/>	Similar projects have been undertaken in the relevant region.
	<input checked="" type="checkbox"/>	The analysis has been performed in accordance with applied tool.
	<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:
		-
Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		<p>The PDD describes the additionality of the project activity. The additionality is demonstrated in accordance with the step-wise approach described in the "Tool for the demonstration and assessment of additionality" – version 07.0.0.</p> <p><u>Consideration of CDM before project start:</u></p> <p>The investment decision was on 2011-12-27 which was the day, when the bid price was offered establishing the acceptance of all conditions and price to operate the wind farms and generate energy.</p> <p>In addition, the project starting date is considered 2013-10-18 – signatures of the PPAs – which is the earliest date at which is day of the first major financial commitment, so in accordance with the Glossary of Terms. The validation team has checked several evidences to assess those dates. The decision to proceed was taken by a person who has the authority to do so.</p> <p>The project starting date is after 2nd August 2008 and the PP has informed the Brazilian DNA on 2012-02-17^{/PSD/} and UNFCCC on 2012-01-27^{/PSD/} which is within the 6 months of investment decision. In addition, on 2014-09-10^{/PSD/}, the PP has reinforced the information to the UNFCCC with the complex of the five plants as only one project.</p> <p>The CDM benefits have been essential for the decision as an estimate has been used at the calculation of the winning bid price made by the PPs in the auction, at which the project was running against projects with other sources which were not wind energy.</p> <p><u>Identification if the project activity is the first-of-its-kind Step 0:</u></p>

Not applicable to the project activity.

Identification of alternatives Step 1:

As the baseline is directly given by the methodology ACM0002, the selection of alternatives is not required.

Investment analysis Step 2:

It is worth noting that the investment analysis was done for all five plants together as this approach is more conservative as revealed during the interviews with PP's representatives. The PPs presented evidences that the feasibility of the implementation of the group of wind farms and the possibility to respond to energy demand of the market are possible when all wind farms are treated as a complex and this was the reason to perform a unique investment analysis what was deemed correct by the validation team.

If implemented separately for each individual plant, shared structures would dramatically increase the project's CAPEX and would further reduce the financial return of the project. Similarly, costs such as O&M and administrative expenditures present economies of scale. On the other hand, if the option were to develop financial models for each individual plant, the criteria chosen to distribute the costs of shared infrastructure among the plants would be arbitrary and would hardly reflect the reality of the project. Thus, an analysis per plant would not be consistent because the input data of financial models would be based more on rationales than evidences.

The chosen approach for demonstrating the additionality of the project is the Benchmark Analysis (Option III). The project activity generates economic benefits with the sale of energy, therefore the simple cost analysis (Option I) cannot be used. As there is no evidence that the proposed baseline scenario does not leave any other option to the PPs than to make an investment to supply the same product or service, the investment comparison analysis (Option II) cannot be used. So, Benchmark analysis (Option III) is appropriate and the best method to demonstrate additionally for a project implemented with the sole purpose of energy generation for commercialization. Equity IRR is the financial indicator chosen.

A viewable and unprotected excel spread sheet document was made available to validation team and was reviewed about clarity and access of calculation and data. Further, the values of IRR in the PDD are consistent with the financial spread sheet. All input values used in the investment analysis were valid and applicable at the time of the investment decision.

The period of investment analysis considers 20 years, which is consistent with the expected technical lifetime of the turbines.

The period of analysis is conservative and in line with the Methodological Tool Investment Analysis. All assets will be fully depreciated by the end of the 20 year period. The considered residual value is only regarding the value of the lands used for the project activity.

The PLF used to calculate the assured energy in the financial analysis and ER calculations is not the same as there was a change in the design of the project after the auction. The ones used for the financial analysis are provided by the calculation of the average guaranteed energy generation given by the Technical qualification of the wind farms from EPE^{PLF} by the installed capacity. EPE is the Energetic Research Enterprise and part of the Brazilian Ministry of Mines and Energy and responsible for the approval of plants to participate at the auction. The values are Total Installed Capacity of 89.2 MW and Total Assured Energy of 45.4 MW_{avg}. The values per plants are as follows:

- WPP Goiabeira – Installed Capacity: 19.2 MW; Assured Energy: 9.9 MW_{avg};
- WPP Ubatuba – Installed Capacity: 12.6 MW; Assured Energy: 5.8 MW_{avg};
- WPP Santa Catarina – Installed Capacity: 16.0 MW; Assured Energy: 8.5 MW_{avg};
- WPP Pitombeira – Installed Capacity: 27.0 MW; Assured Energy: 13.9 MW_{avg};
- WPP Ventos do Horizonte – Installed Capacity: 14.4 MW; Assured Energy: 7.3 MW_{avg}.

The PLFs used to calculate the assured energy for ER calculations are given by a new study done over the new design of the project with revised installed capacities

approved by ANEEL^{/PLF/}. The values are Total Installed Capacity of 98.7 MW and Total Assured Energy of 52.138 MW_{avg}. The values per plants are as follows:

- WPP Goiabeira – Installed Capacity: 23.1 MW; Assured Energy: 11.957 MW_{avg};
- WPP Ubatuba – Installed Capacity: 12.6 MW; Assured Energy: 6.8766 MW_{avg};
- WPP Santa Catarina – Installed Capacity: 18.9 MW; Assured Energy: 9.5746 MW_{avg};
- WPP Pitombeira – Installed Capacity: 27.3 MW; Assured Energy: 15.475 MW_{avg};
- WPP Ventos do Horizonte – Installed Capacity: 16.8 MW; Assured Energy: 8.2544 MW_{avg}.

All values are in accordance with the *Guidelines for the Reporting and Validation of Plant Load Factors* (EB48 – Annex 11), as submitted to the government while applying the project activity for implementation approval.

The project uses *assumed profit* for calculation of income tax, additional income tax and social contribution, hence actual interest payable does not affect tax calculation. In addition, cash in- and outflows have been considered correctly.

At the draft PDD, the PP had used the approaches of the *Guidelines on the Assessment of Investment Analysis* – version 05; at the final PDD, the PP has used the approaches of the *Methodological Tool Investment Analysis* – version 06.0, which explains the calculation of the benchmark at the draft PDD and the use of the default value given by the Tool at the final PDD. Both approaches were assessed as correct by the validation team.

The final chosen benchmark is the Cost of Equity which is in accordance with the *Methodological Tool Investment Analysis* – paragraph 16: “Required/expected returns on equity are appropriate benchmarks for Equity IRR”. The Cost of Equity is default value given by the Appendix of the Tool for the host country – Brazil – and Group 1 – Energy Industries, which is suitable for the project activity.

The benchmark is 10.65% and the calculated Equity IRR is 2.24%. Thus, the IRR is below the benchmark, and hence the project is not financially attractive. Both values are expressed in real terms and are post-taxed.

The benchmark does not include the subjective profitability expectations or risk profile of the project developer. So, it is deemed reasonable to assume that no investment would be made at a rate of return lower than the benchmark.

It is important to note that even when the actual configuration of the complex with the 5 plants with new installed capacities is used for the financial analysis, the Equity IRR results in 4.65% which continues being below the benchmark.

It is also important to note that in the draft PDD and version 1 of the Financial Analysis, the PP has used the value of the price of the electricity of R\$ 112.00/MWh which was the cap price of the auction. In the final version of the PDD and version 2 of the Financial Analysis, the PP has used the actual value of the bid price of the electricity of R\$ 107.70/MWh. Both prices were assessed as correct and proper to be used by the validation team. The change resulted in a decrease of the IRR of the project.

In addition, sensitivity analysis with a variation from -10% to +10% performed with the following items: investment, assured energy, energy price, and operational and maintenance expenditures. Even with the variation, the project continues to give a lower IRR than the benchmark rate. So, all parameters above the 20% threshold and the operational and maintenance expenditures were included and subject to a reasonable variation. Further a breakeven analysis was carried out and presented the following results:

- a. the breakeven point of Investment is achieved at -27.10% which is very unlikely to happen;
- b. the breakeven point of Assured Energy and Energy Price is achieved at +20.40% which is very unlikely to happen as the price of the energy and the energy to be sold (calculated by the installed capacity and PLF) are already determined by the auction results. In addition, the price is fixed and the inflation indexation is already calculated at the financial analysis and clearly demonstrate the unlikelihood of such a scenario;
- c. the breakeven point of Operational and Maintenance expenditures is -

	<p>73.70% which is not a reasonable scenario.</p> <p>For the detailed assessment of financial parameters, refer to Appendix 7.</p> <p><u>Barrier analysis Step 3 or SSC additionality assessment:</u> Not chosen by PPs.</p> <p><u>Common practice analysis Step 4:</u> The geographical region that was considered for the analysis is the national (Brazil) scenario which is reasonable as the energy sector rules are the same for the whole country. The "Methodological Tool Common Practice" – version 03.1 was applied to assess the common practice. As the financial analysis has been done with the installed capacity of all five plants (89.2 MW), the same value has been used for the Common Practice Analysis. From all electricity plants in operation in Brazil, there are 8 wind farm plants with the installed capacity between 44.6 MW and 133.8 MW (+/- 50% of the installed capacity of the project activity) have started before the starting date of the proposed project (2013-10-18) and not under CDM validation or already registered. Therefore, there are 9 plants in operation in Brazil similar to the project activity. So, $N_{all} = 80$. From those 80 plants, 10 are hydro power plants, 61 are thermoelectric power plants and the 9 wind power plants are under PROINFA (Brazilian government incentive) which are not under the new model of the Brazilian Electric Sector issued on 2004 by the Brazilian government in order to regulate the electricity market in Brazil, with totally new rules for planning and commercializing the electricity; so the issuance of those new regulations became the starting point of a new electricity market in the country. Thus, plants that started the operation before 2004 cannot be considered similar to the project activity which started its commercial operations under the new regulations. Therefore, 80 plants apply technologies that are different to the technology applied in the proposed project activity. So, $N_{diff} = 80$. Finally, as $F = 0$ (i.e. lower than 0.2) and $N_{all} - N_{diff} = 0$ (i.e. lower than 3), the proposed project activity is not a common practice within the sector in the applicable geographical area. This demonstrates that project activity is not the common or prevailing practice.</p> <p>Conclusion about the Additionality of the project activity: it was demonstrated and evidenced that the project activity is additional.</p>
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D.8.7. Emission reductions

