



VALIDATION REPORT

ELECTRICITY GENERATION FROM RENEWABLE SOURCES – WINDFARM CAMPO DOS VENTOS II, IN BRAZIL

REPORT No. 2011-1482

REVISION No. 01

DET NORSKE VERITAS



VALIDATION REPORT

Date of first issue: 19 November 2011	ConCert Project No.: PRJC-345292-2011-CCS-BRA	DNV CLIMATE CHANGE SERVICES AS Veritasveien 1, 1322 HØVIK, Norway Tel: +47 67 57 99 00 Fax: +47 67 57 99 11 http://www.dnv.com Org. No: NO 994 774 352 MVA
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Client: Campo dos Ventos II Energias Renováveis S.A.	Client ref.: Fernanda Furlan	

Summary:

Project Name: Electricity generation from renewable sources – Windfarm Campo dos Ventos II**Country:** Brazil**Methodology:** ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"**Version:** 12.2.0**GHG reducing Measure/Technology:** Grid-connected electricity generation from wind power (Sectoral Scope 1)**ER estimate:** 51 922 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

In summary, it is DNV's opinion that for project activity "Electricity generation from renewable sources – Windfarm Campo dos Ventos II" in Brazil, as described in the PDD, version 2 of 30 November 2011, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002 version 12.2.0. Hence DNV requests the registration of the project as a CDM project activity. Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

Report No.: 2011-1482		Subject Group: Environment		Indexing terms Key words Climate Change Kyoto Protocol Validation Clean Development Mechanism <input checked="" type="checkbox"/> No distribution without permission from the client or responsible organisational unit <input type="checkbox"/> free distribution within DNV after 3 years <input type="checkbox"/> Strictly confidential <input type="checkbox"/> Unrestricted distribution
Report title: Electricity generation from renewable sources – Windfarm Campo dos Ventos II, in Brazil				
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Date of this revision: 26 March 2012	Rev. No.: 1	Number of pages: 34		

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Abbreviations

ABNT	Brazilian Association of Technical Standards
ANEEL	Brazilian National Electric Energy Agency
BM	Build Margin
BNDES	Brazilian Development Bank
BOVESPA	Brazilian Stock Exchange
BRL	Brazilian Real; Brazilian currency
CAPEX	Capital Expenditures
CAPM	Capital Asset Pricing Model
CAR	Corrective Action Request
CCEE	Brazilian Chamber of Commerce of Electric Energy
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CL	Clarification request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
COFINS	Tax of the Contribution for the Financing of Social Security
CONAMA	Brazilian National Environmental Council
CPFL	Power and Light Company of the State of São Paulo
CSLL	Tax of the Social Contribution over Net Profit
DNA	Designated National Authority
DNV	Det Norske Veritas
EF	Emission Factor
FAR	Forward Action Request
FGV	Getúlio Vargas Foundation
GHG	Greenhouse gas(es)
GPS	Global Positioning System
IDEMA	Institute of Environment and Sustainable Development of the state of Rio Grande do Norte
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
Ke	Expected Return on Capital
LoA	Letter of Approval
Ltda	Public Limited Company (plc)
MoU	Memorandum of Understanding
NGO	Non-governmental Organisation
ODA	Official Development Assistance
ONS	Brazilian National Operator of the Electric System
OPEX	Operation Expenditures
PASEP	Tax of the Heritage of Public Server Program
PDD	Project Design Document
PIS	Tax of the Social Integration Program
PPA	Power Purchase Agreement
PROINFA	Program of Incentives to Alternative Sources of Energy
RAS	Simplified Environmental Report
SIN	Brazilian National Integrated System – Electricity Grid of Brazil



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tCO ₂ e	Tonnes of CO ₂ equivalents
TSFEE	Tax on regulation of electric energy services
TUST	Tax on use of transmission system
UNFCCC	United Nations Framework Convention on Climate Change
WACC	Weighted Average Cost of Capital
WTG	Wind Turbine Generator



1 EXECUTIVE SUMMARY – VALIDATION OPINION

DNV Climate Change Services AS (DNV) has performed a validation of the project activity “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” 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 baseline and monitoring methodology ACM0002 - "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 12.2.0.

The project activity is a wind power project with fifteen wind turbines that tally to 30 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 51 922 tCO₂e per year over the selected 7-year renewable 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 are able to implement the monitoring plan.

In summary, it is DNV's opinion that the project activity “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” in Brazil, as described in the PDD, version 2 dated 30 November 2011, meets all relevant UNFCCC requirements for the CDM and correctly applies the baseline and monitoring methodology ACM0002, version 12.2.0. Hence, DNV requests the registration of the project as a CDM project activity.

Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development

Rio de Janeiro and Oslo, 26 March 2012.



VALIDATION REPORT

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2 INTRODUCTION

Campo dos Ventos II Energias Renováveis S.A. has commissioned DNV Climate Change Services AS (DNV) to perform a validation of the “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” 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 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 /1/). 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 12.2.0 /23/. The validation was based on the recommendations in the *"Validation and Verification Manual"*, version 1.2 /21/.

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

Some links might open only when copied and pasted in the address bar of your browser.

- /1/ WayCarbon Soluções Ambientais e Projetos de Carbono Ltda.: *CDM-PDD for project activity* “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” in Brazil, version 1 dated 8 September 2011 and version 2 dated 30 November 2011.
- /2/ WayCarbon Soluções Ambientais e Projetos de Carbono Ltda.: *Emission reduction calculation spreadsheet*, version 2, dated 30 November 2011. File name: “c_CER_01_ExanteEstimativeCampoVentosII_WayCarbon_v02_20111130.xls”.
- /3/ WayCarbon Soluções Ambientais e Projetos de Carbono Ltda.: *Benchmark calculation spreadsheet*, version 1, dated 8 September 2011. File name: “b_FAnalysis_01_ElectricitySectorBenchmark_WayCarbon_v01_20110908.xlsx”.
- /4/ WayCarbon Soluções Ambientais e Projetos de Carbono Ltda.: *Financial analysis calculation spreadsheet*, version 2, dated 25 November 2011. File name: “b_FAnalysis_02_EquityIRR_CPFLRenovaveis_v02_20111125.xls”.
- /5/ WayCarbon Soluções Ambientais e Projetos de Carbono Ltda.: *Project Starting Date*: 26 August 2010, this is the date of the 3rd Reserve Power Auction when Campo dos Ventos II sold its energy to the Brazilian Chamber of Commerce of Electric Energy (CCEE), v. Because of this event, a Memorandum of Understanding with Wobben Windpower became valid as contract, which incurred in financial commitments to Campo dos Ventos II (the first financial commitments). It makes reference to an agreement made on 25 August 2010 between Campo dos Ventos II and Wobben Windpower about their participation in the 3rd Reserve Power Auction of 26 August 2010. Version 1, dated 27 August 2010. File name: “g_StartDate_01_WTGAcquisition_Wobben_v01_20100827.pdf”
- /6/ WayCarbon Soluções Ambientais e Projetos de Carbono Ltda.: *Prior Consideration Notification form*, submitted to UNFCCC Secretariat for Prior Consideration of CDM and confirmed by UNFCCC on 27 October 2010.
- /7/ WayCarbon Soluções Ambientais e Projetos de Carbono Ltda.: *Prior Consideration*



- Notification form*, submitted to the Brazilian DNA for demonstration and assessment of prior consideration of CDM and confirmed by the Brazilian DNA on 5 November 2010.
- /8/ IDEMA: *Environmental Previous Licence*, for Windfarm Campo dos Ventos II, licence n° 2010-036827/TEC/LP-0073, issued on 13 May 2010, with expiration date on 13 May 2012.
Available at: http://200.149.240.140/licencas/licencas_emitidas.asp
- /9/ Geoconsult - Consulting, Geology & Environment Ltda.: *Simplified Environmental Report (RAS)*: Environmental studies for Windfarm Campo dos Ventos II, version 1, dated April 2010.
File name: “j_Environmt_01_RAS01_Geoconsult_v01_20100401.pdf”.
- /10/ WayCarbon Soluções Ambientais e Projetos de Carbono Ltda.: *Receipt of Delivery of Mail*, from 4 August 2011 to 16 August 2011. Receipts filled by postal service when delivering registered mail (invitation to stakeholder’s consultation) to recipients.
- /11/ Camargo Schubert Consulting: *Certificates of Wind Measurements and of Production of Energy*, certificate about the plant gross load factor and geographical coordinates of the wind turbine generators, for “Electricity generation from renewable sources – Windfarm Campo dos Ventos II”, dated 15 April 2010. File name: “d_InvInputs_02_PlantLoadFactor_CamargoSchubert_v01_20100415.pdf”.
- /12/ Wobben Windpower:
 - *Description of model E82 E2 – Technical Specifications*, dated 23 October 2010. Available at: http://www.wobben.com.br/produtos_Servicos_e82.htm
 - *Lifetime of the WTGs* – dated 21 August 2007. Filename: “e_Tech_03_LifetimeOfWomdTurbine_Enercon_v01_20070821.pdf”
- /13/ Campo dos Ventos II Energias Renováveis S.A. and CCEE: *Contract of Power Purchase Agreement (PPA)* of 14 MW for 20 years (from 1 September 2013 to 31 August 2033) signed between Campo dos Ventos II Energias Renováveis S.A. and the CCEE, version 1, dated 3 June 2011.
- /14/ Campo dos Ventos II Energias Renováveis S.A. and Salus – Fund of Investment in Participations: *Contracts of purchase of the Project* (documento also includes the previous Memorandum of Understanding between the companies): Campo dos Ventos II Energias Renováveis S.A. purchased the project “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” from a company called “Salus – Fund of Investment in Participations”:
 - Memorandum of Understanding (MoU) – would come into force in the event of “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” was successful in the 3rd Reserve Power Auction of the 26 August 2010, as it indeed happened. Version 1, dated 16 July 2010.
File name: “d_InvInputs_05_AssumptionsAcquisition_CPFLRenovaveis_v01_20100716.pdf”.
- /15/ Campo dos Ventos II Energias Renováveis S.A. and Wobben Windpower: *Contract of supply of equipment and services for the implementation of Windfarm Campo dos Ventos II*, (includes Memorandum of Understanding) for the acquisition of the WTGs, construction and maintenance of the windfarm:



- Memorandum of Understanding (MoU) - would come into force in the event of “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” was successful in the 3rd Reserve Power Auction of the 26 August 2010, as it indeed happened. Version 1, dated 25 August 2010. File name: “d_InvInputs_03_CapexAndOpex_Wobben_v01_20100825.pdf”;
 - Contract (validation of the MoU) - version 2, dated 27 August 2010. File name: “d_InvInputs_03_CapexAndOpex_Wobben_v02_20100827.pdf”;
- /16/ Campo dos Ventos II Energias Renováveis S.A.: *Photographic registry of the wind farm*, sent to ANEEL each month, version 1, dated August 2011. File name: “e_Tech_04_MonthlyProgress_Campo dos Ventos II_v01_201108.pdf”.
- /17/ BNDES: *Disposition of Financial Support*, for the project Campo dos Ventos II, stating that the bank is willing to grant financing for the projects, version 1, dated 5 July 2011. File name: “d_InvInputs_15_FinancingCampoDosVentosII_BNDES_v01_20110705.pdf”.
- /18/ Deloitte Touche Tohmatsu Independent Auditors: *Relationship between Campo dos Ventos II Energias Renováveis S.A. and CPFL Energias Renováveis S.A. (CPFL)*, version 1, dated 7 November 2011. File name: “d_InvInputs_15_FinancialInfo_Deloitte_v01_20111107.pdf”.
- /19/ *Campo dos Ventos II Energias Renováveis S.A.: Land lease agreements between Campo dos Ventos II Energias Renováveis S.A. and land owners:*
- Casa dos Ventos Energias Renováveis, for the lease of the lands of Farm Diamantina, version 1, dated 17 June 2009. File name: “d_InvInputs_08_AssumptionsLandLeaseCessionofRights01_CPFLRenovaveis_v01_20090617.pdf”
 - Companhia Valença Industrial, for the lease of the lands of Farm Nova, version 1, dated 17 June 2009. File name: “d_InvInputs_08_AssumptionsLandLeaseCessionofRights02_CPFLRenovaveis_v01_20090617.pdf”
 - Companhia Valença Industrial, for the lease of the lands of Farm São Vicente, version 1, dated 17 June 2009. File name: “d_InvInputs_08_AssumptionsLandLeaseCessionofRights03_CPFLRenovaveis_v01_20090617.pdf”
 - Companhia Valença Industrial, for the lease of the lands of Farm Santa Fé, version 1, dated 17 June 2009. File name: “d_InvInputs_08_AssumptionsLandLeaseCessionofRights03_CPFLRenovaveis_v01_20090617.pdf”

3.1.2 Letters of approval

- /20/ Interministerial Commission of Global Climate Change (DNA of Brazil): *Letter of approval*: Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.

