

PERRY JOHNSON REGISTRARS



Carbon Emissions Services, Inc.

# VALIDATION REPORT

ENERGÍA EÓLICA DE HONDURAS, S.A.

CERRO DE HULA WIND PROJECT  
IN HONDURAS

REPORT No. C-1-I-01-LL-0163

REVISION No.6

PERRY JOHNSON REGISTRAR CARBON EMISSIONS SERVICES, INC

755 W. BIG BEAVER ROAD, SUITE 1380, TROY, MI48084

Date of first issue:	Project No:
22/06/2011	C-1-I-01-L-0163
Approved by and date:	Organisational unit:
Mr. Bilal Anwar on 23 April 2012	PJRCES
Client:	Client ref.:
Energía Eólica de Honduras S. A.	Mr. Ivan Liebig

**Project Name:** Cerro de Hula Wind Project

**Country:** Honduras

**Methodology:** ACM0002 - Consolidated baseline methodology for grid connected electricity generation from renewable sources

**Version:** 12.2.0

**Sectoral Scope:** 1, Energy Industries (renewable- /non-renewable sources)

**Project Type and Technology:** Renewable Energy (Wind power)

**ER estimate:** 226,978 tCO<sub>2</sub>e/ year

#### Size

☒ Large Scale

☐ Small Scale

#### Validation Status

☐ Corrective Actions Requested

☐ Clarifications Requested

☒ Full Approval and submission for registration

☐ Rejected

In summary, it is the opinion of PJRCES that the Cerro de Hula Wind Project in Honduras, as described in the PDD, version 8 of 17<sup>th</sup> January 2012, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002, version 12.2.0.

PJRCES thus requests the CDM Executive Board to the register the project as a CDM project activity.

Report No.:	Date of this revision:	Rev. No.	Key words:
C-1-I-01-L-0163-Va	23 /04/12	6	Kyoto Protocol, CDM, Executive Board, Renewable Energy, Honduras, Wind Power Project, Cerro De Hula
Report title:			<input checked="" type="checkbox"/> No distribution without permission from the Client or responsible organisational unit <input type="checkbox"/> Limited distribution <input type="checkbox"/> Unrestricted distribution
Cerro de Hula Wind Project in Honduras Validation Report			
Work carried out by:			
Daniel Galván, Hetalkumar Shah, Cláudia Freitas			
Work verified by:			
Mathsy Kutty			

## ABBREVIATIONS

BAU	Business as Usual
BM	Build Margin
CAR	Corrective Action Request
CABEI	Central American Bank for Economic Integration
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification request
Client	EEHSA
Consultants	EcoSecurities International Limited
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
CM	Combined Margin
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
EB	Executive Board
EEHSA	Wind Energy of Honduras (Energía Eólica de Honduras S.A.) a legal entity of Honduras
EcoSecurities	EcoSecurities International Limited a legal entity of the United Kingdom of Great Britain and Northern Ireland
ENEE	National Agency of Electric Energy (Empresa Nacional de Energía Eléctrica), Honduras
EIA	Environmental Impact Assessment
EXIM	Export – Import Bank of the United States of America
FSR	Feasibility Study Report
IPCC	Intergovernmental Panel on Climate Change
Host Country	Honduras
Lenders	EXIM and CABEI

Form: F-06.11

date: 14.03.2011

Revision: 1.2

Revision date: -21.07.2011

Issue

LoA	Letter of Approval
MP	Monitoring Plan
National Interconnected System	Sistema Interconectado Nacional – SIN (Honduras grid)
NDC	National Dispatch Center (Centro Nacional de Despacho)
NGO	Non-governmental Organization
ODA	Official Development Assistance
OM	Operating Margin
PD	Project Developer
PDD	Project Design Document
PP	Project Participants – EEHSA and EcoSecurities
PPA	Power Purchase Agreement entered into by and between ENEE and EEHSA dated 1 October 2008.
Project	Cerro de Hula Wind Project
QMS	Quality Management System
SERNA	Secretary of Natural Resources and Environment (Secretaría de Recursos Naturales y Ambiente)
UNFCCC	United Nations Framework Convention on Climate Change
VVM	Validation and Verification Manual version 01.2.

## TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>8</b>
1.1	OBJECTIVE .....	8
1.2	SCOPE .....	8
<b>2</b>	<b>VALIDATION TEAM AND QUALITY CONTROL.....</b>	<b>9</b>
<b>3</b>	<b>METHODOLOGY OF VALIDATION.....</b>	<b>10</b>
3.1	DESK REVIEW .....	10
3.2	FOLLOW-UP INTERVIEWS.....	13
3.3	RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION REQUESTS.....	15
<b>4</b>	<b>VALIDATION FINDINGS.....</b>	<b>16</b>
4.1	PARTICIPATION REQUIREMENTS .....	16
4.2	PROJECT DESIGN .....	17
4.3	CREDITING PERIOD AND PROJECT DURATION .....	19
4.4	ELIGIBILITY AS SCALE OF PROJECT ACTIVITY .....	19
4.5	APPLICABILITY OF METHODOLOGY TO PROJECT ACTIVITY.....	19
4.6	PROJECT BOUNDARY .....	22
4.7	BASELINE ASSESSMENT .....	23
4.8	ADDITIONALITY ASSESSMENT .....	24
4.9	MONITORING PLAN .....	38
4.10	CALCULATIONS OF GHG EMISSION REDUCTIONS .....	43
4.11	ENVIRONMENTAL IMPACTS .....	44
4.12	COMMENTS BY LOCAL STAKEHOLDERS .....	45

4.13	COMMENTS BY PARTIES, GLOBAL STAKEHOLDERS AND NGOS .....	45
5	VALIDATION OPINION.....	56
6	REFERENCES .....	58
	Appendix A .....	66
	Appendix B.....	121

# 1 INTRODUCTION

Energía Eólica de Honduras S. A. has commissioned PJRCES to perform a validation of the Cerro de Hula Wind Project in Honduras (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. The UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures, and the subsequent and relevant decisions by the CDM Executive Board (EB) and COP/MOP.

## 1.1 OBJECTIVE

The purpose of this validation is to have an independent third party assessment of the project design. In particular, the project’s baseline, additionality, the monitoring plan (MP), and the project’s compliance with

- the requirements of Article 12 of the Kyoto Protocol; the CDM modalities and procedures as agreed in the Marrakesh Accord under decision 17/CP.7;
- other relevant rules, including the Host Country legislation and sustainability criteria.

The above requirements are validated, in order to confirm that the project design, as documented, is sound and reasonable and meets the stated requirements and identified criteria. Validation is seen necessary to provide assurance to stakeholders on the quality of the project and its intended generation of certified emission reductions (CERs).

## 1.2 SCOPE

The scope of validation is given as an independent and objective review of the project design, the project’s baseline study, additionality and monitoring plan which are included in the PDD and other relevant supporting documents.

The scope of the validation is defined as below:

- The Kyoto Protocol, in particular article 12 and modalities and procedures for the CDM
- Decision 2/CMP1 and Decision 3/CMP.1 (Marrakech Accords)
- Further COP/MOP decisions with reference to the CDM (e.g. decisions 4 – 8/CMP.1)
- Decisions and specific guidance by the EB published under <http://cdm.unfccc.int>
- Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed new Baseline and Monitoring Methodology (CDM-NM)
- Baselines and monitoring methodologies (including GHG inventories)



- Management systems and auditing methods
- Environmental issues relevant to the sectoral scope applied for
- Applicable environmental and social impacts and aspects of CDM project activity
- Sector specific technologies and their applications
- Current technical and operational knowledge of the specific sectoral scope and information on best practice

The information included in the PDD and the supporting documents have been reviewed against the requirements and criteria mentioned above and the quality management system (QMS) of PJRCES. The validation team has employed, based on the recommendations in the Validation and Verification Manual (version 1.2), a risk-based approach, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consultation to the organization(s). However, stated requests for clarifications and/or corrective actions may provide inputs for improvements of the project design.

## 2 VALIDATION TEAM AND QUALITY CONTROL

The validation of the project activity has been carried out by qualified personnel in line with the procedures defined in PJRCES's quality manual for validation and team definition. The validation report has undergone a technical review before requesting registration of the project activity. The technical review was performed by an independent technical reviewer.

### Validation team:

Name	Country	Role	Type of work carried out
<i>Daniel Galván Perez</i>	<i>Mexico</i>	<i>Lead Validator</i>	<i>Desk review, site visit, expert inputs and overall management of the validation activity.</i>
<i>Claudia Freitas*</i>	<i>Brazil</i>	<i>Lead Validator</i>	<i>Desk review and management of the validation activity.</i>

---

\* Claudia Freitas replaced Daniel Galván on 21 September 2011 after he left the company to complete the validation of the project activity.

<i>Hetalkumar Shah</i>	<i>India</i>	<i>Technical Expert</i>	<i>Desk review and expert inputs.</i>
<i>Mathsy Kutty</i>	<i>India</i>	<i>Technical reviewer</i>	<i>Independent technical review.</i>

### 3 METHODOLOGY OF VALIDATION

The validation of the project activity is carried out in the following phases:

- Desk review of the PDD made available for global stakeholder comments and other relevant documents
- Follow up interviews (site visits) with the relevant stakeholders
- 
- Resolution of the identified corrective action requests (CARs), clarification requests (CL) and forward action requests (FARs) if any
- Issuance of the final validation opinion and final validation report.

