



VALIDATION REPORT

ELECTRICITY GENERATION FROM RENEWABLE SOURCES - WINDFARMS SANTA CLARA I, SANTA CLARA II, SANTA CLARA III, SANTA CLARA IV, SANTA CLARA V, SANTA CLARA VI AND EURUS VI IN BRAZIL

REPORT No. 2010-1771

REVISION No. 02

DET NORSKE VERITAS



VALIDATION REPORT

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Client: CPFL Geração de Energia S/A	Client ref.: Rodolfo Nardez Sirol

Summary:
Project Name: Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI
Country: Brazil
Methodology: ACM0002 **Version:** 12.1.0.
GHG reducing Measure/Technology: Grid-connected electricity generation from wind power (Sectoral Scope 1)
ER estimate: 149 358 tCO₂e per year (average)
Size
☒ Large Scale ☐ Small Scale
Validation Phases:
☒ Desk Review ☒ Follow up interviews ☒ Resolution of outstanding issues
Validation Status
☐ Corrective Actions Requested ☐ Clarifications Requested
☒ Full Approval and submission for registration ☐ Rejected
 This validation report summarizes the findings of the validation. The only changes made to this version of the validation report compared to the validation report rev. 01 dated 22 June 2011 referred to in the letter of approval of the DNA of Brazil are linked to the status of issuance of the letter of approval by the DNA of Brazil and further information included to address the issues raised by requests for review by three CDM-EB members. In summary, it is DNV's opinion that the project activity "Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI" in Brazil, as described in the PDD, version 2a of 10 May 2012 meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002, version 12.1.0. Hence DNV requests the registration of the project as a CDM project activity

Report No.: 2010-1771	Subject Group: Environment
Report title: Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI in Brazil	
Work carried out by: Gabriel Baines, Andrea Leiroz, Eduardo Camilo and Fernando Rodríguez	
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Abbreviations

ABNT	Brazilian Association of Technical Standards
AIJ	Activities Implemented Jointly
ANEEL	National Electric Energy Agency
BM	Build margin
BNDES	Brazilian Development Bank
Bovespa	Brazilian Stock Exchange
CAR	Corrective Action Request
CCEE	Electric Energy Commercialization Chamber
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH ₄	Methane
CIMGC	Interministerial Commission on Global Climate Change – DNA of Brazil
CL	Clarification request
CM	Combined margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
COPEL	Paraná State Energy Company
DNA	Designated National Authority
DNV	Det Norske Veritas
EPE	Brazilian Government's Company of Energetic Research
FGV	Getúlio Vargas Foundation
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IDEMA	Institute of Environment and Sustainable Development of the state of Rio Grande do Norte
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
MP	Monitoring Plan
NGO	Non-governmental Organisation
NPV	Net Present Value
ODA	Official Development Assistance
OM	Operating margin
ONS	National Operator System
PDD	Project Design Document
PPA	Power Purchase Agreement
PROINFA	Program of Incentive to Alternative Sources of Electric Energy
SIN	National Integrated System – Electricity Grid of Brazil
UNFCCC	United Nations Framework Convention on Climate Change
WEC	Wind Energy Converter



1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change and Environmental Services (DNV) has performed a validation of the project activity “Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurús VI” in Brazil. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism as well as criteria given to provide for consistent project operations, monitoring and reporting.

The review of the project design documentation and the subsequent follow-up interviews have provided DNV with sufficient evidence to determine the fulfilment of stated criteria. The host Party is Brazil, which fulfils the participation criteria. There is no Annex I Party identified yet. The project correctly applies the approved consolidated baseline and monitoring methodology ACM0002, version 12.1.0. – “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”.

The project activity is a wind power project with seven wind farms that tally to 188 MW of installed capacity. By generating electricity from wind power and displacing electricity from the grid that is partly generated from fossil fuels, the project results in reductions of CO₂ emissions that are real, measurable and give long-term benefits to the mitigation of climate change. It is demonstrated that the project is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity.

The total emission reductions from the project are estimated to be on the average 149 358 tCO₂e per year over the selected 10 year fixed crediting period. The emission reduction forecast has been checked, and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.

The monitoring plan provides for the monitoring of the project’s emission reductions. The monitoring arrangements described in the monitoring plan are feasible within the project design and it is DNV’s opinion that the project participants shall be able to implement the monitoring plan.

In summary, it is DNV’s opinion that the project activity “Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurús VI” in Brazil, as described in the PDD, version 2a dated 10 May 2012 meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002, version 12.1.0.. Hence, DNV requests the registration of the project as a CDM project activity.

Rio de Janeiro and Oslo, 2012-05-14

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2 INTRODUCTION

CPFL Geração de Energia S/A has commissioned DNV Climate Change and Environmental Services (DNV) to perform a validation of the “Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurús VI” project in Brazil (hereafter called “the project”). This report summarises the findings of the validation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

2.1 Objective

The purpose of a validation is to have an independent third party assess the project design. In particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC criteria are validated in order to confirm that the project design, as documented, is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

2.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board, including the approved baseline and monitoring methodology ACM0002 (Version 12.1.0.) /25/. The validation was based on the recommendations in the Validation and Verification Manual /24/.

The validation is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design.



3 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design documents
- II follow-up interviews with project stakeholders
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

The following sections outline each step in more detail.

3.1 Desk review of the project design documentation

The following tables list the documentation that was reviewed during the validation.

3.1.1 Documentation provided by the project participants

- /1/ CPFL Geração de Energia S/A and Key Consultoria e Treinamento Ltda.: *CDM-PDD* for project activity “Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI” in Brazil, version 01 dated 3 November 2010, version 02 dated 19 May 2011 and revised version 02a dated 10 May 2012.
- /2/ Key Consultoria e Treinamento Ltda.: *Receipt of Delivery of Mail*, August 2010. Receipts filled by postal service when delivering mail (invitation to stakeholders consultation) to recipients.
- /3/ Key Consultoria e Treinamento Ltda.: *Benchmark calculation spreadsheet*, version 1, date 27 October 2010 and final version 2 of 22 March 2011.
- /4/ Key Consultoria e Treinamento Ltda.: *ER calculation spreadsheet*, version 1, date 25 October 2010 and final version 2 of 16 March 2011.
- /5/ Key Consultoria e Treinamento Ltda.: *IRR calculation spreadsheet* (CPFL-Financial_Analysis.xls), version 1, date 25 October 2010 and final version 2 of 22 March 2011.
- /6/ CPFL Geração de Energia S/A: *Notification form*, submitted to UNFCCC secretariat for prior consideration of CDM on 3 May 2010 and confirmed by UNFCCC on 9 June 2010.
- /7/ CPFL Geração de Energia S/A: *Notification form*, submitted to DNA of Brazil for demonstration and assessment of prior consideration of the CDM on 3 May 2010 and confirmed by DNA on 4 May 2010.
- /8/ Environmental Licenses:
 - Santa Clara I Windfarm Preliminary License – N° 2009-029945/TEC/LP-0101 issued by IDEMA on 22 September 2009 and valid for 2 years.
 - Santa Clara II Windfarm Preliminary License – N° 2009-029942/TEC/LP-0098 issued by IDEMA on 22 September 2009 and valid for 2 years.
 - Santa Clara III Windfarm Preliminary License – N° 2009-029941/TEC/LP-0097



issued by IDEMA on 22 September 2009 and valid for 2 years.

- Santa Clara IV Windfarm Preliminary License – N° 2009-029943/TEC/LP-0099 issued by IDEMA on 22 September 2009 and valid for 2 years.
 - Santa Clara V Windfarm Preliminary License – N° 2009-029948/TEC/LP-0102 issued by IDEMA on 22 September 2009 and valid for 2 years.
 - Santa Clara VI Windfarm Preliminary License – N° 2009-029953/TEC/LP-0107 issued by IDEMA on 2 September 2009 and valid for 2 years.
 - Eurus VI Windfarm Preliminary License – N° 2009-029950/TEC/LP-0104 issued by IDEMA on 16 September 2009 and valid for 2 years.
- /9/ CPFL Geração de Energia S/A: *Equity Contract* of Wind Parks Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI that confirms the participation of CPFL Geração de Energia S/A in each of them, dated 9 September 2009.
- /10/ CPFL Geração de Energia S/A: *Memorandum of Understanding*, for Wind Parks Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI between CPFL Geração de Energia S/A and Wobben Windpower Indústria e Comércio Ltda about the construction of the windfarms, dated 11 December 2009.
- /11/ CPFL Geração de Energia S/A: *1st Addition to the Memorandum of Understanding*, for Wind Parks Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI between CPFL Geração de Energia S/A and Wobben Windpower Indústria e Comércio Ltda about the construction of the windfarms, dated 16 December 2009.
- /12/ Consultancy Camargo Schubert: Email with expected wind production, dated
- /13/ Consultancy Camargo Schubert: *Certificates of Wind Measurements and of Production of Energy*, for Wind Parks Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI about the plant load factor of the wind farms, Version 3 dated 18 June 2010.
- /14/ Enercon Energy: *Aerogenerator Characteristics* - ENERCON E-82 E2 2 MW. Available at: http://www.enercon.de/p/downloads/EN_Productoverview_0710.pdf.
- /15/ TUV Sud: *Lifetime of the Wind Turbine Enercon E-82*, statement from certifier dated 21 August 2007.
- /16/ EPE - Brazilian Government's Company of Energetic Research: *Data set*, for Wind Parks Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI about the geographical coordinates of the wind farms, dated 19 November 2009.
- /17/ Institute of Economic and Social Development of the State of Paraná, *Conjunctural Analysis*, dated December 2006.
- /18/ Getúlio Vargas Foundation: *Cost of Capital to Small Hydroelectric Power Plants in the Clean Development Mechanism Context*, dated November 2010.
- /19/ BNDES: *Credit Lines for Wind Energy hired in Auction*, dated October 2009.
- /20/ CPFL Geração de Energia S/A: *Acquisition of quotes of the wind parks*, signed between CPFL Geração de Energia S/A and Companhia Valença Industrial, dated 9 September



- 2009.
- /21/ EPE - Brazilian Government's Company of Energetic Research: *Studies for the bid of expansion of transmission 2006 to 2010*, available at:
http://www.epe.gov.br/Transmissao/Documents/Estudos_9/PET%202006_2010.pdf
- /22/ CPFL Geração de Energia S/A: *Contracts of land rental*, dated 31 March 2008.

3.1.2 Letters of approval

- /23/ Interministerial Commission on Global Climate Change (DNA of Brazil): *Letter of approval*, dated 14 October 2011.

3.1.3 Methodologies, tools and other guidance by the CDM Executive Board

- /24/ CDM Executive Board: *Validation and Verification Manual*, Version 1.2, EB55 Annex 1 dated 30 July 2010.
- /25/ CDM Executive Board: *Baseline and monitoring methodology ACM0002 – "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"*, version 12.1.0. adopted at EB58.
- /26/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*, version 6.0.0 adopted at EB65 Annex 21.
- /27/ CDM Executive Board: *Tool to calculate the emission factor for an electricity system*, version 2 adopted at EB50 Annex 14.
- /28/ CDM Executive Board: *Glossary of CDM Terms*, version 5 dated 19 August 2009.
- /29/ CDM Executive Board: *Guidelines on the demonstration and assessment of prior consideration of the CDM*, version 3 adopted at EB49 Annex 22.
- /30/ CDM Executive Board: *Guidelines on the Assessment of Investment Analysis*, version 3.1 adopted at EB51 Annex 58.
- /31/ CDM Executive Board: *Guidelines on the Reporting and Validation of Plant Load Factors*, version 1 adopted at EB48 Annex 11.

3.1.4 Documentation used by DNV to validate / cross-check the information provided by the project participants

- /32/ Interministerial Commission on Global Climate Change (DNA of Brazil):, *Emission factor calculation for power grid of Brazil*, published in 2010, Brazilian DNA official website: <http://www.mct.gov.br/index.php/content/view/327769.html#ancora>
- /33/ CCEE, 2nd Brazilian Auction of Reserve Energy - Auction n° 003/2009 - LER-2009, available at:
<http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=ec41d74d98114210VgnVCM1000005e01010aRCRD>
- /34/ ANEEL, *Bank of Information of Generation*, the capacity of electricity generation in Brazil: <http://www.aneel.gov.br/aplicacoes/capacidadebrasil/capacidadebrasil.asp>
- /35/ ANEEL: *Operating wind entrepreneurs*. Available at:
<http://www.aneel.gov.br/aplicacoes/capacidadebrasil/GeracaoTipoFase.asp?tipo=7&fase=3>.
- /36/ Ministry of Environment, *Resolution CONAMA n° 001*, of 23 January 1986 about



- Environmental Impact Assessment. Available at:
<http://www.mma.gov.br/port/conama/res/res86/res0186.html>
- /37/ Presidency of Brazil: *Federal Decree 5025 of March 30th of 2004*. Available at:
http://www.planalto.gov.br/ccivil/_Ato2004-2006/2004/Decreto/D5025.htm.
- /38/ Brazilian National Treasury: *Long Term Brazilian Treasury Bond (type NTN-B)*, available at: http://www.tesouro.fazenda.gov.br/tesouro_direto/
- /39/ BOVESPA: *Daily Return of Bovespa Index*, available at:
<http://www.bmfbovespa.com.br>
- /40/ BOVESPA: *Daily Return of Bovespa Electric Power Index*, available at:
<http://www.bmfbovespa.com.br/shared/IframeHotSiteBarraCanal.aspx?altura=900&idoma=pt-br&url=www.bmfbovespa.com.br/informe/default.asp>
- /41/ BNDES: *Long Term Interest Rate*, available at:
http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Custos_Financeiros/Taxa_de_Juros_de_Longo_Prazo_TJLP/index.html
- /42/ Fernando de Noronha official government home page, available at:
<http://www.noronha.pe.gov.br/>
- /43/ ANEEL: *Atlas of Wind Energy in Brazil*, dated 2005, available at:
[http://www.aneel.gov.br/aplicacoes/atlas/pdf/06-Energia_Eolica\(3\).pdf](http://www.aneel.gov.br/aplicacoes/atlas/pdf/06-Energia_Eolica(3).pdf)
- /44/ ANEEL: *Resolution of Ratification*, dated 11 November 2009, about the ratification of the terms for production of energy in the project, available at:
<http://www.aneel.gov.br/cedoc/reh2009907.pdf>
- /45/ ANEEL Decrees, Dispatches and Notes on Tariffs:
- Normative Resolution n° 77 about discount in tariff for alternative sources, dated 18 August 2004;
 - Decree n° 2410, dated 28 November 1997, creating the TSFEE tariff;
 - Dispatch n° 4774, 22 December 2009 about the values of the TSFEE tariff.
- /46/ Brazilian National Treasury, *Normative Instruction n° 247*, dated 21 November 2002. About PIS/PASEP and Cofins taxes, available at:
<http://www.receita.fazenda.gov.br/legislacao/ins/2002/in2472002.htm>
- /47/ Brazilian National Treasury, *Note 517 for information on legislation about presumed profit companies*, available at:
<http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2005/PergResp2005/pr517a555.htm>
- /48/ Brazilian National Treasury, *Article 22 of Law n° 10684 and Article 3 of Law n° 11727, for social contribution on net profit*, available at:
<http://www.receita.fazenda.gov.br/aliquotas/ContribCsl/Default.htm>
- /49/ ANEEL, *Resolution n° 44 about depreciation rates*, dated 17 March 1999. Available at:
http://www.aneel.gov.br/aplicacoes/leitura_arquivo/arquivos/Tabela_Taxas_Depriacao_RIT.pdf
- /50/ National Operator System - *Grid Procedures*, available at:
www.ons.org.br/procedimentos/index.aspx
- /51/ Ministry of Environment: *Renewable Sources of Energy in Brazil*, dated 2003.
- /52/ Eduardo Camilo and Fernando Rodríguez: *Financial Expert Assessments*, approving



the choice of benchmark and the investment analysis. Dated 13 December 2010 and 20 May 2011, respectively.