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

- /21/ CDM Executive Board: *"Validation and Verification Manual"*, version 1.2, adopted at



- EB55 Annex 1, dated 30 July 2010.
- /22/ CDM Executive Board: *"Glossary of CDM terms"*, version 5, adopted at EB47, paragraph 71, dated 19 August 2009.
- /23/ CDM Executive Board: *Baseline and monitoring methodology ACM0002, "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"*, version 12.2.0, adopted at EB65.
- /24/ CDM Executive Board: *"Tool for the demonstration and assessment of additionality"* version 5.2.1, adopted at EB39 Annex 10, dated 11 August 2011.
- /25/ CDM Executive Board: *"Tool to calculate the emission factor for an electricity system"*, version 2.2.1, adopted at EB63 Annex 19, dated 29 September 2011.
- /26/ CDM Executive Board: *"Guidelines on the demonstration and assessment of prior consideration of the CDM"*, version 4.0, adopted at EB62 Annex 13, dated 15 July 2011.
- /27/ CDM Executive Board: *"Guidelines on the Assessment of Investment Analysis"*, version 5.0, adopted at EB62 Annex 5, 15 July 2011.
- /28/ CDM Executive Board: *"Guidelines on the Reporting and Validation of Plant Load Factors"*, version 1, adopted at EB48 Annex 11, 17 July 2009.

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

- /29/ Brazilian 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>
- /30/ Brazilian Ministry of Environment: *Renewable Sources of Energy in Brazil*, book published in 2003.
- /31/ Brazilian Ministry of Mines and Energy: *Authorization for independent power producer*, stating 30 MW of installed capacity, dated 15 April 2011
Available at:
[http://www.mme.gov.br/mme/galerias/arquivos/noticias/2011/Port_257_Autorizaxo PI E_EOL Campos dos Ventos II.pdf](http://www.mme.gov.br/mme/galerias/arquivos/noticias/2011/Port_257_Autorizaxo_PI_E_EOL_Campos_dos_Ventos_II.pdf)
- /32/ Presidency of Brazil: *Federal Decree n°5025, about PROINFA*, dated March 2004.
Available at: http://www.planalto.gov.br/ccivil_03/_ato2004-2006/2004/decreto/d5025.htm
- /33/ Interministerial Commission of Global Climate Change (DNA of Brazil), *Emission factor for power grid of Brazil in 2010*, published in 2011. Available at:
<http://www.mct.gov.br/index.php/content/view/74689.html>
- /34/ Brazilian National Operator of the Electric System: *Grid Procedures*, Dispatch n° 2744, dated 15 September 2010.
Available at:
www.ons.org.br/procedimentos/index.aspx
- /35/ CCEE Energy Auctions:
- 2nd Brazilian Auction of Reserve Energy - Auction n° 003/2009 - LER-2009 Results, dated 14 December 2009. Available at:
<http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=ec41d74d9811421>



- [0VgnVCM1000005e01010aRCRD](#)
- *3rd Brazilian Auction of Renewable Energy - Auction n° 2013-EOL20 – Results*, dated 26 August 2010. Available at:
<http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=b32c645eb56ba210VgnVCM1000005e01010aRCRD>
 - *11th Brazilian Auction of New Energy – Auction n° 04/2010 - Results*, dated 15 December 2010. Available at:
http://www.ccee.org.br/cceeinterdsm/v/index.jsp?contentType=RESULTADO_LEILAO&vgnextoid=1ece84227d3fc210VgnVCM1000005e01010aRCRD&qryRESULTADO-LEILAO-CD-RESULTADO-LEILAO=6adf84227d3fc210VgnVCM1000005e01010a&x=15&y=11
- /36/ CCEE: *Shared distribution losses for billing purposes* – losses to be discounted from the electricity delivered to the SIN by each generator, based on the virtual gravity center (node of transmission system), dated 2011:
Available at:
<http://www.ccee.org.br/cceeinterdsm/v/index.jsp?vgnextoid=4025a5c1de88a010VgnVCM100000aa01a8c0RCRD>
- /37/ Brazilian National Treasury, *Normative Instruction n° 247, about taxes of Social Integration Program (PIS), Heritage of Public Server Program (PASEP) and Contribution for the Financing of Social Security (COFINS)*, dated 21 November 2002. Available at: <http://www.receita.fazenda.gov.br/legislacao/ins/2002/in2472002.htm>
- /38/ Brazilian National Treasury, *Article n° 3 of Law n° 11727, for social contribution on net profit (CSLL)*, dated 23 June 2008. Available at:
<http://www.receita.fazenda.gov.br/aliquotas/ContribCsl/Aliquotas.htm>
- /39/ Brazilian National Treasury, *information on legislation about presumed profit companies*:
- *Note n° 517*, dated 2011. Available at:
<http://www.receita.fazenda.gov.br/PessoaJuridica/DIPJ/2005/PergResp2005/pr517a555.htm>
 - *Clarifications*, dated 31 December 2010. Available at:
<http://www.receita.fazenda.gov.br/Publico/perguntao/dipj2011/CapituloXIII-IRPJ-LucroPresumido2011.pdf>
- /40/ Brazilian National Treasury: *Long Term Brazilian Treasury Bond (type NTN-B)*, from 2006 to 2010. Available at: http://www.tesouro.fazenda.gov.br/tesouro_direto/
- /41/ Brazilian National Treasury: *Interest rates of general lending rate Selic*, from 1995 to 2011. Available at: <http://www.receita.fazenda.gov.br/pagamentos/jrselic.htm>
- /42/ Central Bank of Brazil: *Historical of target inflation rates*, from 1999 to 2013. Available at : <http://www.bcb.gov.br/Pec/metast/TabelaMetaseResultados.pdf>
- /43/ BNDES: *Credit Lines for Wind Energy hired in Auction*, dated October 2009.
Available at:
http://www.bndes.gov.br/SiteBNDES/bndes/bndes_pt/Institucional/Apoio_Financeiro/Produtos/FINEM/energias_alternativas.html
- /44/ BNDES: *Long Term Interest Rates*, from 2006 to 2010, 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](#)
- /45/ BNDES: *A Panorama of the industry related to Wind energy*, dated April 2009.
Available at:
http://www.bndes.gov.br/SiteBNDES/export/sites/default/bndes_pt/Galerias/Arquivos/conhecimento/bnset/Set2907.pdf
- /46/ BOVESPA: *Daily Return of BOVESPA Index*, from 2006 to 2010.
Available at: <http://www.bmfbovespa.com.br>
- /47/ BOVESPA: *Daily Return of BOVESPA Electric Power Index*, from 2006 to 2010.
Available at:
<http://www.bmfbovespa.com.br/shared/IframeHotSiteBarraCanal.aspx?altura=900&idiona=pt-br&url=www.bmfbovespa.com.br/informe/default.asp>
- /48/ ANEEL: *Bank of Information of Generation*, about the capacity of generation of electricity in Brazil, dated 2011.
Available at: <http://www.aneel.gov.br/aplicacoes/capacidadebrasil/capacidadebrasil.asp>
- /49/ ANEEL: *Depreciation and Heritage for the electricity sector*:
- *Resolution n° 44*, about depreciation rates, dated 17 March 1999.
Available at:
http://www.aneel.gov.br/aplicacoes/leitura_arquivo/arquivos/Tabela_Taxas_De_priacao_RIT.pdf
 - *Manual of patrimonial control of the electric sector*, dated 2 June 2009.
Available at: http://www.aneel.gov.br/cedoc/aren2009367_2.pdf
- /50/ ANEEL: *Bank of Prices and Reference Costs for Transmission Lines and Substations*, dated 5 May 2011. Available at: <http://www.aneel.gov.br/cedoc/ndsp20112108.pdf>
- /51/ ANEEL: *Official Decrees, Dispatches and Notes about Tariffs*:
- *Normative Resolution n° 77* about discount in tariff for alternative sources, dated 18 August 2004. Available at:
<http://www.aneel.gov.br/cedoc/ren2004077.pdf>
 - *Decree n° 2410*, creating the TSFEE tariff, dated 28 November 1997. Available at: http://www.aneel.gov.br/biblioteca/remissiva_legi.cfm?valida=9396
 - *Dispatch n° 4774*, about the values of the TSFEE tariff, dated 22 December 2009. Available at:
<http://www3.aneel.gov.br/netacgi/cobaia.exe?s4=hidroluz&s5=LEGISLA%C7%C3O&l=20&SECT1=IMAGE&SECT4=e&SECT6=HITOFF&SECT3=PLURON&SECT2=THESON&SECT5=BIBL01&d=BIBL&p=1&u=http://www3.aneel.gov.br/biblioteca/pesquisafa.htm&r=3&f=G>
 - *Normative Resolution n° 320*, about charges of the shared installations of generation (nodes of transmission systems) for alternative sources, dated 10 June 2008. Available at: <http://www.aneel.gov.br/cedoc/ren2008320.pdf>
- /52/ ANEEL: *Homologation Resolution n° 1031*, about hiring of reserve energy for wind generation after 2013, dated 22 July 2010, used in the calculation of the tariff of use of transmission system (TUST). Available at:
http://www.aneel.gov.br/aplicacoes/editais_geracao/documentos/052010_Resolu%C3%A7%C3%A3o_20Homologat%C3%B3ria_Edital%2005-2010_.pdf
- /53/ ANEEL: *Material Announcement n° 5*, about transmission costs for “Electricity



- generation from renewable sources – Windfarm Campo dos Ventos II”, dated 13 August 2010. Available at:
http://www.aneel.gov.br/aplicacoes/editais_geracao/documentos/052010_Comunicado_Relevante_5_TUST_.pdf
- /54/ ANEEL: *Operating wind entrepreneurship*, from 1992 to 2011. Available at:
<http://www.aneel.gov.br/aplicacoes/capacidadebrasil/GeracaoTipoFase.asp?tipo=7&fase=3>.
- /55/ 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)
- /56/ Getúlio Vargas Foundation: *Cost of Capital for Small Hydroelectric Power Plants in the Clean Development Mechanism Context*, dated November 2010.
- /57/ Frederico Rosas, independent financial expert for DNV: *Financial Expert Assessment*, approving benchmark and investment analysis presented. Dated 23 November 2011.
- /58/ The European Wind Energy Association: *The Economics of Wind Energy*, dated March 2009.
 Available at:
http://www.ewea.org/fileadmin/ewea_documents/documents/publications/reports/Economics_of_Wind_Main_Report_FINAL-lr.pdf
- /59/ Federation of American Scientists: *Wind Power in the United States: Technology, Economic and Policy Issue*, dated 20 June 2008.
 Available at: <http://www.fas.org/sgp/crs/misc/RL34546.pdf>
- /60/ CDM Executive Board: *Electricity generation from renewable sources – Windfarm Campo dos Ventos II: Validation page*, dated 13 November 2011.
 Available at:
<http://cdm.unfccc.int/Projects/Validation/DB/RHJ630E3J48L9AS05CH75G57SEYNY/Z/view.html>
- /61/ Portal Energia Hoje (electronic newspaper for energy issues): *article about investments on wind farms*, dated 26 October 2011.
 Available at :<http://www.energiahoje.com/online/eletrica/eolica-e-solar/2011/10/26/441614/ampliacao-de-cerro-chato-em-2012.html>

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

On 17 November 2011, DNV auditors Gabriel Baines and Mayra Rocha visited the Campo dos Ventos II Energias Renováveis S.A.’s office at São Paulo, Brazil and performed interviews with project stakeholders.

	Date	Name	Organization	Topic
/62/	17 November 2011	Carlos Shiguematsu Jr.	WayCarbon Soluções	• Project Design and adopted technology
/63/		Luiz Serrano	Ambientais e Projetos de	• Determination of baseline



		Carbono Ltda.	scenario
/64/	Fernanda Furlan de Gouveia	Campo dos Ventos II	• Demonstration of additionality
/65/	Eduardo dos Santos Soares	Energias Renováveis S.A.	• Emission reduction calculations
/66/	Tauries Sakai Nakazawa		• Application of monitoring methodology as well as design and application of the monitoring plan
/67/	Giovanni Vinciprova		
/68/	Júlio César Lemos Pinto		• Assessment of environmental impacts, environmental licences and legal compliance
			• Stakeholders consultation process
			• Financial analysis

3.3 Resolution of outstanding issues

The objective of this phase of the validation is to resolve any outstanding issues which need 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 – Windfarm Campo dos Ventos II" in Brazil is enclosed in Appendix A to this report.

Table 2 of the validation protocol documents the findings of the desk review of the project design documentation and follow-up interviews with project stakeholders. Any findings raised in Table 2 are listed in Table 3 of the protocol, and changes to the description of the project design as a result of these findings will be addressed in Table 3. Table 2 thus may not reflect all aspects of the project as described in the final PDD submitted for registration.

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.



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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	✓	✓	✓	✓		✓	
Assessor under training	Rocha	Mayra	Brazil	✓	✓	✓				
Financial Expert	Rosas	Frederico	Brazil							✓
Technical reviewer	Dudek	Agnes	Norway					✓	✓	

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 /1/, version 2 dated 30 November 2011.

4.1 Participation requirements

The project participants are Campo dos Ventos II Energias Renováveis S.A. and WayCarbon Soluções Ambientais e Projetos de Carbono Ltda. from host Party Brazil. The host Party (Brazil) meets all relevant participation requirements. There is no Annex I Party identified yet.

The project does not involve any public funding from an Annex I Party – the project is seeking financing with the Brazilian Development Bank only - 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.

Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development

4.2 Project design

The “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” project is located in the municipality of Parazinho and João Câmara Municipalities, in the Rio Grande do Norte state, Brazil. Campo dos Ventos II Energias Renováveis S.A. is owned by CPFL Energias Renováveis S.A. /18/.