Means of validation	<p>By means of comparison of the PDD with the applied CDM methodology, methodological tools and presented calculations, the validation team has assessed the estimated emissions reductions of the project activity in accordance with applicable related validation requirements in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /METH/ • /XLS/
Findings	<p><input checked="" type="checkbox"/> The equations applied for calculation are correctly applied according to the approved methodology.</p> <p><input checked="" type="checkbox"/> Conservative assumptions were used when calculating the project emissions.</p> <p><input checked="" type="checkbox"/> All values of data to be applied for the purpose of calculating expected emissions reductions are considered to be reasonable, applicable and conservative.</p> <p><input checked="" type="checkbox"/> The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:</p> <p>CAR B12: The parameter $EF_{grid,CM,y}$ was not calculated with the most updated data available at the Brazilian DNA's website.</p> <p>CAR B13: The parameters Cap_{BL} and Cap_{PJ} are not applicable for wind power projects.</p>

Conclusion	<input type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input checked="" type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.
		<p>All equations, formulas and conservative assumptions have been applied correctly as per the applied methodology (ACM0002 – 16.0).</p> <p>The methodology does not allow different methodological choices.</p> <p>The baseline emissions are calculated based on net energy generated multiplied by the combined margin emission factor (EF) calculated according to the Tool to Calculate the emission factor for an electric system and published by Brazilian DNA.</p> <p>There are no fixed parameters for the type of project activity according to the applied methodology. The values of w_{OM} and w_{BM} of 0.75 and 0.25, respectively, are directly given by the <i>Tool to calculate the emission factor for an electricity system</i>.</p> <p>The ERs are deemed real, measurable and give long-term benefits related to the mitigation of climate change.</p>

D.8.8. Monitoring plan

Means of validation		<p>During the validation all monitoring parameters (as listed in chapter B.7.1 of the PDD) have been checked with regard to the</p> <ul style="list-style-type: none"> (i) description, (ii) source of data, (iii) appropriateness of the applied measurement / determination method, (iv) monitoring frequency, (v) applied QA/QC measures, (vi) purpose of data (vii) formats. <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /METH/ • /MT/
Findings	<input checked="" type="checkbox"/>	All monitoring parameters required by the applied methodology are contained in the monitoring plan.
	<input checked="" type="checkbox"/>	The means of monitoring of all parameters contained in the monitoring plan are feasible.
	<input checked="" type="checkbox"/>	All equations necessary to ex-post emission reduction calculation are clearly defined.
	<input type="checkbox"/>	<p>The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:</p> <p>-</p>
Conclusion	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.
	<input type="checkbox"/>	<p>The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p> <p>It can be confirmed that all monitoring parameters required by the applied methodology are contained in the monitoring plan and the means of their monitoring is feasible.</p> <p>All monitoring parameters required for a wind farm by ACM0002 are contained in the monitoring plan: $EG_{facility,y}$ and $EF_{grid,CM,y}$.</p> <p>Parameter $EF_{grid,CM,y}$ is calculated with the values of $EF_{grid,OM,y}$ and $EF_{grid,BM,y}$ given by the Brazilian DNA. Parameter $EG_{facility,y}$ is monitored directly by plant meters.</p> <p>The monitoring arrangements for the parameters can be implemented, the QA/QC procedures are appropriate and sufficient to ensure that the emission reductions achieved from the project activity can be reported ex-post and further verified. In addition, procedures, type of data and responsibilities are identified and provisions for data archiving are made.</p> <p>The validation procedure is described parameter-wise in the project specific validation checklist (Appendix 5).</p>

D.9. Duration and crediting period

Means of validation	<p>By means of comparison of the PDD and evidences presented, the validation team has checked the compliance of the duration and crediting period with validation requirements related to the starting date, duration and crediting period in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /METH/ • /supplier/ • /unfccc/ 										
Findings	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>The starting date of the project activity is clearly defined and evidenced.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>The type, duration and start date of the crediting period are clearly defined.</td></tr> <tr> <td><input checked="" type="checkbox"/></td><td>The operational lifetime of the project activity is clearly defined and evidenced.</td></tr> <tr> <td><input type="checkbox"/></td><td>The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:</td></tr> <tr> <td></td><td>-</td></tr> </table>	<input checked="" type="checkbox"/>	The starting date of the project activity is clearly defined and evidenced.	<input checked="" type="checkbox"/>	The type, duration and start date of the crediting period are clearly defined.	<input checked="" type="checkbox"/>	The operational lifetime of the project activity is clearly defined and evidenced.	<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:		-
<input checked="" type="checkbox"/>	The starting date of the project activity is clearly defined and evidenced.										
<input checked="" type="checkbox"/>	The type, duration and start date of the crediting period are clearly defined.										
<input checked="" type="checkbox"/>	The operational lifetime of the project activity is clearly defined and evidenced.										
<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:										
	-										
Conclusion	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</td></tr> <tr> <td><input type="checkbox"/></td><td>The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</td></tr> </table> <p>The starting date of the project activity 2013-10-18 which is the day of the PPA signature that represents the first major financial commitment of the PPs.</p> <p>The duration of the renewable crediting period is 7 years. The first period is from 2016-01-01 to 2022-12-31.</p> <p>The operational lifetime of the project activity is 20 years as per the PDD and presented evidences</p>	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.						
<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.										
<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.										

D.10. Environmental impacts

Means of validation	<p>By means of provided evidences and by the assessment of host party regulations regarding the environment, the validation team has checked the compliance of the analysis of the environmental impacts with applicable validation requirements related to the environmental impacts in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /EIA/ • /unfccc/ 						
Findings	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>The project complies with host Party requirements for an Environmental Impact Assessment.</td></tr> <tr> <td><input type="checkbox"/></td><td>The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:</td></tr> <tr> <td></td><td>-</td></tr> </table>	<input checked="" type="checkbox"/>	The project complies with host Party requirements for an Environmental Impact Assessment.	<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:		-
<input checked="" type="checkbox"/>	The project complies with host Party requirements for an Environmental Impact Assessment.						
<input type="checkbox"/>	The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context:						
	-						
Conclusion	<table border="1"> <tr> <td><input checked="" type="checkbox"/></td><td>No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</td></tr> <tr> <td><input type="checkbox"/></td><td>The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</td></tr> </table> <p>For this type of project, the state of Ceará requires a PBA – Environmental Basic Plan^{/EIA/} (that includes documents from the EIA, RIMA, previous licenses, etc.) which was prepared by a third party and submitted to the state environmental authority to start the licensing process.</p> <p>In addition, previous licenses and installation licenses were issued by local environmental agency.</p> <p>There are no significant environmental impacts envisaged for this project as per the PBA.</p> <p>There are no transboundary environmental impacts for the project activity.</p>	<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.	<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.		
<input checked="" type="checkbox"/>	No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.						
<input type="checkbox"/>	The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.						

D.11. Local stakeholder consultation

Means of validation	<p>By means of provided evidences and by the assessment of host party regulations, the validation team has checked the compliance of the local stakeholder consultation process with applicable validation requirements related to the local stakeholder consultation in the VVS.</p> <p>The following sources of information have been used in this context:</p> <ul style="list-style-type: none"> • /PDD/ • /SHCP/ • /dna/ • /unfccc/
Findings	<p><input checked="" type="checkbox"/> An exemption from the requirement of paragraph 78 of the CDM Project Standard – version 09.0 was granted to the project activity by the EB. The requirement of paragraph 77 of the CDM Project Standard – version 07.0 was accomplished.</p> <p><input checked="" type="checkbox"/> The relevant local stakeholders were invited to consultation prior to the publication of the PDD.</p> <p><input checked="" type="checkbox"/> The local stakeholder consultation process can be assessed as adequate and in accordance with host Country requirements.</p> <p><input checked="" type="checkbox"/> The respective requirements have widely been complied with. However, the following issues needed to be addressed in this context: CAR E1: According to the PS v.09 paragraph 78, the project participants shall complete the local stakeholder consultation before the start date of the project activity. Although the start date of the project activity is 2013-10-18, the invitation letters sent to the stakeholders are dated in 2015.</p>
Conclusion	<p><input type="checkbox"/> No CARs/CLs have been raised in this context. No correction was required in the context. The project is in line with the respective requirements.</p> <p><input checked="" type="checkbox"/> The raised CARs/CLs have been addressed appropriately. The PP has carried out the requested corrections. All respective findings could be closed out. For details please refer to Appendix 4.</p> <p>Several relevant stakeholders have been invited for the consultation prior to the publication of the PDD and in accordance with the requirements of the Brazilian DNA:</p> <ol style="list-style-type: none"> Town Hall of Aracati; City Hall of Aracati; Municipal Secretary of the Environment and Sustainability of Aracati; SEMACE – Secretary of the Environment the State of Ceará; FBOMS – Forum of Brazilian NGOs; State Attorney for Public Interest (Ceará); State Attorney for Public Interest (Federal); Local community association; Council of Engineering and Agronomy of the State of Ceará. <p>They have been invited to consultation following host country DNA rules (Resolution 1 and 7) prior to the submission of the PDD to the DOE in order to have its publication D for GSC.</p> <p>No negative comments from local stakeholders were received to date.</p> <p>The local stakeholder consultation process was completed before the submission of the proposed CDM project activity to the DOE for validation; thus, it was performed in accordance with the requirement of paragraph 77 of the CDM Project Standard – version 07.0.</p> <p>An exemption to the requirement of paragraph 78 of the CDM Project Standard – version 09.0 was granted to the project activity by the EB on 2016-01-11 (Reference: INQ-04303)^{/SHCP/}.</p>

SECTION E. Internal quality control

Before the submission of the final validation report, a technical review of the whole validation procedure was carried out. The technical reviewers are competent GHG auditors being appointed for the scope this project falls under. The technical reviewers are not considered to be part of the validation team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the validation opinion and the topic specific assessments as prepared by the validation team leader may have been confirmed or revised. Furthermore reporting improvements might have been achieved.

After the successful technical review, an overall (esp. procedural) assessment of the complete validation has been carried out by a senior assessor located in the accredited premises of TÜV NORD.

After this step the submission for requesting the registration of the project activity is conducted.