#### 3.1 DESK REVIEW

The desktop review includes:

- A review of the PDD (including annexes) /11//12//46/ and the relevant supporting documents. The detailed list of documents reviewed throughout the validation process are included in section 6, under References
- Preparation of a project specific validation protocol in line with the requirements of the Validation and Verification Manual
- Background investigation and follow-up interviews with personnel of the project proponent, the consultant, legal authorities and other stakeholders
- Reporting of validation findings taking into account the public comments received on the UNFCCC website

In order to ensure consideration of all relevant assessment criteria, a validation protocol was used. The protocol shows, in a transparent manner, criteria and requirements, means of verification and the results from pre-validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, details and clarifies the requirements that a CDM project is expected to meet
- It ensures a transparent validation process where the DOE documents how a particular requirement has been validated and the result of its validation

The validation protocol consists of three tables:

- Table 1 (Mandatory Requirements)
- Table 2 (Requirement Checklist)
- Table 3 (Resolution of Issues Identified) as described in figure 1

The completed validation protocol is enclosed in Appendix A to this report identifying Corrective Action Requests and Clarification Requests and FARs (if any).

<i><b>Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities</b></i>		
<i><b>Requirement</b></i>	<i><b>Reference</b></i>	<i><b>Conclusion</b></i>
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either, acceptable based on evidence provided (<b>OK</b>), a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements or a request for <b>Clarification (CL)</b> where further clarifications are needed.</i>

<b>Validation Protocol Table 2: Requirement Checklist</b>			
<b>Validation requirement</b>	<b>Checklist Question / check point</b>	<b>Remarks / comments</b>	<b>Evidence</b>
<i>The various requirements as per para 37 of the CDM modalities and procedures, in line with the validation and verification manual.</i>	<i>The various requirements in Table 2 are linked to checklist questions the project should meet.</i>	<i>The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.</i>	<i>Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable</i>

<b>Validation Protocol Table 3: Resolution of Issues Identified in Table 2</b>			
<b>Draft report clarifications, corrective action requests and forward action requests</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation conclusion</b>
<i>If the conclusions from the draft Validation are either a CAR, FAR or a CL, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the CAR, FAR or CL is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

### 3.2 FOLLOW-UP INTERVIEWS

PJRCES, during the site visit, 27 and 28 April 2011, performed interviews with project stakeholders to confirm the information presented in the PDD and to resolve issues identified in the document review. Representatives of Globeleq Mesoamerica Energy<sup>\*</sup>, ENEE<sup>†</sup> and SERNA<sup>‡</sup> were also interviewed as below.

The main topics of the interviews are summarised in the table below.

	Date	Name	Organization	Topic
01	27/04/2011	Roberto Cuellar	Minister of SERNA (DNA)	Environmental compliance LoA
02	27/04/2011	Ricardo Matute	ENEE	First of its kind project consideration PPA
03	27/04/2011	Jose Jorge Canales	ENEE	First of its kind project consideration PPA
04	27/04/2011	Karen Bonilla	ENEE	First of its kind project consideration PPA

---

*<sup>\*</sup>Globeleq Mesoamérica Energy, S.A. is the legal entity that directly and indirectly owns 100% of the interest in EEHSA, and sometimes it may be referred hereto as “Mesoamerica Energy”*

*<sup>†</sup>National Power Utility in Honduras*

*<sup>‡</sup>Ministry of Natural Resources and Environment*

05	27/04/2011	Gerardo Salgado	ENEE	First of its kind project consideration PPA
06	27/04/2011	Alexander Rojo	EEHSA (PD)	Project background
07	27/04/2011	Jose Morán	EEHSA (PD)	Project electrical substation Wind turbine location Wind technical feasibility study
08	28/04/2011	Leonel Umaña	Globeleq Mesoamerica Energy	Project operation, maintenance and monitoring Project technology, operation and maintenance
09	28/04/2011	Scarleth Nuñez	EEHSA	Environmental aspects
10	28/04/2011	Ivan Liebig	EcoSecurities	Applicability of selected methodology Baseline determination Emission reduction calculation Emission reduction monitoring plan Project additionality Project monitoring plan
11	28/04/2011	Remberto Barahona	Vice-Mayor of San Buena Aventura	Local opinion regarding the project
12	28/04/2011	María Sofía Martínez	Land Owner	Local opinion regarding the project
13	28/04/2011	Eleticia Lopez / Karla Lopez	Land Owner	Local opinion regarding the project

### 3.3 RESOLUTION OF CLARIFICATION AND CORRECTIVE ACTION REQUESTS

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

Findings established during the validation can either be seen as a non-fulfilment of CDM criteria or where a risk to the fulfilment of project objectives is identified.

Corrective action requests (**CAR**) are issued, where:

- i) Mistakes have been made with a direct influence on project results;
- ii) CDM and/or methodology specific requirements have not been met; or
- iii) There is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

A request for clarification (**CL**) may be used where additional information is needed to fully clarify an issue.

Additionally, a forward action request (**FAR**) may be raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. The FARs so identified however, shall not relate to the CDM requirements for registration.

The validation process resulted into a total of 11 CARs, 16 CLs. No FARs have been raised. All the CARs and CLs have been satisfactorily addressed by the PP before the final validation opinion is established.

Main changes between the PDD published for global stakeholder consultation process and the final PDD submitted for registration are as follows:

- The description of the project activity further elaborated and clarified;
- Technology description further elaborated;
- Project background information, prior consideration further elaborated to clarify the causes behind the delay in the implementation of the project;
- Additionality section improved by applying the *first-of-its-kind* guidelines approved by the Executive Board at EB63;
- Further information provided relating to investment and technological barriers;

- Crediting period revised from 7 years (renewable) to fixed ten years as per the *first-of-its-kind* guidelines;
- Calculation of baseline emissions and parameters for emission reductions revised;
- Stakeholder consultation process further elaborated on how comments have been taken into consideration;
- Overall generic consistency and completeness of the PDD improved.

## 4 VALIDATION FINDINGS

The details of the assessment and the main results have been described below in accordance with the VVM v1.2 (approved at EB 55) reporting requirements. 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.

### 4.1 PARTICIPATION REQUIREMENTS

The project participants are Energía Eólica de Honduras, S.A. of Honduras and EcoSecurities International Limited of United Kingdom of Great Britain and Northern Ireland. The host Party Honduras and the Annex I Party United Kingdom of Great Britain and Northern Ireland are parties to the Kyoto Protocol, meet the requirements to participate in the CDM and have approved the project activity and the participants involved in the project. The letters of approval /16//17/ refer to the precise proposed CDM project activity title in the PDD being submitted for registration.

The designated national authority (DNA) of Honduras has issued a Letter of Authorization (LoA) on 05 August 2011 /16/, authorizing Energía Eólica de Honduras, S.A. as a project participant and confirming that the project assists in achieving its sustainable development. Annex I country United Kingdom of Great Britain and Northern Ireland issued LoA on 12 October 2011 /17/. This LoA authorizes EcoSecurities International Limited as a project participant.

Written approvals of voluntary participation of the Parties involved were confirmed against the LoA of Honduras and United Kingdom of Great Britain and Northern Ireland. The letters of approval were received from the project participants. The authenticities of LOAs have been confirmed by checking the original letters /16//17/. Validation team considered the letters to be in accordance with the requirements of the paragraphs 45- 48 of the VVM v01.2.



The project does not involve public funding, 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 Honduras. The project will be funded by Central American Bank for Economic Integration (CABEI) and Export – Import Bank of the United States of America (EXIM) /39/.

## 4.2 PROJECT DESIGN

Cerro de Hula Wind Project (hereinafter “The Project”) involves the installation of 51 wind turbines of 2 MW capacity each with the total installed capacity as 102 MW. The project also involves the construction of a substation called Cerro de Hula. The annual estimated electricity generation is 345,970MWh/yr with the plant load factor calculated as 39.5% /9/. The estimated power generation is based on energy yield assessment taking into consideration the long term series wind data (WAsP Modeling) adjusting to the uncertainty by applying a RIX (Ruggedness Index) correction. The estimated power value is also adjusted to the contracted capacity (100 MW) as compared to the installed capacity.

The load factor is based on the energy yield assessment undertaken for the Project by a third party entity ‘Mott MacDonald Group’. Hence, the load factor complies with the requirements of ‘*Guidelines for the reporting and validation of plant load factors*’/56/

The project will be the first wind farm developed and connected to the Sistema Interconectado Nacional (Honduras power grid). The project is developed by Energía Eólica de Honduras, S.A. (hereinafter “Project Developer”) as a CDM project activity and has secured a Power Purchase Agreement (PPA) /5/ with the National Power Utility (“ENEE”) for the period of 20 years which is also indicated as the lifetime of the project activity. The project will be located in the municipalities of Santa Ana and San Buenaventura, department of Francisco Morazán in Honduras/3//11/which is 24 km South of Tegucigalpa in Honduras.