The geographical coordinates /11/ of the proposed project activity are

- Latitude: - 5.3329°
- Longitude: - 35.9455°

and presented to IDEMA in the approved Simplified Environmental Report (RAS) /9/.

The coordinates of all WTGs were presented in the document “d_InvInputs_02_PlantLoadFactor_CamargoSchubert_v01_20100415.pdf” /11/ from Campo dos Ventos II Energias Renováveis S.A. and determine the polygon formed by the windfarm.

The project is a wind power project which involves installation and operation of 15 wind turbines. The installed capacity of each turbine is 2 MW thus constituting a total installed capacity of 30 MW /8/ /31/.

It was cross-checked by DNV through the manufacturer’s product specifications /12/ that the project design engineering uses the megawatt-class, three-bladed, variable speed wind turbines, which is deemed to reflect good practices.

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The annual electricity delivered to the Brazilian National Interconnected System (SIN) is expected to be 131 750 MWh corresponding to an average net plant load factor of 50.10% (15.04 MW of net installed capacity) sourced from Camargo Schubert Consulting measurements /11/. It reflects the long-term net expected energy generation with 50% surplus probability (P50).

For electricity selling and billing purposes, as determined by CCEE /36/, the losses in the Brazilian National Interconnected System (SIN), the grid of Brazil, must be discounted by each electricity producer from the electricity it delivers to the SIN, so the total effective generation of the system equals the total effective capacity of the system. As per official data from 2006 to 2010 /36/, 2.5% of losses shall be considered in the billing system, thus constituting in a net capacity of 14.66 MW (14.664 MW before rounding).

Therefore, in this project, for emission reduction estimation purposes, the net capacity of 15.04 MW /11/ was used. However, for the investment analysis, the net capacity of 14.66 MW was considered.

The electricity generated by the project will be delivered to the SIN - which has part of its electricity generated by fossil fuel power plants.

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 SIN.

At the time of commencing of validation, the physical implementation of the project had started only the construction of the foundations as was confirmed through the photographic report sent to ANEEL every month /16/.

The starting date of the proposed project activity was defined as 26 August 2010, the date of the auction of reserve power in which the electricity generation facility Campo dos Ventos II had its energy contracted and its contract for the supply of equipment and services with Wobben Windpower validated /5/.

The expected operational lifetime of the project activity is 20 years (from 1 September 2013 to 31 August 2033) derived from the PPA signed between Campo dos Ventos II Energias Renováveis S.A. and CCEE /13/. The difference of electricity generated between the PPA (14 MW) and actual generation used for invoicing (14.66 MW) will be negotiated in the spot market and was considered in the sensitivity analysis, as described in the applicable section of this report.

A 7-year renewable crediting period has been chosen for the project, starting on 1 September 2013 or the registry date of the project activity at the CDM-UNFCCC, whichever is later. The chosen crediting starting date is deemed to be reasonable and it is matching the beginning of the PPA. The emission reductions are estimated to be 51 922 tCO₂e per year, which corresponds to 363 454 tCO₂e over the first seven years of 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 12.2.0 /23/.

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 Brazilian Ministry of Mines and Energy authorization for independent power producer /31/, through the result of the 3rd Brazilian Auction of Renewable Energy /35/ of 26 August 2010 and the contract between Campo dos Ventos II Energias Renováveis S.A. and Wobben Windpower /15/;
- 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 Brazilian Ministry of Mines and Energy authorization for independent power producer /31/, through the result of the 3rd Brazilian Auction of Renewable Energy /35/ of 26 August 2010 and the contract between Campo dos Ventos II Energias Renováveis S.A. and Wobben Windpower /15/;
- The project is connected to the Brazilian 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 the Brazilian National Electric Energy Agency (ANEEL) /48/.

The assessment of the project's compliance with the applicability criteria of methodology *ACM0002*, version 12.2.0 /23/ 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 the project activity and the system boundary for the grid electricity system is also correctly defined as all power plants connected physically to the Brazilian 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 – Windfarm Campo dos Ventos II" is clearly defined in accordance with applicable guidelines of both *ACM0002*, version 12.2.0 /23/ and the *"Tool to calculate the emission factor for an electricity system"*, version 2.2.1 /25/.

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 Brazilian 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 12.2.0 /23/.

4.5 Baseline identification

A) Baseline determination

The baseline is in accordance with *ACM0002*, version 12.2.0 /23/ 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"*, version 2.2.1 /25/.

According to *ACM0002*, version 12.2.0 /23/ 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 is published yearly by the DNA of Brazil /33/. The calculations are based on electricity generation data provided by the Brazilian National Operator of the Electric System (ONS) for the electricity generated in the grid. The weighting of the OM and BM is set to be 0.75 and 0.25 respectively, which are the default values stipulated for wind farm projects by the *"Tool to calculate the emission factor for an electricity system"*, version 2.2.1 /25/.

The approved baseline methodology has been correctly applied and it defines the baseline scenario.

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 /1/.

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 are 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 12.2.0 /23/.



4.6 Additionality

As required by ACM0002, version 12.2.0 /23/, the additionality of the proposed project is demonstrated by applying the *"Tool for the demonstration and assessment of additionality"* version 5.2.1 /24/.

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

Project start date:

The starting date of the proposed project activity was defined as 26 August 2010, the date of the auction of reserve power in which the electricity generation facility Campo dos Ventos II had its energy contracted and its contract for the supply of equipment and services with Wobben Windpower validated /5/.

As agreed in the Memorandum of Understanding (MoU) signed with Wobben Windpower on 25 August 2010 /15/, if Campo dos Ventos II Energias Renováveis S.A. was successful in its participation at the Brazilian 3rd Reserve Power Auction, Campo dos Ventos II Energias Renováveis S.A. and Wobben Windpower would agree to enter into the contracts for the supply of equipment and services for the project activity. The document "g_StartDate_01_WTGAcquisition_Wobben_v01_20100827.pdf" version 1, is dated 27 August 2010 making reference to the agreement made on the 25 August 2010 to the terms of the auction of the 26 August 2010.

DNV considers this date (26 August 2010) - determined by the auction date /5/ and the validation of the contract /15/ - correctly established as the date of start of the project, since it is the date of the first financial commitment of the project, as this contract is for the acquisition of the WTGs, construction and maintenance of the windfarm, this it is an umbrella contract, that covers all the services and equipment for the construction of the project. Hence, DNV confirmed that this was the earliest commitment to financial expenditure, in accordance to *"Glossary of CDM terms"*, version 5 /22/.

Prior consideration of CDM:

In accordance with the guidance from the CDM Executive Board /26/, the proposed project is a newly built wind farm and the starting date of the project activity (26 August 2010) is after 2 August 2008. The notification for the proposed project was sent by the project participant to the UNFCCC Secretariat and the Brazilian DNA. Confirmation from the UNFCCC Secretariat was received on 27 October 2010 /6/. Notification was sent to the Brazilian DNA and confirmed on 5 November 2010 /7/. Both notifications were sent within six months of the project activity starting date. DNV considers that CDM was therefore seriously considered in the decision to proceed with the project activity.

The project participants started the global stakeholder consultation on 15 October 2011 /60/. 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 *"Guidelines on the demonstration and assessment of prior consideration of the CDM"*, version 4.0 /26/.

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 12.2.0 /23/, 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", version 2.2.1 /25/.

In accordance with the paragraph 105 of *VVM* /21/, the approved methodology *ACM0002*, version 12.2.0 /23/, 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

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 benchmark is the expected return on capital (K_e), after tax, in real terms. It was calculated as expected capital (K_e) using Capital Asset Pricing Model (CAPM) as a benchmark to the financial return of the shareholders of the company. The benchmark was calculated to be 12.75% by Campo dos Ventos II Energias Renováveis S.A. based on paragraph 12 of the *"Guidelines on the Assessment of Investment Analysis"*, version 5.0 /27/: "Required/expected returns on equity are appropriate benchmarks for an Equity IRR". The required/expected return on equity was calculated under option 6 (a) presented in the *"Tool for the demonstration and assessment of additionality"* version 5.2.1 /24/ as follows:

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

Where:

- R_f (risk free rate) is calculated as 6.88%, based on the Long Term Brazilian Treasury Bond (type NTN-B) of years 2006 (August to December), 2007, 2008, 2009 and 2010 (January to July). NTN-B bonds are post-tax bonds. DNV cross-checked the values presented with the Brazilian National Treasury home page /40/ and confirmed that this value was the latest available in the time of the investment decision (which is the same of the project starting date) /5/ and are thus correct;
- R_m (market return) is calculated as 11.08%, based on Daily Return of Bovespa Index of years 2006 (August to December), 2007, 2008, 2009 and 2010 (January to July).

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Bovespa bonds are post-tax bonds. DNV cross-checked the values presented with the Bovespa home page /46/ and confirmed that this value was the latest available in the time of the investment decision (which is the same of the project starting date) /5/ and are thus correct;

- β (beta) is considered to be 1.40, based on the covariance of the Daily Return of Bovespa Electric Power Index of years 2006 (August to December), 2007, 2008, 2009 and 2010 (January to July) /47/. Beta when relevered used the conditions of presumed profit regime, which tax rate is zero when relevering beta /39/. DNV cross-checked the values presented with the Bovespa home pages /47/ and confirmed that these values were the latest available in the time of the investment decision (which is the same of the project starting date) /5/ and are thus correct;

Thus the expected return on capital (K_e) is 12.75%.

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. CAPM model is generally used to calculate a benchmark on an equity basis (K_e), and in this case it was used a relevered beta for conditions of a presumed profit taxation regime, for which income tax rate is zero in relevering /39/. DNV confirmed this approach is correct with the assistance of independent financial expert Frederico Rosas /57/.

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 /56/. FGV is a renowned and trustable independent centre of economic studies in Brazil. In the estimation 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) and specific literature (Ibbotson). 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 values obtained for a theoretical hydro power plant of up to 50 MW in Brazil are 26.71% in the year of 2005, 23.63% in 2006, 22.36% in 2007, 23.31% in 2008 and 26.29% in 2009 /56/. All these values are higher than the value of the benchmark calculated by Campo dos Ventos II Energias Renováveis S.A.(12.75%) and this lower value is in accordance with an observed tendency of decrease, since interest rates have been constantly falling in Brazil in the past recent years /41/.

DNV confirmed that the assumptions taken and the values considered for the benchmark calculation are reasonable, according to statement from independent financial expert /57/.

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

Input parameters

Electricity generation from renewable sources – Windfarm Campo dos Ventos II is composed of 15 WTGs /14/, installed capacity of 30 MW /14/ /31/, plant net load factor of 50.10% /9/ /11/, net capacity of 15.04 MW /9/ /11/ and therefore the annual electricity delivered to the Brazilian National Interconnected System (SIN) is expected to be 131 750 MWh. This is the amount of energy used in the ex-ante estimation of the emission reductions.

However, for the investment analysis, the net capacity of 14.66 MW (14.664 MW before rounding) was considered for the estimation of electricity generation and incomes. The reason for this is that, for electricity selling and billing purposes, CCEE determines that the losses in

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the SIN must be discounted by each electricity producer from the electricity it delivers to the SIN /36/, so the total effective generation of the system equals the total effective capacity of the system. As per official data from 2006 to 2010 /36/, 2.5% of losses shall be considered in the billing system, thus constituting in a net capacity of 14.66 MW. For this net capacity, the estimated generation is then 128 457 MWh per year.

DNV has validated all input values to the investment analysis based on appropriate evidence, as described below.

Investment costs:

The total investment (nominal values in the first year of the assessment period, as in contracts mentioned for each parameter) is BRL 127 100 941.85. When rolled to the actual years of expenditures, adding the inflation (thus in real values), the total investment is BRL 138 233 126.00. The inflation rate used in the investment analysis was a variable decreasing rate, starting on 5.20% in the first year of the assessment and falling to 3.68% in the last year of the assessment. These values are neighbouring the 4.5% used as the inflation target determined by the Central bank of Brazil /42/ per year for the estimation of the inflation since 2003 and is in line with an expected decreasing inflation forecast of the government in the long term /42/. All values of investment costs below are in nominal values and inflation was correctly applied in the investment analysis /4/ /57/. From this amount:

- BRL 82 058 793.00 (64.6% of total investment) corresponds to the investment in the WTGs as per the MoU and Contract between Campo dos Ventos II Energias Renováveis S.A. and Wobben Windpower /15/. Prices were agreed during the 3rd of Reserve Power Auction /5/, the event that marked the starting date of the project. DNV cross-checked and confirmed that the values and conditions of this contract, signed on 27 August 2010 /5/ /15/ are the same as in the MoU signed for the acquisition of the WTGs, construction and maintenance of the windfarm between these same two companies on 25 August 2010 /5/ /15/. DNV also assessed the percentage of the costs of the wind towers in the total cost of wind energy projects and compared the project with Brazilian and European projects. The typical wind project in Brazil presented 70% of costs in WTGs in January 2009 /45/ while European projects presented 75.6% of costs in WTGs in March 2009 /58/. DNV considers that the proposed project costs of WTGs are thus reasonable;
- BRL 33 259 815.00 (26.2% of total investment) corresponds to engineering, voltage network, substation of elevation and transmission lines costs, based on the contract between Campo dos Ventos II Energias Renováveis S.A. and Wobben Windpower /15/ and as per estimates made by Campo dos Ventos II Energias Renováveis S.A. based on ANEEL's Bank of Prices and Reference Costs for Transmission Lines and Substations /50/. DNV confirmed these values cross-checking the mentioned documents. DNV also assessed the percentage of the costs of the engineering, medium voltage network and substation in the total cost of wind energy projects and compared the project with American projects due to the lack of information about wind engineering, medium voltage network and substation in Brazil. The typical wind project in the USA presented 26% of costs in wind engineering, medium voltage network and substation in 2005 /59/. DNV considers that the costs for proposed project are reasonable and coherent with the average wind entrepreneurships.