Main changes between the PDD published for the 30 days stakeholder commenting period and the PDD submitted for registration:

- Corrective actions related to the CAR/CL described in Appendix A of this report.

3.2 Follow-up interviews with project stakeholders

The project is a newly built wind farm project; through the documents which the project participant provided, DNV can confirm the project design, construction, operation and monitoring plan and all baseline scenario information.

The representatives of the project owner CPFL Geração de Energia S/A and project participants from Key Consultoria e Treinamento Ltda. were interviewed on 21 December 2010 at CPFL Geração de Energia S/A office in Campinas by DNV auditors Andrea Leiroz and Gabriel Baines, to resolve the issues identified during the desk review.

During the desk review, the relevant documents including PDD /1/, receipts of delivery of mail to stakeholders /2/, benchmark calculation /3/, ER calculation spreadsheet /4/, IRR spreadsheet /5/, notification to UNFCCC and its confirmation /6/, notification to Brazilian DNA and its confirmation /7/, preliminary environmental licenses /8/, equity contract of the windparks /9/, memorandum of understanding of the windparks /10/. The construction of the project had not been initiated at the time of validation. Hence, DNV can justify that a physical site visit for this project was not required during the validation stage.

	Date	Name	Organization	Topic
/53/	21	Carlos Shiguematsu Jr.	Key Consultoria e Treinamento Ltda.	• Project Design and adopted technology
/54/	December	Rui Dolabella Pereira		• Determination of baseline scenario
/55/	2010	Laura Alves		• Demonstration of additionality
/56/		Tauries Sakai Nakazawa	CPFL Geração de Energia S/A	• Emission reduction calculations
/57/		Júlio César Lemos Pinto		• Application of monitoring methodology as well as design and application of the monitoring plan
/58/		Eduardo dos Santos Soares		• Assessment of environmental impacts, environmental licenses and legal compliance
/59/		Fernanda Furlan de Gouveia		• Stakeholders consultation process



3.3 Resolution of outstanding issues

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified prior to DNV's positive conclusion on the project design. In order to ensure transparency a validation protocol was customised for the project. The protocol shows in a transparent manner the criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organises, details and clarifies the requirements a CDM project is expected to meet;
- It ensures a transparent validation process where the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of four tables. The different columns in these tables are described in the figure below. The completed validation protocol for the project activity "Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI" in Brazil is enclosed in Appendix A to this report.

A corrective action request (CAR) is raised if one of the following occurs:

- (a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- (b) The CDM requirements have not been met;
- (c) There is a risk that emission reductions cannot be monitored or calculated.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.



Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities				
Requirement	Reference	Conclusion		
The requirements the project must meet.	Gives reference to the legislation or agreement where the requirement is found.	This is either acceptable based on evidence provided (OK) or a corrective action request (CAR) if a requirement is not met.		

Validation Protocol Table 2: Requirement Checklist				
Checklist question	Reference	Means of verification (MoV)	Assessment by DNV	Draft and/or Final Conclusion
The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in different sections, following the logic of the CDM-PDD	Gives reference to documents where the answer to the checklist question or item is found.	Means of verification (MoV) are document review (DR) , interview (I) or any other follow-up actions (e.g., on site visit and telephone or email interviews) and cross-checking (CC) with available information relating to projects or technologies similar to the proposed CDM project activity under validation.	The discussion on how the conclusion is arrived at and the conclusion on the compliance with the checklist question so far.	OK is used if the information and evidence provided is adequate to demonstrate compliance with CDM requirements. A corrective action request (CAR) is raised when project participants have made mistakes, the CDM requirements have not been met or there is a risk that emission reductions cannot be monitored or calculated. A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met. A forward action request (FAR) during validation is raised to highlight issues related to project implementation that require review during the first verification of the project activity.

Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests			
Corrective action and/or clarification requests	Ref. to checklist question in table 2	Response by project participants	Validation conclusion
The CARs and/ or CLs raised in Table 2 are repeated here.	Reference to the checklist question number in Table 2 where the CAR or CL is explained.	The responses given by the project participants to address the CARs and/or CLs .	The validation team's assessment and final conclusions of the CARs and/or CLs .

Validation Protocol Table 4: Forward Action Requests		
Forward action request	Ref. to checklist question in table 2	Response by project participants
The FARs raised in Table 2 are repeated here.	Reference to the checklist question number in Table 2 where the FAR is explained.	Response by project participants on how forward action request will be addressed prior to first verification.

Figure 1: Validation protocol tables



3.4 Internal quality control

The validation report underwent a technical review performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3.5 Validation team

<i>Role</i>	<i>Last Name</i>	<i>First Name</i>	<i>Country</i>	<i>Type of involvement</i>						
				Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	TA 1.2 competence	Financial expertise
Team leader (Validator)	Baines	Gabriel	Brazil	✓	✓	✓				
Validator	Leiroz	Andrea	Brazil	✓	✓	✓	✓		✓	
Financial Expert	Camilo	Eduardo	Brazil							✓
Financial Expert	Rodríguez	Fernando	Mexico							✓
Technical reviewer	Wong	Simon Yon-Sing	Malaysia					✓	✓	

The qualification of each individual validation team member is detailed in Appendix B to this report.



4 VALIDATION FINDINGS

The findings of the validation are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the PDD, version 2a dated 10 May 2012 /1/.

4.1 Participation requirements

The project participants are CPFL Geração de Energia S/A and Key Consultoria e Treinamento Ltda. of host Party Brazil. The host Party (Brazil) meets all relevant participation requirements. There is no Annex I Party identified yet.

A letter of approval (LoA) /23/ was issued by DNA of Brazil on 14 October 2011, authorizing CPFL Geração de Energia S/A and Key Consultoria e Treinamento Ltda. of host Party Brazil as project participants and confirming that the project assists in achieving sustainable development.

The letter of approval was received from the project participants. DNV does not doubt the authenticity of the letters of approval. DNV considers the letters are in accordance with paragraphs 45- 48 of the VVM /24/.

The project does not involve any public funding from an Annex I Party, and the validation did not reveal any information that indicated that the project can be seen as a diversion of official development assistance (ODA) funding towards Brazil.

4.2 Project design

The 'Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurús VI' project is located in the municipality of Parazinho, state of Rio Grande do Norte, in Brazil.

The geographical coordinates of the proposed project activity are listed below as confirmed in documents from the Brazilian Government's Company of Energetic Research (EPE) /16/ and the Certificates of Wind Measurements and of Production of Energy /13/.

Santa Clara I		
Equipment	S latitude	W longitude
Control Centre	5.2611	35.8982
Turbine SC I -01	5.2346	35.8947
Turbine SC I - 02	5.2371	35.8954
Turbine SC I - 03	5.2392	35.8961
Turbine SC I - 04	5.2409	35.8975
Turbine SC I - 05	5.2430	35.8987
Turbine SC I - 06	5.2448	35.8920



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Turbine SC I - 07	5.2470	35.8929
Turbine SC I - 08	5.2491	35.8937
Turbine SC I - 09	5.2512	35.8946
Turbine SC I - 10	5.2533	35.8955
Turbine SC I - 11	5.2554	35.8963
Turbine SC I - 12	5.2576	35.8917
Turbine SC I - 13	5.2576	35.8971
Turbine SC I - 14	5.2616	35.8991
Turbine SC I - 15	5.2637	35.9000

Santa Clara II		
Equipment	S latitude	W longitude
Control Centre	5.2529	35.9091
Turbine SC II - 01	5.2442	35.9006
Turbine SC II - 02	5.2453	35.9027
Turbine SC II - 03	5.2452	35.9081
Turbine SC II - 04	5.2468	35.9098
Turbine SC II - 05	5.2501	35.9017
Turbine SC II - 06	5.2521	35.9029
Turbine SC II - 07	5.2538	35.9042
Turbine SC II - 08	5.2554	35.9058
Turbine SC II - 09	5.2570	35.9073
Turbine SC II - 10	5.2587	35.9086
Turbine SC II - 11	5.2606	35.9099
Turbine SC II - 12	5.2631	35.9104
Turbine SC II - 13	5.2662	35.9102
Turbine SC II - 14	5.2692	35.9111
Turbine SC II - 15	5.2704	35.9134

Santa Clara III		
Equipment	S latitude	W longitude
Control Centre	5.2716	35.9129
Turbine SC III - 01	5.2659	35.9009
Turbine SC III - 02	5.2675	35.9028
Turbine SC III - 03	5.2696	35.9039
Turbine SC III - 04	5.2720	35.9045
Turbine SC III - 05	5.2741	35.9055
Turbine SC III - 06	5.2759	35.9065
Turbine SC III - 07	5.2771	35.9084
Turbine SC III - 08	5.2787	35.9099
Turbine SC III - 09	5.2798	35.9119



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Turbine SC III - 10	5.2804	35.9145
Turbine SC III - 11	5.2710	35.9159
Turbine SC III - 12	5.2721	35.9179
Turbine SC III - 13	5.2739	35.9192
Turbine SC III - 14	5.2756	35.9209
Turbine SC III - 15	5.2769	35.9229

Santa Clara IV		
Equipment	S latitude	W longitude
Control Centre	5.2393	35.9077
Turbine SC IV - 01	5.2546	35.9185
Turbine SC IV - 02	5.2528	35.9167
Turbine SC IV - 03	5.2514	35.9149
Turbine SC IV - 04	5.2498	35.9133
Turbine SC IV - 05	5.2484	35.9116
Turbine SC IV - 06	5.2426	35.9171
Turbine SC IV - 07	5.2411	35.9155
Turbine SC IV - 08	5.2398	35.9137
Turbine SC IV - 09	5.2388	35.9117
Turbine SC IV - 10	5.2380	35.9095
Turbine SC IV - 11	5.2373	35.9071
Turbine SC IV - 12	5.2367	35.9046
Turbine SC IV - 13	5.2354	35.9028
Turbine SC IV - 14	5.2341	35.9010
Turbine SC IV - 15	5.2319	35.9001

Santa Clara V		
Equipment	S latitude	W longitude
Control Centre	5.2647	35.9270
Turbine SC V - 01	5.2817	35.9388
Turbine SC V - 02	5.2795	35.9378
Turbine SC V - 03	5.2780	35.9364
Turbine SC V - 04	5.2765	35.9348
Turbine SC V - 05	5.2750	35.9333
Turbine SC V - 06	5.2734	35.9318
Turbine SC V - 07	5.2720	35.9301
Turbine SC V - 08	5.2710	35.9281
Turbine SC V - 09	5.2696	35.9263
Turbine SC V - 10	5.2674	35.9255
Turbine SC V - 11	5.2653	35.9246
Turbine SC V - 12	5.2631	35.9237



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Turbine SC V - 13	5.2611	35.9226
Turbine SC V - 14	5.2593	35.9212
Turbine SC V - 15	5.2579	35.9195

Santa Clara VI		
Equipment	S latitude	W longitude
Control Centre	5.2374	35.9160
Turbine SC VI - 01	5.2443	35.9185
Turbine SC VI - 02	5.2455	35.9204
Turbine SC VI - 03	5.2466	35.9224
Turbine SC VI - 04	5.2479	35.9242
Turbine SC VI - 05	5.2497	35.9256
Turbine SC VI - 06	5.2525	35.9259
Turbine SC VI - 07	5.2400	35.9268
Turbine SC VI - 08	5.2386	35.9250
Turbine SC VI - 09	5.2368	35.9237
Turbine SC VI - 10	5.2346	35.9230
Turbine SC VI - 11	5.2331	35.9214
Turbine SC VI - 12	5.2322	35.9193
Turbine SC VI - 13	5.2312	35.9172
Turbine SC VI - 14	5.2310	35.9146
Turbine SC VI - 15	5.2309	35.9115

Eurus VI		
Equipment	S latitude	W longitude
Control Centre	5.2352	35.9368
Turbine EU VI - 01	5.2316	35.9282
Turbine EU VI - 02	5.2326	35.9304
Turbine EU VI - 03	5.2331	35.9330
Turbine EU VI - 04	5.2340	35.9353

The project is a wind power project which involves installation and operation of 94 WECs (ENERCON E82 E2 model) /10/. The installed capacity of each WEC unit is 2.0 MW /14/ thus, constituting a total installed capacity of 188 MW. Out of the 94 WECs, 15 WECs will be installed in each wind farm except for Eurus VI wind farm where 4 WECs will be installed.

The wind turbines were manufactured by Wobben /10/, a subsidiary of Enercon Germany, which is an advanced technological industrial company, specialized in the development and manufacturing of large wind power equipment and related main components. It has been cross-checked by DNV through the manufacturers product specifications /14/ that the project design engineering uses the megawatt-class, three-bladed, variable speed wind turbines, which is deemed to reflect good practices.



The annual electricity delivered to the National Interconnected System (SIN) is expected to be 726 712 MWh, corresponding to an average plant load factor of 44.13% sourced from the “*Certificates of Wind Measurements and of Production of Energy*” /13/ prepared by Consultancy Camargo Schubert, an independent third party.

The load factor initially calculated by the same Consultancy Camargo Schubert /12/ was adjusted since its starting date, on the decision making. The plant load factor was previously of 42.77%, incurring in an expected delivered energy of 704 480 MWh/year /12/. This change in the plant load factor did not modify the additionality of the project, as it is demonstrated in the the additionality analysis.

The electricity generated by the project will be linked to a 230 kV onsite transformer substation, and ultimately delivered to the SIN - which has part of its electricity generated by fossil fuel power plants - via a 230 kV transmission line of 10 km /44/

Being a renewable electricity project, the project activity will generate greenhouse gas (GHG) emission reductions by avoiding the CO₂ emissions from the electricity generation by fossil fuel power projects.

The project’s system boundaries are clearly defined as the project site and the National Interconnected System (SIN), the grid of Brazil.

The project construction had not been initiated at the commencement of validation.

The starting date of the proposed project activity was defined as 14 December 2009, which represents the realization of Brazilian 2nd Reserve Power Auction (2^o *Leilão de Energia de Reserva - Leilão nº 003/2009 - LER-2009* /33/), in which the seven electricity generation facilities Santa Clara I, II, III, IV, V, VI and Eurus VI had its energy contracted and its contract for the supply of equipment and services validated. According to the Memorandum of Understanding /10/ signed with Wobben on 11 December 2009, if the project proponent was successful in its participation at the Brazilian 2nd Reserve Power Auction – which indeed came to happen - the project proponent and Wobben would agree to enter into the contracts for the supply of equipment and services for the project activity (the main component of total required investments). This date corresponds to the earliest financial commitment for the proposed project activity.

The expected operational lifetime of the project activity is 20 years derived from the Lifetime of the Wind Turbine Enercon E-82 /15/.

A 10-year fixed crediting period has been chosen for the project, starting on 1 July 2012 or the registration date, whichever is later. The chosen crediting starting date is deemed to be reasonable. The emission reductions are estimated to be 149 358 tCO₂e per year and 1 493 580 tCO₂e over the 10-year fixed crediting period.

DNV considers the project description of the project contained in the PDD to be complete and accurate. The PDD complies with the relevant forms and guidance for completing the PDD.

4.3 Application of selected baseline and monitoring methodology

The project correctly applies the approved baseline and monitoring methodology ACM0002 “*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*” version 12.1.0. /25/ .