The project design and its techno-economic features are based on the feasibility study report (FSR), developed by EEHSA and Mesoamerica Energy in September 2008/35/, which is a third Party technical and consulting body. It was noted that in the FSR that wind turbines with capacity of 1500 KW each were planned to be installed for the project. However, during the site visit, EEHSA informed that it was decided to purchase wind turbines with capacity of 2000 kW each because of lack of wind turbines with single capacity 1500 kW in the market during the turbine purchase period. Furthermore, in May 2010, Mott MacDonald\* undertook an assessment of the energy yield for the project, as part of a due diligence assignment/9/. Based on the analysis and the findings presented Gamesa-G87 wind turbines were recommended for project implementation /9/. This deviation from the FSR is not

---

\*Mott MacDonald Group is a diverse management, engineering and development consultancy delivering solutions for public and private clients world-wide which elaborated the report “Energy Yield Assessment for Cerro de Hula Wind Farm”, Honduras, May2010.

considered by PJRCES to have any impact on the project implementation or its eligibility as a CDM project activity. Also during the site visit the geographic coordinates of the polygon where the Project will be located were confirmed. The coordinates are as follows:

<b>Longitude</b>	<b>Latitude</b>
87° 16' 21.508'' W	13° 56' 36.776'' N
87° 14' 26.612'' W	13° 57' 58.275'' N
87° 12' 46.619'' W	13° 57' 58.368'' N
87° 8' 23.221'' W	13° 55' 43.472'' N
87° 8' 23.165'' W	13° 54' 10.701'' N
87° 11' 59.759'' W	13° 54' 10.55'' N
87° 9' 43.032'' W	13° 51' 37.66'' N
87° 10' 32.975'' W	13° 50' 55.308'' N
87° 13' 53.031'' W	13° 53' 47.664'' N
87° 14' 59.663'' W	13° 53' 37.883'' N
87° 16' 21.439'' W	13° 55' 38.184'' N

It has been noted that the PPA /5/, established with the ENEE, is based on the installed capacity of 100MW instead of total installed capacity of 102MW. It has been explained in the PDD and further confirmed with PPs during the site visit that the additional 2MW capacity has been reserved for back-up purposes in the event of any turbine being taken offline for routine maintenance or for any other reasons such as a turbine failure or to back up electricity generation contracted with ENEE during low wind season. The total electricity generation (MWh) value as mentioned in the Mott MacDonald Report (based on 102MW installed capacity) has been accordingly adjusted to obtain an equivalent value for 100 MW installed capacity which is also the contracted capacity /5/. This estimated total power generation value is used to calculate emission reductions as described in the PDD and confirmed by the DOE. The resulting ER calculations, based on the 100MW, in accordance with the PPA /5/, are found to be conservative as capacity in the PPA is lower than that mentioned in the Mott MacDonald report/9/.

PJRCES is able to confirm that the final PDD is in compliance with relevant forms and guidance and has followed the structure and guidance in the latest relevant PDD template (CDM-PDD, Ver. 03.0) Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed new Baseline and Monitoring Methodology (CDM-NM) /27/.

The project description in the final PDD is found to be complete and accurate.

### 4.3 CREDITING PERIOD AND PROJECT DURATION

The project starting date is indicated to be 24 June 2010 which is the date of the signing the turnkey engineering, procurement and construction agreement (EPC) /8/. Further details of project start date and prior consideration can be found in section 4.8.1 of this report. Operational lifetime is determined as 20 years which is based on the feasibility study report /35/ and equipment lifetime /4//10/ and also the duration of the PPA with the National Power Utility (ENEE) /5/.

In the PDD made available for stakeholder consultation a renewable crediting period (7 x 3) was indicated which was, following the ‘Guidelines on additionality of first-of-its-kind project activities’ /45/ subsequently revised and changed to a 10 years fixed crediting period. The starting date of the crediting period is indicated to be from 01 March 2012, or the date of registration, whichever is later.

### 4.4 ELIGIBILITY AS SCALE OF PROJECT ACTIVITY

The project activity is a renewable energy project with an installed capacity of 102 MW, qualifying as a large scale project activity. The scale of the installed capacity has been verified by reviewing the following project documentation and equipment purchase contracts:

- FSR of the project activity developed by EEHSA and Mesoamerica Energy on September 2008 /35/
- Turbine purchase agreement with the supplier which indicates the scale of the equipment /4/
- Power Purchasing Agreement between the PP and the ENEE based on 100 MW/5/
- Environmental license issued on 12 March 2009 for the development of the project activity to the PP /7/

Based on the above assessment and evidences the scale of the project activity is confirmed.

### 4.5 APPLICABILITY OF METHODOLOGY TO PROJECT ACTIVITY

#### *Applicability of the approved baseline methodology*

The project activity correctly applies the approved consolidated baseline and monitoring methodology - ACM0002 “Consolidated baseline methodology for grid connected electricity generation from renewable sources” version 12.2.0, valid from 17 September 2010 onwards /24/.

The validation of compliance of the project activity with the applicability conditions of the applied methodology /24/ by PJRCES has been undertaken as follows:

<b>Applicability Conditions</b>	<b>Validation</b>	<b>Referenc e Documen t</b>
This methodology is applicable to grid connected renewable power generation project activities that (a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant); (b) involve a capacity addition; (c) involve a retrofit of (an) existing plant(s); or (d) involve a replacement of an existing plant(s).	<p>The project activity is a Greenfield power plant with an installed capacity of 102 MW. The electricity generated will be dispatched to the Sistema Interconectado Nacional (national grid).</p> <p>The compliance with the applicability condition has been confirmed through the review of FSR, PDD, PPA and equipment purchase agreement.</p>	<p>/24/ /35/ /8/ /5/</p>
The project activity is the installation, capacity addition, retrofit or replacement of a power plant/unit of one of the following types: hydropower 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.	<p>The project activity is a Greenfield wind power plant with an installed capacity of 102 MW. The electricity generated will be dispatched Sistema Interconectado Nacional (national grid).</p> <p>The compliance with the applicability condition has been confirmed through the review of FSR, PDD, PPA and equipment purchase agreement.</p>	<p>24/ /35/ /8/ /5/</p>
The project activity does not involve switching from fossil fuels to renewable energy sources at the site of the project activity.	<p>The project activity does not involve fuel switching from fossil fuels to renewable energy sources. The project activity is a Greenfield wind farm project.</p> <p>The compliance with the applicability condition has been confirmed through the review of FSR, PDD, PPA and equipment purchase agreement.</p>	<p>/24/ /35/ /8/ /5/</p>
The methodology is not applicable to Biomass fired	The project is not a biomass fired power plant.	/24//35//8/

power plants.		/5/
The methodology is not applicable to Hydro power plants that result in new single reservoir or in the increase in an existing single reservoir where the power density of the power plant is less than 4 W/m <sup>2</sup>	The project is not a hydro power plant.	/24/ /35/ /8/ /5/

In addition, the applicability conditions included in the tools applied and referred to above apply as follows:

Tool	Applicability conditions	Applicability
Tool for demonstration and assessment of additionality (v06)	Once the additionally tool is included in an approved methodology, its application by project participants using this methodology is mandatory.	The chosen methodology prescribes the use of this tool. There is no further applicability condition for using the tool.
Tool to calculate the emission factor for an electricity system (v02.2.0)	This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	The Proposed Project Activity is the installation of a wind power plant supplying electricity to the Grid.  Estimation of operating margin, build margin and combined margin has been calculated applying the steps of the tool.
	The tool is not applicable if the project electricity system is located partially or totally in an Annex-I country.	The project electricity system is located in a non-Annex I country.

Based on the above analysis, PJRCES is able to confirm that the approved baseline methodology ACM0002 “Consolidated baseline methodology for grid connected electricity generation from renewable sources” version 12.2.0 is applicable to the project activity. It is further confirmed that the referred tools are also applicable and appropriately applied in the context of the project activity.

### ***Appropriateness of the baseline scenario selection methodology***

The project activity consists of the installation of a new grid-connected renewable electricity generation plant (wind farm) that will be installed at a site where no renewable power plant was operated previously and the electricity generated will be dispatched to the Sistema Interconectado Nacional (national grid) in Honduras.

The baseline scenario has thus been correctly identified in accordance with applied baseline and monitoring methodology ‘ACM0002 version 12.2.0’ /24/ as follows:

*Electricity delivered to the grid by the project activity would otherwise have been generated by the operation of grid-connected power plants in Sistema Interconectado Nacional (national grid) of Honduras 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 2.2.0 /52/.*

It is confirmed that the approved baseline methodology has been correctly applied and the identified baseline scenario most reasonably represents what would occur in the absence of the proposed CDM project activity.

## **4.6 PROJECT BOUNDARY**

As per the requirements of the applied baseline and monitoring methodology ACM0002 /24/, the spatial extent of the project boundary includes all the power plants physically connected to the Sistema Interconectado Nacional (national grid) and the project power plant. The spatial extent of the project boundary is clearly defined as the site of project activity and the grid system comprising all power plants connected physically to the grid.

The details of project boundary have been determined by means of reviewing the project documentation, such as, FSR /35/ and PPA /5/ and also by the physical inspection during the site visit. The selected sources and gases are justified for the project activity. Emission sources and gases included in the project boundary are:

	<b><i>GHGs Included</i></b>	<b><i>Description of Sources</i></b>
<b><i>Baseline emissions</i></b>	<b><i>CO<sub>2</sub></i></b>	According to ACM0002 only CO <sub>2</sub> emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity are accounted for.
<b><i>Project Emissions</i></b>	<b><i>N/A</i></b>	As the project is a wind power plant no GHG emissions from the project have to be considered according to ACM0002.
<b><i>Leakage</i></b>	<b><i>N/A</i></b>	<b><i>N/A</i></b>

PJRCES is able to confirm that the application of the baseline methodology is transparent and conservative. The identified project boundary and selected sources and gases are justified for the project activity.

The validation of the project activity did not reveal other GHG 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 the applied baseline methodology ACM0002 (version 12.2.0).

## **4.7 BASELINE ASSESEMENT**

The applied baseline and monitoring methodology ‘ACM0002 version 12.2.0’ prescribes the baseline as the electricity delivered to the grid by the project that 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”/52/.