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Additionally, as the the 3rd Reserve Power Auction of the 26 August 2010 is an inverted auction, where the lowest price offered by the producer wins, DNV considers this approach is correct, since it is conservative;

- BRL 5 375 333 (4.2% of total) corresponds to the project acquisition /14/. Campo dos Ventos II Energias Renováveis S.A. purchased “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” from Salus – Fund of Investment in Participations. It only came into force when “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” was successfully given the right to produce and deliver electricity in the 3rd Reserve Power Auction of the 26 August 2010. 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.
- BRL 2 581 000.00 (2.0% of total) corresponds to the estimates made by Campo dos Ventos II Energias Renováveis S.A. for environmental expenses, such as environmental management system (BRL 50 000/year during five years), recovery plan (BRL 45 000/year during four years), deforestation control (BRL 30 000/year during two years), noise control system (BRL 24 571/year during seven years), environmental compensation (0.5% of total investment, or BRL 635 501.00), flora and fauna monitoring system (BRL 22 857/year during seven years), archeology (BRL 95 000/year during two years), erosion (BRL 40 000/year during four years), education plan (BRL 38 571/year during seven years) and others minor expenses. DNV assessed these estimations made by Campo dos Ventos II Energias Renováveis S.A. and cross-checked this value with simulations presented in the book from the Brazilian Ministry of Environment “*Renewable Sources of Energy in Brazil*” /30/, which considered the value of environmental costs in 2.0% and considered this value reasonable is for wind power projects in Brazil;
- BRL 3 826 000.00 (3.0% of total) corresponds to the estimates made by Campo dos Ventos II Energias Renováveis S.A. for hired administration (security, facilities, transportation: BRL 1 784 000.00), insurances (BRL 286 000.00), communication systems (BRL 1 000 000.00), certification of the measurement of winds and production of energy (BRL 185 000.00), consulting services (financial and taxes consulting, certification of the design of the foundations of the towers and topographical services: BRL 571 000.00). DNV assessed these estimations and considers that are reasonable and coherent with the usual costs of the mentioned services in Brazil for other wind projects /61/.

CAPEX cost within the total investment is BRL 121 725 608.45, meaning that the project presents a specific cost of BRL 4 057 520.28/installed MW. DNV compared the CAPEX of “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” with other windfarms in Brazil /43/ /61/, and considered that the CAPEX values for the project are reasonable.

Project	Installed Capacity	CAPEX (Million BRL)	Million BRL/ Installed MW
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	(MW)		
Ventos do Sul /43/	150	662.4	4.416
Wind Park Rio do Fogo /43/	49.3	207.7	4.213
Água Doce /43/	9	28.3	3.144
Wind Park Beberibe /43/	25.6	140.9	5.504
Wind Park Vale dos Ventos /43/	48	262	5.458
Wind Pedra do Sal /43/	18	103.5	5.750
Wind Complex Cerro Chato /61/	90	400	4.444
Wind Complex Cerro Chato Phase II /61/	78	270	3.461
Wind Complex Geribatu /61/	258	1 000	3.875
Wind Complex Chuí /61/	144	570	3.958
Average	-	-	4.423
Campo dos Ventos II	30	122	4.057

DNV confirmed that the values of the parameters of “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” were the latest available in the time of the investment decision (which is the same as the project starting date: 26 August 2010) and concluded that the total investments for the proposed project are reasonable for windfarms.

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 the contract between Campo dos Ventos II Energias Renováveis S.A. and Wobben Windpower /15/, the price for the O&M of the WTGs is zero for the first two years of operation, BRL 19 845.00 for the third year, BRL 88 200.00 for fourth and fifth years and BRL 97 020.00 for the sixth to the twentieth year.

The O&M for the transmission line (in nominal values – as an estimation of the values mentioned below for the first year of the assessment) is BRL 145 103.00 per year. Campo dos Ventos II Energias Renováveis S.A. estimated this value as 1.5% of the implementation costs of substation and voltage network, as it is a subterranean system and for medium voltage. The estimation was made following ANEEL’s guidelines on “Bank of Prices and Reference Costs for Transmission Lines and Substations” /50/. DNV considered that the estimation was performed in accordance with the guideline.

Electricity charges and taxes:

- TSFEE tax will cost BRL 66 946.00 in the first year of full operation and will vary according to yearly inflation expected from the Central Bank of Brazil. DNV considered this value is correct as it follows ANEEL’s Decree nº 2410 /51/ and targets of inflation rates from the Central Bank of Brazil /42/.
- TUST tax was calculated following ANEEL’s regulatory decrees /52/ and is determined as value per kW produced per month. In 2014, the first year of full operation, it is BRL 5 183/kW.month, totalling BRL 1 116 498.00. This tax is



determined by ANEEL in the Material Announcement n° 5 /52/, being determined as BRL 5.408/kW month from 1 July 2012 to 30 June 2013, BRL 5.258/kW month from 1 July 2013 to 30 June 2014, BRL 5.108/kW month from 1 July 2014 to 30 June 2015, BRL 4.958/kW month from 1 July 2015 to 30 June 2016, BRL 4.808/kW month from 1 July 2016 to 30 June 2017, BRL 4.658/kW month from 1 July 2017 to 30 June 2018, BRL 4.508/kW month from 1 July 2018 onwards. As the tax is determined from every 1 July of one year to 30 June of the next year, and the investment analysis /4/ is presented in calendar years, Campo dos Ventos II Energias Renováveis S.A used the average of the two years in its assessment. DNV cross-checked the values used with the valued determined in Material Announcement n° 5 /52/ and considered this calculation is correct.

- Charges for the use of the shared installations of generation are calculated following regulatory decrees /51/, being considered a system of 390 MW for 13 windfarms of the region, including Campo dos Ventos II Windfarm. The charges of BRL 9 425 000/year were divided proportionally to the installed capacity of each windfarm (30 MW for Campo dos Ventos II Windfarm). Thus charges for the use of the shared installations of generation are estimated in BRL 725 000.00 per year and will vary according to inflation. DNV confirmed that these values are in accordance with ANEEL's Normative Resolution n° 320 /51/.

O&M insurance will cost 0.25% of the total CAPEX, as estimated by Campo dos Ventos II Energias Renováveis S.A. following commonly applied insurance costs. Insurance covers installation, performance and operation, totalling BRL 304 314.00 for the first year of full operation. DNV cross-checked this value with simulations presented in the book from the Brazilian Ministry of Environment "*Renewable Sources of Energy in Brazil*" /30/, which considered the value of insurance in 0.2% and considered this value is reasonable for wind power projects in Brazil.

Land rent is 1.5% of gross revenues, as stated in the contracts with land owners in the area of the windfarm /19/. DNV cross-checked the contracts with land owners and confirmed this value. All these contracts were signed before the project starting date, but did not incur in expenses considered in the investment analysis.

O&M per year represents an estimate of 2.44% of the total investment.

Comparing with simulations presented in the book from the Brazilian Ministry of Environment "*Renewable Sources of Energy in Brazil*" /30/, which considered values of O&M ranging from 1% to 4%, the value of O&M of the project is reasonable.

DNV confirmed that the values of the parameters were the latest available in the time of the investment decision (which is the same as the project starting date: 26 August 2010) and concludes that the O&M cost for the proposed project is reasonable for windfarms.

Annual power generation:

According to the PDD /1/ and Camargo Schubert Consulting /11/, it is expected that the proposed project will supply to SIN approximately 131 750 MWh at a plant load factor of 50.10%. However, as previously explained, for the investment analysis, the net capacity of 14.66 MW (14.664 MW before rounding) was considered for the estimation of electricity generation and incomes. The reason for this is that, for electricity selling and billing purposes,

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CCEE determines that the losses in the SIN must be discounted by each electricity producer from the electricity it delivers to the SIN /36/, so the total effective generation of the system equals the total effective capacity of the system. As per official data from 2006 to 2010 /36/, 2.5% of losses shall be considered in the billing system, thus constituting in a net capacity of 14.66 MW. For this net capacity, the estimated generation is then 128 457 MWh per year. *"Guidelines on the Reporting and Validation of Plant Load Factors"* /28/ gives instruction 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 cross-checking that the values are in line with the Certificates of Wind Measurements and of Production of Energy from Camargo Schubert Consulting /11/ should be considered sufficient for validation of plant load factor. This was the case for this project. Nevertheless, according to BNDES the typical range of plant load factor in Brazil is from 30% to 60% /45/ and according to *"Renewable Sources of Energy in Brazil"*, the average plant load factor of a wind park in Brazil is 40% /30/. DNV considers that the plant load factor for "Electricity generation from renewable sources – Windfarm Campo dos Ventos II" is reasonable for windfarms in Brazil.

As per the Certificates of Wind Measurements and of Production of Energy from Camargo Schubert Consulting /11/, 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 June 2008 to 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 confirmed that the values of the parameters were the latest available in the time of the investment decision (which is the same as the project starting date: 26 August 2010) and concludes that the assumed annual power generation from the Certificates of Wind Measurements and of Production of Energy from Camargo Schubert Consulting /11/ is appropriate and acceptable.

Power tariff:

The price agreed on 3 June 2011 /13/ for the energy of the project is BRL 126.19 and the amount of energy hired is 14 MW, as confirmed in the PPA between Campo dos Ventos II Energias Renováveis S.A. and the CCEE /13/. As per electricity regulations for auctions in Brazil /35/, the price used in PPAs between a company that won an auction and CCEE has to be the same price that was given as a bid in the auction (it is an inverted auction, where the smallest price offered by the seller is the winner) . Therefore the price agreed on the PPA of 3 June 2011 /13/ is BRL 126.10, the same price that Campo dos Ventos II Energias Renováveis S.A. used to win the auction 3rd Brazilian Auction of Renewable Energy /35/.

The PPA guarantees the purchase of electricity correspondent to 14 MW of capacity. However, as previously explained, the installed capacity used in the investment analysis was 14.66 MW (14.664 MW before rounding). The exceeding electricity can be sold in the spot (free) market, which presents lower prices than long term PPAs. Nevertheless the investment analysis used the same price as the guaranteed in the PPA (BRL 126.19) for the spot sales.

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DNV considered this approach conservative and correct. Selling electricity in the spot market, however, can happen only every four years, because the model of commercialization defined by CCEE /35/ states that the amount of electricity generated has decreasing tolerance bands every quadrennial. When generating above those bands the extra electricity may be sold in the free market. When generating below those bands the revenue will suffer a proportional discount by the price agreed in the auction.

The PPA period is 20 years and the price cannot be changed. It will only vary according to the inflation during the period. The inflation rate used in the investment analysis was a variable decreasing rate, starting on 5.20% and falling to 3.68%. These values are neighbouring the 4.5% used as the inflation target determined by the Central bank of Brazil /42/ per year for the estimation of the inflation since 2003 and is in line with an expected decreasing inflation forecast of the government in the long term /42/. DNV cross-checked these values with the official sources /13/ /35/ /42/ and considered it reasonable.

Taxes and depreciation:

DNV also confirmed that the special purpose societies formed for the project are eligible for the presumed profit regime, in accordance to the Brazilian national fiscal legislation /39/. Values of 8% /39/ for the income rate basis and income tax of 25%, 0.65% for the PIS/PASEP tax /37/, 3% for the COFINS tax /37/, 12% of revenues basis and a 9% rate is applied as CSLL /38/ and a linear depreciation of 4.1% /49/ were established according to the Brazilian legal requirements. DNV confirmed that the regulations and values of taxes used in the project are the latest available in the time of the investment decision (which is the same as the project starting date: 26 August 2010) and are correct. In the presumed profit regime, depreciation has no impact in the Equity IRR. In this case, income tax rates are calculated over revenues and not over gross profits.

Cost of debt financing:

Campo dos Ventos II Energias Renováveis S.A. applied for financing with the Brazilian Development Bank (BNDES), the main source of financing for infrastructure projects in Brazil. Historically BNDES has granted 59% /43/ but is allowed to reach up to 75% /43/ of financing of CAPEX to windfarm projects. Campo dos Ventos II Energias Renováveis S.A. estimated in 71% of CAPEX to be financed and this was used in the investment analysis. DNV considers this approach conservative, because as the leveraging increases, the Equity IRR also increases.

Based on the sum of the financing cost expected for the loan to be granted by BNDES /17/, the following apply:

- Long term interest rate: 6% /44/;
- BNDES spread: 0.9% /43/;
- Credit risk rate: 0.82% /44/. This is the value that Campo dos Ventos II Energias Renováveis S.A. estimated for credit risk rate charged on the loan. It is within the range commonly practiced by BNDES (from 0.46% to 3.57%) /43/.

DNV cross-checked the values presented with BNDES home page /43/ /44/ and confirmed that these values are adequate for a windfarm in Brazil.