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The applied baseline methodology is justified as it has been demonstrated that the project activity ensures that:

- The project activity is the installation of a grid-connected and greenfield wind power plant which was verified through the Memorandum of Understanding between CPFL Geração de Energia S/A and Wobben Windpower Indústria e Comércio Ltda about the construction of the windfarms /10/ and the results of the 2nd Brazilian Auction of Reserve Energy - Auction nº 003/2009 - LER-2009 /33/.
- Being a wind farm project, it does not involve any switching from fossil fuel to renewable energy at the project site, which could be verified by DNV through the follow-up interview /53/ /54/ /55/ /56/ /57/ /58/ /59/ and the Memorandum of Understanding (which is also valid as contract) between CPFL Geração de Energia S/A and Wobben Windpower Indústria e Comércio Ltda about the construction of the windfarms /10/.
- The project is connected to the National Interconnected System (SIN), the electricity grid of Brazil, for which the geographical and system boundaries are clearly identified and information on the characteristics of this grid is made available by National Electric Energy Agency (ANEEL) /34/.

The assessment of the project's compliance with the applicability criteria of ACM0002 (version 12.1.0.) are documented in detail in section B.2 of Table 2 in the validation protocol in Appendix A to this report.

4.4 Project boundary

The spatial extent of the project boundary is correctly defined as the site of project activity and the system boundary for the grid electricity system is also correctly defined as all power plants connected physically to the National Interconnected System (SIN), the electricity grid of Brazil, to which the project will be connected. It is DNV's opinion that the project boundary of Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurús VI is clearly defined in accordance with applicable guidelines of both ACM0002 /25/ and the "*Tool to calculate the emission factor for an electricity system*" /27/.

Emission sources and gases included in the project boundary are:

	<i>GHGs involved</i>	<i>Description</i>
Baseline emissions	CO ₂	The baseline emission factor for the project is determined <i>ex-post</i> as a combined margin (CM), consisting of combination of the operating margin (OM) and build margin (BM) of the National Interconnected System (SIN), the electricity grid of Brazil.
Project emissions	N/A	Project emission is regarded as zero as the project is a renewable energy (wind source) project.
Leakage	N/A	There are no leakages that need to be considered in applying this methodology.



The identified boundary and selected sources and gases are justified for the project activity. The validation of the project activity did not reveal other greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed project activity which are expected to contribute more than 1% of the overall expected average annual emission reduction, which are not addressed by ACM0002 (Version 12.1.0.) /25/.

4.5 Baseline identification

A) Baseline determination

The baseline is in accordance with ACM0002 (version 12.1.0.) /25/ that electricity delivered to the grid by project activity would otherwise have been generated by the operation of grid-connected power plants in SIN 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”* /27/.

According to ACM0002 (version 12.1.0.) /25/ baseline emissions are equal to power generated by the project delivered to the SIN, multiplied by the baseline emission factor. The grid emission factor will be determined *ex-post* as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) emission coefficient for the project. The Brazilian grid emission factor has been recently published by the DNA of Brazil /32/. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid. The weighting of the OM and BM is set to be 75% and 25% respectively, which are the default values stipulated for wind farm projects by *“Tool to calculate the emission factor for an electricity system”* (version 2) /27/.

The approved baseline methodology has been correctly applied to identify a complete list of realistic and credible baseline scenarios, and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

As the project activity is a new grid-connected wind power plant, the baseline scenario is already defined by the methodology and properly stated in section B.4 of PDD.

All the assumption and data used by the project participants are listed in the PDD and/or supporting documents. All documentation relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD. Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable. Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD.

DNV considers the chosen baseline to be applicable and in line with the methodology ACM0002 version 12.1.0. /25/.

4.6 Additionality

As required by ACM0002, the additionality of the proposed project is demonstrated by applying the *“Tool for the demonstration and assessment of additionality”* (version 5.2) /26/.



4.6.1 Evidence for prior CDM consideration and continuous actions to secure CDM status

Project start date:

The starting date of the project activity was defined as 14 December 2009, which represents the realization of Brazilian 2nd Reserve Power Auction (2^o Leilão de Energia de Reserva - Leilão n° 003/2009 - LER-2009 /33/), in which the seven electricity generation facilities Santa Clara I, II, III, IV, V, VI and Eurús VI had its energy contracted and its contract for the supply of equipment, construction and maintenance services validated. According to the Memorandum of Understanding /10/ signed with Wobben on 11 December 2009, as the project proponent was successful in its participation at the Brazilian 2nd Reserve Power Auction, the project proponent and Wobben agreed to enter into the contracts for the supply of equipment and services for the project activity. Hence, DNV was able to confirm that the earliest commitment to financial expenditure is the Brazilian 2nd reserve power auction (14 December 2009) /33/, which is considered as the project starting date.

Serious consideration of CDM and efforts to secure CDM status:

In accordance with the guidance from the CDM Executive Board /29/, the proposed project is a newly built wind farm and the starting date of the project activity (14 December 2009) is after 2 August 2008. Thus, the notification letter for the proposed project was sent by the project participant to the Brazilian DNA on 3 May 2010 /7/ and approved by Brazilian DNA on 4 May 2010. Then the project owner sent the prior consideration of the CDM Form to UNFCCC on 27 April 2010 /6/, which is within six months of the project activity starting date i.e. 14 December 2009. It has been confirmed by UNFCCC secretariat on its website dated 9 June 2010. CDM was therefore seriously considered in the decision to proceed with the project activity.

The project participants started the global stakeholder consultation (5 November 2010) eleven months after the starting date of the project activity (14 December 2009). To the consideration of DNV, this shows sufficient actions to secure CDM status in parallel with the physical implementation of the project.

It is DNV's opinion that the proposed CDM project activity complies with the requirements of the latest version of the guidance on prior consideration of CDM.

4.6.2 Identification of alternatives to the project activity

The project activity is the installation of a new grid-connected renewable power plant, thus according to the methodology ACM0002, version 12.1.0. /25/, the baseline scenario for the project activity is defined as follow:

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".

In accordance with the paragraph 105 of VVM /24/, the approved methodology ACM0002 version 12.1.0. /25/ that is selected by the proposed project activity has prescribed the baseline scenario as shown above, thus no alternatives to the project activity in order to determine the baseline scenario are identified in the PDD /1/.



4.6.3 Investment analysis

Choice of approach

As the project generates financial and economic benefits other than CDM related income through the sales of electricity, a benchmark analysis was selected for conducting the investment analysis.

Benchmark selection

The selected benchmark is a project benchmark calculated based in bond rates. The benchmark was calculated to be 12.01% by CPFL Geração de Energia S/A based on paragraph 12 of the “Guidelines on the Assessment of Investment Analysis” version 3.1 /30/: “weighted average costs of capital (WACC) are appropriate benchmarks for a project IRR”. The WACC was calculated based in the Capital Asset Pricing Model (CAPM) as per the option 6 (a) presented in the additionality tool as follows:

$$K_e = R_f + \beta (R_m - R_f)$$

Where:

- R_f (risk free rate) is calculated as 11.64%, based on the Term Brazilian Treasury Bond (type NTN-B) of years 2006, 2007, 2008, 2009 /38/;
- R_m (market return) is calculated as 20%, based on Daily Return of Bovespa Index of years 2006, 2007, 2008, 2009 /39/;
- β (beta) is considered to be 1.50, based on the covariance of the Daily Return of Bovespa Electric Power Index of years 2006, 2007, 2008, 2009 /40/. Beta when relevered used the conditions of Presumed (or Assumed) Profit regime, which tax rate is zero when releveraging beta.

Thus, K_e is calculated to be 24.6%.

The weighted average costs of capital is calculated as follows:

$$WACC = K_e * W_e + K_d * W_d$$

Where:

- K_e (return on equity) is calculated as 24.6% as per indicated above;
- K_d (cost of debt financing) is calculated as 7.81% based on the sum of the financing cost (long term interest rate, 6% /41/), BNDES spread (0.9%) /19/ and the credit risk rate (0.91%) /19/;
- W_e (weight of equity) is 25%, as the remaining of the W_d explained below;
- W_d (weight of debt) is 75%, which is the maximum financing granted by BNDES for wind farms /19/. In the period of January 2009 to October 2009 the average financing granted for wind farm was 59% /19/. As a maximum 75% of debt results in the lowest benchmark, DNV considers this approach is conservative and reasonable.

Thus, WACC is calculated to be 12.01%.

This benchmark is not specific to the project participants, since it was calculated based on public data considering the risks faced by any wind power project in Brazil. Although CAPM



model is generally used to calculate a benchmark on an equity basis, in this case it is accepted to be applied for a benchmark on a project basis, because it was adapted to the project using releveraged beta for condition of a presumed (or assumed) profit regime, for which tax rate is zero in releveraging. DNV confirmed this approach is correct with independent financial experts Eduardo Camilo and Fernando Rodríguez /52/ .

DNV also compared the benchmark demonstrated in the PDD with a benchmark estimated by Getúlio Vargas Foundation (FGV) for the Cost of Capital to Small Hydroelectric Plants /18/. FGV is a renowned and trustable independent centre of economic studies in Brazil. In the estimation of developed by FGV the calculation of the benchmark is performed in the same way as of the above mentioned, also founded on official sources (BNDES, Ibbotson) and specific literature. The benchmark estimated by Getúlio Vargas Foundation can be compared to wind farm projects since the economic environment and players are similar to small hydro power projects in Brazil. The value obtained for a theoretical hydro power plant of up to 50 MW in Brazil in the year of 2005 is 14.7%, higher than the value of the benchmark calculated by CPFL Geração de Energia S/A (12.01%).

DNV confirmed that the assumptions taken and the values considered for the benchmark calculation are reasonable, according to statement from independent financial experts from Rio de Janeiro Federal University /52/.

Hence, DNV concludes that the benchmark calculated for the proposed project is reasonable.

Input parameters

The project participants presented the investment analysis in a unified manner, treating all seven wind parks as one project. DNV considers that characteristics of the project (same type of wind turbines, adjacents to each other, same substation and distribution network, same price and buyer to electricity) allow this way of analysis. DNV has validated all input values to the investment analysis based on appropriate evidence, as described below.

Investment costs:

The total investment is estimated to be R\$ 801 273 669.00. From this amount:

- R\$ 683 049 984.80 (85% of total investment) corresponds to the investment in the wind towers and construction services as per 1st Addition to the Memorandum of Understanding /11/. This is the price agreed between Wobben and CPFL Geração de Energia S/A during the Auction of Reserve Energy /33/, the event that marked the starting date of the project. The 1st Addition to the Memorandum of Understanding /11/ decreased in 5% the prices of the Memorandum of Understanding /10/ and was necessary to win the auction's bid, being signed two days after the auction to officialise the terms verbally agreed between Wobben and CPFL Geração de Energia S/A during the bid. Although these values are smaller than in the decision making, the investment analysis utilizes the modified values of the 1st Addition to the Memorandum of Understanding /11/ and DNV considers this approach is correct because it is conservative.
- R\$ 59 868 185.20 (7% of total investment) corresponds to voltage network, substation of elevation and transmission lines costs, as per estimates made by CPFL Geração de



Energia S/A based on the company's previous projects settled in the Brazilian Government's Company of Energetic Research: Studies for the bid of expansion of transmission 2006 to 2010 /21/. As the rights to sell energy are obtained in an inverted auction, where the lowest price wins, DNV considers this approach is correct, since it is conservative;

- R\$ 32 769 668.75 (4% of total) corresponds to acquisition of quotes of the seven wind parks as per the contract of acquisition /20/. This value is a project specific characteristic that can come along a given project and impact in the estimative of its costs. Comparison with other projects was not applicable.
- R\$ 16 639 000.00 (2% of total) corresponds to hired administration, security, residences, transportation, insurances, communication systems, certification of the measurement of winds and production of energy, financial and taxes consulting, certification of the design of the foundations of the towers and topographical services and other expenses
- R\$ 8 916 830.00 (1% of total) corresponds to environmental expenses, such as environmental management system, recovery of areas plan, deforestation control, noise control system, environmental compensation, flora and fauna monitoring system, erosion and sedimentation system, education plan and others.

DNV concludes that the total investments for the proposed project are reasonable for wind power plants.

O&M costs:

The operation and maintenance cost for the proposed project includes O&M of the wind power plants, O&M of the transmission lines, transmission charges, insurance fees and land rent.

As per Memorandum of Understanding /10/ and 1st Addition to the Memorandum of Understanding /11/ the prices for the O&M of the wind power plants are variable through the years, starting on R\$ 45 000.00 in the first year and reaching R\$ 99 000.00 in the 6th year, continuing with this value until the end of the contract.

The estimates for the O&M of the transmission lines are 1.5% of the voltage network and substation costs, a total of R\$ 500 000.00/year, based on previous hydro power projects of CPFL Geração de Energia S/A that also present transmission components, activity in which the company has a wide expertise.

Transmission charges were calculated following regulatory decrees /44/ /45/ and vary on the production of energy, totalling around R\$ 9 500 000.00 for the first year of full operation.

Insurance fees were calculated as 0.25% of the total CAPEX, totalling around R\$ 2 210 254.00 for the first year of full operation onwards.



Land rent is 1.5% of the annual gross income, as per contract /22/, totalling around R\$ 1 600 000.00 for the first year of full operation.

Total estimate O&M represent 1.7% of the total investment.

Comparing with simulations presented in the book from the Ministry of Environment “Renewable Sources of Energy in Brazil” /51/, which considered values of O&M ranging from 1% to 4%, the value of O&M of the project is reasonable.

DNV concludes that the O&M cost is reasonable for wind power plants.

Annual power generation:

According to the PDD /1/ and Certificates of Wind Measurements and of Production of Energy /13/, it is expected that the proposed project will supply to SIN approximately 726 712 MWh at a plant load factor (PFL) of 44.13% /13/. Annex 11 of CDM EB’s 48th meeting report /31/ gives a guideline for validation of plant load factor for renewable energy. One option is to use plant load factor provided by a third party contracted by the project participants. The certificates of wind measurements has this purpose and hence, according to current CDM regulation, the checking that the values are in line with the Certificates of Wind Measurements and of Production of Energy /13/ should be considered sufficient for validation of plant load factor. This was the case for this project.

As per the study /13/, the yearly data of wind resource used to estimate the electricity generation from the project was determined based on the on-site measured wind data from 1 June 2008 to 31 May 2009 and the historical meteorological data of 20 years (from 1989 to 2009), which was provided by NCAR/NCEP Global Reanalysis Project (NOAA-USA); the yearly data was then processed in professional software to calculate the annual theoretical power generation, from which the annual effective power generation was obtained through discount by considering factors such as air density, trailing stream, wind turbine efficiency etc. DNV concludes that the assumed annual power generation from the study of Camargo Schubert /13/ is appropriate and acceptable.

Power tariff:

In Brazil, the auctions for reserve energy follow the inverted auctions model, in which the smallest price charged by the producer in the bid wins the slot. In the 2nd Brazilian Auction of Reserve Energy - Auction n° 003/2009 - LER-2009 /33/, CPFL Geração de Energia S/A offered the best prices for wind farms Santa Clara I to VI and Eurús VI, thus winning these slots. The price offered for the seven wind farms were the same, R\$ 150/MWh. In this auction, the average price for the 71 slots was R\$ 148.39 and present a range of R\$ 131.00 to R\$ 153.07. These prices will not change until the end of the PPA period, of 20 years, only varying according to the inflation. The PPA is defined by the auction itself /33/ and lasts for 20 years.

Taxes and depreciation:

DNV could also confirm that the special purpose societies formed for the project are eligible for the presumed (or assumed) profit regime, in accordance to the national fiscal legislation. Values of 8% /47/ for the income rate basis and income tax of 25%, 0.65% for the



PIS/PASEP tax /46/, 3% for the Cofins tax /46/, 12% of revenues basis and a 9% rate is applied as social contribution on net income (CSLL) /48/ and a linear depreciation of 4.3% /49/ were established accordingly to the Brazilian legal requirements. In the presumed profit regime, depreciation has no impact in the project's internal rate of return. In this case, tax rates are calculated over revenues and not over gross profits.