The connected power grid for the proposed project is the Honduran grid which is dominated by fossil fuel fired power plants /29//31//32/. Therefore, the baseline scenario is the continuation of the current situation, i.e. to get equivalent supply from the Sistema Interconectado Nacional (national grid).

As per the paragraph 105 of the CDM-VVM version 1.2 /22/, if the applied approved baseline methodology prescribes the baseline scenario no further analysis of baseline alternatives is required. It is confirmed by PJRCES that the baseline identified in the final version of the PDD /46/ is correctly identified following the conditions and requirements of the applied baseline methodology /24/. It is further confirmed that:

- (a) All the assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (b) All documentation used is relevant for establishing the baseline scenario and correctly quoted and interpreted in the PDD;
- (c) Assumptions and data used in the identification of the baseline scenario are justified appropriately, supported by evidence and can be deemed reasonable;
- (d) Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD
- (e) The approved baseline methodology has been correctly applied to identify the most reasonable baseline scenario and the identified baseline scenario reasonably represents what would occur in the absence of the proposed CDM project activity.

## 4.8 ADDITIONALITY ASSESSMENT

The additionality of the proposed project is demonstrated by applying the “*Tool for the demonstration and assessment of additionality*”, version 06.0.0 /47/ and the “*Guidelines on additionality of first-of-its-kind project activities*”(EB 63 Annex 11) /45/.

### Start date of the project activity

The project start date is indicated to be 24 June 2010 which is the date of signing the turnkey engineering, procurement and construction agreement (EPC) between EEHSA (project developer) and a consortium formed by Iberdrola Ingeniería y Construcción México S.A de C.V and Gamesa Wind US LLC (equipment supply company) /8/. The identification of EPC contract as the start date shows an important milestone in the implementation of the project activity when significant financial resources by the PPs have been committed.

It has been noted that the project has been in progress since 1995 but did not succeed in implementation because of number of financial, technological reasons, political instability in the country and also due to local regulatory hurdles. PJRCES, taking into consideration the history of the project activity, undertook an extensive review of the background information of the project and



concluded that the project faced significant difficulties and resulted into considerable delays before it was decided to proceed as a CDM project. The table below lists the documents which PJRCES specifically reviewed in validating the background of the project activity in validating causes of its delay and also its eligibility as the CDM project:

Document	Description & Validation	Date	Document Reference
Agreement between Zond Internacional and the Honduran Ministry of Communications, Public Works and Transport (SECOPT)	<p>The agreement was signed between the Ministry and the Third Party Technical Body to carry out the study for the development of a wind energy project in the region of ‘Cerro de Hula’.</p> <p>PJRCES have reviewed the report of Zond Internacional and is able to confirm that the study carried out the analysis of availability of wind resources in the region and potential for setting-up a wind energy project in the region.</p>	19 March 1995	/48/
Studies to support the potential wind availability and further analysis of the project feasibility took place between 1995 and 2005.	<p>Reports from the Honduran Ministry of Communications, Public Works and Transport (SECOPT)</p> <p>The activities in this period reflect the time it took to gather information to confirm wind resource availability.</p>	Between 1995 and 2005	/11//12/ Interviews during the site visit with PPs and government officials
Initial Project Idea Note (PIN) submitted to Prototype Carbon Fund for financing purposes	<p>An initial PIN was submitted to the Prototype Carbon Fund, though financing by the PCF was not ultimately realized.</p> <p>The PIN and its submission to PCF was reviewed by PJRCES.</p>	December 2000	/19/
Further analysis of wind	Change in ownership took place in		

resources in the region carried out by Energías Renovables de Mesoamérica S.A	<p>Zond Internacional and the company was taken over by Energías Renovables de Mesoamérica S.A. This change in the ownership also resulted into additional due diligence and analysis of wind resources in the region and the installed capacity of the Project was enhanced from 49.5 MW to 102 MW.</p> <p>PJRCES reviewed the document and verified the findings that the project potential capacity was increased.</p>	May 2005	/55/
Signing of the contract with EcoSecurities Group PLC (now EcoSecurities International Limited) to carry out a CDM Eligibility Analysis for the implementation of the Project under the CDM.	<p>Considering the technical, financial and local regulatory difficulties, PPs signed the contract with the specialized CDM consulting company in order for the project to be developed as a CDM project activity. The eligibility analysis demonstrated that the project is eligible under CDM and some of the barriers the project had been facing in its implementation will be alleviated by CDM.</p> <p>PJRCES is able to confirm that the project faced barriers and difficulties and only its eligibility under the CDM made the implementation of the project possible.</p>	23 February 2006	/15/

The review of above evidences demonstrated to PJRCES that the project has been in progress since 1995 but due to number of financial, technical and local regulatory difficulties was not successfully implemented. It further shows that consideration of the project as the CDM project activity alleviated some of the difficulties and helped project to proceed with its implementation. Since the project developer was aware of CDM before the start date of the project therefore the decision to proceed with the

implementation under CDM is demonstrated. A detailed validation of barriers faced by the project are faced discussed in section 4.8.4 of this report.

#### 4.8.1 PRIOR CDM CONSIDERATION AND CONTINUED ACTION TO SECURE CDM STATUS

The project activity is a new project with the starting date after 02 August 2008, as per the “*Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM*” /33/. In accordance with the requirements of the guidelines the PPs informed Honduras DNA /6/ and the UNFCCC secretariat /6/ of the project commencement and their intention to seek CDM status on 09 January 2009 (prior to the start date of 24 June 2010). Due to the delay in the implementation of the project activity, the PP sent a second notification to the UNFCCC secretariat on 07 January 2011 /6/, which was within two years from the initial notice to the UNFCCC secretariat.

PJRCES reviewed all notifications/6/ and also cross-checked on the UNFCCC website and found them to be in line with the “*Guidelines on the demonstration and assessment of prior consideration of the CDM*”/33/.

Since the project had been in progress for a long period of time PJRCES also undertook an extensive review of the status of activities related to the project’s implementation in order to verify the timelines and also prior consideration and status of continued action undertaken by PPs to secure CDM status. The table below presents details of some key events, timelines and also how PJRCES validated these events.

Date	Event	Validation	Document Reference
1 May 2005	Mesoamérica Energy buys Zond de Honduras  (Mesoamérica has changed to Globeleq Mesoamérica Energy)	PJRCES reviewed the agreements and structures and is able to confirm the changes in the companies’ names.	/25/  /23/
23 February	EcoSecurities and EEHSA sign a CDM Project Development and Service	PJRCES reviewed the agreement between EcoSecurities and EEHSA. The agreement is	/15/

<b>Date</b>	<b>Event</b>	<b>Validation</b>	<b>Document Reference</b>
2006	Agreement	to develop the Project as a CDM Project activity.	
8 November 2006	Eligibility analysis is concluded by CDM consultant	PJRCES verified a CDM eligibility analysis carried out by EcoSecurities. The content of the analysis undertaken by the consultant specifically showed the eligibility of the project as the CDM project activity.	/49/
13 December 2007	Environmental Impact Study approved	PJRCES verified the Environmental Impact Study EIAs approved and valid for the project activity.	/34/
September 2008 (study done during the month)	Feasibility study submitted to SERNA for approval	PJRCES verified the FSR and the approval from SERNA and is able to confirm that both are in accordance with host country requirements and also that the project design is based on the approved FSR.	/35/
30 September 2008	Operation contract signed by EEHSA and SERNA (operation contract is a contract for the site operation)	Operation contract was verified by PJRCES and is found valid.	/42/
1 October 2008	Power Purchase Agreement - PPA signed with ENEE	PJRCES verified PPA which was signed.	/5/
22&23 November 2008	Stakeholder consultation	PJRCES reviewed all the stakeholders' process: records, photos and attendance list of the meetings that took place on 22 and 23	/36/

<b>Date</b>	<b>Event</b>	<b>Validation</b>	<b>Document Reference</b>
		November 2008.	
9January 2009	CDM Prior Consideration Form submitted to the UNFCCC	PJRCES verified form submitted to UNFCCC and confirmed it was in accordance with the UNFCCC prior consideration guidelines.	/6/ /33/
12 January 2009	Confirmation of reception of CDM Prior Consideration Form	PJRCES verified the confirmation from UNFCCC.	/41/
12 March 2009	Environmental license issued	PJRCES verified the environmental license issued for the project.	/7/
26 March 2009	PPA approval published	PJRCES verified the published approval	/5/
22 March 2010	Contract signed between EcoSecurities and EEHSA	PJRCES verified the contract signed between PP (EEHSA) and consultant (EcoSecurities)	/15/
May 2010	Energy Yield Assessment developed	PJRCES verified the final report developed by Mott MacDonald	/9/
24 June 2010	Contract signed between Gamesa and EEHSA (EPC - the turnkey engineering, procurement and construction agreement)	EPC turnkey contract was verified by PJRCES and confirmed the date.	/8/
4 November 2010	US Ex-Im Bank and CABI contracts approve financing	Documents were verified by PJRCES that confirmed the financing approval.	/39/

<b>Date</b>	<b>Event</b>	<b>Validation</b>	<b>Document Reference</b>
17 December 2010	Construction start date	PJRCES confirmed this date in the EPC agreement	/8/
7 January 2011	CDM Prior Consideration Form re-submitted	PJRCES verified notifications submitted to UNFCCC and Honduras DNA and confirmed it was in accordance with the UNFCCC prior consideration guidelines.	/6/
11 January 2011	Confirmation of reception of CDM Prior Consideration Form (the re-submitted)	PJRCES verified the confirmation from UNFCCC	/41/
3 March 2011	Modalities of Communication MOC /13/	PJRCES verified MOC form	/13/
4 April 2011	Validation contract signed with Perry Johnson Registrars	PJRCES has the contract signed	/50/
14 April 2011	Global stakeholder consultation commenced.	PJRCES confirmed date in the UNFCCC site.	/51/
5 August 2011	LoA from Honduras DNA	PJRCES verified LoA from the host country DNA	/16/
12 October 2011	LoA from UK DNA	PJRCES verified LoA from UK DNA	/17/

The validation team of PJRCES has assessed and verified the evidence for the starting date of the project as well as the activities presented with respect to prior consideration and continued real actions undertaken by the PPs. Based on the review of the evidence PJRCES is able to confirm that the choice of the starting date (contract of turbines& EPC) is in accordance with the ‘glossary of

CDM terms' /44/ and that PP have followed the '*Guidelines on the demonstration and assessment of prior consideration of the CDM, (EB 62 Annex 13)*)/33/.