Calculation and conclusion:

The IRR calculations were provided in spreadsheet /4/ and verified by DNV. The assumptions and calculations were verified and found to be correct by DNV. The Equity IRR is post-tax and the assessment period of 20 years is equivalent to the lifetime of the project /12/, in which the real IRR without CDM revenues is 9.44%. This confirms that the project in the absence of CDM benefits and compared to the benchmark of 12.75% is not financially attractive /3/ /4/.

Sensitivity analysis:

A sensitivity analysis was carried out for parameters contributing more than 20% to the revenues or costs in order to check the robustness of the investment analysis. Reasonable variations of the revenues, capital expenditures and operation & 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 verified that the Equity 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 the IRR of 9.44% to reach the benchmark of 12.75%
Electricity Tariff	+ 10.97%
Electricity Generation	+15.65%
CAPEX	- 13.12%
OPEX	- 118.00%

1) Electricity Tariff: Revenues are dependent of the energy generated and the tariff of the energy. To reach the 12.75% benchmark, electricity tariff must increase by 10.97% above inflation, which is not likely to happen. The tariff is defined in contract as BRL 126.19 for the 20 years of duration of the PPA and cannot be changed /13/. Furthermore, there is only one PPA signed with CCEE /13/, which compromises 14 MW of energy, and the contracted energy will not change along the PPA period, according to the electricity market rules for auctions /35/ - and there is no contract signed for the excess of energy generated besides this. Usually energy sold in the spot (free) market in short term PPAs does not reach the same values as long term PPAs. Nevertheless, the investment analysis used the same price as the guaranteed in the PPA (BRL 126.19) for the spot sales. DNV considered this approach conservative and correct. Selling electricity in the spot market, however, can happen only every four years, because the model of commercialization defined by CCEE states that the amount of electricity generated has decreasing tolerance bands every quadrennial. When generating above those bands the extra electricity may be sold in the free market. When generating below those bands the revenue will suffer a proportional discount by the price agreed in the auction.

2) Electricity Generation: To reach the 12.75% benchmark, electricity generation must increase by 15.65%. According to the PDD /1/ and Certificates of Wind Measurements and of Production of Energy from Camargo Schubert Consulting /11/, the assumed annual output is based on 20 year historical (from 1990 to 2010) weather statistic data from wind resources measurement provided by NCAR/NCEP Global Reanalysis Project (NOAA-USA). With this,



the plant load factor was defined as 50.10%, for a windfarm of 30 MW of 15.04 MW of net installed capacity. 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 maximized 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) CAPEX: DNV assessed that a 13.12% decrease in investment costs is unlikely to happen. Contracts signed with Wobben Windpower /15/ for the acquisition of the WTGs, construction and maintenance of the windfarm and with Salus /14/ for the shares of the project represent 80.2% of the total investment and are already signed. It would be necessary that the remaining 19.8% of the total investment (regarding transmission lines, civil construction, environmental expenses and other) to decrease 85% for the benchmark of 12.75% to be reached. Such a wide decrease is unlikely to happen because estimates for transmission lines, civil construction, environmental expenses and other costs were performed in an appropriate manner as explained in section 4.6.3 under Input Parameters above.

4) OPEX: The annual O&M cost consists of maintenance cost, material costs, salary and welfare, insurance cost and other cost. It would take 118.00% decrease in the O&M cost to the IRR reach the benchmark of 12.75%, which means that O&M would be zero and this is unlikely to happen.

The sensitive analysis above shows that unfavorable 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"* version 5.2.1 /24/ 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 Brazilian national grid have been analysed.

DNV confirmed that despite the available high technical potential for wind energy utilization in Brazil; by the time of the decision-making of the project only 0.90% of electricity in Brazil was generated from wind farms /48/.

By the time of the decision-making of the project, there were 54 operating wind plants /48/ /54/. In that time, 43 out of the 54 (79.6%) operating wind plants in Brazil had PROINFA /32/ (Brazilian national program started in 2002 to foster the share of alternative energy)



incentives. Five of the 11 non-PROINFA operating plants were being developed as CDM projects.

All 6 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 /48/ /54/ /55/);
- or experimental power plant owned by state-owned power utilities (Olinda Wind Power Plant /48/ /54/ /55/);
- or implemented with support from other country governments (Morro do Camelinho Wind Power Plant /48/ /54/ /55/);
- or owned (totally or partially) by Wobben Windpower Industria e Comércio Ltda. (Prainha, Taíba, Mucuripe and Palmas Windpower Plants /48/ /54/ /55/). Wobben Windpower manufactures the wind turbines themselves (it was the first Brazilian company to manufacture large scale WTGs) and in these projects (Prainha, Taíba, Mucuripe and Palmas Windpower Plants) Wobben projected, constructed, assembled, operated and maintains the windfarms. As per *"Tool for the demonstration and assessment of additionality"* /24/ these four projects are examples of easier access to wind technology than to other project developers and obtained smaller implementation costs than entrepreneurs for these services.

Finally, it is DNV opinion that these figures and facts confirm that the development of wind farms like Electricity generation from renewable sources – Windfarm Campo dos Ventos II 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 12.2.0 /23/. 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, *"Consolidated baseline methodology for grid-connected electricity generation from renewable sources"*, version 12.2.0 /23/.

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



4.7.1 Parameters determined ex-ante

The parameters determined ex-ante are the weighting of operating margin emission factor (W_{OM}) and weighting of build margin emission factor (W_{BM}). As per *"Tool to calculate the emission factor for an electricity system"*, version 2.2.1 /25/ for wind projects, W_{OM} is 0.75 and W_{BM} is 0.25 during the first and subsequent crediting period.

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, the build margin and combined margin emission factors. According to the *"Tool to calculate the emission factor for an electricity system"*, version 2.2.1 /25/ 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 is calculated and published yearly by the DNA of Brazil /33/. The calculations are based on electricity generation data provided by the Brazilian National Operator of the Electric 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 the proposed project to the Brazilian grid.

The power exported to and imported from the SIN will be monitored continuously and consolidated hourly and monthly 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 CCEE databank.

The meters are multi-phase, 3 elements, 4 wire (for 4 wire systems), of system rated frequency, rated current according to the secondary of current transformer, nominal voltage according to the secondary of potential transformer, bi-directional and their accuracy is not lower than 0.2S, as determined in the standards of the ABNT - Brazilian Association of Technical Standards adopted by Brazilian National Operator of the Electric System /34/. 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 /34/.

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 program.

Detailed procedures have been elaborated in section B.7.2 of the PDD. 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 monitored parameters operating margin (OM) and build margin (BM) according to "Tool to calculate the emission factor for an electricity system", version 2.2.1 /25/ for the 7-year renewable crediting period.

The Brazilian grid emission factor is published yearly by the DNA of Brazil /33/. The calculations are based on electricity generation data provided by the Brazilian National Operator of the Electric System (ONS) for the electricity generated in the grid in the year of 2010. This is the most recent information available at the start of the validation, when the PDD was published (15 October 2011).

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.



The method dispatch data analysis OM was chosen by the Brazilian DNA. The OM is calculated to be 0.4787 tCO₂/MWh and the BM is calculated as 0.1404 tCO₂e/MWh. This results in a combined margin emission factor of 0.3941 tCO₂e/MWh.

The annual electricity delivered to the SIN was estimated as 131 750 MWh based on the plant load factor of 50.10%, calculated by Camargo Schubert Consulting /11/.

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 51 922 tCO₂e per year for the selected crediting period.

Through cross-checking, DNV assessed and confirms that:

- all assumptions and data used by the project participants are listed in the PDD /1/ 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 /29/) a Simplified Environmental Report (RAS) is required to grant the Environmental Previous Licence of electricity generation projects with more than 10 MW of installed capacity. As stated in the PDD, a Simplified Environmental Report (RAS) /9/ has been conducted according to Brazilian law and regulation /29/. The potential significant environmental impacts of the project have been sufficiently identified. No significant environmental impacts are expected from the project activity.

DNV verified that the wind farm was granted the Environmental Previous Licence issued by the Institute of Environment and Sustainable Development of the state of Rio Grande do Norte (IDEMA) which is valid until 13 May 2012 /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 29 July 2011 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 - and to comment on the project, in accordance with the requirements of Resolution 7 (5 March 2008) of the Brazilian DNA.

DNV has checked all the invitation letters and the mail receipts /10/. No comments were received for the proposed project



DNV considers the local stakeholder consultation was carried out adequately.

4.11 Comments by Parties, stakeholders and NGOs

The PDD, version 1 dated 8 September 2011 /1/, was made publicly available on the CDM website /60/ and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period, from 15 October 2011 to 13 November 2011.

No comments were received for the proposed project.

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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	OK. 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	Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.
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	Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including

Requirement	Reference	Conclusion
		the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.
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	OK. 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	OK. Brazil has ratified the Kyoto Protocol on 23 August 2002.
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK. No participating Annex I Party is yet identified.
9. 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	OK. No participating Annex I Party is yet identified.

Requirement	Reference	Conclusion
About additionality		
10. 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		
11. 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		
12. 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. The Environmental Previous Licence, as required by the Brazilian regulation, was presented by the project participants.
About stakeholder involvement		
13. 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	OK.
14. 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.	CDM Modalities and Procedures §40	OK.
Other		
15. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK.
16. 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.

Requirement	Reference	Conclusion
17. 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.
18. 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 type="checkbox"/> Yes <input checked="" type="checkbox"/> No As per " <i>Validation and Verification Manual</i> ", PDD must be completed adequately but the Annexes of the PDD did not contain any information	CL7	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/ /6/ /8/ /9/ /10/ /13/ /16/	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		OK.

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>appropriately justified through statistical analysis.</p> <p><input type="checkbox"/> The project is an individual small scale 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 participants Campo dos Ventos II Energias Renováveis S.A. and WayCarbon Soluções Ambientais e Projetos de Carbono Ltda. were interviewed on 17 November 2011 at Campo dos Ventos II Energias Renováveis S.A. office in São Paulo by DNV auditors Gabriel Baines and Mayra Rocha, to resolve the issues identified during the desk review.</p> <p>During the desk review, the relevant documents</p>		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			including the PDD, the ER calculation spreadsheet, the benchmark calculation, the IRR spreadsheet, the notification to UNFCCC and its confirmation, the notification to Brazilian DNA and its confirmation, the Previous Environmental Licence, the environmental studies for the wind farm, the receipts of delivery of mail to stakeholders, the contracts of PPA and of purchase of the Project have been assessed. The construction of the project had only started, just the construction of the foundations, as was confirmed through the photographic report sent to ANEEL every month. 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/ /16/	DR	At the time of commencing of validation, the physical implementation of the project had started only the construction of the foundations as was confirmed through the photographic report sent to ANEEL every month.		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/ /9/ /11/	DR	The “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” project is located in the municipalities of Parazinho and João Câmara Municipalities, in the Rio Grande do Norte state, Brazil. The geographical coordinates of the proposed project activity are <ul style="list-style-type: none"> • Latitude: - 5.3329° 		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<ul style="list-style-type: none"> Longitude: - 35.9455° <p>The project is a wind power project which involves installation and operation of 15 wind turbines. The installed capacity of each turbine is 2 MW thus, constituting a total installed capacity of 30 MW.</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/ /35/	DR	No, it is a greenfield project that will utilize new equipment. The project activity is the installation of a greenfield wind power plant that is connected to the Brazilian national grid, as confirmed in the CCEE result of the 3 rd Brazilian Auction of Renewable Energy - Auction n° 2013-EOL20 of 26 August 2010.		OK.
A.2.6	Does the project design engineering reflect current good practices?	/1/ /12/	DR	It was cross-checked by DNV through the manufacturer's product specifications that the project design engineering uses the megawatt-class, three-bladed, variable speed wind turbines, which is deemed to reflect good practices.		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/ /48/	DR	DNV has confirmed that both the installed capacity and generation of wind power plants was only 0.90% of the total capacity and power generation of Brazil according to the ANEEL's Bank of Information of Generation. DNV has confirmed that by the time of the project investment decision phase, there were 54 wind farms operating in Brazil.		OK.
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	The involved party is Brazil as the host Party. There is no Annex I Party identified yet. The project participants are Campo dos Ventos II		OK.