SECTION F. Validation opinion


Energia dos Ventos IV S.A. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to validate the project: "Energia dos Ventos I, II, III, IV and X CDM Project (JUN1184), Brazil" with regard to the relevant requirements of the UNFCCC for CDM project activities, as well as criteria for consistent project operations, monitoring and reporting. UNFCCC criteria include article 12 of the Kyoto Protocol, the modalities and procedures for CDM (Marrakech Accords) and the relevant decisions by COP/MOP and CDM Executive Board

In detail the conclusions can be summarized as follows:

- the project is in line with all relevant host country criteria (Brazil) and all relevant UNFCCC requirements for CDM. Project activity approval has been obtained from DNA of Brazil, vide the Letter of Approval issued on 2016-06-13. Changes of this revision 1.1 are only made to applicable UNFCCC requirements and LoA assessment. The changes do not impact the project activity content;
- the project additionality is sufficiently justified in the PDD;
- the monitoring plan is transparent and adequate;
- the calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the calculated emission reductions of 1,636,264 tCO₂e are most likely to be achieved within the (1st renewable) crediting period.

The conclusions of this report show, that the project, as it was described in the project documentation, is in line with all criteria applicable for the validation.

São Paulo, 15/06/2016




Sergio Cruz
Team Leader

Appendix 1. Abbreviations

Abbreviations	Full texts
ALUPAR	Owner of Energia dos Ventos
ANEEL	Brazilian Electricity Regulatory Agency
BAU	Business as usual
BM	Build Margin
BNDES	National Bank for Social Economic Development
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CCEE	Chamber of Commerce of Electric Energy
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CM	Combined Margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
COELCE	Company of Energy of State of Ceará
CONAMA	National Environmental Council
COP/MOP	Conference of Parties / Meeting of Parties
CP	Certification Program
DNA	Designated National Authority
EB	CDM Executive Board
EDV.I	Energia dos Ventos I S.A. – WWP Goiabeira
EDV.II	Energia dos Ventos II S.A. – WWP Ubatuba
EDV.III	Energia dos Ventos III S.A. – WWP Santa Catarina
EDV.IV	Energia dos Ventos IV S.A. – WWP Pitombeira
EDV.X	Energia dos Ventos X S.A. – WWP Ventos de Horizonte
EIA	Environmental Impact Assessment
ELETRORÁS	National Electric Utility Company (State Owned)
EPE	Energetic Research Enterprise
FAR	Forward Action Request
GE	General Electric
GHG	Greenhouse gas(es)
GT	Glossary of Terms
ICG	Transmission Installation of Shared Connection for Generation Centrals
IEE	Electric Power Index
IPCC	Intergovernmental Panel on Climate Change
LoA	Letter of Approval
MME	Ministry of Mines and Energy
MoC	Modalities of Communication
MoU	Memorandum of Understanding
MP	Monitoring Plan
OM	Operating Margin
ONS	National Operator of the Electric System
OSV	On-site visit
PA	Project Activity
PDD	Project Design Document
PP	Project Participant(s)

Abbreviations	Full texts
PBA	Environmental Basic Plan
PPA	Power Purchase Agreement
QA/QC	Quality assurance/Quality control
RAS	Simplified Environmental Report
RIMA	Environment Impact Report
SEMACE	Secretary of the Environment the State of Ceará
SIN	National Interconnected System
TFSEE	Fee of Electric Energy Services Inspection
TJLP	Long Term Interest Rate (from the Portuguese: <i>Taxa de Juros de Longo Prazo</i>)
TUSDg	Fee for the Use of the Distribution System
TUST	Fee for the Use of the Transmission System
UNFCCC	United Nations Framework Convention on Climate Change
VVS	Validation and Verification Standard
WPP	Wind power plant

Appendix 2. Competence of team members and technical reviewers



Statement of Competence
Agreement and authorization according to the provisions of the TÜV NORD J/CDM Certification Program

Mr. Sergio Cruz


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2017-12-16
VCS / ISO 14064-2	Senior Assessor	2017-12-16

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
13.1	Solid waste and wastewater

185 - Rev. 6, Date: 2015-01-07

185_2015-01-07_185-01-07_w4.doc



Statement of Competence
Agreement and authorization according to the provisions of the TÜV NORD J/CDM Certification Program

Mr. Ricardo Lopes


SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2018-03-03
VCS / ISO 14064-2	Senior Assessor	2018-03-03

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
13.1	Solid waste and wastewater

77 - Rev. 6, Date: 2015-03-04

021-14085-F20-w3-1-2015-03-04



Statement of Competence
Agreement and authorization according to the provisions of the TÜV NORD J/CDM Certification Program

Mr. Marcelo Sebben

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2017-08-31
VCS / ISO 14064-2	Lead Assessor	2017-08-31

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewables
13.1	Solid waste and wastewater

297 - Rev. 6, Date: 2015-01-07

297_2015-01-07_297-w4.doc

Appendix 3. Documents reviewed or referenced

No.	Reference	Author	Title	References to the document	Provider
1.	/CPM/	DOE	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)	-	Other
2.	/GOT/	UNFCCC	Glossary “CDM terms” – version 08.0	https://cdm.unfccc.int/filestorage/e/x/t/extfile-20150226124447549-glos_CDM.pdf/glos_CDM.pdf?t=UmZ8bnFjODI3fDCW9A3vJwR03kQQh4sbLiYu	Other
3.	/IPCC/	IPCC	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories: work book	www.ipcc-nggip.iges.or.jp	Other
4.	/KP/	UNFCCC	Kyoto Protocol (1997)	http://unfccc.int/kyoto_protocol/items/2830.php	Other
5.	/MA/	UNFCCC	Decision 3/CMP. 1 (Marrakesh – Accords)	http://cdm.unfccc.int/Reference/COPMOP/index.html	Other
6.	/METH/	UNFCCC	ACM0002 – “Grid-connected electricity generation from renewable sources” – version 16.0	http://cdm.unfccc.int/filestorage/0/X/6/0X6IERWMG92J7V3B8OTKFSL1QZH5PA/EB81_repan09_ACM0002_ver16.0_clean.pdf?t=cFI8bnZsdGNufDAY5EU7eVsoM9E1CSG4bUXR	Other
7.	/MT/	UNFCCC	<u>Methodological Tools:</u> - Tool to calculate the emission factor for an electricity system – version 05.0 - Tool for the demonstration and assessment of additionality – version 07.0.0 - Common Practice – version 03.1 - Investment Analysis – version 06.0	http://cdm.unfccc.int/Reference/tools/index.html	Other
8.	/PDD-T/	UNFCCC	Project Design Document Form (CDM-PDD-FORM) – version 06.0	https://cdm.unfccc.int/Reference/PDDs_Forms/index.html	Other
9.	/PS/	UNFCCC	CDM Project Standard – version 9.0	http://cdm.unfccc.int/Reference/Standards/index.html	Other
10.	/SAMPLE/	UNFCCC	- Guidelines for Sampling and Surveys for CDM Project Activities and Programme Activities – version 04.0 - Standard for Sampling and Surveys for CDM Project Activities and	https://cdm.unfccc.int/Reference/Guidclarif/index.html http://cdm.unfccc.int/Reference/Stan	Other

No.	Reference	Author	Title	References to the document	Provider
			Programme Activities – version 5.0	dards/index.html	
11.	/VVS/	UNFCCC	CDM Validation and Verification Standard – version 09.0	http://cdm.unfccc.int/Reference/Standards/index.html	Other
12.	/COMMON /	ANEEL	<u>Common Practice Assessment:</u> - List of operation starting date of plants	http://www.aneel.gov.br/area.cfm?idArea=37&idPerfil=2 2011-05-15	PP / Other
		ANEEL	- Chronogram of Events – Hydroelectric power plants	2012-06-12	
		ANEEL	- Chronogram of Events – Thermoelectric power plants	2012-06-12	
		ANEEL	- Chronogram of Events – Wind farm power plants	2012-06-12	
		PP	- Common Practice spread sheet	version 1 version 2 version 3	
13.	/CON/	DOE	Signed Proposal for Carrying out the validation of the CDM project “Energia dos Ventos I, II, III, IV and X CDM Project (JUN1184), Brazil” among TÜV Nord and Energia dos Ventos IV S.A. – #15CDMBR060104	2015-08-17	Other
14.	/EIA/	Ecology Brasil	<u>Environment Impact Assessment:</u> - RIMA - EIA - PBA	Jun/2014 Jun/2014 Oct/2014	PP
15.	/EL/	-	<u>Environmental Legislation:</u> - CONAMA’s Resolution nº 279/2001 - Federal Law 380/2008		Other
16.	/FD/	BNDES	<u>Financial Data:</u> - Renewable Energy Projects Presentation	2011-08-15	PP/Other
		Alupar	- Trimestral Information Report to Stockholders	2011-09-30	
		ANEEL	- Framework of Auction # 07/2011 – Process # 48500.004335/2011-53	2011-11-18	
		ANEEL	- Auction Annex – Model of the Contract of Commercialization of Energy	2011	
		EPE	- Technical qualification # 11A5-104/EPE/2011 to participate at the auction – WPP Goiabeira	2011-12-02	
		EPE	- Technical qualification # 11A5-106/EPE/2011 to participate at the auction – WPP Santa Catarina	2011-12-02	
		EPE	- Technical qualification # 11A5-110/EPE/2011 to participate at the auction – WPP Ubatuba	2011-12-02	
		EPE	- Technical qualification # 11A5-113/EPE/2011 to participate at the auction – WPP Pitombeira	2011-12-02	
		EPE	- Technical qualification # 11A5-404/EPE/2011 to participate at the auction – WPP Ventos de Horizonte	2011-12-02	
		ANEEL	- Auction Results	http://www.aneel.gov.br/aplicacoes/editais_geracao/documentos_editai	