PJRCES have determined that the CDM was seriously considered before the decision to go ahead with the proposed project. In fact only CDM consideration made the project implementation possible. And that continued action to secure CDM status was taken by PPs in accordance with the "*Guidelines on the demonstration and assessment of prior consideration of the CDM*" version 4 /33/. It has been further noted that due to barriers faced by the project the implementation of the project was only possible with the CDM consideration.

#### **4.8.2 STEP 1: IDENTIFICATION OF ALTERNATIVES TO THE PROJECT ACTIVITY CONSISTENT WITH CURRENT LAWS AND REGULATIONS**

According to the applied baseline methodology ACM0002 version 12.2.0 /24/, if the project activity is the installation of a new grid connected renewable power plant/unit, the baseline scenario is the following:

***"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" /52/.***

The proposed project is a new wind farm project activity that would deliver 345,970 MWh/yr of electricity to the Sistema Interconectado Nacional (national grid) in Honduras, which is dominated by fossil-fueled power stations/29//31//32/. As per paragraph 105 of the VVM, no analysis of baseline alternatives is required if the approved methodology that is selected by the proposed CDM project activity prescribes the baseline scenario. However, PPs have identified alternative scenarios in the PDD which have been validated by PJRCES.

Alternative scenarios for the project activity have been identified as per the applied baseline methodology ACM0002 v12.2.0/24/ and the applicable tool for demonstration and assessment of additionality (v06) /47/. PPs have analyzed the identified alternatives and summary of the analysis is presented below:

***Alternative 1: The proposed project activity without CDM: construction of a wind farm connected to the grid, implemented without considering CDM revenues.***

***Alternative 2: Continuation of the current situation. Electricity will continue to be provided by the existing grid.***

The identification of alternatives and their substantiation have been found consistent and in accordance with the requirements of the applied baseline methodology as well its applicable tool. The alternatives listed in the PDD are found to be credible and complete as per the requirements of the approved applied methodology, VVM and tool for demonstration and assessment of additionality (v06) /47/.

#### Sub-step 1b. Consistency with mandatory laws and regulations

Alternatives mentioned above are in compliance with Honduras legislation. PJRCES, based on its local and sectoral expertise, and review of related legislations and regulations is able to confirm that above two alternative scenarios are in compliance with the local laws and regulations. No local regulation have been noted which prohibits the implementation of a wind farm and similarly for continuation of electricity to be provided by the grid which is also baseline for the project activity.

The non-implementation of the project activity without CDM was due to existing barriers that prevented potential project proponents from carrying out the proposed project activity undertaken without being registered as a CDM project activity. The validation of these barriers is presented below on section “Step 3 Barrier Analysis”.

### **4.8.3 STEP 2: INVESTMENT ANALYSIS**

According to the “Tool for the demonstration and assessment of additionality” /47/, a barrier analysis was chosen; therefore no investment analysis has been performed.

### **4.8.4 STEP 3: BARRIER ANALYSIS**

The additionality of the project is demonstrated through the prevailing practice barrier (inter alia the project activity is “First-of-its-Kind) approach. In accordance with the “*Guidelines on additionality of first-of-its-kind project activities*” v1.0 (EB63 Annex11)/45/and the “*Tool for the demonstration and assessment of additionality*”, version 6.0.0 /47/, additionality is proven if project is proven to be “first-of-its-kind”. The project is proven to be “first-of-its-kind” in the host country by satisfying the conditions laid-out in the guidelines. Further validation is provided below.



It may be noted that the PPs also identified and justified technological barriers and investment barriers. These barriers are included to complement the main additionality argument (that of the **prevailing practice barrier inter alia “First-of-its-Kind”**) and also to elaborate and highlight the factors that discouraged/prevented the project developer from implementing the project activity without CDM for a considerable period of time. Therefore, in conclusion, this project is being deemed additional by virtue of its **“first of its kind” nature**.

PJRCES validated that the proposed project activity:

- (a) Is the first of its kind as **no similar project activity** is being implemented in Honduras (project boundary)
- (b) No project using a similar **technology** (wind energy) is being used in Honduras
- (c) The **geographical area** was correctly defined as per ‘*Guidelines on additionality of First-of-its-kind project activities /45/ and tool for the demonstration and assessment of additionality, version 6.0.0’/47/*.

Additionally, PJRCES validated that the project activity faces barriers that:

- Prevent the implementation of this type of proposed project activity; and
- Do not prevent the implementation of at least one of the alternatives.

In validating the barriers identified by the PPs, PJRCES has taken into account the ‘*Guidelines for objective demonstration and assessment of barriers*’ (EB 50 Annex 13) /54/ and ‘*Guidelines on additionality of First-of-its-kind project activities /45/*. PJRCES applied following two-step approach in assessing the barrier analysis performed:

- (a) Determined whether the barriers, in particular, prevailing practice barrier and the project being the first-of-its kind, are real by assessing the available evidence and undertaking interviews with relevant individuals to determine whether the barriers listed in the PDD exist. Also PJRCES, using its sectoral knowledge, has ensured that existence of barriers is real and can be substantiated by independent sources of information, as described below.
- (b) Determined whether the barriers prevent the implementation of the project activity but not the implementation of at least one of the possible alternatives (which is the continuation of the current situation)

Based on its local and sectoral knowledge PJRCES has concluded that the project is “first-of its-kind” in the host country and also that the set of investment, technological barriers prevents the implementation of the proposed CDM project activity and does not prevent implementation of the identified Alternative 2(baseline scenario). The details of the identified barriers and their validation are as follows:

**1) Prevailing practice barrier; inter alia the project activity is First-of-its-kind**

The project is the first wind power plant in Honduras, as evident from publically available information also verified through interviews with ENEE/29/ /31/ /32/ /37/. A review of contracted capacity by ENEE from private power producers over the period of 2000-2009 /29/ shows that percentage share of renewable energy, in particular, hydro power has considerably increased but share of thermal power is still significantly higher than overall share of renewable power in the country. Based on the publicly available information published on ENEE's website, the renewable power plants operating in Honduras are only hydropower and biomass /29/ /31/ /32/ /37/. No other wind power project has been so far implemented in the country.

As per the '*Guidelines on additionality of first-of-its-kind project activities*'/45/ and the '*Tool for demonstration and assessment of additionality*', Version 06.0.0 /47/, the project can be considered as first-of-its-kind project activity in the geographical area of Honduras since:

- (a) The Project is **the first project that applies wind power generation** technology in the applicable geographical area. The applicable geographical area is the Host country (in line with the definitions provided in the Tool for demonstration and assessment of additionality", Version 06.0.0 /47/. Since there are no other wind power projects in Honduras and the technology is different from any other technologies been able to deliver the same output that have started commercial operations in the applicable geographical area before the start date of the project.
- (b) Project participants have selected a fixed crediting period of ten years for the project activity.

Following the requirements of the guidelines, the entire host country has been defined as the applicable geographical area for the demonstration of first-of-its-kind project activity. It is confirmed that there are no commercial wind farms operating in Honduras, nor it has been proposed in another CDM project activity in Honduras. The project is the first wind project that has been proposed and will be implemented in the host country and the only one that has been published by a DOE for public comments. Therefore in accordance to the tool of the EB 65, Annex 21/47/, the project can be considered as a "first of its kind".

PJRCES further confirmed during the interviews held with ENEE, during the onsite visit, that there are no wind power plants in commercial operation in Honduras. Furthermore, it was confirmed by ENEE that no other wind power project is even under construction in Honduras. Publicly available information\* on the future energy sources of the country shows the future wind projects and only this project Cerro de Hula Wind Project, is considered.

---

\*<http://www.enee.hn/renovables.htm> - see section 4.

### **Alleviation of barriers by CDM**

As per paragraph 39 of the EB 65, Annex 21, for barriers due to project being first of its kind, it is **not required** to demonstrate that CDM alleviates the identified barriers for the implementation of the project. Also, first of its kind activities are **not required** to demonstrate that the identified barriers would prevent potential project proponents from carrying out the proposed project activity undertaken without being registered as a CDM project activity, therefore the project can be considered additional due to its demonstrated “first-of-its-kind” nature.

### **2) Investment Barrier**

The investment barriers identified by PPs relate to specific difficulties in attracting investors and attracting finance for a technology which has not been tested and implemented in the country before. The political instability in the country also contributed in the difficulties to attract investors and underpins international financial institutions unwillingness to commit funds on a long-term basis. Following are the specific investment barriers and details of their validation.