Calculation and conclusion

The IRR calculations were provided in spreadsheet /5/ and verified by DNV. The assumptions and calculations were verified and found to be correct by DNV. The IRR is after tax and the assessment period of 20 years is equivalent to the lifetime of the project /15/, in which the nominal IRR without CDM revenues is 10.81%. This confirms that the project in the absence of CDM benefits and compared to the benchmark of 12.01% is not financially attractive /5/. With CER revenues, the project IRR after taxes increases to 11.42%, which increases the financial viability of the project /5/.

Sensitivity analysis

A sensitivity analysis has been carried out for parameters contributing more than 20% to the revenues or costs in order to check the robustness of the financial analysis. Reasonable variations of the electricity tariff, energy generation, capital expenditures and operation and maintenance costs were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen. None of the parameters in the sensitivity analysis are considered to have any significant positive correlation. DNV was able to verify that the project IRR will reach the benchmark only if the above mentioned parameters change by values as mentioned below:

Key Indicators	Variation of the parameter indicator needed to reach the benchmark of 12.01%
Electricity tariff	+ 7.85%
Annual output delivered to the grid	+ 9.80%
Total investments	- 9.15%
Annual O&M costs	- 88.50%

1) Electricity tariff: To reach the 12.01% benchmark, power tariff must increase by 7.85% above inflation to R\$ 161.76/MWh, which is not likely to happen. In Brazil, the tariffs are strictly set by ANEEL in the time of the auction and cannot be changed during the period of the PPA, determined as 20 years in the rules of the auction.

2) Annual output delivered to the grid: According to the PDD and study from Camargo Schubert /13/, the assumed annual output is based on the long term (from 1989 to 2008) weather statistic data and wind resources measurement provided by NCAR/NCEP Global Reanalysis Project (NOAA-USA) and the plant load factor was defined as 44.13%. Before this study, a preliminary plant load factor of 42.77% had been estimated, and this was the value used at the time of the decision making (the energy auction /33/). This difference reflects an increase of 3.16%, so a further 6.64% increment would be necessary to reach the



benchmark. According to “Renewable Sources of Energy in Brazil” /51/, the average plant load factor of a wind park in Brazil is 40%. Considering that the annual output calculations for the proposed project were carried out using professional software designed for wind energy and that the output was maximised by considering air density corrections, turbine efficiency, planned maintenance, contaminated rotors, and auxiliary power use, it is unlikely that the electricity delivered to the grid will suffer this additional increase.

3) Investment costs: DNV was able to confirm that a 9.15% decrease in investment costs is unlikely to happen, as 97% of the total investment of the proposed project goes towards purchase of the quotes of the project, and purchase and installation of electric equipments (including wind turbines, towers and transformers) as indicated in the PDD and contracts /10/ /11/, have a defined price at the decision making time and cannot be changed. Therefore the total investment is not likely to decrease by more than 9.15%.

4) Annual O&M: The annual O&M cost consists of maintenance cost, material costs, salary and welfare, insurance cost and other cost and were defined in the contracts /10/ /11/ signed between CPFL Geração de Energia S/A and Wobben Windpower Indústria e Comércio Ltda. Considering that the contract was based on fixed prices, a 88.50% decrease is unlikely to happen.

The sensitive analysis above shows that very unrealistic favourable circumstances would be needed for the IRR to reach the benchmark.

In conclusion, the investment analysis and sensitivity assessment have shown that the proposed project is not financially attractive.

4.6.4 Barrier analysis

Barrier analysis was not applied for the proposed project.

4.6.5 Common practice analysis

According to the EB “*Tool for the demonstration and assessment of additionality*” /26/ the common practice analysis is carried out on similar projects which are considered to be in the same region, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.

The geographical scope for common practice analysis was determined to be Brazil, since all power plants connected to the national grid have been analyzed.

DNV was able to confirm that despite of the available high technical potential for wind energy utilization in Brazil, only less than 1% of electricity in Brazil is generated from wind farms /34/.

By the time of the decision-making of the project, there were 45 operating wind plants and two wind plants under construction /34/ /35/. In that time, 36 out of the 45 (80%) operating wind plants in Brazil had PROINFA /37/ (national program started in 2002 to foster the share of alternative energy) incentives. Two of the 9 non-PROINFA operating plants were being developed as CDM projects /34/. All 7 non-CDM and non-PROINFA wind plants present very specific characteristics that make them not similar to regular projects: they were either served by a hybrid wind-diesel isolated electric complex (Fernando de Noronha Wind Power



Plant, an island located 540 km far from the Brazilian coast that uses 25% of wind energy and 75% of thermal energy /34/ /35/ /42/ /43/), or experimental power plant owned by state-owned power utilities (Olinda Wind Power Plant /34/ /35/ /43/), or implemented with support from other country governments (Morro do Camelinh Wind Power Plant /34/ /35/ /43/) or owned (totally or partially) by Wobben Wind Power Industria e Comércio Ltda, that manufactures the wind turbines themselves (Prainha, Taíba, Mucuripe and Palmas Wind Power Plants /34/ /35/ /43/. As per *"Tool for the demonstration and assessment of additionality"* (version 6.0.0) /26/, these four projects (Prainha, Taíba, Mucuripe and Palmas Windpower plants /34/ /35/ /43/) are examples of different access to wind turbine technology in relation to other project developers. *Wobben Windpower Industria e Comercio Ltda* - the owner of these four projects - was the first Brazilian company to manufacture large scale wind turbine generators and manufactured the wind turbines of the four projects themselves. Therefore, DNV considers that *Wobben Windpower Industria e Comercio Ltda* has easier access to technology in developing wind power projects for energy generation because they are directly involved in the production chain of wind turbine generators, having longer knowledge of suppliers, direct access to materials and services and generally greater know-how of the whole production process, differently of the project participant of project *"Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI"*.

Additionally, the project participants performed also the common practice step-wise approach described in paragraph 47 of the *"Tool for the demonstration and assessment of additionality"* (version 6.0.0), applicable for measures that are listed on paragraph 6 of this same tool:

Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity

Since installed capacity of the project activity is 188 MW, the output range of the common practice analysis is 94 MW to 282 MW (+/-50% of the installed capacity).

The capacity of the whole wind farm complex, which includes the wind farms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI, is selected for determining the output range instead of individual wind units' installed capacity. This is in order to be consistent with the investment analysis. This is in DNV's opinion appropriate as the whole project was considered as one undividable investment, as stated in the discussion on the starting date above.

Step 2: In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number N_{all} . Registered CDM project activities and projects activities undergoing validation shall not be included in this step.

As referred in the PDD /1/, based on lists of wind electricity generation plant units operating in Brazil published regularly by ANEEL /35/, considering the 24 windfarm complexes in operation in Brazil, 20 do not deliver the same capacity as the project activity, considering the output range established in step 1 above. Two out of the remaining 4 wind farms are under



CDM validation. Therefore, there are 2 wind farms in operation in Brazil that deliver the same capacity as the project activity and are not under CDM validation or already registered.

$$N_{\text{all}} = 2$$

Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number N_{diff} .

According to the "Tool for the demonstration and assessment of additionality" (version 6.0.0), "different technologies are technologies that deliver the same output and differ by at least one of the following:

(...)

(iv) Investment climate in the date of the investment decision, inter alia:

- Access to technology;
- Subsidies or other financial flows;
- Promotional policies;
- Legal regulations."

Wind farms developed under PROINFA were considered as plants that were under different promotional policies than the one applied in the project activity, according to the aforementioned concept.

Considering the discussion regarding the PROINFA, 2 out of 2 wind farms in operation in Brazil that deliver the same capacity as the project activity and are not under CDM validation or already registered are developed under PROINFA, i.e. that were under different promotional policies than the proposed project activity and cannot be compared to the present project activity.

Therefore, $N_{\text{diff}} = 2$

Step 4: Calculate factor $F = 1 - N_{\text{diff}} / N_{\text{all}}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity.

$$F = 1 - N_{\text{diff}} / N_{\text{all}} \rightarrow F = 1 - 2 / 2 \rightarrow F = 0,00$$

Outcome of step 4a: Since $F = 0.00$ (i.e. lower than 0.2) and $N_{\text{all}} - N_{\text{diff}} = 2 - 2 = 0$ (i.e. lower than 3), the proposed project activity is not a common practice within the sector in the applicable geographical area.

DNV cross-checked values presented in the PDD with ANEEL data /35/ and confirmed they are correct.

Finally, it is DNV opinion that these figures and facts confirm that the development of wind farms like Electricity generation from renewable sources - Windfarms Santa Clara I, Santa



Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI does not represent a common practice in Brazil.

In conclusion, it is DNV's opinion that the project is not a likely baseline scenario and that emission reductions from the project are thus additional.

4.7 Monitoring

The project applies the approved monitoring methodology ACM0002 "*Consolidated baseline methodology for grid-connected electricity generation from renewable sources*", (version 12.1.0.) /25/. The selected monitoring methodology is applicable for the project activity as it involves grid-connected renewable power generation using wind energy.

Monitoring of sustainable development indicators is not required by the DNA of Brazil. The monitoring plan will give opportunity for real measurements of achieved emission reductions. The environmental impacts are considered minor and will be monitored by the local environmental authority during the project lifetime.

The project monitoring plan is in compliance with the monitoring methodology ACM0002 (version 12.1.0.).

It is DNV's opinion, that the project participants are able to implement the monitoring plan.

4.7.1 Parameters determined ex-ante

There is no parameter determined *ex-ante*.

4.7.2 Parameters monitored ex-post

The parameters monitored *ex-post* are the net electricity generation from the proposed project activity, the operating margin, build margin and combined margin emission factors.

According to the "*Tool to calculate the emission factor for an electricity system*" /27/, the dispatch data analysis OM method was considered for the determination of the operating margin (OM). Thus, the combined margin CO₂ emission factor ($EF_{grid,CM,y}$) will be monitored ex-post. The Brazilian grid emission factor has been recently published by the DNA of Brazil /32/. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid, as described in section 4.8.

The net electricity dispatched will be measured through the metering equipment at the point of connection of Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI to the Brazilian grid.

The power exported to and imported from the SIN will be monitored continuously and recorded on monthly basis. In addition, the electricity sales receipts will be provided for data quality control and cross check. In addition, this data will be verified against data provided in the Electric Energy Commercialization Chamber (*Câmara de Comercialização de Energia Elétrica – CCEE*) databank.

The meters are bi-directional and their accuracy is not lower than 0.2S, as determined in the standards of the ABNT - Brazilian Association of Technical Standards. The main and backup meters are installed at the onsite substation of the wind farm.

The meters will be equipped with a system of salvage of records in case of power loss, storing data for 100 hours. Additionally, all the electricity dispatched to the grid will be monitored online by CCEE. Backup meters are equivalent to the main meters and have the same



technical standards.

All meters will be calibrated every two years by a qualified third party according to the national and industrial regulations “Grid Procedures” from the ONS Module 12, Sub-module 12.3 /50/.

Data will be archived for 2 years following the end of the last crediting period or 2 years after the last issuance of CER for this project activity, whichever occurs later. The project owner will be responsible for the overall monitoring and reporting and will keep all the data and material.

4.7.3 Management system and quality assurance

The project’s monitoring plan includes:

- A description of the monitoring management structure and the main responsibility of each department.
- Monitoring parameters.
- A description of the installation of meters.
- A description of the meters calibration and maintenance.
- Data Monitoring.
- Data quality control.
- Data management system.
- Training programme.

Detailed procedures have been elaborated in the PDD section B.7.2. These will be maintained and implemented to enable subsequent verification of emission reductions. The application of the monitoring methodology is transparent and DNV considers that the project participants are able to implement the monitoring plan. Algorithms and/or formulae used to determine emission reductions

4.8 Algorithms and/or formulae used to determine emission reductions

The emission reductions (ER_y) by the project activity during the crediting period are calculated as the difference between baseline emissions (BE_y), project emissions (PE_y) and emissions due to leakage (L_y), as follows:

- 1) Baseline emissions: baseline emissions (BE_y in tCO_2) are the product of the baseline emissions factor (EF_y in tCO_2/MWh) times the electricity supplied by the project activity to the grid (EG_y in MWh).
- 2) Project emissions: there are no emissions from the project activity which is a renewable wind energy project.
- 3) Leakage: no leakage has to be considered for the proposed project activity.

The baseline emission factor for the project will be determined *ex-post* as a combined margin (CM), consisting of combination of the operating margin (OM) and build margin (BM) according to “Tool to calculate the emission factor for an electricity system” version 2 /27/ for the fixed 10 years crediting period.

The Brazilian grid emission factor has been recently published by the DNA of Brazil /32/. The calculations are based on electricity generation data provided by the National Operator



System (ONS) for the electricity generated in the grid in the year of 2009. This is the most recent information available at the start of the validation i.e. 5 November 2010.

The system boundary for the grid electricity system affected by the project is defined as the system of the Brazilian grid (SIN).

It has been calculated as the weighted average ($w_{OM} = 0.75$; $w_{BM} = 0.25$) of the operating margin and the build margin emission factors.

Dispatch data analysis OM was chosen by the Brazilian DNA. The OM is calculated to be 0.2476 tCO₂/MWh.

The BM is calculated as 0.0794 tCO₂e/MWh, resulting in a combined margin emission factor of 0.2055 tCO₂e/MWh.

The annual electricity delivered to the SIN is expected to be 726 712 MWh /1/.

Based on the calculations and results presented in the sections above the implementation of the project activity will result in an average *ex-ante* estimation of emission reduction conservatively calculated to be 149 358 tCO₂e per year for the selected crediting period.

All assumptions and data used by the project participants are listed in the PDD and/or supporting documents, including their references and sources. All documentation used by the project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD. All values used in the PDD are considered reasonable in the context of the proposed CDM project activity. The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions. All estimates of the baseline, project and leakage emissions can be replicated using the data and parameter values provided in the PDD.

4.9 Environmental impacts

According to Brazilian environmental law (Federal Resolution CONAMA 001/86 /36/) a Simplified Environmental Report (RAS) is required to grant the installation license. As stated in the PDD, a Simplified Environmental Report (RAS) has been conducted according to Brazilian law and regulation /36/. The potential significant environmental impacts of the project have been sufficiently identified. No significant environmental impacts are expected from the project activity.

DNV was able to verify that all wind farms were granted the Preliminary License issued by the Institute of Environment and Sustainable Development of the state of Rio Grande do Norte (IDEMA) which were valid for 2 years /8/.

4.10 Comments by local stakeholders

Local stakeholders, such as the Municipal governments and City Councils, Federal and State Attorney, the environmental state and local agencies, the Brazilian forum of NGOs and local communities associations, were invited on 2 August 2010 to comment on the project - in accordance with the requirements of Resolution 7 (5 March 2008) of the Brazilian DNA - to visit the website <http://www.munduscarbo.com/projetos.htm> in order to access the project documentation which includes the CDM-PDD and a correspondent version in Portuguese.

DNV has checked all the invitation letters and the mail receipts /2/. The project activity received just one comment from the Federal prosecution explaining that the entity had nothing



to comment about the project, since they consider that themselves are not eligible to comment on this issue. This is a standard position of the Federal prosecution for all CDM project that invite them to comments. The project participants have archived the letter.

DNV considers the local stakeholder consultation carried out adequately.