No.	Reference	Author	Title	References to the document	Provider
		Alstom	- Proposal for Purchasing Wind Turbines – Ref.: ECO-11-0152-01-V04 for Alupar	s.cfm?IdProgramaEdital=100 2011-12-18	
		MME	- Directive # 428 – Concession to WPP Ubatuba to operate as independent producer of electric energy	2012-07-16	
		MME	- Directive # 431 – Concession to WPP Goiabeira to operate as independent producer of electric energy	2012-07-17	
		MME	- Directive # 433 – Concession to WPP Santa Catarina to operate as independent producer of electric energy	2012-07-19	
		MME	- Directive # 435 – Concession to WPP Ventos de Horizonte to operate as independent producer of electric energy	2012-07-19	
		MME	- Directive # 442 – Concession to WPP Pitombeira to operate as independent producer of electric energy	2012-07-24	
17.	/FD_cross /	Poul Erik Morthorst	<u>Cross Check – Financial Data:</u> - Wind Energy Facts – Volume 2 – Costs & Prices	http://www.ewea.org/fileadmin/ewea_documents/documents/publications/WETF/Facts_Volume_2.pdf 2011-12-18	PP
		Alstom	- Proposal for Purchasing Wind Turbines – Ref.: ECO-11-0152-01-V04 for Alupar	2011-12-18	
		PP	- Contract of Turbines among Energia dos Ventos I and WEG Equipamentos Elétricos – EV.JU.COM.0049-13	2013-12-02	
			- Contract of Turbines among Energia dos Ventos II and WEG Equipamentos Elétricos – EV.JU.COM.0199-13	2013-12-02	
			- Contract of Turbines among Energia dos Ventos III and WEG Equipamentos Elétricos – EV.JU.COM.0200-13	2013-12-02	
			- Contract of Turbines among Energia dos Ventos IV and WEG Equipamentos Elétricos – EV.JU.COM.0201-13	2013-12-02	
			- Contract of Turbines among Energia dos Ventos X and WEG Equipamentos Elétricos – EV.JU.COM.0202-13	2013-12-02	
18.	/IRR/	PP	IRR Calculation	version 1 version 2 version 3	PP
19.	/LEGIS/	ANEEL	<u>Legislation:</u> - Normative Resolution # 474 – Set annual rates for depreciation of assets of the electric sector	2012-02-07	Other
		ANEEL	- Resolution #1233 – set Fees for the Use of the Transmission System (TUST) and Distribution System	2011-11-18	

No.	Reference	Author	Title	References to the document	Provider
		ANEEL	(TUSDg)		
		ANEEL	- Technical Note #0061/2011-SRD/ANEEL – Calculation of fees for the use of Distribution Systems	2011-11-11	
			- Dispatch #4080 – set Fee of Electric Energy Services Inspection (TFSEE)	2010-12-27	
		ANEEL	- Normative Resolution # 77	2004-08-18	
		-	- Law # 9430 – Rules of CSLL	2003-12-29	
		-	- Law # 10637 – Rules of PIS and PASEP	2002-12-30	
		Fazenda	- Normative Instruction SRF # 247 – Article 52	2002-11-21	
		-	- Law # 9249 – Rules of CSLL and Additional Income Tax	1995-12-26	
		-	- Law # 10833 – Rules of COFINS	1996-12-27	
		-	- Law #9427 – Rules the concession for the generation of electricity	1996-12-26	
		-	- Law # 7689 – Rules of CSLL	1988-12-15	
20.	/LIC/	SEMACE	<u>Licenses:</u> - <u>Previous Licenses:</u> o WPP Goiabeira – # 304-2014	2014-09-30 – valid until 2017-09-29	PP
		SEMACE	o WPP Ubatuba – # 301-2014	2014-09-26 – valid until 2017-09-25	
		SEMACE	o WPP Santa Catarina – # 300-2014	2014-09-26 – valid until 2017-09-25	
		SEMACE	o WPP Pitombeira – # 302-2014	2014-09-26 – valid until 2017-09-25	
		SEMACE	o WPP Ventos de Horizonte – # 303-2014	2014-09-26 – valid until 2017-09-25	
		SEMACE	- <u>Installation Licenses:</u> o WPP Goiabeira – # 008-2015	2015-02-12 – valid until 2018-02-11	
		SEMACE	o WPP Ubatuba – # 006-2015	2015-02-12 – valid until 2018-02-11	
		SEMACE	o WPP Santa Catarina – # 009-2015	2015-02-12 – valid until 2018-02-11	
		SEMACE	o WPP Pitombeira – # 007-2015	2015-02-12 – valid until 2018-02-11	
		SEMACE	o WPP Ventos de Horizonte – # 010-2015	2015-02-12 – valid until 2018-02-11	
21.	/LIFE/	ANEEL	<u>Project Lifetime:</u> - Manual of Asset Control of Electric Sector – Annex to ANEEL Resolution #367/2009	rev. 1 – 2009-09-11	PP/Other
		PP	- Framework of Auction # 07/2011 – Process # 48500.004335/2011-53 - Commercialization Contracts (PPA)	2011-11-18 2013-10-18	
22.	/LOA/	DNA	Letter of Approval	2016-06-13	PP
23.	/MOC	PP	Modalities of Communication	2015-10-07	PP

No.	Reference	Author	Title	References to the document	Provider
24.	/PDD/	PP	Project Design Document for CDM project: “Energia dos Ventos I, II, III, IV and X CDM Project (JUN1184), Brazil”	version 1.1 – 2015-09-16 version 2 – 2015-10-16 version 2.1 – 2015-12-09	PP
25.	/PLF/	<p>EPE</p> <p>EPE</p> <p>EPE</p> <p>EPE</p> <p>EPE</p> <p>MML Energia</p>	<p><u>Plant Load Factor:</u></p> <p>- <u>Financial Analysis:</u></p> <ul style="list-style-type: none"> Technical qualification # 11A5-104/EPE/2011 to participate at the auction – WPP Goiabeira Technical qualification # 11A5-106/EPE/2011 to participate at the auction – WPP Santa Catarina Technical qualification # 11A5-110/EPE/2011 to participate at the auction – WPP Ubatuba Technical qualification # 11A5-113/EPE/2011 to participate at the auction – WPP Pitombeira Technical qualification # 11A5-404/EPE/2011 to participate at the auction – WPP Ventos de Horizonte <p>- <u>CERs calculation:</u></p> <ul style="list-style-type: none"> WPP Goiabeira WPP Ubatuba WPP Santa Catarina WPP Pitombeira WPP Ventos de Horizonte 	<p>2011-12-02</p> <p>2011-12-02</p> <p>2011-12-02</p> <p>2011-12-02</p> <p>2011-12-02</p> <p>2014-11-26</p> <p>2014-11-26</p> <p>2014-11-26</p> <p>2014-11-26</p> <p>2014-11-26</p>	PP
26.	/PSD/	<p>UNFCCC</p> <p>Brazilian DNA PP</p>	<p><u>Prior consideration and project starting date:</u></p> <ul style="list-style-type: none"> Print screen of UNFCCC website confirming the date when the communication was received (per plant) Letters from the Brazilian DNA confirming the notification Print screen of UNFCCC website confirming the date when the communication was received (all 5 plants together) Commercialization Contracts (PPA) Construction Contract among Energia dos Ventos I and SS&B Construtora Ltda. Construction Contract among Energia dos Ventos II and SS&B Construtora Ltda. Construction Contract among Energia dos Ventos III and SS&B Construtora Ltda. Construction Contract among Energia dos Ventos IV and SS&B Construtora Ltda. Construction Contract among Energia dos Ventos X and SS&B Construtora Ltda. Contract of Turbines among Energia 	<p>2012-01-27</p> <p>2012-02-17</p> <p>2014-09-10</p> <p>2013-10-18</p> <p>2015-01-12</p> <p>2015-01-12</p> <p>2015-01-12</p> <p>2014-12-18</p> <p>2015-01-12</p> <p>2013-12-02</p>	PP

No.	Reference	Author	Title	References to the document	Provider
			dos Ventos I and WEG Equipamentos Elétricos – EV.JU.COM.0049-13 - Contract of Turbines among Energia dos Ventos II and WEG Equipamentos Elétricos – EV.JU.COM.0199-13 - Contract of Turbines among Energia dos Ventos III and WEG Equipamentos Elétricos – EV.JU.COM.0200-13 - Contract of Turbines among Energia dos Ventos IV and WEG Equipamentos Elétricos – EV.JU.COM.0201-13 - Contract of Turbines among Energia dos Ventos X and WEG Equipamentos Elétricos – EV.JU.COM.0202-13	2013-12-02 2013-12-02 2013-12-02 2013-12-02	
27.	/SHCP/	PP Brazilian Post PP UNFCCC	<u>Stakeholder consultation process:</u> Invitation letter to stakeholders Proof of Delivery Request letter asking for the exemption of paragraph 78 of the CDM Project Standard - version 09.0 – EDV-TC-022-2015 Exemption letter to the requirement of paragraph 78 of the CDM Project Standard - version 09.0 – Reference: INQ-04303	2015-02-23 2015-04-29/28 2015-05-04/05/06 2015-06-29 2015-08-19 2015-09-11 2015-12-15 2016-01-11	PP PP UNFCCC
28.	/TD/	Alupar	<u>Project technical description:</u> - Construction Chronogram of the Complex	2015-03-03	PP
29.	/XLS/	PP	Emission reduction calculation spread sheet	version 0 version 2	PP
30.	/aneel/	-	National Electric Energy Agency	http://www.aneel.gov.br/	Other
31.	/bcb/	-	Central Bank of Brazil	http://www.bcb.gov.br	Other
32.	/bndes/	-	BNDES – National Bank for Social Economic Development	http://www.bndes.gov.br <u>Long Term Interest Rate:</u> http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Custos_Financeiros/Taxa_de_Juros_de_Longo_Prazo_TJLP/index.html	Other
33.	/ccee/	-	Chamber of Electric Energy Commerce	http://www.ccee.org.br/	Other
34.	/conama/	-	National Environmental Council	http://www.mma.gov.br/port/conama/	Other
35.	/dna/	-	DNA of Brazil	http://www.mct.gov	Other

No.	Reference	Author	Title	References to the document	Provider
				v.br	
36.	/damo/	-	Aswath Damodaran	http://people.stern.nyu.edu/adamodar/	Other
37.	/eletrobras/	-	Brazilian Generation, Transmission and Distribution Company	www.eletrobras.com	Other
38.	/epe/		Energetic Research Enterprise	http://www.epe.gov.br	Other
39.	/fazenda/	-	Federal Revenue Bureau of Brazil	www.receita.fazenda.gov.br	Other
40.	/ipcc/	-	IPCC publications	www.ipcc-nggip.iges.or.jp	Other
41.	/ipea/	-	Ipeadata	www.ipeadata.gov.br/	Other
42.	/ons/	-	National Operator of the Electric System Historic Generation Data	http://www.ons.org.br/home/ http://www.ons.org.br/historico/geracao_energia.aspx	Other
43.	/unfccc/	-	UNFCCC	http://cdm.unfccc.int	Other