<b><u>Barrier</u></b>	<b><u>Validation of the Barrier</u></b>
Wind energy is not considered one of the main sources of energy in Honduras, despite the availability of wind resources in the country. This is due to high up-front investment requirements (such as, wind availability studies, land tenure closure, etc.).  Lack of operational experience in the country with the technology makes the investments in the technology risky and the financial sector is not willing to provide project finance for making investments for	PJRCES reviewed the documents and information issued by the Government /29//30//32/ which clearly showed that current power generation mix in Honduras is largely fossil-fuel based and alternative technologies in the country had not been developed. There is no other wind farm project operating and/or being installed in the country.  The background of the project with respect to significant delays and earlier unsuccessful attempts in its implementation since 1995 partly due to lack of finances and operational experience also show that wind technology is subject to difficulties and barriers in the country.

wind projects in the country	
Honduras is historically classified as a high risk country reflecting political instability which poses specific commercial risks to foreign investors. Because of these high risks the country had faced difficulties in attracting foreign investors for infrastructure related projects requiring reasonably large scale investment	<p>PJRCES reviewed the classification and risk profile of Honduras specifically for long-term investments /30/. Independent sources of country risk (OECD classification shows Honduras as 6 where 7 being highest and The Belgian Export Credit Agency (ONDD) also classify country as high risk). This shows that the country is indeed classified as high risk country which makes it unattractive for international investors as well as for international financial institutions to provide project finance on a long-term basis /40/.</p> <p>Attempts to arrange finance domestically both in the government and private sector had not been successful either, as is evident from the delays in project implementation since 1995.</p>

### **Alleviation of barriers by CDM**

This particular barrier is alleviated with the provision of additional revenue to the project developers from sale of CERs. This additional revenue acts as an investment incentive to invest in this technology (which is new to the country) despite the specific risks posed by the country (as described above) as well as bear the additional cost for the operations of the project activity.

### **3) Technological Barrier**

#### **Technical Difficulties**

The technological difficulties (barriers) faced by the project activity ranged from availability of wind data in the region in order to analyze the feasibility of the project, to the complete lack of technical knowledge and knowhow for implementing and operating wind turbines /5/. The technological barriers were noted to be further augmented due to the selected location of the project activity

which is characterized by complex terrain, tropical weather conditions with landslides /35/. These conditions mean that the civil works face a major technological barrier and add further to the cost of the project implementation. Furthermore, as being the very first wind project in the country, both Honduras and EEHSA does not have experience in implementing and operating such projects, adding to risk, complexity and cost when working (for example) with local civil contractors with no experience of working in the varied topographical location of the project site and with the demands that wind project development present.

Taking into consideration the apparent technological difficulties and the lack of expertise, the project owner signed an EPC contract with Iberdrola Ingeniería and Construcción Mexico and Gamesa Wind US /8/. Both international companies are experienced in wind power projects.

### **Alleviation of barriers by CDM**

As presented in the PDD, the project is the first wind power project in the country and it faces technological barriers and risks of technological failure as no technological know-how exists in the country to develop and operate wind projects domestically. Given the technological uncertainty in the country, the eligibility of the project under CDM allows project developers to better manage the risks by being better able to establish contracts with specialized companies such as EPC contract with Iberdrola Ingeniería and Construcción Mexico and Gamesa Wind US /10/, for the implementation and operation of the project in this particular technology.

### **Barriers Summary**

Based on the above evidence and also on PJRCES sectoral knowledge it is confirmed that the identified investment and technological barriers would not prevent the identified baseline alternative, which is continuation of the current situation i.e. power continues to be provided by the national grid, including addition of new generation sources.

The prevailing practice in the country is clearly the development of thermal and hydroelectric power sources with no apparent barriers and thus the need for CDM financing for this non-conventional energy project is clearly demonstrated. In conclusion, PJRCES is able to confirm that the project faces real barriers in its implementation which resulted into considerable delays. It is further confirmed that these barriers do not prevent the implementation of the alternative, and that **the project is first-of-its-kind and therefore it is additional.**

#### 4.8.5 STEP 4: COMMON PRACTICE ANALYSIS

According to the 'Tool for the demonstration and assessment of additionality, version 06', paragraph 43, common practice analysis is not applicable as the project is demonstrated to be first-of-its-kind.

PJRCES, confirms that based on the above information and various barriers associated with the project activity, it is sufficiently demonstrated that the project is not a likely baseline scenario and thus project is additional.

### 4.9 MONITORING PLAN

The monitoring plan is in line with the approved monitoring methodology ACM0002, version 12.2.0 /24/ and monitoring arrangements are sufficient for the real measurement of emission reductions resulting from the project activity. As a newly developed wind power project and in accordance with the applied monitoring methodology, the only required monitoring parameter is 'net electricity supplied by the project plant/unit to the grid' ( $EG_{\text{facility},y}$ ) which is calculated from the continuous measurement of electricity import and export. Other parameters are not relevant and need not be monitored.

The monitoring equipment includes two bi-directional meters with one used as a main meter while the other as the back-up meter, located at the substation. The accuracy of the meter is to be based on the manufacturer's specifications and ENEE requirements as specified in the PPA/5/. In order to confirm that the monitoring arrangements have been adequately designed by PP in order to ensure that correct verification of resulting emission reductions can be achieved, PJRCES have undertaken a careful review of following monitoring aspects:

- As per the PPA the PP will install meters appropriate to accurately meter electricity, in this case PowerLogic ION type digital meters are used. An evaluation of technical specifications /57/ of these meters showed that these are digital meters and do not require calibration but only verification of their accuracy. Furthermore, these meters are factory tested according to International Electrotechnical Commission (IEC) and American National Standards Institute (ANSI) standards; however, it is recommended that before a new meter is installed, final accuracy verification is tested.
- As per the requirements of ENEE, specified in the PPA /5/, accuracy class of 0.2S of meters shall be maintained by having conducted the verification tests every two years;
- The PPA further stipulates that verification tests shall be carried out by an accredited third party laboratory /5/;

- As illustrated in the PDD and validated in this report the proposed project is being implemented by Globeleq Mesoamerica Energy\* (GME) /23//25/. GME is one of the leading companies in the development and operation of wind energy projects in Central America, having considerable experience in the management and monitoring of wind projects;
- Furthermore, it is noted that a draft monitoring manual has been prepared by PPs which includes the details of monitoring arrangements, monitoring procedures (QA/QC procedures, procedures for calibration of metering equipment, etc.) as well as definition of roles and responsibilities /58/. This monitoring manual provides confidence once the project becomes operational that the monitoring shall be undertaken as per the monitoring requirements and defined arrangements.

Based on the validation of above information and documents,,PJRCES confirms that monitoring arrangements and equipment are adequate for the monitoring of a wind power plant and for the correct verification of emission reductions. It is further confirmed that PPs have demonstrated the ability to successfully implement the planned and designed monitoring arrangements as specified in the monitoring plan.

#### **4.9.1 MANAGEMENT SYSTEM AND QUALITY ASSURANCE**

Details of the data to be collected, the frequency of data recording and its format, responsibilities and authorities for project management, procedures for monitoring and reporting, QA/QC procedures, procedures for calibration of metering equipment and procedures for training and maintenance have been included in the monitoring manual /58/. All data will be archived electronically and with paper backup, and be kept for at least 2 years after the end of the last crediting period. All these elements will also be further verified during verification.

The application of the monitoring methodology is transparent and PJRCES considers that the project participants are able to implement the monitoring plan.

Following the requirements of the paragraph 123 of the CDM-VVM, PJRCES is able to confirm that:

- (a). The monitoring plan is fully in compliance with the requirements of the applied monitoring methodology ACM0002, version 12.2.0;
- (b). The monitoring arrangements described in the PDD are feasible and adequate with the project design; and
- (c). The PPs are able to implement the monitoring plan.

---

\* <http://globeleq.com/>

## 4.9.2 PARAMETERS DETERMINED EX-ANTE

PJRCES has assessed the data sources and assumptions of the data and parameters that will not be monitored and will remain fixed throughout the crediting period. The parameters are found to be correct and in accordance with the applied baseline methodology ACM0002 version, 12.2.0 and the '*Tool to calculate the emission factor for an electricity system, version 2.2.0*' /52/,

PJRCES is able to confirm that all parameters are appropriate, applicable to the project activity and will result in a conservative estimate of the emission reductions. Following parameters are determined ex-ante:

### **Grid emissions factor:**

Following the requirements of the ACM0002, version 12.2.0, and steps of the '*Tool to calculate the emission factor for an electricity system to calculate the grid emission factor*'/52/,the grid emission factor is calculated as a combined margin (CM) which is the combination of operating margin (OM) and build margin (BM).

The PDD was published for Global Stakeholders consultation on 14 April 2011, and the calculation of the grid emission factor has been calculated with the latest data which was the most recently available at the commencement of validation. Electricity exports and imports from and to the grid have been appropriately considered as per the tool as described in the PDD. Off-grid power plants have not been considered.

**Operating Margin (OM):**The OM is calculated based on the simple OM method which is found justified since the low cost /must run resources constitute less than 50% of total grid generation from the year 2005 to 2009 (32.7% in 2005, 36.5% in 2006, 37.1% in 2007, 37.9% in 2008 and 45.0% in 2009) /31//32/.The data used in the emission factor calculation is in accordance with data provided by ENEE's statistics for years 2007, 2008 and 2009 /37/.The simple OM was calculated using the ex-ante option using a 3-year generation-weighted average based on the most recent data available at the time of the CDM-PDD to the DOE for validation.