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<p>a) Party has ratified the Kyoto Protocol</p> <p>b) Party has designated a Designated National Authority</p> <p>c) The assigned amount has been determined</p>		<p>Brazil (host)</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input checked="" type="checkbox"/> Yes <input type="checkbox"/> No</p>	<p>Energias Renováveis S.A. and WayCarbon Soluções Ambientais e Projetos de Carbono Ltda. 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>A.3.2 Do the letters of approval meet the following requirements?</p> <p>a) LoA confirms that Party has ratified the Kyoto Protocol</p> <p>b) LoA confirms that participation is voluntary</p> <p>c) The LoA confirms that the project contributes to the sustainable development of the host country?</p> <p>d) The LoA refers to the precise project activity title in the PDD</p> <p>e) The LoA is unconditional with respect to (a) to (d) above</p> <p>f) The LoA is issued by the respective Party's DNA</p> <p>g) The LoA was received directly by the DNA or the PP</p> <p>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</p>	<p>/1/ /20/</p>	<p>DR</p> <p>Brazil (host)</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p><input type="checkbox"/> DNA <input type="checkbox"/> PP</p>	<p>Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.</p>		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
A.3.3	Have all private/public project participants been authorized by an involved Party?	/1/ /20/	DR	Prior to the submission of the final validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation by the DNA of Brazil that the project assists it in achieving sustainable development.		
A.4 Technical description of the project activity (VVM para 58-64)						
A.4.1	Is the project's location clearly defined?	/1/ /9/ /11/	DR	<p>Yes, the locations of the project are clearly defined:</p> <ul style="list-style-type: none"> • Latitude: - 5.3329 • Longitude: - 35.9455 <p>and presented to IDEMA in the approved Simplified Environmental Report (RAS).</p> <p>The coordinates of all WTGs were presented in the document “d_InvInputs_02_PlantLoadFactor_CamargoSchubert_v01_20100415.pdf” from Campo dos Ventos II Energias Renováveis S.A. and determine the polygon formed by the windfarm.</p>		OK.
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/ /17/	DR	<p>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.</p> <p>The project is applying for BNDES (Brazilian Development Bank) funding.</p>		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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/ /23/	DR	The project correctly applies the approved baseline and monitoring methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", version 12.2.0.		OK
B.1.2	If applicable, has any specific guidance provided by the CDM EB in respect to the applied methodology been considered?	/1/ /24/ /25/	DR	Yes, the "Tool to calculate the emission factor for an electricity system" (version 2.2.1) and the "Tool for the demonstration and assessment of additionality" (version 5.2.1) are also applicable. The latest available version of the "Tool for the demonstration and assessment of additionality" at the beginning of validation was not used.	CL2	OK.
B.2 Applicability of methodology (and tools) (VVM para 65-76)						
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/ /23/	DR	As per "Validation and Verification Manual", all applicability conditions of methodology ACM0002 version 12.2.0 shall be explained.	CL3	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/ /23/	DR	As per "Validation and Verification Manual", all applicability conditions of methodology ACM0002 version 12.2.0 shall be explained.	CL3	OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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/ /23/	DR	As per " <i>Validation and Verification Manual</i> ", all applicability conditions of methodology ACM0002 version 12.2.0 shall be explained.	CL3	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/ /25/	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 of Brazil, to which the project will be connected. Project and system boundaries are defined in accordance with applicable guidelines of both ACM0002 version 12.2.0 and the " <i>Tool to calculate the emission factor for an electricity system</i> " version 2.2.1".		OK.
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 Brazilian 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	As per ACM0002 version 12.2.0 the "Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion" is used in the calculation of the project emissions if there are fossil fuel sources in the project site and they represent more than 1% or emission reductions. Project participants do not justify if there are emissions from fossil fuel gensets, that these are not exceeding 1% of emission reductions and clarify how this can be ensured during the crediting period	CL6	OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.4 Baseline scenario determination (VVM para 81-88, 105-107)						
B.4.1	Which baseline scenarios have been identified? Is the list of baseline scenarios complete?	/1/ /23/ /25/	DR	The baseline is in accordance with <i>ACM0002</i> version 12.2.0 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 <i>"Tool to calculate the emission factor for an electricity system"</i> .		OK.
B.4.2	How have the other baseline scenarios been eliminated in order to determine the baseline?	/1/ /23/	DR	Not applicable, as <i>ACM0002</i> , version 12.2.0 prescribes the baseline scenario.		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/ /23/	DR	The baseline determination is in line with <i>ACM0002</i> , version 12.2.0.		OK.
B.4.5	Has the baseline scenario been determined using conservative assumptions where possible?	/1/ /23/	DR	This is not applicable as the baseline is directly determined as per <i>ACM0002</i> , version 12.2.0.		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/ /23/	DR	This is not applicable as the baseline is directly determined as per <i>ACM0002</i> , version 12.2.0.		OK.
B.4.7	Is the baseline scenario determination compatible with the available data and are all literature and sources clearly referenced?	/1/ /23/	DR	This is not applicable as the baseline is directly determined as per <i>ACM0002</i> , version 12.2.0.		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. 	/1/	DR	The baseline determination has been adequately documented in the PDD: <ul style="list-style-type: none"> Not applicable. Not applicable. Not applicable. 		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
<ul style="list-style-type: none"> 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 				<ul style="list-style-type: none"> Not applicable. The methodology has been correctly applied to identify what would occur in the absence of the proposed CDM project activity 		
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/ /23/ /24/	DR	As required by ACM0002, version 12.2.0, the additionality of the project has been established using the <i>"Tool for the demonstration and assessment of additionality"</i> , version 5.2.1.		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/	DR	The project starting date is 26 August 2010, the date of the auction of reserve power in which the electricity generation facility Campo dos Ventos II had its energy contracted and its contract for the supply of equipment and services with Wobben Windpower validated, so after 2 August 2008. Therefore, notifications to both the UNFCCC and the DNA were required as per <i>"Guidelines on the demonstration and assessment of prior consideration of the CDM"</i> ,		OK.

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			version 4.0, adopted at EB62 Annex 13, dated 15 July 2011, valid at the time of the starting date of the project. Notification on the CDM activity was submitted to both UNFCCC and the DNA and confirmed by UNFCCC and the DNA on 27 October 2010 and 5 November 2010 respectively.		
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	The project starting date is 26 August 2010, the date of the auction of reserve power in which the electricity generation facility Campo dos Ventos II had its energy contracted and its contract for the supply of equipment and services with Wobben Windpower validated, so after 2 August 2008. Therefore, notifications to both the UNFCCC and the DNA were required as per " <i>Guidelines on the demonstration and assessment of prior consideration of the CDM</i> ", version 4.0, adopted at EB62 Annex 13, dated 15 July 2011 valid at the time of the starting date of the project. Notification on the CDM activity was submitted to both UNFCCC and the DNA and confirmed on 27 October 2010 and 5 November 2010 respectively.		OK.
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 26 August 2010, thus 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 26 August 2010, thus after 2 August 2008.		OK.
B.5.9 When was the project commissioned?	/1/	DR	It is not applicable to the proposed project		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				activity as its starting date is 26 August 2010, thus after 2 August 2008.		
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 26 August 2010, thus after 2 August 2008.		OK.
Investment analysis (VVM para 108-114)						
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.
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/ /40/ /46/ /47/	DR	Yes, the benchmark is the expected return on capital (Ke), after tax, in real terms. It was calculated as expected capital (Ke) using CAPM. All values estimated in project were applicable at the time of the investment decision. Data presented was cross-checked with official sources from the Brazilian National Treasury and BOVESPA to assess its validity.		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	The financial indicator is Equity IRR calculated after tax in real terms, therefore in correspondence with the benchmark presented.		OK.
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	Yes, all underlying assumptions are adequate to the project activity. No waste was considered for this project.		OK.

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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/ /27/ /37/ /39/ /38/ /49/	DR	DNV confirmed that the special purpose societies formed for the project are eligible for the presumed profit regime, in accordance to the Brazilian national fiscal legislation. Values of 8% for the income rate basis and income tax of 25%, 0.65% for the PIS/PASEP taxes, 3% for the COFINS tax, 12% of revenues basis and a 9% rate is applied as CSLL and a depreciation period of 20 years was applied in the investment analysis were established according to the Brazilian legal requirements. According to the guidance of "Guidelines on the Assessment of Investment Analysis", version 5.0, adopted at EB62 Annex 5, 15 July 2011, the interest payable should be taken into account of the income tax calculation in cases where the benchmark applied in the investment analysis is post tax. However, 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 use of depreciation of equipment was not explained in the PDD	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	The time period of the investment analysis is 20 years, the same as the WTGs lifetime and the PPA duration. Working capital returned in the end of the assessment period was not explained in the PDD	CAR5	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	/1/	DR	Not applicable.		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	adequate?					
B.5.20	How was the amount of output (e.g. sales of electricity) assessed?	/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 checked="" 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. The annual electricity delivered to SIN is expected to be 131 750 MWh corresponding to an average plant load factor of 50.10% (15.04 MW of net installed capacity) sourced from the “Certificates of Wind Measurements and of Production of Energy” prepared by Consultancy Camargo Schubert, an independent third party. Gross plant load factor, net plant load factor and the energy generation of the project and their calculation are not clearly stated in the PDD.	CAR1	OK.
B.5.21	How was the output price (e.g. electricity price) assessed? Were the data available and valid at the time of decision?	/1/ /35/	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 DNV confirmed that the price for the electricity generated in the project was determined as BRL 126.19 in the 3 rd Brazilian Auction of Reserve Energy - Auction n° 2013-EOL20 and was available at the time of decision.		OK.

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
B.5.22 How were the investment costs assessed? Were the data available and valid at the time of decision?	/1/ /5/ /15/ /35/ /45/ /50/ /58/	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, contracts and annual financial reports related to the project and the project participants <ul style="list-style-type: none"> BRL 82 058 793.00 (64.6% of total investment) corresponds to the investment in the WTGs as per the MoU and Contract between Campo dos Ventos II Energias Renováveis S.A. and Wobben Windpower. Prices were agreed during the 3rd of Reserve Power Auction, the event that marked the starting date of the project. DNV cross-checked and confirmed that the values and conditions of this contract, signed on 27 August 2010 are the same as in the MoU signed for the acquisition of the WTGs, construction and maintenance of the windfarm between these same two companies on 25 August 2010. DNV also assessed the percentage of the costs of the wind towers in the total cost of wind energy projects and compared the project with Brazilian and European projects. The typical wind project in Brazil presented 70% of costs in WTGs in January 2009 while European projects presented 75.6% of costs in WTGs in March 2009. DNV considers that the proposed project costs of WTGs are thus 	CAR1 CAR4	OK.

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>reasonable;</p> <ul style="list-style-type: none"> • BRL 33 259 815.00 (26.2% of total investment) corresponds to engineering, voltage network, substation of elevation and transmission lines costs, based on the contract between Campo dos Ventos II Energias Renováveis S.A. and Wobben Windpower and as per estimates made by Campo dos Ventos II Energias Renováveis S.A. based on ANEEL's Bank of Prices and Reference Costs for Transmission Lines and Substations. DNV confirmed these values cross-checking the mentioned documents. DNV also assessed the percentage of the costs of the engineering, medium voltage network and substation in the total cost of wind energy projects and compared the project with American projects due to the lack of information about wind engineering, medium voltage network and substation in Brazil. The typical wind project in the USA presented 26% of costs in wind engineering, medium voltage network and substation in 2005. DNV considers that the costs for proposed project are reasonable and coherent with the average wind entrepreneurships. Additionally, as the the 3rd Reserve Power Auction of the 26 August 2010 is an inverted auction, where the lowest price offered by the producer wins, DNV considers this 		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>approach is correct, since it is conservative;</p> <ul style="list-style-type: none"> • BRL 5 375 333 (4.2% of total) corresponds to the project acquisition. Campo dos Ventos II Energias Renováveis S.A. purchased “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” from Salus – Fund of Investment in Participations. It only came into force when “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” was successfully given the right to produce and deliver electricity in the 3rd Reserve Power Auction of the 26 August 2010. 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. • BRL 2 581 000.00 (3.0% of total) corresponds to environmental expenses, such as environmental management system, recovery plan, deforestation control, noise control system, environmental compensation, flora and fauna monitoring system, erosion, education plan and others. DNV assessed these estimations and considers that are reasonable and coherent with the average wind entrepreneurship; 		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<ul style="list-style-type: none"> BRL 3 826 000.00 (2.0% of total) corresponds to hired administration, security, facilities, 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. DNV assessed these estimations and considers that are reasonable and coherent with the average wind entrepreneurship. <p>Gross plant load factor, net plant load factor and the energy generation of the project and their calculation are not clearly stated in the PDD</p> <p>Calculation and use of depreciation of equipment was not explained in the PDD</p>		
B.5.23 How were the O&M costs assessed? Were the data available and valid at the time of decision?	/1/ /15/ /19/ /51/ /52/	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 <p>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.</p> <p>As per the contract between Campo dos Ventos II Energias Renováveis S.A. and Wobben Windpower, the price for the O&M of the WTGs is zero for the first two years of operation, BRL</p>	CL4	OK.