4.11 Comments by Parties, stakeholders and NGOs

The PDD, version 1 dated 3 November 2010, was made publicly available on the CDM website <http://cdm.unfccc.int/Projects/Validation/DB/L10H14G4EQMD05UGZGOFTJN0GQ4C48/view.html> and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 5 November 2010 to 4 December 2010.

No comments were received.

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APPENDIX A

CDM VALIDATION PROTOCOL

Table 1 Mandatory requirements for Clean Development Mechanism (CDM) project activities

Requirement	Reference	Conclusion
About Parties		
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3.	Kyoto Protocol Art.12.2	No participating Annex I Party is yet identified.
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK Table 2, Section A.2
5. In case public funding from Parties included in Annex I is used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	Decision 17/CP.7, CDM Modalities and Procedures Appendix B, § 2	OK. The validation did not reveal any information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	The Brazilian designated national authority for the CDM is the Comissão Interministerial de Mudança Global do Clima.
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	Brazil has ratified the Kyoto Protocol on 23 August 2002.

Requirement	Reference	Conclusion
<ul style="list-style-type: none"> The participating Annex I Party's assigned amount shall have been calculated and recorded. 	CDM Modalities and Procedures §31b	No participating Annex I Party is yet identified.
<ul style="list-style-type: none"> The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7. 	CDM Modalities and Procedures §31b	No participating Annex I Party is yet identified.
About additionality		
8. Reduction in GHG emissions shall be additional to any that would occur in the absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity.	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK
About forecast emission reductions and environmental impacts		
9. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change.	Kyoto Protocol Art. 12.5b	OK
For large-scale projects only		
10. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	Ok. Table 2, Section D.
About stakeholder involvement		
11. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received.	CDM Modalities and Procedures §37b	Local stakeholders, such as the Municipal governments and City Councils, Federal and State Attorney, the environmental state and local agencies, the Brazilian forum of NGOs and local communities

Requirement	Reference	Conclusion
		<p>associations, were invited on 2 August 2010 to comment on the project, in accordance with the requirements of Resolution 7 (5 March 2008) of the Brazilian DNA.</p> <p>DNV has checked all the invitation letters and the mail receipts /2/. The project activity received just one comment from the Federal prosecution explaining that the entity is not able to analyse the project.</p>
<p>12. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for minimum 30 days, and the project design document and comments have been made publicly available.</p>	<p>CDM Modalities and Procedures §40</p>	<p>The PDD, version 1 dated 3 November 2011, was made publicly available on the CDM website and Parties. Stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 5 November 2011 to 4 December 2011.</p> <p>No comments were</p>

Requirement	Reference	Conclusion
		received.
Other		
13. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
14. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances.	CDM Modalities and Procedures §45c,d	OK
15. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure.	CDM Modalities and Procedures §47	OK
16. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP.	CDM Modalities and Procedures §37f	OK

Table 2 Requirements checklist

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A General description of project activity					
A.1 Title of the project activity (VVM para 55-57)					
A.1.1 Does section A.1 of the PDD include a clearly identifiable project title, Version number of the PDD and date of the PDD?	/1/	DR	<input checked="" type="checkbox"/> Clearly identifiable title of the project activity <input checked="" type="checkbox"/> Version number of the PDD is included <input checked="" type="checkbox"/> Date of the PDD is included.		OK
A.1.2 Is the PDD is in accordance with the applicable requirements for completing PDDs?	/1/	DR	<input checked="" type="checkbox"/> Yes <i>If no, list where the PDD is not in accordance:</i>		OK
A.2 Description of the project activity (VVM para 58-64)					
A.2.1 How was the design of the project assessed?	/1/ /2/ /3/ /4/ /5/ /6/ /7/ /8/ /9/ /10/	DR	<i>What type is the project?</i> <input type="checkbox"/> Project in existing facility or utilizing existing equipment(s) <input type="checkbox"/> Project is either a large scale project or a small scale project with emission reductions exceeding 15 000 tCO ₂ e per year. In this case, a site visit must be performed. <input type="checkbox"/> Project is a bundled small scale project, with each project in the bundle with emission reductions not exceeding 15,000 tCO ₂ e per year. In such case the number of physical site visits may be based on sampling, if the sampling size is appropriately justified through statistical analysis. <input type="checkbox"/> The project is an individual small scale		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>project activity with emission reductions not exceeding 15 000 tCO₂e per year. In this case, DOE may not conduct a physical site visit as appropriate.</p> <p><input checked="" type="checkbox"/> Greenfield project</p> <p><i>How was the design of the project assessed?</i></p> <p><input type="checkbox"/> Physical site inspection</p> <p><input checked="" type="checkbox"/> Reviewing available designs and feasibility studies</p> <p><i>If a physical site inspection is not undertaken, justify why no site visit was undertaken:</i></p> <p>The project is a newly built wind farm project; through the documents which the project participant provided, DNV can confirm the project design, construction, operation and monitoring plan and all baseline scenario information.</p> <p>The representatives of the project owner CPFL Geração de Energia S/A and project participants from Key Consultoria e Treinamento Ltda. were interviewed on 21 December 2010 at CPFL Geração de Energia S/A office in Campinas by DNV auditors Andrea Leiroz and Gabriel Baines, to resolve the issues identified during the desk review.</p> <p>During the desk review, the relevant documents including PDD /1/, receipts of delivery of mail to stakeholders /2/, benchmark calculation /3/, ER calculation spreadsheet /4/, IRR spreadsheet /5/, notification to Brazilian DNA and its</p>		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			confirmation /6/, notification to UNFCCC and its confirmation /7/, preliminary environmental licenses /8/, equity contract of the windparks /9/, Memorandum of Understanding of construction of the windparks /10/. The construction of the project had not been initiated at the time of validation, as was confirmed through the photographic report and satellite images. Hence, DNV can justify that a physical site visit for this project was not required during the validation stage.		
A.2.2 If a greenfield project, describe the physical implementation of the project when the validation was commenced.	/1/	DR	At the time of commencing of validation, the physical implementation of the project had not been started yet.		OK
A.2.3 If physical site visits were performed based on sampling (only applicable for bundled small scale projects, each with emission reductions not exceeding 15 000 tCO ₂ e per year), justify the sampling through a statistical analysis:	/1/	DR	It is not applicable for the proposed project since it is not a bundled small scale project.		OK
A.2.4 Is the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity?	/1/	DR	The Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurus VI project is located in the municipality of Parazinho, state of Rio Grande do Norte, in Brazil. The geographical coordinates of the proposed project activity are: 5.2611 S latitude, 35.8982 W longitude for Santa Clara I wind farm, 5.2529 S latitude, 35.9091 W longitude for Santa Clara II wind farm, 5.2716 S latitude, 35.9129 W longitude for Santa Clara III wind farm, 5.2393 S latitude, 35.9077 W longitude for Santa Clara IV wind farm, 5.2647 S latitude, 35.9270 W longitude for Santa Clara V	CAR1 CL7	OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<p>wind farm, 5.2374 S latitude, 35.9160 W longitude for Santa Clara VI wind farm, 5.2352 S latitude, 35.9368 W longitude for Eurus VI wind farm. DNV requests project participant to sufficiently provide evidences of the locations of the wind farms.</p> <p>The project involves installation and operation of 94 WECs (ENERCON E82 E2 model). The installed capacity of each WEC unit is 2.0 MW, thus constituting a total installed capacity of 188 MW. Out of the 94 WECs, 15 WECs will be installed in each wind farm except by Eurus VI wind farm where 4 WECs will be installed. The wind turbines are manufactured by Wobben/Enercon and the technology has been considered good practice in Brazil.</p>		
A.2.5	Does the project activity involve alteration of existing installations? If so, have the differences between pre-project and post-project activity been clearly described in the PDD?	/1/	DR	No, it is a greenfield project that will utilize new equipments.		OK
A.2.6	Does the project design engineering reflect current good practices?	/1/	DR	Yes, good practices are followed in the project design and applied in construction works. The technology employed by the project is currently employed worldwide.		OK
A.2.7	Would the technology result in a significantly better performance than any commonly used technologies in the host country? Is any transfer of technology from any Annex-I Party involved?	/1/ /34/	DR	DNV has confirmed that both the installed capacity and generation of wind power plants was only around 1% of the total capacity and power generation of Brazil according to the ANEEL's Bank of Information of Generation /34/. DNV has confirmed that by the time of the project investment decision phase, there were 45 wind farms operating or under construction in Brazil. DNV was able to verify that the 94 wind energy		OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				converter (WECs) to be installed are national equipment which will be installed using mainly local work labour as argued by the project participants.		
A.3 Participation requirements (VVM para 51-54, 125-127)						
A.3.1	Do all participating Parties fulfil the participation requirements as follows:	/1/	DR	<p>The involved party is Brazil as the host Party. There is no Annex I Party identified yet. The project participants are CPFL Geração de Energia S/A and Key Consultoria e Treinamento Ltda. of Brazil. The project participants are listed in Section A.3 of the PDD and the information is consistent with the contact details provided in Annex 1 of the PDD.</p> <p>Brazil (host)</p> <p>a) Party has ratified the Kyoto Protocol <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>b) Party has designated a Designated National Authority <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>c) The assigned amount has been determined <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p>		OK
A.3.2	Do the letters of approval meet the following requirements?	/1/ /23/	DR	<p>A letter of approval (LoA) /23/ was issued by DNA of Brazil on 14 October 2011, authorizing CPFL Geração de Energia S/A and Key Consultoria e Treinamento Ltda. of host Party Brazil as project participants and confirming that the project assists in achieving sustainable development.</p> <p>Brazil (host)</p> <p>a) LoA confirms that Party has ratified the Kyoto Protocol <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>b) LoA confirms that participation is voluntary <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>c) The LoA confirms that the project contributes to the sustainable development of the host country? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
d) The LoA refers to the precise project activity title in the PDD		<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/> No		
e) The LoA is unconditional with respect to (a) to (d) above		<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/> No		
f) The LoA is issued by the respective Party's DNA		<input checked="" type="checkbox"/>	Yes	<input type="checkbox"/> No		
g) The LoA was received directly by the DNA or the PP		<input type="checkbox"/> DNA	<input checked="" type="checkbox"/> PP			
h) In case of doubt regarding the authenticity of the letter of approval, describe how it was verified that the letter of approval is authentic		There was no doubt that the letter of approval is authentic.				
A.3.3	Have all private/public project participants been authorized by an involved Party?	/1/ /23/	DR	A letter of approval (LoA) /23/ was issued by DNA of Brazil on 14 October 2011, authorizing CPFL Geração de Energia S/A and Key Consultoria e Treinamento Ltda. of host Party Brazil as project participants and confirming that the project assists in achieving sustainable development.		OK
A.4 Technical description of the project activity (VVM para 58-64)						
A.4.1	Is the project's location clearly defined?	/1/	DR	The geographical coordinates of the project are: 5.2611 S latitude, 35.8982 W longitude for Santa Clara I, 5.2529 S latitude, 35.9091 W longitude for Santa Clara II, 5.2716 S latitude, 35.9129 W longitude for Santa Clara III, 5.2393 S latitude, 35.9077 W longitude for Santa Clara IV, 5.2647 S latitude, 35.9270 W longitude for Santa Clara V, 5.2374 S latitude, 35.9160 W longitude for Santa Clara VI, 5.2352 S latitude, 35.9368 W longitude for Eurys VI in the municipality of Parazinho, state of Rio Grande do Norte, in Brazil. DNV requests project participant to	CL7	OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				sufficiently provide evidences of the locations of the wind farms.		
A.5 Public funding of the project activity						
A.5.1	In case public funding from Parties included in Annex I is used for the project activity, have these Parties provided an affirmation that such funding does not result in a diVersion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties?	/1/	DR	The project does not involve public funding from Parties included in Annex I, and the validation did not reveal any information that indicates that the project can be seen as a diversion of official development assistance (ODA) funding towards Brazil.		OK
B Application of a baseline and monitoring methodology						
B.1 Methodology applied (VVM para 65-76)						
B.1.1	Does the project apply an approved methodology and the correct and valid Version thereof?	/1/ /25/	DR	The project applies the approved baseline and monitoring methodology ACM0002 version 12.1.0., “ <i>Consolidated baseline methodology for grid-connected electricity generation from renewable sources</i> ”. /25/ There is a mistake in the version of methodology ACM0002 being used in the PDD. The correct version is available and the PDD must be updated /25/.	CL2	OK
B.1.2	If applicable, has any specific guidance provided by the CDM EB in respect to the applied methodology been considered?	/1/ /27/	DR	Yes, the “ <i>Tool to calculate the emission factor for an electricity system</i> ” (version 2) is also applicable. As the project activity is a new grid-connected wind power plant, the baseline scenario is already defined by the methodology and properly stated in section B.4 of PDD. Therefore, the “ <i>Combined tool to identify the baseline scenario and demonstrate</i> ”	CL3	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<i>additionality</i> ”in section B.1 is not in accordance to ACM0002 version 12.1.0.		
B.2 Applicability of methodology (and tools) (VVM para 65-76) <i>Insert a row for each applicability criteria of the applied methodology (and tools)</i>						
B.2.1	How was it validated that project complies with the following applicability criteria: The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir), wind power plant/unit, geothermal power plant/unit, solar power plant/unit, wave power plant/unit or tidal power plant/unit?	/1/ /33/	DR	The project activity is the installation of a greenfield wind power plant that is connected to the national grid, as confirmed in the 2 nd Brazilian Auction of Reserve Energy - Auction n° 003/2009 - LER-2009. /33/		OK
B.2.2	How was it validated that project complies with the following applicability criteria: 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?	/1/ /33/	DR	The project does not involve switching from fossil fuel to renewable energy at the project site, as confirmed in the 2 nd Brazilian Auction of Reserve Energy - Auction n° 003/2009 - LER-2009. /33/		OK
B.2.3	Is the selected baseline on of the baseline(s) described in the methodology and this hence confirms the applicability of the methodology?	/1/ /25/	DR	Yes. The selected baseline of the project is based on the baseline described in ACM0002 (version 12.1.0.). Therefore, it is deemed that the approved methodology ACM0002 Version 12.1.0. is applicable to the project activity. /25/		OK
B.3 Project boundary (VVM para 78-80)						
B.3.1	What are the project’s system boundaries (components and facilities used to mitigate GHGs)? Are they clearly defined and in accordance with the methodology?	/1/ /27/.	DR	The spatial extent of the project boundary is correctly defined as the site of project activity and the system boundary for the grid electricity system is also correctly defined as all power plants connected physically to the National Interconnected System (SIN), the electricity grid		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				of Brazil, to which the project will be connected. Project and system boundaries are defined in accordance with applicable guidelines of both ACM0002 /25/ and the “Tool to calculate the emission factor for an electricity system”/27/.		
B.3.2	Which GHG sources are identified for the project? Does the identified boundary cover all possible sources linked to the project activity? Give reference to documents considered to arrive at this conclusion.	/1/	DR	The only GHG source applied is the CO ₂ generated by fossil fuel power plants connected to the National Interconnected System (SIN), the electricity grid of Brazil.		OK
B.3.3	Does the project involve other emissions sources not foreseen by the methodologies that may question the applicability of the methodology? Do these sources contribute with more than 1% of the estimated emission reductions of the project?	/1/	DR	No, the project activity does not involve other emissions sources.		OK
B.4 Baseline scenario determination (VVM para 81-88, 105-107) <i>Ensure that the evaluation of all alternatives provided in the PDD and required by the methodology and also possible alternatives/offshoots of alternatives are discussed. Check that all alternatives required to be considered by the methodology are included in the final PDD. If baseline alternatives required to be considered by the methodology are considered not applicable, please assess the justification for this.</i>						
B.4.1	Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/ /25/ /27/	DR	The baseline is in accordance with ACM0002 version 12.1.0. /25/ that electricity delivered to the grid by project activity would otherwise have been generated by the operation of grid-connected power plants in SIN and by the addition of new generation sources, as reflected in the combined margin (CM) calculations		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				described in the “ <i>Tool to calculate the emission factor for an electricity system</i> ” /27/		
B.4.2	How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/ /25/	DR	Not applicable, as ACM0002 prescribes the baseline scenario./25/		OK
B.4.3	What is the baseline scenario?	/1/	DR	Refer to B.4.1.		OK
B.4.4	Is the determination of the baseline scenario in accordance with the guidance in the methodology?	/1/ /25/	DR	The baseline determination is in line with ACM0002. /25/		OK
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /25/	DR	This is not applicable as the baseline is directly determined as per ACM0002. /25/		OK
B.4.6	Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/ /25/	DR	This is not applicable as the baseline is directly determined as per ACM0002. /25/		OK
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /25/	DR	This is not applicable as the baseline is directly determined as per ACM0002. /25/		OK
B.4.8	Is the baseline determination adequately documented in the PDD? <ul style="list-style-type: none"> • All assumptions and data used by the project participants are listed in the PDD and related document to be submitted for registration. The data are properly referenced. • All documentation is relevant as well as correctly quoted and interpreted. • Assumptions and data can be deemed reasonable • Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD. • The methodology has been correctly applied to identify what would occurred in the absence of the proposed CDM project activity 	/1/	DR	The baseline determination has been adequately documented in the PDD: <ul style="list-style-type: none"> • Not applicable. • Not applicable. • Not applicable. • Not applicable. • The methodology has been correctly applied to identify the baseline scenario. 		OK