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

Table 1. CL from this validation

CL ID	A1	Section no.	B.1; Appendix 1	Date: 09/10/2015
Description of CL				
<p>According to the "Instructions for filling out the project design document form for CDM project activities" it is missing:</p> <ol style="list-style-type: none"> at Section B.1, the reference to the UNFCCC CDM website for the methodological tools and the list of used tools is not correct; at the Appendix 1, the contact information of responsible person according with Section B.8. 				
Project participant response (1st round)				Date: 14/10/2015
In the PDD version 2 was included at Section B.1 the reference to the UNFCCC website (for the methodological tools) and also in the Appendix 1 was included the contact information of the person responsible for application of the methodology.				
Documentation provided by project participant (1st round)				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.1; Appendix 1		New version No.: 2
<input type="checkbox"/>	Changes in MR	Section(s):		New version No.:
<input type="checkbox"/>	Changes in XLS	Worksheet(s):		New version No.:
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 15/10/2015
<ol style="list-style-type: none"> Section B.1 has been revised and the specific references to the UNFCCC CDM website for the methodological tools have been included. In addition, the list of used tools is now in accordance with the tools effectively applied; Appendix 1 has been completed with the contact information of responsible person in accordance with Section B.8. 				
CL is closed				
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CL ID	B1	Section no.	B.5	Date: 09/10/2015
Description of CL				
<i>It is not indicated the legal basis for the depreciation considered in the financial model.</i>				
Project participant response (1st round)				Date: 14/10/2015
<i>As evidenced by the depreciation rate established in the Manual of Asset Control of Electric Sector – Annex to ANEEL resolution 367/2009, rev. 1 (02/06/2009) – Table XVI (code 590), which reflects the general technical lifetime expectations of wind turbines in 5%.</i>				
Documentation provided by project participant (1st round)				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.5	New version No.: 2	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Analise_Fin_EV_v2	New version No.: 2	
<input checked="" type="checkbox"/>	Other: Manual of Asset Control of Electric Sector – Annex to ANEEL Resolution #367/2009 – rev. 1/LIFE/			
DOE assessment (1st round)				Date: 15/10/2015
<p>According to the Brazilian accounting regulations the assets will be fully depreciated at the end of the analysis period, as evidenced by the depreciation rate established in the Manual of Asset Control of Electric Sector – Annex to ANEEL Resolution #367/2009 – rev. 1, which reflects the general technical lifetime expectations of wind turbines with depreciation rate of 5% per year. This reference has been included at the financial model.</p> <p>In addition, the rules and results of the energy auction which result in a 20 year PPA have been reviewed by validation team.</p> <p>This reference has been indicated at the financial model.</p> <p>CL is closed</p>				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CL ID	B2	Section no.		Date: 09/10/2015
Description of CL				
<i>In the tab “Assumptions” of the financial model, it is not indicated the detailed loan conditions and respective sources.</i>				
Project participant response (1st round)				Date: 14/10/2015
<i>The detailed loan condition was indicated in the financial spread sheet version 2 (tab “Assumptions”).</i>				
Documentation provided by project participant (1st round)				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.5	New version No.: 2	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Analise_Fin_EV_v2	New version No.: 2	
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 15/10/2015
<p>The loan conditions were better detailed and correctly referenced at the tab “Assumptions”.</p> <p>CL is closed</p>				
Conclusion <i>Tick the appropriate checkbox</i>		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CL ID	B3	Section no.	B.5	Date: 09/10/2015
Description of CL				
<i>The source given for TUSDg, tab “Assumptions” of Financial Model, does not clearly lead to value of R\$ 2,003 considered in the calculations.</i>				
Project participant response (1st round)				Date: 14/10/2015
<p><i>The value for TUSDg is based on the value presented in the “ANEEL Resolution Number 1233 of 18/11/2011” with 50% of discount based on “ANEEL Resolution Number 77 of 18/08/2007”.</i></p> <p><i>In fact the value of 4.006 is the lowest one presented for a similar project activity (wind power plant) in the Annex III on page 17 from “ANEEL Resolution Number 1233 of 18/11/2011”</i></p>				
Documentation provided by project participant (1st round)				

<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Analise_Fin_EV_v2	New version No.: 2
<input checked="" type="checkbox"/>	Other: Resolution #1233 ^{LEGIS/} ; Normative Resolution # 77 ^{LEGIS/}		
DOE assessment (1st round)			Date: 15/10/2015
<p>The presented value is indeed the lowest fee for transmission of the electricity for wind farms at ANEEL's Resolution. In addition, the 50% discount is a legal reduction given by ANEEL for plants using renewable sources with less than 30,000kW of installed capacity.</p> <p>CL is closed</p>			
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

CL ID	B4	Section no.	B.5	Date: 09/10/2015
Description of CL				
<p>It is not found in ANEEL dispatch 4080, the justification for the application of 0.5% given for ANEEL fee at tab "Assumptions" of the Financial Model.</p>				
Project participant response (1st round)				Date: 14/10/2015
<p>The 0.5% is based on Law 9427/1996</p> $TFg = P \times Gu$ <p>where:</p> <p>TFg = Fiscalization fee for the generation service;</p> <p>P = installed capacity and</p> <p>Gu = 0.5% of the annual benefit unit value arising from generation service operation.</p> <p>More details in: http://www.migratio.com.br/legislacao/LEI_9427-96.pdf</p>				
Documentation provided by project participant (1st round)				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Analise_Fin_EV_v2	New version No.: 2	
<input checked="" type="checkbox"/>	Other: Law #9427 ^{LEGIS/}			
DOE assessment (1st round)				Date: 15/10/2015
<p>The application of the ANEEL's fee of 0.5% is due to Law #9427 which rules the concession for the generation of electricity. The reference has been corrected at the Financial Model.</p> <p>CL is closed</p>				
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

Table 2. CAR from this validation

CAR ID	B5	Section no.	B.5	Date: 09/10/2015
Description of CAR				
<p>In section A.3 of PDD it is stated a total installed capacity of 109.2MW in the first paragraph, which is in accordance with Installation licenses granted by the project activity. However, at the table of Section A.3, it is stated a total capacity of 98.7MW. In addition, in the investment analysis, the total capacity considered is 89.2MW as per the table at Section B.5, which is the data approved by EPE and considered for the auction. Further, the financial analysis was done considering wind generators of 1.6 and 1.8MW and the wind farms are being installed using 2.1MW wind generators.</p> <p>So, it is not clear in the PDD whether the final capacity will be 98.7MW or 109.2MW; and in either case, there is an increase of total capacity in relation to the one considered at the moment of investment decision (89.2MW).</p> <p>Thus, it is not justified that the project additionality is not affected by the capacity increase.</p>				
Project participant response (1st round)				Date: 14/10/2015
<p>After the auction the wind studies were refined, WTG machine options, etc. In the firstly moment it was considered possible to expand capacity to 109.2 MW. But after another studies it was decided that the "optimal" capacity would be 98.7 MW of total installed capacity and so the contracts were signed and the</p>				

park is being built.

As financial analysis must be performed considering the moment of decision-making (auction), it was considered the original capacity approved by the EPE (Empresa de Pesquisas Energéticas) with 89.2 MW. The information was better described in the PDD version 2.

In order to allow the analysis of the changes over the project additionality a financial analysis was presented to the DOE considering the actual capacity and costs.

Documentation provided by project participant (1 st round)			
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): A.1; A.3; B.5	New version No.: 2
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:
<input type="checkbox"/>	Other:		

DOE assessment (1 st round)	Date: 15/10/2015
<p>The PP's information is consistent with evidences and interviews performed during the site visit.</p> <p>At the time of the investment decision (2011-12-27 – day of the bid price at auction) the project was planned with 89.2 MW of total installed capacity (Goiabeira – 19.2 MW; Ubatuba – 12.6 MW; Santa Catarina – 16.0 MW; Pitombeira – 27.0 MW; Ventos de Horizonte – 14.4 MW)^{/FD/PLF/}. Those capacities have been used for the Financial Analysis as they were valid at the time of the decision. This analysis has demonstrated that the project activity is not the most financially attractive alternative.</p> <p>On March/2014, a new study was performed by MML Energia and new capacities have been considered (Goiabeira – 23.1 MW; Ubatuba – 12.6 MW; Santa Catarina – 18.9 MW; Pitombeira – 27.3 MW; Ventos de Horizonte – 16.8 MW)^{/PLF/} with the total of 98.7 MW of installed capacity for the five plants. Those are the installed capacities actually being implemented at the wind farms as verified during the on-site visit. Although not essential as those revised capacities were not valid at the time of the decision, the PP presented to the validation team a financial analysis based on actual implementation in order to check the additionality of the project activity even with the change at the original design which could be confirmed by the validation team.</p> <p>The expansion of the capacity to 109.2 MW was not considered at the time of the investment decision; neither is considered now due to economic aspects, thus this possibility is not being assessed at this validation.</p> <p>The proper revisions have been made throughout the PDD.</p> <p>CAR is closed</p>	

Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed
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CAR ID	B6	Section no.	B.5	Date: 09/10/2015
Description of CAR				
<p>The values of total investment considered by EPE were used in the financial analysis. They are based on the average investment by installed MW. However, no proposals from suppliers for wind generators, civil works, BOP, etc. have been presented to justify the conservativeness of EPE values.</p>				
Project participant response (1st round)				Date: 14/10/2015
<p>To justify the conservativeness of the EPE values was included the offers from suppliers (WEG and Alstom) and also the public reference from the BNDES bank contained in http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Sala_de_Imprensa/Noticias/2015/Energia/20150506_eolicas.html which summarizes an investment value for WPP with R\$ 4.5 million per MW.</p>				
Documentation provided by project participant (1st round)				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input checked="" type="checkbox"/>	Other: Proposal for Purchasing Wind Turbines (Alstom) ^{/FD_cross/} ; Contracts of Turbines (WEG) ^{/FD_cross/}			
DOE assessment (1st round)				Date: 15/10/2015
<p>The values used as total investment at the financial analysis have been collected from EPE's technical qualifications of the wind farms. Those values have been cross checked with Alstom's proposal of the time of the investment decision and the contracts effectively signed with WEG which demonstrates the conservativeness of the values of the financial analysis.</p> <p>In addition, public reference from BNDES (major loan agent for this type of project in Brazil) also evidences the conservativeness of the financial analysis.</p> <p>Refer to the full assessment of the financial parameters at Appendix 7 of this Report.</p>				

CAR is closed	
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

CAR ID	B7	Section no.	B.5	Date: 09/10/2015
Description of CAR				
<p>The ratio of Equity considered in the financial model is 50%. However, BNDES is virtually the only financing institution for wind projects in the auction scheme in Brazil and its rules allow up to 70% debt, i.e. up to 100% of equipment.</p> <p>There is no justification in the PDD for the use of the rate of 50% for Equity applied at the financial analysis.</p>				
Project participant response (1st round)				Date: 14/10/2015
<p>The Debt and Equity Ratio was adjusted to: 36.5% Equity / 63.5% Debt – based on the average debt and equity ratio applied to similar project activity in accordance with the applied ratio of wind projects financed by BNDES (BNDES Presentation from 15/08/2011).</p>				
Documentation provided by project participant (1st round)				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.5	New version No.: 2	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Analise_Fin_EV_v2	New version No.: 2	
<input checked="" type="checkbox"/>	Other: Renewable Energy Projects Presentation – BNDES ^{7-D/}			
DOE assessment (1st round)				Date: 15/10/2015 30/11/2015

The Debt and Equity Ratio has been revised. The considered ratio of debt/equity of 63.5%/36.5% corresponds to the average leverage of renewable energy projects funded by BNDES which is the major loan agent for energy projects in Brazil and can be evidenced by a presentation from August 2011.