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>19 845.00 for the third year, BRL 88 200.00 for fourth and fifth years and BRL 97 020.00 for the sixth to the twentieth year.</p> <p>The O&M for the transmission line is BRL 145 103.00 per year. It is estimated as 1.5% of the implementation costs of substation and voltage network, as it is a subterranean system and for medium voltage.</p> <p>Electricity charges and taxes:</p> <ul style="list-style-type: none"> • TSFEE tax will cost BRL 66 946.00 in the first year of full operation and will vary according to inflation. • TUST tax was calculated following regulatory decrees and varies on the production of energy, starting as BRL 5 408.00/KW.month for the first year of full operation, totalling BRL 1 116 498.00, and decreasing gradually as determined by ANEEL. • Charges for the use of the shared installations of generation are calculated following regulatory decrees, being BRL 725 000.00 per year and will vary according to inflation. DNV confirmed that these values are in accordance with the Brazilian national regulation. <p>O&M insurance will cost 0.25% of the total CAPEX, as estimated by Campo dos Ventos Energias Renováveis S.A. Insurance covers installation, performance and operation, totalling BRL 304 314.00 for the first year of full operation.</p> <p>Land rent is 1.5% of gross revenues, as stated in</p>		

Checklist Question	Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
			<p>the contracts with land owners in the area of the windfarm. DNV cross-checked the contracts with land owners and confirmed this value. All these contracts were signed before the project starting date, but did not incur in expenses considered in the investment analysis.</p> <p>O&M per year represents an estimate of 2.44% of the total investment.</p> <p>Comparing with simulations presented in the book from the Brazilian Ministry of Environment “<i>Renewable Sources of Energy in Brazil</i>” /30/, which considered values of O&M ranging from 1% to 4%, the value of O&M of the project is reasonable.</p> <p>As per “Guidelines on the Assment of Investment Analysis” all input values must be valid for the investment analysis and demonstrated in the PDD. Electricity transmission costs were not included in the PDD..</p>		
B.5.24 Describe the assessment of the other input parameters. Were the data available and valid at the time of decision?	/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>All input parameters were described above in B.5.23.</p>		OK.
B.5.25 Was the financial calculation spreadsheet verified and found to be correct?	/1/	DR	<p>The Equity IRR calculations were provided in a spreadsheet and were assessed by DNV and the financial expert. The Equity IRR over 20 years without CDM revenues is 9.44% which confirms that the project in the absence of CDM benefits and compared to the benchmark is not financially</p>		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				attractive.		
B.5.26	Sensitivity analysis: Have the key parameters contributing to more than 20% of the revenue/costs during operating or implementation been identified? Has possible correlation between the parameters been considered?	/1/	DR	<p>A sensitivity analysis was 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, CAPEX and OPEX and maintenance costs were checked by calculating the variation necessary to reach the benchmark and then discussing the likelihood for that to happen.</p> <p>The variation of the plant load factors considered in the project was not considered in sensitivity analysis of the additionality of the project</p> <p>As per "Guidelines on the Assessment of Investment Analysis", sensitivity analysis must include variables that constitute more than 20% of either total project costs or total revenues. The variation needed in CAPEX to the financial indicator reach the benchmark was not included in the sensitivity analysis</p>	CAR3 CL5	OK.
B.5.27	Sensitivity analysis: Is the range of variations is reasonable in the project context?	/1/	DR	<p>The variation of the plant load factors considered in the project was not considered in sensitivity analysis of the additionality of the project</p> <p>As per "Guidelines on the Assessment of Investment Analysis", sensitivity analysis must include variables that constitute more than 20% of either total project costs or total revenues. The variation needed in CAPEX to the financial indicator reach the benchmark was not included in the sensitivity analysis</p>	CAR3 CL5	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	/1/	DR	The variation of the plant load factors considered in the project was not considered in sensitivity	CAR3 CL5	OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
small?				analysis of the additionality of the project As per "Guidelines on the Assessment of Investment Analysis", sensitivity analysis must include variables that constitute more than 20% of either total project costs or total revenues. The variation needed in CAPEX to the financial indicator reach the benchmark was not included in the sensitivity analysis		
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.
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	/1/	DR	Not applicable as barrier analysis was not applied		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
	be real? Are the barriers due to prevailing practise substantiated by a source independent of the project participants?			for the proposed project.		
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.
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 analysed.		OK.
B.5.44	What is the data source(s) used for the common practice analysis?	/1/ /48/	DR	ANEEL data from the Bank of Information of Generation in Brazil is used to analyse other wind power plants. By the time of the decision-making of the project, there were 54 operating wind plants. In that time, 43 out of the 56 (79.6%) operating wind plants in Brazil had PROINFA (Brazilian national program started in 2002 to		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				foster the share of alternative energy) incentives. Five of the 11 non-PROINFA operating plants were being developed as CDM projects.		
B.5.45	How many similar non-CDM-projects exist in the region within the scope?	/1/ /48/	DR	All 6 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), or experimental power plant owned by state-owned power utilities (Olinda Wind Power Plant), or implemented with support from other country governments (Morro do Camelinho Wind Power Plant) 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).		OK.
B.5.46	How were possible essential distinctions between the project activity and similar activities assessed?	/1/ /48/	DR	Distinctions were assessed by ANEEL Bank of Information of Generation website and cross-checked with information from UNFCCC.		OK.
B.5.47	What is the conclusion of the common practice analysis?	/1/	DR	The project activity cannot be considered a common practice once the similar projects existent in the region have all received some type of financial incentive, either PROINFA or CDM.		OK.
Conclusion						
B.5.48	What is the conclusion with regard to the additionality of the project activity?	/1/	DR	In conclusion, it is DNV's opinion is that the investment analysis and sensitivity analysis have shown that the proposed project is not financially attractive and that the project is not a likely baseline scenario. Common practice analysis		

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				demonstrated that the project is not common practice in the country. Therefore DNV considers that emission reductions from the project are additional.		
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 $EF_{grid,BM}$ parameter available at validation verified?	/1/	DR	Project participants did not follow the the grid emission factor calculated and made public by the Brazilian DNA	CAR2	OK.
B.6.2	How was the $EF_{grid,OM}$ parameter available at validation verified?	/1/	DR	Project participants did not follow the the grid emission factor calculated and made public by the Brazilian DNA	CAR2	OK.
B.6.3	How was the $EF_{grid,CM}$ parameter available at validation verified?	/1/	DR	Project participants did not follow the the grid emission factor calculated and made public by the Brazilian DNA	CAR2	OK.
Baseline emissions (VVM para 89-93)						
B.6.4	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	<p>Baseline emissions (BEy in tCO₂) are the product of the baseline emissions factor (EFy in tCO₂/MWh) times the electricity supplied by the project activity to the grid (EGy 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 "Tool to calculate the emission factor for an electricity system", version 2.2.1, for the renewable 7-year crediting period.</p> <p>The Brazilian grid emission factor is published yearly by the DNA of Brazil. The calculations are</p>	CAR2 CL1	OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<p>based on electricity generation data provided by the Brazilian National Operator of the Electric System (ONS) for the electricity generated in the grid. Project participants did not follow the the grid emission factor calculated and made public by the Brazilian DNA</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 (wOM = 0.75; wBM = 0.25) of the operating margin and the build margin emission factors as it is the default value for "Wind and solar power generation projects activities", as per <i>"Tool to calculate the emission factor for an electricity system"</i>, version 2.2.1.</p> <p>It is not clear what is the period of emission reductions in the first and last years of the crediting period</p>		
B.6.5	Have conservative assumptions been used when calculating the baseline emissions?	/1/	DR	See B.6.4	CAR2	OK.
B.6.6	Are uncertainties in the baseline emission estimates properly addressed?	/1/	DR	See B.6.4	CAR2	OK.
Project emissions (VVM para 89-93)						
B.6.7	Are the calculations documented according to the approved methodology and in a complete and transparent manner?	/1/	DR	<p>There are no emissions resulted from the operation of project activity which is a renewable energy project based in wind generation.</p> <p>As per ACM0002 version 12.2.0 the "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion" is used in the calculation</p>	CL6	OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				of the project emissions if there are fossil fuel sources in the project site and they represent more than 1% or emission reductions. Project participants do not justify if there are emissions from fossil fuel gensets, that these are not exceeding 1% of emission reductions and clarify how this can be ensured during the crediting period		
B.6.8	Have conservative assumptions been used when calculating the project emissions?	/1/	DR	Not applicable.		OK.
B.6.9	Are uncertainties in the project emission estimates properly addressed?	/1/	DR	As per ACM0002 version 12.2.0 the “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” is used in the calculation of the project emissions if there are fossil fuel sources in the project site and they represent more than 1% or emission reductions. Project participants do not justify if there are emissions from fossil fuel gensets, that these are not exceeding 1% of emission reductions and clarify how this can be ensured during the crediting period	CL6	OK.
Leakage (VVM para 89-93)						
B.6.10	Are the leakage calculations documented according to the approved methodology and in a complete and transparent manner?	/1/ /23/	DR	As per <i>ACM0002</i> , version 12.2.0 no leakage has to be considered for the proposed project activity.		OK.
B.6.11	Have conservative assumptions been used when calculating the leakage emissions?	/1/ /23/	DR	As per <i>ACM0002</i> , version 12.2.0 no leakage has to be considered for the proposed project activity.		OK.
B.6.12	Are uncertainties in the leakage emission estimates properly addressed?	/1/ /23/	DR	As per <i>ACM0002</i> , version 12.2.0 no leakage has to be considered for the proposed project activity.		OK.
Emission Reductions (VVM para 89-93)						
B.6.13	Algorithms and/or formulae used to determine emission	/1/	DR	Gross plant load factor, net plant load factor and	CAR4	OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
reductions: <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. 				the energy generation of the project and their calculation are not clearly stated in the PDD		
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/ /23/	DR	Yes. The means of monitoring described in the plan comply with <i>ACM0002</i> version 12.2.0.		OK.
B.7.2	Does the monitoring plan contains all necessary parameters, and are they clearly described?	/1/	DR	<p>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.</p> <p>The net electricity dispatched will be measured through the metering equipment at the point of connection of electricity generation from the “Electricity generation from renewable sources – Windfarm Campo dos Ventos II” to the Brazilian grid.</p> <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</p>		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				period.		
B.7.3	In case parameters are measured, is the measurement equipment described? Describe each relevant parameter.	/1/	DR	See B.7.2		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		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		OK.
B.7.6	Is the monitoring frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	See B.7.2		OK.
B.7.7	Is the recording frequency adequate for all monitoring parameters? Describe each parameter.	/1/	DR	See B.7.2		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	<p>The project applies the approved monitoring methodology <i>ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"</i>, (version 12.2.0). The selected monitoring methodology is applicable for the project activity as it involves grid-connected renewable power generation using wind energy.</p> <p>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.</p>		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				<p>The project monitoring plan is in compliance with the monitoring methodology <i>ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources"</i>, (version 12.2.0).</p> <p>It is DNV's opinion, that the project participants are able to implement the monitoring plan.</p>		
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)?	/1/	DR	See B.7.8		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		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		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/	DR	Neither <i>ACM0002</i> , version 12.2.0, 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.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
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 determined? What are the dates of the first contracts for the project activity? When was the first construction activity?	/1/ /5/ /16/	DR	The starting date of the proposed project activity was defined as 26 August 2010, the date of the auction of reserve power in which the electricity generation facility Campo dos Ventos II had its energy contracted and its contract for the supply of equipment and services with Wobben Windpower validated. The project construction was at the very beginning - the construction of the foundations - at the commencement of validation (15 October 2011), as it was confirmed per the photographic registry of the wind farm, sent to ANEEL each month.		OK.
C.1.3	Is the stated expected operational lifetime of the project activity reasonable?	/1/ /12/	DR	The expected operational lifetime of the project activity is 20 years and it is deemed reasonable.		OK.
C.1.4	Is the start date, the type (renewable/fixed) and the length of the crediting period clearly defined and reasonable?	/1/ /13/	DR	A 7-year renewable crediting period has been chosen for the project. The chosen crediting period starting date, on 1 September 2013 or the registry date of the project activity at the CDM-UNFCCC, whichever is later. It is deemed to be reasonable and is matching the beginning of the PPA.		OK.
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/ /9/ /29/	DR	According to Brazilian environmental law a Simplified Environmental Report (RAS) is required to grant the Environmental Previous Licence of electricity generation projects with		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				more than 10 MW of installed capacity. As stated in the PDD, a Simplified Environmental Report (RAS) has been conducted according to Brazilian law and regulation.		
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 verified that the wind farm was granted the Environmental Previous Licence issued by the Institute of Environment and Sustainable Development of the state of Rio Grande do Norte (IDEMA) which is valid until 13 May 2012.		OK.
D.1.3	Will the project create any adverse environmental effects?	/1/ /8/	DR	No significant environmental impacts are expected from the project activity. The wind farm was granted the Environmental Previous Licence, which is part of the environmental regulatory process.		OK.
D.1.4	Have identified environmental impacts been addressed in the project design?	/1/	DR	See D.1.3		OK.
D.1.5	Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/	DR	See D.1.3		OK.
D.1.6	Are transboundary environmental impacts considered in the analysis?			See D.1.3		OK.
E Stakeholder Comments (VVM para 128-130)						
E.1.1	Have relevant stakeholders been consulted?	/1/ /10/ /60/	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 29 July 2011 to comment on the project - in accordance with the requirements of Resolution 7		OK.

Checklist Question		Ref	MoV	Assessment by DNV	Draft Concl.	Final Concl.
				(5 March 2008) of the Brazilian DNA. The PDD, version 1 dated 8 September 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 15 October 2011 to 13 November 2011.		
E.1.2	Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	Yes, DNV checked all the invitation letters and the postal service mail receipts.		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	No comments were received for the proposed project during the local and the global stakeholder consultations.		OK.
E.1.5	Has due account been taken of any stakeholder comments received?	/1/	DR	DNV considers the local and global stakeholder consultation was carried out adequately.		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
CAR1 Gross plant load factor, net plant load factor and the energy generation of the project and their calculation are not clearly stated in the PDD.	B.5.20 B.5.22 B.6.13	The expected energy generation is evidenced by Camargo & Schubert's simulations sent to CPFL on 15 April 2010 (document with detailed technical analysis and calculations provided to the DOE) and reflects the long-term net expected energy generation with 50% surplus probability	DNV assessed the revised version (version 2) of the PDD /1/ and confirmed that the plant load factors and energy generation are now clearly stated. Therefore this CAR is closed.