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5 Additionality determination (VVM para 94-121)						
B.5.1	What approach/tool does the project use to assess additionality? Is this in line with the methodology?	/1/ /25/ /26/	DR	As required by ACM0002 /25/, the additionality of the project has been established using the “ <i>Tool for the demonstration and assessment of additionality</i> ” (version 5.2). /26/		OK
B.5.2	Have the regulatory requirements correctly been taken into account to evaluate the project activity and the alternatives?	/1/	DR	Yes, the baseline alternative complies with regulatory requirements.		OK
B.5.3	Is sufficient evidence provided to support the relevance of the arguments made?	/1/	DR	Yes, as described below in the following items.		OK
B.5.4	What is the project additionality mainly based on (Investment analysis or barrier analysis)?	/1/	DR	The additionality is based in investment analysis.		OK
Prior consideration of CDM (VVM para 98-103)						
B.5.5	What is the evidence for serious consideration of CDM prior to the time of decision to proceed with the project activity?	/1/ /6/ /7/ /29/	DR	For this proposed project with a starting date of the project activity being 14 December 2009, so after 2 August 2008, notifications to both the UNFCCC and the DNA were required as per Annex 22 of EB 49 /29/ valid at the time of the starting date of the project. Notification on the CDM activity was submitted to both UNFCCC and the DNA on 3 May 2010 /6/ /7/ and confirmation of receipt on 3 May 2010 from the UNFCCC and 4 May 2010 from the DNA. Since the validation started on 5 November 2010 by webhosting and global stakeholder consultation, which is less than one year after that, sufficient efforts to secure CDM in parallel with the implementation have been demonstrated.		OK
B.5.6	If the starting date is after 2 August 2008 and before the global stakeholder consultation, has the DNA and UNFCCC confirmed that the project participants have informed in writing of the project’s intention to seek CDM status?	/1/ /6/ /7/	DR	For this proposed project with a starting date of the project activity being 14 December 2009, so after 2 August 2008, notifications to both the UNFCCC and the DNA were required as		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
		/29/		per Annex 22 of EB 49 /29/ valid at the time of the starting date of the project. Notification on the CDM activity was submitted to both UNFCCC and the DNA on 3 May 2010 /6/ /7/ and confirmation of receipt on 3 May 2010 from the UNFCCC and 4 May 2010 from the DNA. Since the validation started on 5 November 2010 by webhosting and global stakeholder consultation, which is less than one year after that, sufficient efforts to secure CDM in parallel with the implementation have been demonstrated.		
Continuous efforts to secure CDM status (only to be completed if starting date is before 2 August 2008)						
B.5.7	What initiatives were taken by the project participants from the starting date of the project activity to the start of validation in parallel with the physical implementation of the project activity?	/1/	DR	It is not applicable to the proposed project activity as its starting date is after 2 August 2008.		OK
B.5.8	When did the construction of the project activity start?	/1/	DR	It is not applicable to the proposed project activity as its starting date is after 2 August 2008.		OK
B.5.9	When was the project commissioned?	/1/	DR	It is not applicable to the proposed project activity as its starting date is after 2 August 2008.		OK
B.5.10	Does the timeline of the project confirm that continuous actions in parallel with the implementation were taken to secure CDM status?	/1/	DR	It is not applicable to the proposed project activity as its starting date is after 2 August 2008.		OK
Investment analysis (VVM para 108-114) <i>The list of questions below must be adjusted to the parameters in the investment analysis relevant to the project under validation.</i>						
B.5.11	Does the project activity or any of the remaining alternatives generate revenues apart from CDM? Is this reflected in the PDD?	/1/	DR	Yes, the proposed project activity generates financial and economic benefits through the sales of electricity other than CDM-related income		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.12	Do any of the alternatives to the project activity involve investment? Is this reflected in the PDD?	/1/	DR	No, the other alternatives listed in the investment analysis do not involve investments.		OK
B.5.13	Is the choice of benchmark analysis, investment comparison or simple cost analysis correct?	/1/	DR	Since the proposed project generates financial and economic benefits through the sales of electricity other than CDM-related income, a benchmark analysis is correctly selected as the analysis method.		OK
B.5.14	Is the benchmark/discount rate the latest available at the time of decision?	/1/	DR	<p>The benchmark is defined as the weighted average cost of capital (WACC), it was estimated using an Adjusted-Beta CAPM.</p> <p>The selected benchmark (WACC) was calculated to be 16.36% based in the Capital Asset Pricing Model (CAPM) as per the option 6 (a) presented in the additionality tool. However, the information provided in section B.5 of the PDD is not sufficient to clearly describe how WACC was calculated. Hence, the benchmark calculation needs to be thoroughly presented in section B.5, all parameters used in its composition and estimates need to be explained. It is required to be demonstrated that the input values used in the benchmark are valid and applicable at the time of taking the investment decision by the project participants.</p>	CAR4	OK
B.5.15	What is the financial indicator? Is it on equity/project basis? Before/after tax? Is the financial indicator in correspondence with the benchmark?	/1/	DR	<p>The financial indicator is project IRR calculated after tax, and therefore in correspondence with the benchmark chosen.</p> <p>DNV requests project participant to include in the PDD the tax Social Contribution on Net Profit (CSLL) charged on the project and used in the</p>	CL9	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				investment analysis /5/.		
B.5.16	Are the underlying assumptions appropriate, e.g. what is considered as waste in the baseline is considered to have zero value?	/1/	DR	See B.5.14	CAR4	OK
B.5.17	Does the income tax calculation take depreciation into account? Is the depreciation year in accordance with normal accounting practice in the host country?	/1/	DR	See B.5.14	CAR4	OK
B.5.18	Is the time period of the investment analysis and operating time of the project realistic? Has salvage value been taken into account? Is working capital returned in the last year of operation?	/1/	DR	Project participants are requested to include information about PLF in the PDD and provide documental evidences. See B.5.14 Project participants are requested to provide documental evidence in order to confirm the expected operational lifetime of the project activity.	CAR4 CAR4 CL1	OK
B.5.19	When a feasibility study report or similar approved by the government is used as the basis for the investment analysis: Can it be confirmed that the values used in the PDD are fully consistent with the FSR and is the period of time between finalization of the FSR and the investment decision adequate?	/1/	DR	Not applicable.		OK
B.5.20	How was the amount of output (e.g. sales of electricity) assessed? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/	DR	<input type="checkbox"/> The plant load factor provided to banks and/or equity financiers while applying the project activity for project financing, or to the government while applying the project activity for implementation approval <input type="checkbox"/> The plant load factor determined by a third party contracted by the project participants (e.g. an engineering company) <input type="checkbox"/> Other approach. <i>Provide details on how the load factor was</i>	CAR4	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<i>validated::</i> Project participants are requested to include information about PLF in the PDD and provide documental evidences.		
B.5.21 How was the output price (e.g. electricity price) assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/ /33/	DR	<input checked="" type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants <i>Provide details on how the output price was validated:</i> Electricity price was determined in the 2 nd Brazilian Auction of Reserve Energy - Auction n° 003/2009 - LER-2009 and was available at the time of decision. /33/		OK
B.5.22 How were the investment costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/	DR	<input type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input type="checkbox"/> Review of feasibility reports, public announcements, contracts and annual financial reports related to the project and the project participants <i>Provide details on how the investment costs were validated:</i> In accordance with paragraph 6 of CDM M&P information used to determine additionality, to describe the baseline methodology and its application, and to support an environmental impact assessment, shall not be considered proprietary or confidential. Project participants shall therefore, in accordance with paragraph 45 (b) of CDM M&P describe the choice of	CAR5	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>approaches, assumptions, methodologies, parameters, data sources, key factors and additionality in a transparent and conservative manner. The scope and detail of the description in the PDD should allow interested parties to reproduce the rationale of the project.</p> <p>Project participants are requested to present on PDD detailed investment analysis, presenting the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates.</p> <p>Moreover, the input parameters used in the financial analysis are not justified to be reasonable and adequately represent the economic situation of the project. Evidence is to be provided for the assumed input parameters. In addition, it is required to be demonstrated that the input values used in the investment analysis are valid and applicable at the time of taking the investment decision by the project participants. The IRR calculation with CERs revenues should also be included in the spreadsheet and PDD.</p>		
B.5.23 How were the O&M costs assessed? Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/	DR	<p><input type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices)</p> <p><input type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants</p> <p><i>Provide details on how the O&M costs were validated:</i></p> <p>In accordance with paragraph 6 of CDM M&P information used to determine additionality, to describe the baseline methodology and its</p>	CAR5	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>application, and to support an environmental impact assessment, shall not be considered proprietary or confidential. Project participants shall therefore, in accordance with paragraph 45 (b) of CDM M&P describe the choice of approaches, assumptions, methodologies, parameters, data sources, key factors and additionality in a transparent and conservative manner. The scope and detail of the description in the PDD should allow interested parties to reproduce the rationale of the project.</p> <p>Project participants are requested to present on PDD detailed investment analysis, presenting the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates.</p> <p>Moreover, the input parameters used in the financial analysis are not justified to be reasonable and adequately represent the economic situation of the project. Evidence is to be provided for the assumed input parameters. In addition, it is required to be demonstrated that the input values used in the investment analysis are valid and applicable at the time of taking the investment decision by the project participants. The IRR calculation with CERs revenues should also be included in the spreadsheet and PDD.</p>		
B.5.24 Describe the assessment of the other input parameters. Were the data available and valid at the time of decision? Remember to include all the data sources used and list all the projects that have been used for cross-checking in accordance with VVM paragraph 95.	/1/	DR	<input type="checkbox"/> Cross-check against third-party or publicly available sources (e.g. invoices or price indices) <input type="checkbox"/> Review of feasibility reports, public announcements and annual financial reports related to the project and the project participants	CAR5	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p><i>Provide details on how other input parameters were validated:</i></p> <p>In accordance with paragraph 6 of CDM M&P information used to determine additionality, to describe the baseline methodology and its application, and to support an environmental impact assessment, shall not be considered proprietary or confidential. Project participants shall therefore, in accordance with paragraph 45 (b) of CDM M&P describe the choice of approaches, assumptions, methodologies, parameters, data sources, key factors and additionality in a transparent and conservative manner. The scope and detail of the description in the PDD should allow interested parties to reproduce the rationale of the project.</p> <p>Project participants are requested to present on PDD detailed investment analysis, presenting the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates.</p> <p>Moreover, the input parameters used in the financial analysis are not justified to be reasonable and adequately represent the economic situation of the project. Evidence is to be provided for the assumed input parameters. In addition, it is required to be demonstrated that the input values used in the investment analysis are valid and applicable at the time of taking the investment decision by the project participants. The IRR calculation with CERs revenues should also be included in the spreadsheet and PDD.</p>		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.25 Was the financial calculation spreadsheet verified and found to be correct?	/1/	DR	<p>In accordance with paragraph 6 of CDM M&P information used to determine additionality, to describe the baseline methodology and its application, and to support an environmental impact assessment, shall not be considered proprietary or confidential. Project participants shall therefore, in accordance with paragraph 45 (b) of CDM M&P describe the choice of approaches, assumptions, methodologies, parameters, data sources, key factors and additionality in a transparent and conservative manner. The scope and detail of the description in the PDD should allow interested parties to reproduce the rationale of the project.</p> <p>Project participants are requested to present on PDD detailed investment analysis, presenting the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates.</p> <p>Moreover, the input parameters used in the financial analysis are not justified to be reasonable and adequately represent the economic situation of the project. Evidence is to be provided for the assumed input parameters. In addition, it is required to be demonstrated that the input values used in the investment analysis are valid and applicable at the time of taking the investment decision by the project participants. The IRR calculation with CERs revenues should also be included in the spreadsheet and PDD.</p>	CAR5	OK
B.5.26 Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or	/1/ /30/	DR	A sensitivity analysis has been performed by decreasing and increasing in 10% the investments	CAR6	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
implementation been identified? Has possible correlation between the parameters been considered?				costs, operation and maintenance costs and electricity price. As per the CDM Executive Board: “Guidelines on the Assessment of Investment Analysis” (Version 3.1) – Annex 58 EB51 /30/ the sensitivity analysis must include the variables that represent 20% of either total project costs or total project revenues. These parameters must be subject to reasonable variations, i.e.: the sensitivity of variables where it would reach the benchmark value needs to be considered. In addition, project participants are requested to justify why these variations are not reasonable. Project participants are also requested to include the electricity generation in the sensitivity analysis.		
B.5.27	Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/	DR	See B.5.26	CAR6	OK
B.5.28	Have the key parameters been varied to reach the benchmark and the likelihood of this to happen been justified to be small?	/1/	DR	See B.5.26	CAR6	OK
Barrier analysis (VVM para 115-118)						
B.5.29	Are the barriers identified complimentary to a potential investment analysis? Does the barrier have a clear impact on the financial returns so that it can be assessed in an investment analysis? Each barrier is discussed separately.	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.30	How were the <u>investment barriers</u> assessed to be real? Are the investment barriers substantiated by a source independent of the project participants?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.31	How does CDM alleviate the investment barriers?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.32	Is the project activity prevented by the investment barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.33	How were the <u>technological barriers</u> assessed to be real? Are the technological barriers substantiated by a source independent of the project participants?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.34	How does CDM alleviate the technological barriers?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.35	Is the project activity prevented by the technological barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.36	How were the <u>barriers due to prevailing practise</u> assessed to be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.37	How does CDM alleviate the barriers due to prevailing practise?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.38	Is the project activity prevented by the barriers due to prevailing practise and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.39	How were the <u>other barriers</u> assessed to be real? Are the other barriers substantiated by a source independent of the project participants?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.40	How does CDM alleviate the other barriers?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK
B.5.41	Is the project activity prevented by the other barriers and at least one of the possible alternatives to the project activity is feasible under the same circumstances?	/1/	DR	Not applicable as barrier analysis was not applied for the proposed project.		OK