This ratio was usual at the time of the investment decision to similar projects in Brazil.

Nevertheless, it is not clear the source of the ration equity and debt weighting (0.365 and 0.635 respectively - cells C6 and C7) as the source provided at the Excel spread sheet states a 49.8/50.2 equity/debt ratio.

In addition, at tabs “BRK Invest” and “-10% invest”, it is applied a 50% of equity (New Investment Value / 2 in Cells D29 of both tabs) instead the applied equity of 36.5%.

CAR remains open

Project participant response (2nd round)				Date: 01/12/2015
<p>The source of the ratio equity and debt weighting was adjusted in the Excel spread sheet in line with the slide 12 of the BNDES Presentation resulting in 36.5/63.5 the equity/debt ratio. Also the tabs “BRK Invest” and “-10% invest” were adjusted accordingly.</p>				
Documentation provided by project participant (2nd round)				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.5	New version No.: 2.1	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Analise_Fin_EV_v2_TR	New version No.: 3	
<input type="checkbox"/>	Other:			
DOE assessment (2nd round)				Date: 09/12/2015

The source of the ratio equity and debt was revised in the Excel spread sheet.

In addition, tabs “BRK Invest” and “-10% invest” were also revised taking into account the applied equity of 36.5%.

CAR is closed

Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed
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CAR ID	B8	Section no.	B.5	Date: 09/10/2015
Description of CAR				
<p>The debt interest was calculated using BNDES current financing conditions instead of financing conditions at the moment of investment decision. In addition, the considered credit risk of the company of 2% is not justified.</p>				
Project participant response (1st round)				Date: 14/10/2015

Considering the latest available Alupar statement (September 2011), prior the investment decision on December 2011, it is possible to check that the BNDES conditions for other similar ventures from Alupar, the Power Plants Foz do Rio Claro and Ijuí with maturity in 2027 (same/close than the CDM project activity expectation with financing period considered 16 years - so if starting in 2012 would to finish in 2027) is TJLP + 3.17%.

The spread value contains BNDES fee + Risk fee. This value was included in the financial spread sheet version 2.

Documentation provided by project participant (1 st round)			
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.5	New version No.: 2
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Analise_Fin_EV_v2	New version No.: 2
<input type="checkbox"/>	Other: Trimestral Information Report to Stockholders – Alupar ^{FD}		
DOE assessment (1 st round)			Date: 15/10/2015
<p>The debt interest rate has been revised using evidences from time of the investment decision. In accordance with financial reports to the Alupar's stockholders, the rate used for similar projects being developed at that time (end of 2011).</p> <p>Thus, the value of the debt interest rate is now calculated with TJLP plus BNDES fee plus Risk fee from the time of the investment decision resulting in a rate of 4.67%. In this new calculation, the risk fee of the company and BNDES fee were revised.</p> <p>CAR is closed</p>			
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

CAR ID	B9	Section no.	B.5	Date:	09/10/2015
Description of CAR					
<p>The calculation of the base for income tax in the financial model is not correct, as it has been considered the operational profit, but in fact the applicable tax regime for the projects is assumed profit, by which a percentage of gross revenues is the basis for calculation of income tax, additional income tax and social contribution.</p>					
Project participant response (1 st round)					Date:
					14/10/2015
<p>The financial spread sheet version 2 contains the regime adjustment. The right one is the assumed profit.</p>					
Documentation provided by project participant (1 st round)					
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.5	New version No.: 2		
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:		
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Analise_Fin_EV_v2	New version No.: 2		
<input type="checkbox"/>	Other:				
DOE assessment (1 st round)					Date:
					15/10/2015 30/11/2015
<p>The correct tax regime for the project which is assumed profit has been properly applied at the whole IRR calculation.</p> <p>Nevertheless, the Additional Income tax of 10% of the assumed profit (8%) which exceeds R\$ 240 thousand/year cannot be traced at tab "Cashflow" as the additional income tax is set to 0%.</p> <p>CAR remains open</p>					
Project participant response (2 nd round)					Date:
					01/12/2015
<p>The spread sheet was revised with the Additional Income tax of 10%.</p>					
Documentation provided by project participant (2 nd round)					
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.5	New version No.: 2.1		
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:		
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Analise_Fin_EV_v2_TR	New version No.: 3		
<input type="checkbox"/>	Other:				
DOE assessment (2 nd round)					Date:
					09/12/2015
<p>The "Cashflow" tab was revised and the Additional Income tax of 10% of the assumed profit (8%) which exceeds R\$ 240 thousand/year is now traceable and used at the calculations for the whole period.</p>					

CAR is closed	
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed

CAR ID	B10	Section no.	B.5	Date: 09/10/2015
Description of CAR				
<i>The value of cell F2 in tab "OPEX" is not in accordance with the value of 5% considered in the "Cash Flow" tab.</i>				
Project participant response (1st round)				Date: 14/10/2015
<i>The cell F2 is a mistake in the financial spread sheet version 1. In the version 2 the OPEX was well described taking in consideration more conservative values based on Third Party Offer from an expert. The costs are based on value in R\$ per Wind Tower Generation (WTG) per year.</i> <i>The O&M values are different for the years 1 to 5, 6 to 10 and 11 to 20.</i>				
Documentation provided by project participant (1st round)				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.5	New version No.: 2	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Analise_Fin_EV_v2	New version No.: 2	
<input checked="" type="checkbox"/>	Other: Proposal for Purchasing Wind Turbines – Alstom TM			
DOE assessment (1st round)				Date: 15/10/2015
The values for operation and maintenance expenditures have been revised and are now in accordance with presented evidences from the time of the investment decision. According to a proposal from the end of 2011, the O&M for all five plants would cost R\$ 8,378,240 (from the 1 st to the 5 th year of operation), R\$ 12,181,520 (from the 6 th to the 10 th year of operation) and R\$ 14,606,800 (from the 11 th to the 20 th year of operation). Those values are now consistently used in all tabs of the excel spread sheet financial analysis.				
CAR is closed				
Conclusion Tick the appropriate checkbox	<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed			

CAR ID	B11	Section no.	B.5	Date: 09/10/2015
Description of CAR				
<i>As the Common Practice Analysis is part of the Investment Analysis, the same value of the installed capacity shall be used for both assessments.</i>				
Project participant response (1st round)				Date: 14/10/2015
<i>The Common Practice Analysis version 2 was adjusted for the same installed capacity value used in the investment analysis. And results in a more conservative analysis since was possible to include more similar project activities in the assessment.</i>				
Documentation provided by project participant (1st round)				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.5	New version No.: 2	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Common Practice_EV_v2	New version No.: 2	
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 15/10/2015 30/11/2015
The value available at the time of the investment decision (2011-12-27) of 89.2 MW of total installed capacity (Goiabeira – 19.2 MW; Ubatuba – 12.6 MW; Santa Catarina – 16.0 MW; Pitombeira – 27.0 MW; Ventos de Horizonte – 14.4 MW) has been used at the Common Practice Analysis. The conclusion is that the project activity is not the common practice in the region. In addition, a Common Practice Analysis with the value of the new study of 98.7 MW of installed capacity for the five plants was performed and presented to the validation team to confirm that the project activity even with the new capacity is not the common practice. The Common Practice analysis has been performed in accordance with Methodological Tool Common Practice – v. 03.1. Nevertheless, the analysis shall be revised as the steps were not followed accordingly.				
CAR remains open				

Project participant response (2nd round)			Date: 09/12/2015
<i>The Common Practice Analysis was revised.</i>			
Documentation provided by project participant (2nd round)			
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.5	New version No.: 2.1
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:
<input checked="" type="checkbox"/>	Changes in XLS	Worksheet(s): Common Practice_EV_TR_v2	New version No.: 3
<input type="checkbox"/>	Other:		
DOE assessment (2nd round)			Date: 09/12/2015
<p>The Common Practice Analysis has been revised accordingly.</p> <p>Now the N_{all} has consolidated all power plants similar than the project activity and the N_{diff} is the sum of hydroelectric and thermoelectric power plants + the wind power plants that are under PROINFA (Brazilian government incentive). The revised analysis is in accordance with the requirements of the Methodological Tool Common Practice – v. 03.1.</p> <p>CAR is closed</p>			
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed	

CAR ID	B12	Section no.	B.6.3; B.7.1	Date: 09/10/2015
Description of CAR				
<i>The parameter $EF_{grid,CM,y}$ was not calculated with the most updated data available at the Brazilian DNA's website.</i>				
Project participant response (1st round)				Date: 14/10/2015
<i>The parameter was updated to the 2014 year in the PDD version 2. The most updated data available at the Brazilian DNA's website.</i>				
Documentation provided by project participant (1st round)				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.6.3; B.7.1	New version No.: 2	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 15/10/2015
<p>The values of $EF_{grid,OM,y}$ and $EF_{grid,BM,y}$ from 2014 which are the latest ones available at the DNA's website have been used to calculate the $EF_{grid,CM,y}$.</p> <p>CAR is closed</p>				
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CAR ID	B13	Section no.	B.6.2; B.7.1	Date: 09/10/2015
Description of CAR				
<i>The parameters Cap_{BL} and Cap_{PJ} are not applicable for wind power projects.</i>				
Project participant response (1st round)				Date: 14/10/2015
<i>The parameters were excluded in the PDD version 2.</i>				
Documentation provided by project participant (1st round)				
<input checked="" type="checkbox"/>	Changes in the PDD	Section(s): B.6.2; B.7.1	New version No.: 2	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment (1st round)				Date: 15/10/2015
<p>The parameters Cap_{BL} and Cap_{PJ} have been correctly excluded from Sections B.6.2 and B.7.1 respectively.</p> <p>CAR is closed</p>				
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