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>(P50).</p> <p>The net PLF of the project activity is 50.1% and this assumption was used in the Emission Reductions estimative. Please see the new version of the ex-ante calculation spreadsheet.</p> <p>As described in the Section B.5 of the PDD, Sub-step 2.c, Assumption 2, for the purpose of electricity selling and financial billing, the losses in the Brazilian Grid are shared amongst energy generation players in Brazil and are discounted for effective sales meanings. CPFL electricity technicians analyzed the losses occurred in recent years and recommended the application of 2.5% of energy losses in the Brazilian Grid for the related project activity (document provided to the DOE for details).</p> <p>The gross energy generation was not considered in any calculation in the present project. Either for Emission Reductions estimative or demonstration of additionality, which is appropriated in the Brazilian context.</p>	
<p>CAR2</p> <p>Project participants did not follow the the grid emission factor calculated and made public by the Brazilian DNA.</p>	<p>B.6.1 to B.6.6</p>	<p>The ex ante estimation of Emission Reductions was revised by using the most recent data made public available by the Brazilian DNA.</p> <p>Results of the calculation were presented in the PDD version 2 sent to DOE.</p>	<p>DNV assessed the revised version (version 2) of the PDD /1/ and emission reductions calculations spreadsheet /2/ and confirmed that the emission factor calculated and made public by the Brazilian DNA /33/ were correctly applied.</p> <p>Therefore this CAR is closed.</p>
<p>CAR3</p>	<p>B.5.26 to</p>	<p>A sensitivity analysis was carried out in the</p>	<p>DNV assessed the revised version (version</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
<p>The variation of the plant load factors considered in the project was not considered in sensitivity analysis of the additionality of the project.</p>	B.5.28	<p>context of the proposed project activity by varying the main assumptions, as follows: Capital Expenditures (CAPEX), Operational Expenditures (OPEX), Electricity Price (i.e. the price in the Power Purchase Agreement) and the Plant Load Factor.</p> <p>Regarding the Plant Load Factor and expected energy generation of Campo dos Ventos II wind farm, the data is evidenced by Camargo & Schubert's simulations sent to CPFL on 15 April 2010 (document with detailed technical analysis and calculations provided to the DOE), which reflects the long-term net expected energy generation with 50% surplus probability (P50).</p> <p>The Camargo Schubert's Certification brings a value of PLF of 50.1%, which gives an assured energy of 15.04 MW in average.</p> <p>With the objective of Equity IRR calculation, as described in the Section B.5 of the PDD, Sub-step 2.c, Assumption 2, for the purpose of electricity selling and financial billing, the losses in the Brazilian Grid are shared amongst energy generation players in Brazil and are discounted for effective sales meanings. CPFL electricity technicians analyzed the losses occurred in recent years and recommended the application of 2.5% of energy losses in the Brazilian Grid for the related project activity (document provided to the DOE for</p>	<p>2) of the PDD /1/ and financial analysis calculations spreadsheet /4/ and confirmed that the variation of the plant load factors /11/ was considered in the sensitivity analysis.</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>details).</p> <p>Such losses were previewed in Power Purchase Agreement Minute available by Brazilian Electricity Regulatory Agency in Brazil by the time of investment decision. Please see 5th Clause, sub-clause 5.3 of the Power Purchase Agreement minute (ref.: d_InvInputs_01_PPA_Aneel_v01_20110603).</p> <p>In this way, the electricity that will be effectively invoiced is: $15.04 \times 0.975 = 14.664$ MW, approximately. This calculation is included in the financial spreadsheet sent to DOE.</p> <p>By the time of investment decision, date on which the project participants have sold the electricity in the public Auction (the “Reserve Energy Auction” from the government), the contracted capacity of 14 MW was the fixed amount of energy authorized for sale by the Brazilian regulatory agency, and the maximum amount of energy subject to sale in the auction. The variable energy (higher or lower than the fixed amount) must also be considered according to conditions explained in clause 6 of the “Annex II – Reserve Energy Contract” of the “3rd Reserve Energy Auction Rules”.</p> <p>In this way, not the contracted energy (14MW), but the net electricity available to be invoiced (14.664MW, approximately)</p>	

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
		<p>was considered in the calculation of the Equity Internal Rate of Return – project's financial indicator.</p> <p>So, in the Sub-step 2.d. Sensitivity analysis, the required variation in the energy generation was calculated and results presented. Such variation in the energy generation is an increase of 15.65% in the electricity price. According to the Auction Rules the contracted energy will not change along the PPA period.</p> <p>Please see the PDD version 2.</p>	
<p>CAR4</p> <p>Calculation and use of depreciation of equipment was not explained in the PDD.</p>	<p>B.5.17</p> <p>B.5.22</p>	<p>The calculus of depreciation is based on standards determined by the Brazilian Electricity Regulatory Agency (Agência Nacional de Energia Elétrica - ANEEL) and (Receita Federal).</p> <p>The average depreciation value is 4.1% per year. It is calculated by applying the depreciation rates defined by the Brazilian Electricity Regulatory Agency (Agência Nacional de Energia Elétrica - ANEEL) and (Receita Federal). The rate of depreciation has considered the Total Capital Expenditure and was calculated and included in the financial spreadsheet.</p> <p>ANEEL considers a depreciation Rate of 2% per year for Civil Construction structures; 5% p.a. for generators and 3.33% for electrical components. Such depreciation rates were used in the calculation of the average depreciation</p>	<p>DNV assessed the revised version (version 2) of the PDD /1/ and financial analysis calculations spreadsheet /4/ and confirmed that the depreciation was correctly applied, according to ANEEL's Resolution nº 44 /49/.</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>value of 4.1% per year.</p> <p>By using the rules of ANEEL for depreciation, it will not occur a residual value.</p> <p>The rate of depreciation has considered the Total Capital Expenditure and was calculated and included in the financial spreadsheet.</p>	
<p>CAR5</p> <p>Working capital returned in the end of the assessment period was not explained in the PDD.</p>	B.5.18	<p>Considering that the proposed project activity was planned for 20 years of operation, the project participants has considered a Long Term financing structure based on the conditions of Brazilian Development Bank (<i>Banco Nacional de Desenvolvimento Econômico e Social – BNDES</i>).</p> <p>Therefore, no working capital was considered by PPs in the time of investment decision.</p>	<p>DNV assessed the revised version (version 2) of the PDD /1/ and financial analysis calculations spreadsheet /4/ and confirmed that working capital returning in the end of the assessment period will not occur, in accordance to Long Term financing usual procedures.</p> <p>Therefore this CAR is closed.</p>
<p>CL1</p> <p>It is not clear what is the period of emission reductions in the first and last years of the crediting period.</p>	B.6.4	<p>The period of emission reductions in the first and last years of crediting period was completed in the PDD version 2.</p>	<p>DNV assessed the revised version (version 2) of the PDD /1/ and emission reductions calculations spreadsheet /2/ and confirmed that the emission reductions for all years of the first crediting period were correctly demonstrated.</p> <p>Therefore this CL is closed.</p>
<p>CL2</p> <p>The latest available version of the “Tool for the demonstration and assessment of additionality” at the beginning of validation was not used.</p>	B.1.2	<p>The latest available version of the “Tool for the demonstration and assessment of additionality” at the beginning of validation was used in the PDD version 2, which is the version 5.2.1.</p>	<p>DNV assessed the revised version (version 2) of the PDD /1/ and confirmed that the latest version of the <i>"Tool for the demonstration and assessment of additionality"</i> /24/ available at the beginning of validation was used correctly.</p>

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
			Therefore this CL is closed.
CL3 As per " <i>Validation and Verification Manual</i> ", all applicability conditions of methodology ACM0002 version 12.2.0 shall be explained.	B.2.1 to B.2.3	The ACM0002 version 12.2.0 applicability conditions and the outcome of each one were included in the PDD version 2. Please see the new version attached.	DNV assessed the revised version (version 2) of the PDD /1/ and confirmed that all applicability conditions of <i>ACM0002</i> 12.2.0 /23/ were correctly addressed. Therefore this CL is closed.
CL4 As per " <i>Guidelines on the Assessment of Investment Analysis</i> ", all input values must be valid for the investment analysis and demonstrated in the PDD. Electricity transmission costs were not included in the PDD.	B.5.23	The transmission costs considered were defined to the project activity by ANEEL and are referenced in Material Announcement 5 (Comunicado Relevante 5) of the Auction 05/2010, from 13 August 2010. Considering that the periods of Transmission tariff starts every year on 1 July and terminates on 30 June, an adjustment was necessary in order to have a tariff applicable for an ordinary Brazilian year, which starts on 1 January and ends on 31 December. For example: for the first year of generation (2013) the TUST – transmission tariff applicable was the same published by ANEEL; in the second year the average between tariffs from <u>1 July, 2013/31 June, 2014</u> and <u>1 July, 2014/31 June, 2015</u> was calculated in order to have a correct spreadsheet and because it shall be in line with the mechanic of spreadsheet. The transmission costs were included in the PDD version 2.	DNV assessed the revised version (version 2) of the PDD /1/ and financial analysis calculations spreadsheet /4/ and confirmed that transmission costs were correctly included and considered, according to ANEEL's Material Announcement n° 5 /53/. Therefore this CL is closed.
CL5 As per " <i>Guidelines on the Assessment of Investment Analysis</i> ", sensitivity analysis must	B.5.26 to B.5.28	The variation needed in the CAPEX in order to the financial indicator reach benchmark was included in the PDD.	DNV assessed the revised version (version 2) of the PDD /1/ and financial analysis calculations spreadsheet /4/ and confirmed

Corrective action and/ or clarification requests	Reference to Table 2	Response by project participants	Validation conclusion
include variables that constitute more than 20% of either total project costs or total revenues. The variation needed in CAPEX to the financial indicator reach the benchmark was not included in the sensitivity analysis.		The required variation in the CAPEX is a 13.12% of reduction. This reduction would hardly occur once over 80% of the expected CAPEX has a price defined (at the decision making time) with turbine supplier.	that the variation of the CAPEX was correctly applied. Therefore this CL is closed.
<p>CL6</p> <p>As per ACM0002 version 12.2.0 the “Tool to calculate project or leakage CO2 emissions from fossil fuel combustion” is used in the calculation of the project emissions if there are fossil fuel sources in the project site and they represent more than 1% or emission reductions. Project participants do not justify if there are emissions from fossil fuel gensets, that these are not exceeding 1% of emission reductions and clarify how this can be ensured during the crediting period.</p>	<p>B.3.3</p> <p>B.6.7</p> <p>B.6.8</p>	<p>The substation project for the Campo dos Ventos II wind farm foresees as main power for auxiliary services its own generation. i.e. in the substation there will be the transformation that will reduce the level of tension generation (34.5kV) to levels compatible with the auxiliary equipment's (220 or 380V).</p> <p>It is not previewed the installation of a genset in the project site to provide electricity for auxiliary equipment.</p> <p>The only backup system previewed for the auxiliary equipment (in the case of lack of generation – a scenario that will hardly occur), is the electricity connection with the grid.</p> <p>In this way, there will not occur emissions from fossil fuel gensets. Therefore, it will not exceed 1% of emission reductions.</p>	<p>DNV accepted this explanation, in the future, verification site visits will assess the non-existence of potential gensets within the project boundary.</p> <p>Therefore this CL is closed.</p>
<p>CL7</p> <p>As per <i>"Validation and Verification Manual"</i>, PDD must be completed adequately but the Annexes of the PDD did not contain any information.</p>	A.1.2	Considering that all pertinent information from the project activity, baseline application and monitoring information was provided throughout the PDD, the annexes were left in blank in a purposeful way.	<p>DNV assessed the revised version (version 2) of the PDD /1/ and confirmed it was correctly completed.</p> <p>Therefore this CL is closed.</p>

Table 4 Forward action requests

Forward action request	Reference to Table 2	Response by project participants
No FAR was identified in this validation.		

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APPENDIX B

CURRICULA VITAE OF THE VALIDATION TEAM MEMBERS

Gabriel Baines

Gabriel Baines holds a Bachelor's Degree in Environmental Engineering. He has an overall work experience of 6 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 cover the fields of environmental management and management systems such as ISO 14001.

He has experience of around 2 years in validation and verification of numerous CDM projects in DNV, both in Brazil and abroad.

His qualification and experience in CDM demonstrate his sufficient sectoral competence Renewable Energies and Swine Manure.

Mayra Rocha

Mayra Rocha holds a Bachelor's Degree in Economics from Federal University of Rio de Janeiro and has a Master's Degree in Environmental Planning from COPPE.

Prior to joining DNV Mayra had more than four years of experience in Climate Change Services. She has worked with development and revision of CDM Projects and Greenhouse Gas Inventories in environmental consulting firms; in the Brazilian Government (Brazilian Ministry of Science and Technology) and also for the UNFCCC, as external consultant.

Frederico Rosas

Frederico holds a Bachelor Degree in Management and a specialization in Business Administration.

He is professor at Fundação Getúlio Vargas, where he teaches financing, costs management, price management, investment analysis and controllership.

He has working experience of more than 15 years in companies of the area of finances, mining and cosmetics.

Agnes Dudek

Agnes Dudek holds a PhD Degree in applied physics. Having an overall experience of around 11 years. Prior to joining DNV having 7 years experience in scientific research covering satellite remote sensing, mesoscale weather forecast modelling and air pollution dispersion modelling and monitoring.

She has experience of around 4 years in validation and verification of numerous CDM projects.

Her qualification, research experience and experience in CDM demonstrate her sufficient sectoral competence in energy generation from renewable energy sources.