The OM is calculated to be 0.6621 tCO<sub>2</sub>/MWh. The sources and calculation has been verified by PJRCES and confirmed to be consistent with the applied tool.

**Build Margin:** The BM is calculated as the generation-weighted average emission factor (tCO<sub>2</sub>/MWh) of all power units *m* during the most recent year *y* for which power generation data is available.

The sample group of *power units m* used to calculate the build margin was option (b) the set of power capacity additions in the electricity system that comprise 20% (in this case 23.1%) of the system generation (in MWh) and those have been built most recently. The sample consists of a set of the latest power plants which have been built most recently and which represent more than



20% of the total system generation//31//32/. The power plants registered as CDM project activities were excluded from the sample group. Furthermore, power units built more than 10 years ago were also excluded from the sample group /38/.

The BM is calculated to be 0.6381 tCO<sub>2</sub>/MWh. The sources and calculation has been verified by PJRCES and confirmed to be consistent with the applied tool.

The combined margin emission factor( $EF_{grid,CM,y}$ ) is calculated as the weighted average of the Operating Margin emission factor ( $EF_{grid,OM,y}$ ) and the Build Margin emission factor ( $EF_{grid,BM,y}$ ). The default weights for wind projects are defined as follows:  $w_{OM} = 0.75$  and  $w_{BM} = 0.25$  (owing to their intermittent and non-dispatchable nature).

The resulting combined margin emission factor 0.6561 tCO<sub>2</sub>e/MWh which is fixed for the entire ten years of crediting period.

<i>Data/ parameter</i>	<i>Unit</i>	<i>Ex ante determined value</i>
Operating Margin (OM)	tCO <sub>2</sub> /MWh	0.6621
Build Margin (BM)	tCO <sub>2</sub> /MWh	0.6381
Emission Factor (CM)	tCO <sub>2</sub> /MWh	0.6561

Other parameters determined ex-ante are presented in the below table:

	<b>Parameter</b>	<b>Description</b>	<b>Source Verified</b>	<b>Value Verified</b>
1	<b>FC<sub>i,m,y</sub></b>	Amount of fuel <i>i</i> (in mass or volume unit) consumed by each power plant /unit in the Grid	Yes. The source of data is ENEE's Planning Department	Yes. The values are based on the official data.
2	<b>EG<sub>m,y</sub></b>	Net electricity generated and delivered to the grid by each power plant used for OM/BM calculations in year <i>y</i>	Yes. The source of data is official statistical data.	Yes. The values are based on the official statistical data.
3	<b>NCV<sub>bunker, diesel &amp; coal</sub></b>	Net calorific value (energy content) per mass unit of bunker, diesel & coal fuels	Yes. The source of data is IPCC 2006. Guidelines for National Green House Gas Inventories.	Yes. The values used are IPCC. 2006 default values. Guidelines for National Green House Gas

				Inventories.
4	$P_{\text{bunker, diesel \& coal}}$	Fuel density for bunker, diesel and coal	Yes. The source of data is IPCC 2006. Guidelines for National Green House Gas Inventories.	Yes. The values used are IPCC. 2006 default values. Guidelines for National Green House Gas Inventories.
5	$EF_{\text{CO}_2, \text{ bunker, diesel \& coal}}$	CO <sub>2</sub> emission factor per unit of energy of diesel	Yes. The source of data is IPCC 2006. Guidelines for National Green House Gas Inventories.	Yes. The values used are IPCC. 2006 default values. Guidelines for National Green House Gas Inventories.
6	$\eta_{m,y}$	Average net energy conversion efficiency of power unit $m$ in year $y$	Yes. Default value from ' <i>Tool to calculate the emission factor for an electricity system</i> (Version 2.2.0)' in Table 1 from Annex 1 for Coal generation technology on New units after 2000 (most conservative value).	Yes. Default value from ' <i>Tool to calculate the emission factor for an electricity system</i> (Version 2.2.0)'

### 4.9.3 PARAMETERS MONITORED EX-POST

The only parameter to be monitored is the net electricity generation supplied by the project plant to the grid. The net electricity generated from the project will be measured through two bidirectional electricity meter (main and back up) at the metering point which is the Cerro de Hula substation. This data will be cross verified against the sales receipts from the Sistema Interconectado Nacional (national grid).

## 4.10 CALCULATIONS OF GHG EMISSION REDUCTIONS

The emission reductions (ER<sub>y</sub>) by the project activity during the crediting period is the difference between baseline emissions (BE<sub>y</sub>), project emissions (PE<sub>y</sub>) and emissions due to leakage (L<sub>y</sub>), as follows:

- a) **Baseline emissions:** Baseline emissions (BE<sub>y</sub> in tCO<sub>2</sub>) are the product of the grid emission factor ( $EF_{grid, CM, y}$  in tCO<sub>2</sub>/MWh) times the electricity that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)

$$BE_y = EG_{PJ, y} \times EF_{grid, CM, y}$$

Where:

$BE_y$	= Baseline emissions in year y (tCO <sub>2</sub> /yr)
$EG_{PJ, y}$	= Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year y (MWh/yr)
$EF_{grid, CM, y}$	Combined margin CO <sub>2</sub> emissions factor in year y (tCO <sub>2</sub> /MWh)

As the Project activity is the installation of a new grid-connected wind farm at a site where no wind farm was operated prior to the implementation of the Project activity,

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

$EG_{facility, y}$  = Quantity of net electricity generation supplied by the project plant to the grid in year y (MWh/yr)

- b) **Project emissions:** There are no emissions from the project, which is a wind energy project with no fossil-fired backup power source (ACM0002 v12.2.0).
- c) **Leakage:** As per the requirements of the applied baseline methodology, no leakage has to be considered for the project activity.

As mentioned above, the grid emission factor is determined *ex ante* as a combined margin, consisting of a weighted average of the operating margin (OM) and build margin (BM). Based on the above mentioned emission factor and net power generation of approximately 345,970 MWh (considering an installed capacity of 100 MW based on the PPA) annual estimated emission reductions are calculated as follows:

$$ER_y = BE_y = EG_{PJ,y} * EF_{Grid,CM,y}$$

$$ER_y = BE_y = 345,970MWh * 0.6561tCO_2/MWh$$

$$ER_y = 226,978 tCO_2e/year$$

The estimated emission reduction data and parameter values provided in the PDD and supporting files submitted to the DOE have been verified by PJRCES.

In summary,

- (a) The GHG calculations presented in the Cerro de Hula GHG reductions & grid emission factor Calculation spreadsheet /18/ is complete and transparent, and their accuracy has been verified.
- (b) No other project emission or leakage sources contributing more than 1% and not mentioned by the methodology have been identified.
- (c) All assumptions and data used by the project participants are listed in the PDD, including their references and sources;
- (d) All documentation used by project participants as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD;
- (e) All values used in the PDD are considered reasonable in the context of the proposed CDM project activity;
- (f) The baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions;
- (g) All estimates of the baseline emissions can be replicated using the data and parameter values provided in the PDD.

## 4.11 ENVIRONMENTAL IMPACTS

According to the Honduras Environmental Regulation and SERNA, wind power projects fall under category 2 /7/, this means that the project developer shall carry out, and submit for approval, a Qualitative Environmental Analysis /43/. The Qualitative Environmental Analysis was carried out by AMBITEC S.A. de C.V. Ambiente y Tecnología in September 2008 and was approved by SERNA on 12 March 2009 /7/.

PJRCES has confirmed during the onsite visit that SERNA carried out follow up inspections to the project construction in order to verify that the project is constructed in accordance with SERNA requirements. PJRCES also confirms that the project activity fully complies with the SERNA environmental regulations of Honduras and that no significant environmental impacts are expected from the project activity. It is further confirmed that appropriate measures were undertaken to address the identified environmental impacts.

## 4.12 COMMENTS BY LOCAL STAKEHOLDERS

Local stakeholders from local residents and local government were invited through a meeting and a questionnaire was provided for comments /36/. The stakeholder consultation was carried out in both municipalities, where the project will be located, on 22 November 2008 in the Municipal Room in San Buenaventura Municipality and on 23 November 2008 in the multi-use room in Santa Ana Municipality.

The event was properly announced by:

- Personal invitations to the community, local authorities, non-governmental organizations and educative centers
- Radio Sabana Grande inviting the communities
- Web page of Mesoamerica Energy

PJRCES has reviewed records of the invitations and interviewed local stakeholder that attended the meetings /36/. The project is publicly available in Mesoamerica Energy website\* and the PPs have submitted a copy of the payment made to Radio Sabana for public announcements /53/.PJRCES has reviewed the record and evidence and has interviewed the Vice-mayor of San Buena Ventura and two land owners from the area. Their comments are found consistent with the comments received during the local stakeholder meetings /36/.

PJRCES considers the local stakeholder consultation was carried out adequately and followed local practices. Furthermore, from the summary of comments received and also verifying through the interviews with local representative it is confirmed that the stakeholders are supportive of the project implementation and no negative comments were received during the local stakeholder consultation.

## 4.13 COMMENTS BY PARTIES, GLOBAL STAKEHOLDERS AND NGOS

The PDD, version 1.2, 8 April 2011, was made publicly available through the CDM website for a global stakeholder process for period of 30 days period from 14 April 11 - 13 May 11.

---

\*<http://www.mesoamericaenergy.com> (link "projects")

One comment with 55 questions was received. The questions as comments, with responses from the PP and how these have been validated are presented in the table below.