CAR ID	E1	Section no.	E.1	Date: 30/11/2015
Description of CAR				
According to the PS v.09.0 paragraph 78, the project participants shall complete the local stakeholder consultation before the start date of the project activity. Although the start date of the project activity is 2013-10-18, the invitation letters sent to the stakeholders are dated in 2015.				
Project participant response (1st round)				Date: 11/01/2016
A request was sent to the EB asking for the exemption of the requirement as the rule was not valid at the time of the start date of the project activity. The exemption was granted by the EB to the project activity.				
Documentation provided by project participant (1st round)				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input checked="" type="checkbox"/>	Other: Exemption letter to the requirement of paragraph 78 of the CDM Project Standard – version 09.0 – EB			
DOE assessment (1st round)				Date: 12/01/2016
A request for an exemption from the requirement of PS v.09.0 paragraph 78 was sent to the EB by the PP (EDV-TC-022-2015) ^{/SHCP/} . The exemption to the requirement was granted to the project activity by the EB on 2016-01-11 (Reference: INQ-04303) ^{/SHCP/} .				
In addition, the requirement of PS v.07.0 paragraph 77 was accomplished. The local stakeholder consultation process was completed before the submission of the proposed CDM project activity to the DOE. Thus, in accordance with the exemption conditions.				
CAR is closed				
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> Additional action should be taken (finding remains open) <input checked="" type="checkbox"/> The finding is closed		

Table 3. FAR from this validation

FAR ID	-	Section No.	-	Date: -
Description of FAR				
-				
Project participant response				Date: -
-				
Documentation provided by project participant				
<input type="checkbox"/>	Changes in the PDD	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in MR	Section(s):	New version No.:	
<input type="checkbox"/>	Changes in XLS	Worksheet(s):	New version No.:	
<input type="checkbox"/>	Other:			
DOE assessment				Date: -
-				
Conclusion Tick the appropriate checkbox		<input type="checkbox"/> To be checked during the next periodic verification		

Appendix 5. Monitored Parameters

Table A-5: Validation Checklist – Monitored Parameters

Checklist Item (incl. guidance for the verification team)	Reference	Validation Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.			
1. EG _{facility,y}	Parameter: Quantity of net electricity generation supplied by the project plant/unit to the grid in year y						
Indicate whether the provided information for the monitoring parameter complies with the approved methodology including applicable tool(s) in the aspects listed. For checking the use of international standards in the nomenclature, consider: Standard format (e.g. 1,000 representing one thousand and 1.0 representing one). Values shall be directly given in SI units – or additionally to original units transferred to SI. Short scale naming system: (Only) million = 10 ⁶ and billion 10 ⁹ shall be used.	/MR/ /METH/	Requirement	OK	Not OK	N/A	OK	OK
		Label	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Data Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Description	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Source of data	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Measurement equipment / measure method	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Monitoring frequency	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		QA/QC procedures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Purpose of data	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Standard format	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		SI units	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Short scale naming	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
		In the context of this parameter the following finding was raised: N/A					
2. EF _{grid,CM,y}	Parameter: Combined margin CO ₂ 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”						
Indicate whether the provided information for the monitoring parameter complies with the approved methodology including applicable tool(s) in the aspects listed. For checking the use of international standards in the nomenclature, consider: Standard format (e.g. 1,000 representing one thousand and 1.0 representing one).	/MR/ /METH/ /MT/	Requirement	OK	Not OK	N/A	OK	OK
		Label	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Data Unit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Description	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Source of data	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Measurement equipment / measure method	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		Monitoring frequency	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Checklist Item (incl. guidance for the verification team)	Reference	Validation Team Comments (Means and results of assessment)	Draft Concl.	Final Concl.		
<i>Values shall be directly given in SI units – or additionally to original units transferred to SI.</i> <i>Short scale naming system: (Only) million = 10⁶ and billion 10⁹ shall be used.</i>		QA/QC procedures	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
		Purpose of data	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Standard format	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		SI units	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		Short scale naming	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
		<i>In the context of this parameter the following finding was raised:</i>				
		N/A				

Appendix 6. Assessment of Applicability Criteria of Methodology

Table A-6: Assessment of Applicability Criteria

Applicability Criteria	Evidence used	Met	N/A	Assessment of validation team
For grid-connected renewable energy power generation project activities that: (a) install a Greenfield power plant; (b) involve a capacity addition to (an) existing plant(s); (c) involve a retrofit of (an) existing operating plant(s)/unit(s); (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or (e) involve a replacement of (an) existing plant(s)/unit(s).	/PDD/ /METH/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The project activity complies with the condition as it fits option (a), consisting in the implementation of new wind power plant/unit (Greenfield plant).
The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit (either with or without reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit.	/PDD/ /METH/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The project activity complies with the condition as it is the installation of new wind power plant/unit.
In the case of capacity additions, retrofits or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.	/PDD/ /METH/	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not applicable to the project activity as it consists of new wind power plant/unit.
In case of hydro power plants, one of the following conditions shall apply: (a) the project activity is implemented in an existing reservoir, with no change in the volume of reservoir; or (b) the project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density calculated using equation (3) of the tool is greater than 4 W/m ² ; or (c) the project activity results in new single or multiple reservoirs and the power density calculated using equation (3) of the tool is greater than 4 W/m ² ; or (d) the project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3) of the tool, is lower than or equal to 4 W/m ² , all of the following conditions shall apply: (i) the power density calculated using the total installed capacity of the integrated project, as per equation (4) of the tool, is greater than 4 W/m ² ; (ii) water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity; (iii) Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m ² shall be: a) lower than or equal to 15 MW; and b) less than 10 per cent of the total installed capacity of integrated hydro power project.	/PDD/ /METH/	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not applicable to the project activity as it is not a hydro power plant.

Applicability Criteria	Evidence used	Met	N/A	Assessment of validation team
In the case of integrated hydro power projects, project proponent shall: (a) demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or (b) provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.	/PDD/ /METH/	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not applicable to the project activity as it is not a hydro power plant.
The methodology is not applicable to the following: (a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; (b) Biomass fired power plants.	/PDD/ /METH/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The project activity complies with the condition as it does not involve switching from fossil fuels to renewable energy sources at the site of the project activity, nor biomass fired power plants/units.
In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is "the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance".	/PDD/ /METH/	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Not applicable to the project activity as it does not consist in retrofit, rehabilitation, replacement, or capacity addition.
The applicability conditions included in the tools referred to in the applied methodology.	/PDD/ /METH/	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The project activity complies with the condition as it accomplishes to all requirements of the tools to which the methodology refers to.

Appendix 7. Assessment of Financial Parameters

Table A-7: Assessment of Financial Parameters

<input type="checkbox"/>	No financial parameters are used for additionality justification
<input checked="" type="checkbox"/>	Assessment of all financial parameters see below

Parameter	Value applied	Unit	Source of Information	Reference	DOE ASSESSMENT		
					Correctness of applied value	Appropriateness of source	Comment
Installed Capacity	89.2	MW	Wind Farms Technical Qualification Data Sheets – EPE	/PLF/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Description:</i> the value is the total installed capacity of the plant authorized to participate at the auction.</p> <p><i>Validator's action:</i> the value can be evidenced by the technical qualification of EPE, which is a company that is part of the Brazilian Ministry of Mines and Energy and responsible for the approval of plants to participate at the auction.</p> <p><i>Conclusion:</i> the value is consistent an approved by the EPE qualification.</p>
Total Investment	308,221,000	R\$	Wind Farms Technical Qualification Data Sheets – EPE Proposal for Purchasing Wind Turbines – Alstom Contract of Turbines with WEG Equipamentos Elétricos	/FD/ /FD_cross/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Description:</i> total investment cost reported is composed of all costs of CAPEX. The total value was evidenced by the technical qualification of EPE approved for the auction. Several items have been described and supporting evidences submitted to validation team along with the financial analysis of the project.</p> <p><i>Validator's action:</i> the technical qualifications of EPE and cross-checking documents have been checked by the validation team.</p> <p>Further, the project activity has an investment around US\$ 1,858 per installed kW (<i>conversion rate on 2011-12-27: US\$ 1.00 = R\$ 1.86</i>).</p> <p>When comparing this value with other <u>wind farms investments per installed MW</u> it is possible to conclude that the project activity has an investment comparable to the market value as can be cross checked with public and official sources, as can be verified below:</p>

Parameter	Value applied	Unit	Source of Information	Reference	DOE ASSESSMENT																			
					Correctness of applied value	Appropriateness of source	Comment																	
						<ul style="list-style-type: none">Examples of wind projects in Brazil: <table><tr><th>Title</th><th>MW</th><th>US\$/kW</th></tr><tr><td>Osório Wind Power Plant¹</td><td>50</td><td>6,584</td></tr><tr><td>Pedra do Sal Wind Farm²</td><td>18</td><td>3,565</td></tr><tr><td>Windfarm Complex Santana do Livramento³</td><td>90</td><td>1,998</td></tr><tr><td>Windfarm Complex Santa Vitória do Palmar and Chui⁴</td><td>144</td><td>2,158</td></tr><tr><td>Windfarm Morro dos Ventos phase 2⁵</td><td>60</td><td>1,976</td></tr></table> <p>¹ CDM registered project Ref. # 0603;</p> <p>² CDM registered project Ref. # 0693;</p> <p>³ CDM registered project Ref. # 7964;</p> <p>⁴ CDM registered project Ref. # 8012;</p> <p>⁵ CDM registered project Ref. # 8253.</p> <ul style="list-style-type: none">Specialized literature: <ul style="list-style-type: none">- Financing Renewable Energy in the European Energy Market – Final Report by Ecofys, Fraunhofer ISI, TU Vienna EEG and Ernst & Young (2011): price in Europe: from US\$ 1,504/kW to US\$ 2,039/kW;- IEA Wind Task 26 Final Report – National Renewable Energy Laboratory (NREL) – (2011) – Price of Reference Case taking into account the values of Denmark, Germany, Netherlands, Spain, Sweden, Switzerland and United States: US\$ 2,014/kW. <p>By this comparison, the weighted average value of total investment in wind farms in Brazil is above the presented value of the project activity which presents an investment similar to European and American projects, even with foreigner technology and know-how. Therefore, the total investment presented is</p>	Title	MW	US\$/kW	Osório Wind Power Plant ¹	50	6,584	Pedra do Sal Wind Farm ²	18	3,565	Windfarm Complex Santana do Livramento ³	90	1,998	Windfarm Complex Santa Vitória do Palmar and Chui ⁴	144	2,158	Windfarm Morro dos Ventos phase 2 ⁵	60	1,976
Title	MW	US\$/kW																						
Osório Wind Power Plant ¹	50	6,584																						
Pedra do Sal Wind Farm ²	18	3,565																						
Windfarm Complex Santana do Livramento ³	90	1,998																						
Windfarm Complex Santa Vitória do Palmar and Chui ⁴	144	2,158																						
Windfarm Morro dos Ventos phase 2 ⁵	60	1,976																						