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Common practice analysis (VVM para 119-121)						
B.5.42	What is the geographical scope of the common practice analysis? Is this justified?	/1/	DR	The common practice analysis is made for Brazil. This is reasonable since all power plants connected to the Brazil grid are considered.		OK
B.5.43	What is the scope of technology and size (e.g. capacity of power plant) for the common practice analysis and how has this been justified?	/1/	DR	All wind power plants in Brazil are analyzed.		OK
B.5.44	What is the data source(s) used for the common practice analysis?	/1/ /34/	DR	ANEEL data from the Bank of Information of Generation in Brazil /34/ is used to analyze other wind power plants.		OK
B.5.45	How many similar non-CDM-projects exist in the region within the scope?	/1/	DR	DNV requests project participant to provide documents not accessible in the world wide web and that were used in the common practice analysis.	CL8	OK
B.5.46	How were possible essential distinctions between the project activity and similar activities assessed?	/1/	DR	See B.5.45	CL8	OK
B.5.47	What is the conclusion of the common practice analysis?	/1/	DR	See B.5.45	CL8	OK
Conclusion						
B.5.48	What is the conclusion with regard to the additionality of the project activity?	/1/	DR	It is DNV's opinion that the project is additional.		OK
B.6 Calculations of GHG emission reductions						
Data and parameters that are available at validation and that are not monitored (VVM para 199-203)						
B.6.1	How was the grid emission factor verified?	/1/	DR	The only parameters determined <i>ex-ante</i> are W_{OM} and W_{BM}		OK
Baseline emissions (VVM para 89-93)						
B.6.2	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /27/	DR	Baseline emissions (BE_y in tCO_2) are the product of the baseline emissions factor (EF_y in	CL5 CAR3	OK

MoV = Means of Verification, DR= Document Review, I= Interview, CC= Cross-Checking

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	/32/		<p>tCO₂/MWh) times the electricity supplied by the project activity to the grid (EG_y in MWh).</p> <p>The baseline emission factor for the project will be determined <i>ex-post</i> as a combined margin, consisting of combination of the operating margin (OM) and build margin (BM) according to “<i>Tool to calculate the emission factor for an electricity system</i>” version 2 /27/ for the fixed 10 years crediting period.</p> <p>The Brazilian grid emission factor has been recently published by the DNA of Brazil /32/. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid.</p> <p>The system boundary for the grid electricity system affected by the project is defined as the system of the Brazilian grid (SIN).</p> <p>It has been calculated as the weighted average ($w_{OM} = 0.75$; $w_{BM} = 0.25$) of the operating margin and the build margin emission factors.</p> <p>Regarding to the grid emission factor, there are two points to be revised:</p> <ul style="list-style-type: none"> - OM emission factor. <p>The Brazilian grid emission factor has been recently published by the DNA of Brazil. The Brazilian DNA published the values of OM and BM emission factors and not values for CO₂ emission factor for grid power units in the top of the dispatch order in hour h in year y as</p>		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>mentioned in the PDD. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid in the year.</p> <p>The Brazilian DNA applies the dispatch data analysis OM.</p> <p>As per “<i>Tool to calculate the emission factor for an electricity system (version 2)</i>”:</p> <p><i>“For the dispatch data analysis OM, <u>use the year in which the project activity displaces grid electricity</u> and update the emission factor annually during monitoring.”</i></p> <p>The OM emission factor is calculated in the PDD as an average of the four previous years (2006-2009) instead of just for one year. Therefore project participants are requested to revise the OM emission factor value applied in the calculation of the grid emission factor.</p> <p>BM emission factor.</p> <p>The build margin emissions factor is the generation-weighted average emission factor (tCO₂/MWh) of all power units m during the most recent year y for which power generation data is available. Thus, as OM, BM emission factor needs to be determined for just one year and not as an average for four years as stated in the PDD.</p> <p>Since the PDD was webhosted on 5 November 2010, data for 2009 needs to be applied as this is</p>		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				the most recent electricity generation data by the time the PDD was webhosted. Project participants are requested to remove the reference to "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" from the PDD since this tool is not used in the calculation of the project emissions.		
B.6.3	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	See B.6.2	CL5	OK
B.6.4	Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	See B.6.2	CL5	OK
Project emissions (VVM para 89-93)						
B.6.5	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	There are no emissions resulted from the operation of project activity which is a renewable energy project based in wind generation.		OK
B.6.6	Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Not applicable.		OK
B.6.7	Are uncertainties in the project emission estimates properly addressed?	/1/	DR	Not applicable.		OK
Leakage (VVM para 89-93)						
B.6.8	Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /25/	DR	As per ACM0002, no leakage has to be considered for the proposed project activity.		OK
B.6.9	Have conservative assumptions been used when calculating the leakage emissions?	/1/	DR	Not applicable.		OK
B.6.10	Are uncertainties in the leakage emission estimates properly addressed?	/1/	DR	Not applicable.		OK
Emission Reductions (VVM para 89-93)						
B.6.11	Algorithms and/or formulae used to determine emission reductions:	/1/	DR	While it is estimated that 726 712 MWh of electricity will be generated per year when all		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<ul style="list-style-type: none"> All assumptions and data used by the project participants are listed in the PDD and related document submitted for registration. The data are properly referenced All documentation is correctly quoted and interpreted. All values used can be deemed reasonable in the context of the project activity The methodology has been correctly applied to calculate the emission reductions and this can be replicated by the data provided in the PDD and supporting files to be submitted for registration. 				plants are operational, the PDD correctly estimates that the total emission reductions from the project will be 149 358 tCO ₂ e per year along the selected 10-year fixed crediting period (which starts on 1 July 2012 or the date of registration of the CDM project activity, whichever is later). The emission reduction estimation can be replicated using data and parameters values provided in the PDD and supporting files submitted for registration. The data sources mentioned were verified by DNV. In summary, the GHG calculations are complete and transparent, and their accuracy has been verified. No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been found.		
B.7 Monitoring plan (VVM para 122-124)						
Data and parameters monitored						
B.7.1	Do the means of monitoring described in the plan comply with the requirements of the methodology?	/1/ /25/	DR	Yes. The means of monitoring described in the plan complies with ACM0002 version 12.1.0.. /25/		OK
B.7.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR	The parameters monitored <i>ex-post</i> are the net electricity generation from the proposed project activity, the operating margin, build margin and combined margin emission factors. The net electricity dispatched will be measured through the metering equipment at the point of connection of Electricity generation from renewable sources - Windfarms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurús VI to the Brazilian grid.	CAR7 CAR3 CL4	OK

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>The power exported to and imported from the SIN will be monitored continuously and recorded on a monthly basis. In addition, the electricity sales receipts will be provided for data quality control and cross check. Data will be archived for 2 years following the end of the last crediting period.</p> <p>The PDD describes in a general way the equipment to be used for monitoring purposes. Additional relevant technical details about the type of electricity meter and accuracy are requested to be included in appropriate sections of the PDD. Therefore, the monitoring plan must present detailed information about the requirements for maintenance and calibration of the measurement equipment.</p> <p>According to the “<i>Tool to calculate the emission factor for an electricity system</i>”, the dispatch data analysis OM method was considered for the determination of the operating margin (OM). Thus, combined margin CO₂ emission factor (EF_{grid,CM,y}) will be monitored <i>ex-post</i>. The Brazilian grid emission factor has been recently published by the DNA of Brazil. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid.</p> <p>Regarding to the grid emission factor, there are two points to be revised:</p> <ul style="list-style-type: none"> - OM emission factor. <p>The Brazilian grid emission factor has been recently published by the DNA of Brazil. The</p>		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>Brazilian DNA published the values of OM and BM emission factors and not values for CO2 emission factor for grid power units in the top of the dispatch order in hour h in year y as mentioned in the PDD. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid in the year.</p> <p>The Brazilian DNA applies the dispatch data analysis OM.</p> <p>As per “Tool to calculate the emission factor for an electricity system (version 2)”:</p> <p>“For the dispatch data analysis OM, use the year in which the project activity displaces grid electricity and update the emission factor annually during monitoring.”</p> <p>The OM emission factor is calculated in the PDD as an average of the four previous years (2006-2009) instead of just for one year. Therefore project participants are requested to revise the OM emission factor value applied in the calculation of the grid emission factor.</p> <p>BM emission factor.</p> <p>The build margin emissions factor is the generation-weighted average emission factor (tCO2/MWh) of all power units m during the most recent year y for which power generation data is available. Thus, as OM, BM emission factor needs to be determined for just one year and not as an average for four years as stated in</p>		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				the PDD. Since the PDD was webhosted on 5 November 2010, data for 2009 needs to be applied as this is the most recent electricity generation data by the time the PDD was webhosted. The parameters OM and CM, published by the Brazilian DNA must be included in section B.7.1 of the PDD.		
B.7.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR	See B.7.2	CAR7 CAR3 CL4	OK
B.7.4	In case parameters are measured, is the measurement accuracy addressed and deemed appropriate? Describe each relevant parameter.	/1/	DR	See B.7.2	CAR7 CAR3 CL4	OK
B.7.5	In case parameters are measured, are the requirements for maintenance and calibration of measurement equipment described and deemed appropriate? Describe each relevant parameter.	/1/	DR	See B.7.2	CAR7 CAR3 CL4	OK
B.7.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	See B.7.2	CAR7 CAR3 CL4	OK
B.7.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	See B.7.2	CAR7 CAR3 CL4	OK
Ability of project participants to implement monitoring plan						
B.7.8	How has it been assessed that the monitoring arrangements described in the monitoring plan are feasible within the project design?	/1/	DR	Authorities and responsibilities for project management, monitoring and reporting activities are clearly defined. However, the project's monitoring plan should include detailed	CAR8	OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				information regarding data and parameters to be monitored, compilation of the monitored data and dealing with errors, QA/QC procedures, training plan, calibration and record keeping.		
B.7.9	Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?			See B.7.8.	CAR8	OK
B.7.10	Are the data management and quality assurance and quality control procedures sufficient to ensure that the emission reductions achieved by/resulting from the project can be reported ex post and verified?	/1/	DR	See B.7.8.	CAR8	OK
B.7.11	Will all monitored data required for verification and issuance be kept for two years after the end of the crediting period or the last issuance of CERs, for this project activity, whichever occurs later?	/1/	DR	See B.7.8.	CAR8	OK
Monitoring of sustainable development indicators/ environmental impacts						
B.7.12	Is the monitoring of sustainable development indicators/ environmental impacts warranted by legislation in the host country?	/1/ /25/	DR	Neither ACM0002 /25/ nor the Brazilian DNA requires collection and archiving of relevant data concerning environmental, social and economic impacts.		OK
B.7.13	Does the monitoring plan provide for the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	See B.7.12		OK
B.7.14	Are the sustainable development indicators in line with stated national priorities in the host country?	/1/	DR	See B.7.12		OK
C Duration of the project activity / crediting period						
C.1.1 Start date of project activity (VVM para 99-100, 104)						
C.1.2	How has the starting date of the project activity been	/1/	DR	The starting date of the project activity is defined	CAR2	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
determined? What are the dates of the first contracts for the project activity? When was the first construction activity?	/28/		<p>in section C.1.1 of the PDD as 14 December 2009, the date in which CPFL Geração de Energia S/A participated in the 2nd Brazilian Auction of Reserve Energy and had the wind farms contracted.</p> <p>According to the “Glossary of CDM terms (version 05), “The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity (...) the start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity.</p> <p>Thus, project proponents are requested to provide documental evidence of the starting date of the project as the earliest of implementation, construction and real action in line with the definition in the CDM EB: Glossary of CDM Terms /28/.</p> <p>In addition, project participants are requested to clearly describe in section B.5 of the PDD the project start date in order to confirm that this date is after 2 August 2008.</p>		
C.1.3 Is the stated expected operational lifetime of the project activity reasonable?	/1/	DR	The expected operational lifetime of the project activity is 20 years. Project participants are requested to provide documental evidence in order to confirm the expected operational lifetime of the project activity.	CC	OK
C.1.4 Is the start date, the type (renewable/fixed) and the length of the crediting period clearly defined and reasonable?	/1/	DR	A 10-year fixed crediting period has been chosen for the project, starting on 1 July 2012 or the registration date, whichever is later. The chosen		OK

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Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				crediting starting date is deemed to be reasonable.		
D Environmental Impacts (VVM para 131-133)						
D.1.1	Are there any host country requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved? Does the approval contain any conditions that need monitoring?	/1/ /36/	DR	According to Brazilian environmental law a Simplified Environmental Report (RAS) is required to grant the installation license. As stated in the PDD, a Simplified Environmental Report (RAS) has been conducted according to Brazilian law and regulation /36/.		OK
D.1.2	Does the project comply with environmental legislation in the host country?	/1/ /8/	DR	Yes. The project complies with Brazilian environmental legislation. DNV was able to verify that all wind farms were granted the Preliminary License issued by the Institute of Environment and Sustainable Development of the state of Rio Grande do Norte (IDEMA) which were valid for 2 years /8/.		OK
D.1.3	Will the project create any adverse environmental effects?	/1/	DR	Although no significant environmental impacts are expected from the project activity, the potential environmental impacts should be sufficiently identified in the PDD. DNV requests project participant to sufficiently identify the potential environmental impacts in the PDD and to provide the approved RAS (Simplified Environmental Report) or the Installation License.	CL6	OK
D.1.4	Have identified environmental impacts been addressed in the project design?	/1/	DR	See D.1.3	CL6	OK
D.1.5	Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	See D.1.3	CL6	OK
D.1.6	Are transboundary environmental impacts considered in the analysis?	/1/	DR	See D.1.3	CL6	OK

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Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
E Stakeholder Comments (VVM para 128-130)					
E.1.1 Have relevant stakeholders been consulted?	/1/	DR	Local stakeholders, such as the Municipal governments and City Councils, Federal and State Attorney, the environmental state and local agencies, the Brazilian forum of NGOs and local communities associations, were invited on 2 August 2010 to comment on the project - in accordance with the requirements of Resolution 7 (5 March 2008) of the Brazilian DNA.		OK
E.1.2 Have appropriate media been used to invite comments by local stakeholders?	/1/ /2/	DR	Yes, DNV has checked all the invitation letters and the mail receipts /2/.		OK
E.1.3 If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	Refer to E.1.1.		OK
E.1.4 Is a summary of the stakeholder comments received provided?	/1/	DR	Yes. The project activity received just one comment from the Federal prosecution explaining that the entity is not able to analyse the project.		OK
E.1.5 Has due account been taken of any stakeholder comments received?	/1/	DR	The only comment receive did not require any action.		OK