Parameter	Value applied	Unit	Source of Information	Reference	DOE ASSESSMENT		
					Correctness of applied value	Appropriateness of source	Comment
							<p>assessed as adequate by the validation team.</p> <p><i>Conclusion:</i> the total investment has been evidenced and this has been considered reasonable and consistent by the validation team.</p> <p>All calculations have been demonstrated in the Financial Analysis and the evidences have been presented to validation team.</p> <p>In addition, there are turbine proposals from Alstom and the signed contracts (from after the decision) which demonstrates the conservativeness of the values presented at the financial analysis.</p> <p>Moreover, the comparison of the investment value with other wind farms investments, official sources of information and specialized articles reveals that the used investment values of the project activity are compatible with the market and official sources, in line with paragraph 129 (b) of the VVS.</p> <p>As per the DOE's understanding the value used for the investment analysis is adequate and conservative and can be assessed as valid at the time of the investment decision and compatible with the wind farms market in Brazil.</p>
Debt/Equity ratio	63.5 / 36.5	%	BNDES website	/bndes/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Description:</i> the ratio is set by BNDES which is virtually the only financing institution for wind projects in the auction scheme in Brazil.</p> <p><i>Validator's action:</i> the BNDES website was checked.</p> <p><i>Conclusion:</i> official BNDES ratio and in accordance with market estimates.</p>
Assured Energy	45.4	MW _{avg}	<p>Wind Farms Technical Qualification Data Sheets – EPE</p> <p>Internal Studies 2014 – MML Energia</p>	/PLF/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Description:</i> the value certified by internal study and approved and authorized by EPE as a guarantee percentage of energy that will be generated. The value is from the preliminary study available at the time of the investment decision. This study has been used as it was the one available at the time of the investment decision and it is an internal study due to the expertise of the project owner.</p> <p>By this value, the Plant Load Factor can be calculated as 50.897%</p> <p><i>Validator's action:</i> the EPE qualifications have been analysed.</p>

Parameter	Value applied	Unit	Source of Information	Reference	DOE ASSESSMENT		
					Correctness of applied value	Appropriateness of source	Comment
							<p><i>Conclusion:</i> the value is consistent since the certification is approved by an official agency (EPE) and thus it is in line with EB 48, Annex 11.</p> <p>Even when the new configuration (installed capacity 98.7 MW and new PLF of 52.825%) is used, the IRR remains below the benchmark.</p>
Energy Generation	397,704	MWh/y	Calculated	/PLF/	☒	☒	<p><i>Description:</i> the value is the total energy that will be generated by the project activity. The financial analysis was calculated using this value with the installed capacity and PLF available at the time of the investment decision.</p> <p>Even with the new configuration (installed capacity 98.7 MW and new PLF of 52.825%) and energy generation to 456,726 MWh/y, the IRR remains below the benchmark even with the +/- 10% variation (sensitivity analysis).</p> <p><i>Validator's action:</i> the value is calculated: Assured Energy X 8,760 hours.</p> <p><i>Conclusion:</i> the value is correct and even with the new configuration and greater energy generation, the IRR remains below the benchmark.</p>
Electricity tariff	107.70	R\$/MWh	Results of the Auction # 007/2011	/FD/	☒	☒	<p><i>Description:</i> the electricity price of the generated electricity of the plants at Auction # 007/2011.</p> <p><i>Validator's action:</i> the price is the official result of the auction.</p> <p><i>Conclusion:</i> it is a fixed price that has been determined by the bid price and it is clear and official and valid for 20 years.</p>
O&M costs – wind turbines	8,378,240 (1 st to 5 th years) 12,181,520 (6 th to 10 th years) 14,606,800 (11 th to 20 th years)	R\$/year	Proposal for Purchasing Wind Turbines – Alstom	/FD/	☒	☒	<p><i>Description:</i> O&M costs per wind generator per period of years given by the supplier's proposal. The value is given per wind turbine per year and with different values for the periods of operation as follows:</p> <ul style="list-style-type: none"> - R\$ 158,080 per turbine/year from the 1st to 5th years; - R\$ 229,080 per turbine/year from the 6th to 10th years; - R\$ 275,600 per turbine/year from the 11th to 20th years. <p><i>Validator's action:</i> the proposal of the supplier and was checked.</p>

Parameter	Value applied	Unit	Source of Information	Reference	DOE ASSESSMENT		
					Correctness of applied value	Appropriateness of source	Comment
							<p><i>Conclusion:</i> it is a fixed value established per period of years.</p> <p>In addition, when calculated the total O&M (wind turbines and administrative costs), the amount represents an average over 20 years of 3 to 4% per year of the total investment which is adequate to the type of project.</p> <p>The market value for O&M costs is from 3% to 5% according to specialized literature (i.e. http://www.windpowermonthly.com/news/1010136/Breaking-down-cost-wind-turbine-maintenance/).</p> <p>In addition, no other costs (i.e. administrative costs) have been considered at the financial analysis.</p>
Period of Assessment	20	Years	Manual of Asset Control of Electric Sector – page 215 – item 590 Framework of Auction # 07/2011 PPA	/LIFE/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Description:</i> it is the operational lifetime of the project activity as given by technical guidelines of ANEEL and it is the period of the PPA contract.</p> <p><i>Validator's action:</i> technical guidelines of ANEEL and auction rules were checked.</p> <p><i>Conclusion:</i> official guidelines for the PPA contract and operational lifetime of the wind turbines.</p> <p>Therefore, by the Manual of Asset Control of Electric Sector it is verified that the depreciation rate of wind turbines is 5% per year. Thus, the equipment is fully depreciated after 20 years.</p>
Depreciation	5	%/year	Manual of Asset Control of Electric Sector – page 215 – item 590	/LIFE/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Description:</i> it is the depreciation of the main equipment of the plant throughout the operational years.</p> <p><i>Validator's action:</i> technical guidelines of ANEEL were checked.</p> <p><i>Conclusion:</i> the Manual of Asset Control of Electric Sector sets that the depreciation rate of wind turbines is 5% per year. Thus, the equipment is fully depreciated after 20 years.</p> <p>Thus, after the 20 years, the only expectancy of residual of the project activity is the value of the land (R\$ 450,000).</p>
TUST	5,556,765.60 (1 st year) Decreasing values for the remaining	R\$/year	Law # 10438 Law # 10762 Resolution # 1233 – ANEEL	/LEGIS/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Description:</i> it is a fee charged monthly by ANEEL over the use of transmission line. The value is calculated based on the installed kW. The Resolution has a decreasing table of values during the contracted years of energy generation (from July of one year until June of the following year).</p>

Parameter	Value applied	Unit	Source of Information	Reference	DOE ASSESSMENT		
					Correctness of applied value	Appropriateness of source	Comment
	years						<p><i>Validator's action:</i> it is an official fee charged regulated Laws #10438 and 10762 and Resolution # 1233.</p> <p><i>Conclusion:</i> the values are correctly applied according to Brazilian specific legislation.</p>
TUSDg	2.003	R\$/kW month	Resolution # 1233 – ANEEL Resolution # 77 – ANEEL	/LEGIS/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Description:</i> it is a fee charged monthly by ANEEL over the use of transmission line. The value is calculated based on the installed kW.</p> <p>Being more conservative, as the project activity is eligible for an incentive created by ANEEL which determines a reduction of 50% on tariffs for the use of electrical systems for transmission and distribution by hydroelectric developments and for those based on solar, wind, biomass or qualified cogeneration, where the power injected into the transmission and distribution systems is less than or equal to 30,000 kW, this reduction was used in the financial analysis.</p> <p><i>Validator's action:</i> it is an official fee charged regulated Laws #10438 and 10762 and Normative Resolution # 77.</p> <p><i>Conclusion:</i> the values are correctly applied according to Brazilian specific legislation and EB guidance.</p>
TFSEE	172,035.58	R\$/year	Law # 9427 Dispatch # 4080 –ANEEL	/LEGIS/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Description:</i> it is a fee paid over the annual income resulted from the generation service. It is charged in Brazil by the ANEEL. It is 0.5% of the annual typical unitary economic benefit which is R\$ 385.73 per installed kW.</p> <p><i>Validator's action:</i> ANEEL regulation was checked.</p> <p><i>Conclusion:</i> the value is established by ANEEL's Dispatch # 4080.</p>
PIS/PASEP, Cofins	3.65	%	Normative Instruction # 247 – Article 52	/LEGIS/ /fazenda/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Description:</i> Brazilian tributes are charged over the company's assumed profit (companies with gross revenue below R\$ 48 million can apply the modality of tax call "Assumed profit tax regime"). As the project activity is divided in five plants and each one is owned by a different company, the gross revenues of each one remains below the limit of R\$ 48 million and so all of them are eligible for the Assumed Profit Regime.</p>
Income Tax	15	%	Law # 9249 – Article 3 Law # 9430 – Article 2	/LEGIS/ /fazenda/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<p><i>Validator's action:</i> the presumed profit and the taxes are</p>

Parameter	Value applied	Unit	Source of Information	Reference	DOE ASSESSMENT		
					Correctness of applied value	Appropriateness of source	Comment
			Law # 10637 – Article 46				calculated as follows:
Additional Income Tax	10	%	Law # 9430 – Article 2	/LEGIS/ /fazenda/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> - PIS / PASEP (Social Integration Program): 0.65% of the gross profit; - COFINS (Contribution for Financing Social Security): 3% of the gross profit;
CSLL	9	%	Law # 7689 – Article 3	/LEGIS/ /fazenda/	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<ul style="list-style-type: none"> - CSSL (Social Contribution): 9% of 12% of the gross profit; (assumed profit) - Income tax: 15% of 8% of the gross profit; (assumed profit) - Additional Income tax: 10% of the assumed profit (8%) which exceeds R\$ 240 thousand/year. <p><i>Conclusion:</i> government taxes established by law. Each Specific Purpose Society created for each wind farm, can apply the assumed profit tax modality which is calculated over an assumed percentage over gross revenues.</p>