Table 3 Resolution of corrective action requests and clarification requests

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>CAR1</p> <p>Project participants are requested to include information about PLF in the PDD and provide documental evidences.</p>	<p>A.2.4</p> <p>B.5.18</p> <p>B.5.20</p>	<p>The information about the Plant Load Factor (PLF) has been included in the section A.4.3 of the PDD. The evidences about the PLF (Camargo Schubert Reports - <i>Certificação de Medições Anemométricas e Certificação de Produção de Energia</i>, Ref. C&S-CEG-271/10 (rev-03), C&S-CEG-272/10 (rev-03), C&S-CEG-273/10 (rev-03), C&S-CEG-274/10 (rev-03), C&S-CEG-275/10 (rev-03), C&S-CEG-276/10 (rev-03) and C&S-CEG-277/10 (rev-03)) have been given to the DOE during the site visit.</p>	<p>DNV verified the documents provided (Certificates of Wind Measurements and of Production of Energy elaborated by Consultancy Camargo Schubert for wind farms Santa Clara I, Santa Clara II, Santa Clara III, Santa Clara IV, Santa Clara V, Santa Clara VI and Eurús VI about the plant load factor of the wind farms /13/), elaborated to verify the feasibility of the project, and they contain the plant load factors of each wind park.</p> <p>Therefore, the CAR is closed.</p>
<p>CAR2</p> <p>The starting date of the project activity is defined in section C.1.1 of the PDD as 14 December 2009, the date in which CPFL Geração de Energia S/A participated in the 2nd Brazilian Auction of Reserve Energy and had the wind farms contracted.</p> <p>According to the “<i>Glossary of CDM terms (version 05)</i>”, “<i>The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity (...) the start date shall be considered to be the date on which the project participant has committed</i></p>	<p>C.1.2</p>	<p>The Starting Date of the project activity, 14 December 2009, represents the realization of Brazilian 2nd Reserve Power Auction (2^o <i>Leilão de Energia de Reserva - Leilão nº 003/2009 - LER-2009</i>), in which the seven electricity generation facilities Santa Clara I, II, III, IV, V, VI and Eurús VI had its energy contracted and its contract for the supply of equipment and services validated. According to the Memorandum of Understanding signed with Wobben on 11 December 2009, if the project proponent is successful in its</p>	<p>DNV confirmed that the signing of the Memorandum of Understanding /10/ incurred in relevant expenses to CPFL Geração de Energia S/A when the company was successful in the 2nd Reserve Power Auction, therefore establishing the date of this event as the project starting date. Based on this, DNV acknowledges that the CPFL Geração de Energia S/A and Key Consultoria e Treinamento Ltda. were able to guarantee that CDM was considered in the project prior to the decision making.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p><i>to expenditures related to the implementation or related to the construction of the project activity.</i></p> <p>Thus, project proponents are requested to provide documental evidence of the starting date of the project as the earliest of implementation, construction and real action in line with the definition in the CDM EB: Glossary of CDM Terms /28/.</p> <p>In addition, project participants are requested to clearly describe in section B.5 of the PDD the project start date in order to confirm that this date is after 2 August 2008.</p>		<p>participation at the Brazilian 2nd Reserve Power Auction, the project proponent and Wobben agree to enter into the contracts for the supply of equipment and services for the project activity (the main component of total required investments). So, inline with the Glossary of CDM terms (version 05): <i>“The starting date of a CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity (...) the start date shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity”</i>, the starting date of the project activity is 14 December 2009. The Memorandums of Understanding signed with Wobben have been given to the DOE during the site visit. The description about the starting date has been included in the section B.5 of the PDD.</p>	<p>Therefore, the CAR is closed.</p>
<p>CAR3</p> <p>Regarding to the grid emission factor, there are two points to be revised:</p> <ul style="list-style-type: none"> - OM emission factor. 	<p>B.6.2 B.7.2 to B.7.7</p>	<p>The OM and BM emission factors have been revised according to CAR 3. All calculations and the PDD have been revised.</p>	<p>The revised PDD /1/ and Excel spreadsheets /3/ /4/ /5/ were assessed by DNV. DNV verified that the calculation of the combined margin emission factor is correct and based on the most recent</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>The Brazilian grid emission factor has been recently published by the DNA of Brazil. The Brazilian DNA published the values of OM and BM emission factors and not values for CO₂ emission factor for grid power units in the top of the dispatch order in hour h in year y as mentioned in the PDD. The calculations are based on electricity generation data provided by the National Operator System (ONS) for the electricity generated in the grid in the year.</p> <p>The Brazilian DNA applies the dispatch data analysis OM.</p> <p>As per <i>“Tool to calculate the emission factor for an electricity system (version 2)”</i>:</p> <p><i>“For the dispatch data analysis OM, <u>use the year in which the project activity displaces grid electricity</u> and update the emission factor annually during monitoring.”</i></p> <p>The OM emission factor is calculated in the PDD as an average of the four previous years (2006-2009) instead of just for one year. Therefore project participants are requested to revise the OM emission factor value applied in the calculation of the grid emission factor.</p> <ul style="list-style-type: none"> - BM emission factor. <p>The build margin emissions factor is the generation-weighted average emission factor</p>			<p>information available at the start of the validation i.e. 5 November 2010.</p> <p>Therefore, the CAR is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>(tCO₂/MWh) of all power units <i>m</i> during the most recent year <i>y</i> for which power generation data is available. Thus, as OM, BM emission factor needs to be determined for just one year and not as an average for four years as stated in the PDD.</p> <p>Since the PDD was webhosted on 5 November 2010, data for 2009 needs to be applied as this is the most recent electricity generation data by the time the PDD was webhosted.</p>			
<p>CAR4</p> <p>The selected benchmark (WACC) was calculated to be 16.36% based in the Capital Asset Pricing Model (CAPM) as per the option 6 (a) presented in the additionality tool. However, the information provided in section B.5 of the PDD is not sufficient to clearly describe how WACC was calculated. Hence, the benchmark calculation needs to be thoroughly presented in section B.5, all parameters used in its composition and estimates need to be explained. It is required to be demonstrated that the input values used in the benchmark are valid and applicable at the time of taking the investment decision by the project participants.</p>	<p>B.5.14 B.5.16 to B.5.18</p>	<p>The benchmark calculation has been revised and all parameters used in its composition and estimates have been explained in section B.5 of the PDD.</p> <p>The project participants did not change the input values, only the calculation method of R_m = Expected Return on a Risky Asset (Market Return) was altered. The parameter is now calculated by quantifying 4-year return of Bovespa Index and then annualizing the return of the period (previously, annual returns were calculated and then an average of the years was calculated). This modification was applied after comments of the DOE during the validation in regard to the results of this parameter that has been potentially affected by high return variations as a</p>	<p>DNV assessed the revised PDD and verified that benchmark was corrected and parameters were explained. The value of the benchmark was revised from 16.36% in the first version of the PDD to 12.01% due to changes in the calculation methodology, which is the appropriated method.</p> <p>Therefore, this CAR is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>CAR5</p> <p>In accordance with paragraph 6 of CDM M&P information used to determine additionality, to describe the baseline methodology and its application, and to support an environmental impact assessment, shall not be considered proprietary or confidential. Project participants shall therefore, in accordance with paragraph 45 (b) of CDM M&P describe the choice of approaches, assumptions, methodologies, parameters, data sources, key factors and additionality in a transparent and conservative manner. The scope and detail of the description in the PDD should allow interested parties to reproduce the rationale of the project.</p> <p>Project participants are requested to present on PDD detailed investment analysis, presenting the costs related to the equipments, insurance, project installation and operation/maintenance, prices, taxes, resolutions, estimates.</p> <p>Moreover, the input parameters used in the financial analysis are not justified to be reasonable and adequately represent the economic situation of the project. Evidence is to be provided for the assumed input</p>	B.5.22 to B.5.25	<p>consequence of the world crisis.</p> <p>The detailed investment analysis and the IRR calculation with CERs revenues have been included in section B.5 of the PDD. The spreadsheet has been sent to the DOE. The evidences have been sent to the DOE and they demonstrate that input values used in the investment analysis are valid and applicable at the time of the investment decision by the project participants.</p>	<p>DNV assessed the revised PDD and verified that this requirement has been fulfilled by the addition of the input values for the investment analysis. Evidences of the costs were received on 28 February 2011 and therefore this CAR is closed.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
parameters. In addition, it is required to be demonstrated that the input values used in the investment analysis are valid and applicable at the time of taking the investment decision by the project participants. The IRR calculation with CERs revenues should also be included in the spreadsheet and PDD.			
<p>CAR6</p> <p>A sensitivity analysis has been performed by decreasing and increasing in 10% the investments costs, operation and maintenance costs and electricity price. As per the CDM Executive Board: “<i>Guidelines on the Assessment of Investment Analysis</i>” (Version 3.1) – Annex 58 EB51 /30/ the sensitivity analysis must include the variables that represent 20% of either total project costs or total project revenues. These parameters must be subject to reasonable variations, i.e.: the sensitivity of variables where it would reach the benchmark value needs to be considered. In addition, project participants are requested to justify why these variations are not reasonable.</p> <p>Project participants are also requested to include the electricity generation in the sensitivity analysis.</p>	B.5.26 to B.5.28	The sensitivity analysis has been revised according to CAR 7. All calculations and the PDD have been revised.	DNV assessed the revised PDD and verified that the sensitivity analysis was revised to reach the benchmark on the chosen parameters and the possibilities of them to occur were explained. Therefore this CAR is closed..
<p>CAR7</p> <p>The PDD describes in a general way the</p>	B.7.2 to B.7.7	The monitoring plan has been revised in the section B.7.2 of the PDD according	DNV assessed the revised PDD and verified that maintenance and

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
equipment to be used for monitoring purposes. Additional relevant technical details about the type of electricity meter and accuracy are requested to be included in appropriate sections of the PDD. Therefore, the monitoring plan must present detailed information about the requirements for maintenance and calibration of the measurement equipment.		to CAR 8.	calibration were described and therefore this CAR is closed.
CAR8 Authorities and responsibilities for project management, monitoring and reporting activities are clearly defined. However, the project's monitoring plan should include detailed information regarding data and parameters to be monitored, compilation of the monitored data and dealing with errors, QA/QC procedures, training plan, calibration and record keeping.	B.7.8 to B.7.11	The monitoring plan has been revised in the section B.7.2 of the PDD according to CAR 9.	DNV assessed the revised PDD and verified that the required items in the monitoring plan were added. Data and Parameters to be monitored, compilation of the monitored data and dealing with errors, QA/QC procedures, training plan, calibration and record keeping were described and therefore this CAR is closed.
CL1 Project participants are requested to provide documental evidence in order to confirm the expected operational lifetime of the project activity.	B.5.18 C.1.3	The documental evidence in order to confirm the expected operational lifetime of the project activity (ENERCON GmbH – Lifetime of the Wind Turbine ENERCON E-82) has been sent to the DOE.	DNV assessed the document from the manufacturer /15/ that confirms the lifetime of the equipment and therefore this CL is closed.
CL2 There is a mistake in the version of methodology ACM0002 being used in the PDD. The correct version is available and the	B.1.1	The version of methodology ACM0002 has been corrected and the PDD revised.	DNV assessed the revised PDD and verified that the version of the methodology was revised to the most recent version available and therefore

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
PDD must be updated /25/.			this CL is closed.
<p>CL3</p> <p>As the project activity is a new grid-connected wind power plant, the baseline scenario is already defined by the methodology and properly stated in section B.4 of PDD.</p> <p>Therefore, the “<i>Combined tool to identify the baseline scenario and demonstrate additionality</i>” in section B.1 is not in accordance to ACM0002 version 12.1.0.</p>	B.1.2	The section B.1 of the PDD has been revised according to CL3.	DNV assessed the revised PDD and verified the “ <i>Combined tool to identify the baseline scenario and demonstrate additionality</i> ” was removed from section B.1, therefore this CL is closed.
<p>CL4</p> <p>The parameters OM and CM, published by the Brazilian DNA must be included in section B.7.1 of the PDD.</p>	B.7.2 to B.7.7	The parameters monitored in section B.7.1 of the PDD have been revised.	DNV assessed the revised PDD and verified that the parameters OM and CM, were included in section B.7.1. Therefore, the CL is closed.
<p>CL5</p> <p>Project participants are requested to remove the reference to “<i>Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion</i>” from the PDD since this tool is not used in the calculation of the project emissions.</p>	B.6.2 to B.6.4	The section B.1 of the PDD has been revised according to CL5.	DNV assessed the revised PDD and verified that the “ <i>Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion</i> ” was removed from section B.1. Therefore, the CL is closed.
<p>CL6</p> <p>DNV requests project participant to sufficiently identify the potential environmental impacts in the PDD and to provide the approved RAS (Simplified Environmental Report) or the Installation License.</p>	D.1.3 to D.1.6	The potential environmental impacts have been identified in section A.4.3 and section D.2 of the PDD. As described in the RASs, there are no significant negative impacts related to the project activity and most of them have low magnitude and short duration.	There are no major potential environmental impacts and all wind farms granted the Preliminary Licences /8/, which is part of the environmental regulatory process. This is sufficiently described in the PDD /1/. Therefore, the CL is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		The RASs and the Installation Licenses have been sent to the DOE.	
CL7 DNV requests project participant to sufficiently provide evidences of the locations of the wind farms.	A.2.4 A.4.1	Evidences of the locations of the wind farms “ <i>Energetic Research Enterprise (Empresa de Pesquisa Energética – EPE). Entrepreneurship Data Sheet (Ficha de Dados). Santa Clara I, II, III, IV, V, VI, and Eurus VI</i> ” have been sent to the DOE.	DNV assessed documents /16/ from the Brazilian Government’s Company of Energetic Research with information about the wind parks, provided by the Project Participants, that confirm the geographic coordinates of the project and therefore this CL is closed.
CL8 DNV requests project participant to provide documents not accessible in the world wide web and that were used in the common practice analysis.	B.5.45 to B.5.47	The documents not accessible in the world wide web and that were used in the common practice analysis have been sent to DOE.	DNV assessed documents about the economic context of the wind power in Brazil /17/, used by the Project Participants in the common practice analysis and therefore this CL is closed.
CL9 DNV requests project participant to include in the PDD the tax Social Contribution on Net Profit (CSLL) charged on the project and used in the investment analysis /5/.	B.5.15	The section B.5 of the PDD has been revised according to CL9.	DNV assessed the revised PDD and verified that the tax Social Contribution on Net Profit (CSLL) was included in section B.5. Therefore, the CL is closed.

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
No forward action requests were raised in this report.		

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APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Andrea Leiroz

Mrs. Andrea Leiroz holds a Bachelor's Degree in Chemical Engineering, Master Degree in Material Science and Doctor Degree in Mechanical Engineering. Having an overall experience of around thirteen years.

She has experience of around 4 years in validation and verification of numerous CDM projects in DNV, both in Brazil & abroad.

Her qualification, experience in CDM demonstrates her sufficient sectoral competence in Energy Generation from renewable energy sources, Waste handling and disposal and Animal waste management.

Gabriel Baines

Gabriel Baines holds a Bachelor's Degree in Environmental Engineering in the University of São Paulo (Brazil) and has done a short term course in the Environmental School of the University of Leeds (England), having an overall work experience of around 5 years. Prior to joining DNV, has had two and a half years experience in the aluminium industry covering the areas of production and environment. His experience also covers the fields of environmental management and management systems such as ISO 14.001.

He has experience of around 1 year in validation and verification of numerous CDM projects in DNV, both in Brazil and abroad.

His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in 9.1. metal production.

Eduardo Camilo da Silva

Eduardo holds a Doctor Degree in Business Administration and is Adjunt Professor at Federal University of Rio de Janeiro, where he develops researches in the areas of Microstructure of Market and Behavioural Finances.

He holds a Bachelor's Degree in Electronic Engineering from the Army Institute of Engineering.

Has working experience of over 20 years in corporations in the area of Finances, Retail and Information Technology.

Fernando Rodríguez Herrera

Fernando holds a Masters Degree in Business Administration and a Bachelor's Degree in Mechanical Engineering.

He is a Finance Executive with over 10 years international experience specialized in Financial Information, Investor Relations, Corporate Communications, Cash Flow and Budget Control.

Simon Wong Yon

Simon Wong Yon Sing holds a Bachelor's Degree in Chemical Engineering with Environmental Engineering, with a year experience in the field of design and operation/maintenance of wastewater treatment as part of working in wastewater design & equipment supply services. His experience in designing and maintaining the wastewater treatment systems covers the fields of various manufacturing and chemical industries in Malaysia.

He has experience of more than 4.5 years in validation and verification of numerous CDM projects in DNV, both in Malaysia and abroad. His qualification, industrial experience and experience in CDM demonstrate his sufficient sectoral competence in Energy Generation from Renewable Energy Sources, Waste Handling and Disposal and Animal Waste Management System.