Comments		Response by PP	Validation
1	<p><b>General Description</b></p> <ul style="list-style-type: none"> <li>Purpose of the project and how the proposed project activity reduces greenhouse gas emissions are not briefed in the PDD. Refer section A.2.</li> <li>How environmentally safe and sound technology is used for the project and details of technology transfer is not demonstrated adequately. Refer A.4.2</li> <li>Non- debundling nature of the project activity is not adequately justified as per EB54 Annex 13 (Debundling tool). Refer A.4.5</li> </ul>	<p>Both the purpose of the project and how the proposed project activity reduced GHG emissions are clearly described in section A.2.</p> <p>The facts in relation to how environmentally safe the technology is and how this project represents a technology transfer is explained in sections A.2 and B.5 (technology transfer section). For further information please refer to technology provider's website (<a href="http://www.gamesa.es">www.gamesa.es</a>).</p> <p>Last comment is not relevant because the project activity as it is a large scale project activity</p>	<p>PJRCES reviewed each of the questions and concluded that most of the comments are generic in nature and are not applicable to this project. In particular, questions raised on the validation of parameters used to demonstrate the additionality based on investment analysis. Cerro de Hula Wind Project has not applied investment analysis. Similarly the project is not a small-scale project.</p>
2	<p><b>Additionality</b></p> <ul style="list-style-type: none"> <li>Please check the project boundary</li> </ul>	<p>Comment is not relevant nor applies to the project activity.</p>	<p>PJRCES reviewed each of the questions and concluded that</p>

	<p>of the project activity is not based on the guidance of the applicable project category</p> <ul style="list-style-type: none"> <li>• Why has option A (Combined margin) been chosen for calculating emission factor is not justified. Refer B.6</li> <li>• The justification of choosing IRR as financial indicator is not adequately justified. Whether it is equity or project IRR, pre-tax or post tax is not mentioned in the PDD</li> <li>• The emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants</li> <li>• Basis of choosing PLR as benchmark is not adequately demonstrated in the PDD</li> <li>• All the issues of investment analysis guidelines are not discussed in the PDD. Refer B.5.</li> <li>• Justification of parameters including O&amp;M, insurance, loan, derating, escalation, and tariff are not demonstrated with justification.</li> </ul>	<p>Project does not present a financial analysis.</p> <p>All the information for baseline emission determination is presented in a transparent manner in Annex 3 according to methodology ACM0002 v.12.2.0.</p> <p>Please refer to B.5 in PDD specifically <u>Existing Local Regulations</u> section, where it is clearly described what are the national conditions in Honduras for the development of renewable energy generation projects.</p> <p>Please refer to sections B.1 and B.2 on the PDD where the choice of relevant methodologies as well as the rationale behind those choices is explained.</p> <p>Kindly refer to Background on Project Context and CDM consideration in</p>	<p>most of the comments are generic in nature and are not applicable to this project.</p> <p>The comments related to the investment analysis are not applicable since the project activity does not apply investment analysis for demonstration of its additionality.</p>
--	---	---	---

	<p>Refer B.5.</p> <ul style="list-style-type: none"> <li>• Please provide a proof for proposed debt to equity taken at the investment decision. Refer B.5.</li> <li>• Proof for PLF is not justified</li> <li>• Date of offer is not provided</li> <li>• Project cost is not as per state norms. Refer B.5</li> <li>• O&amp;M charges and its escalation is not as per norms</li> <li>• IT rate assumed is not as per standard practice</li> <li>• The application of MAT which is based on tax holiday while calculating WACC is not appropriate</li> <li>• PP has not explained and justified the key assumptions and rationale.</li> <li>• The PP and consultant have not illustrated in a transparent manner all data used to determine the baseline emissions.</li> <li>• Not demonstrated that the proposed project activity is additional as per options provided under attachment A to Appendix B of the simplified modalities and procedures for</li> </ul>	<p>section B.5 of PDD.</p> <p>The selection of simple OM based on low cost/must run resources is not adequately justified.</p>	
--	--	--	--



	<p>small-scale CDM Project activities</p> <ul style="list-style-type: none"> <li>• National policies and circumstances relevant to the baseline of the proposed project activity are not being summarized clarify</li> <li>• Explain and justify all relevant methodological choices for the proposed project activity</li> <li>• Data that is calculated with equations provided in the approved category or default values specified in the category should not be included in the compilation</li> <li>• CER revenue assumed is not consistently applied</li> <li>• Project cost is not as per norms, DOE has to check and clarify.</li> <li>• The project cost of the project should be based on offer and not on purchase order or tariff order</li> <li>• O&amp;M charges considered are on higher side. Pls. clarify.</li> <li>• Benchmark calculation is not as per WACC tool (EB53 Annex 8).</li> <li>• Benchmark calculation is not as per WACC tool (EB53 Annex 8).</li> <li>• The basis of calculation of</li> </ul>		
--	--	--	--

	<p>benchmark is not documented in the section B.5. PLR is not acceptable benchmark for the project. WACC based on Government bonds, risk premiums should be taken</p> <ul style="list-style-type: none"> <li>• Prior consideration of CDM which is important for the determination of additionality is not documented in the section B.5 of the PDD</li> <li>• Date of PPA is not mentioned in the prior consideration of CDM.</li> <li>• The selection of simple OM based on low cost/must run resources is not adequately justified.</li> </ul>		
3	<p>Emission reductions</p> <ul style="list-style-type: none"> <li>• PP has not provided for each parameter the chosen value or, where relevant, the qualitative information</li> <li>• Please provide the actual value applied. Where time series of data is used, where several measurements are undertaken or where surveys have been conducted, provide detailed information</li> <li>• Explain and justify the choice for</li> </ul>	<p>PP has not provided for each parameter the chosen value or, where relevant, the qualitative information.</p> <p>Information on the values applied can be found in section B.6.1 and Annex 3 in PDD.</p> <p>All data sources have been explained and justified (please refer to section B.6.2</p>	<p>PJRCES reviewed each of the questions and concluded that most of the comments are generic in nature and are not applicable to this project.</p> <p>Many of the elements of the calculation of emissions reductions are covered in the validation of the</p>

	<p>the source of data</p> <ul style="list-style-type: none"> <li>• Ex-ante option of calculating OM is not adequately demonstrated.</li> <li>• Kindly refer to section B.6.1 Step 3 of PDD</li> <li>• The selection of option (out of two) for calculating OM is not adequately documented with justification. CEA calculation is based on net electricity generation, the average efficiency of each power unit and the fuel types used in each power unit. Step 4 of B.6.1 8</li> <li>• The argument that CEA data for build margin is calculated as per Emission factor tool is not documented. B.6.1</li> <li>• Spreadsheet is not provided. The data should be presented in a manner that enables reproducing of the calculation of OM, BM, and CM.</li> <li>• The justification of negligible project emissions for wind project is not as per AMS. I. D ver. 16.0 EB 54)</li> <li>• The emission factor value</li> </ul>	<p>Data and parameters that are available at validation) in the PDD.</p> <p>Kindly refer to section B.6.1 Step 3 of PDD.</p> <p>As the OM was calculated using Simple OM Option A, the emission factor is calculated as “the generation-weighted average CO<sub>2</sub> emissions per unit net electricity generation (tCO<sub>2</sub>/MWh) of all generating power plants serving the system, <u>not including low-cost / must-run power plants / units</u>”. Since all registered CDM project activities fall into the category low-cost/ must-run power plants/ units as they are either hydro or biomass plants, they must not be included in the sample group.</p> <p>Comment is nor relevant nor applies to the project activity.</p> <p>According to paragraph 40 in the Clean Development Mechanism Validation and Verification Manual only</p>	<p>project activity.</p>
--	---	---	--------------------------

	(Southern grid) for calculating baseline emission is wrong. Refer B.6.3.	<p>PDD is submitted for Global Stakeholder's Consultation process.</p> <p>Public version spreadsheet will be made publicly available once validation is over and the project requests registration. The workable version of the spreadsheet is confidential and is made available only to the DOE . Once the validation is over, the confidential version would also be made available to the UNFCCC for review.</p>	
4	<p><i>Monitoring plan</i></p> <ul style="list-style-type: none"> <li>• Net electricity should be continuously monitored, hourly measured and at least monthly recorded</li> <li>• Metering regulations as per CEA norms is not adequately followed in monitoring plan. Refer B.7.2</li> <li>• Metering regulations as per CEA norms is not adequately followed in monitoring plan. Refer B.7.2</li> <li>• Provide a detailed description of the</li> </ul>	<p>Please refer to section B.7.1 for specifications on how will electricity be monitored, measured and recorded.</p> <p>Metering regulations as per CEA norms is not adequately followed in monitoring plan. Refer B.7.2.</p>	<p>PJRCES reviewed each of the questions and concluded that most of the comments are generic in nature and are not applicable to this project</p>

	<p>monitoring plan, including an identification of the data to be monitored and the procedures that will be applied during monitoring</p> <ul style="list-style-type: none"> <li>• The PP should include sources of data that will be actually used for the proposed Project activity (e.g. which exact national statistics, actual measurement etc.).</li> <li>• Where the parameters are to be measured in accordance with the guidance of the approved Project category or the general guidance to the indicative methodologies, specify the measurement methods and procedures including accepted industry standards or national or international standards which will be applied, which measurement equipment is used, how the measurement is undertaken.</li> <li>• Which calibration procedures are applied, what is the accuracy of the measurement method, who is the responsible person / entity that should undertake the measurements and what is the measurement interval</li> </ul>	<p>Kindly refer to section B.7.2 in PDD.</p> <p>Kindly refer to section B.7.2 in PDD. Calibration procedures are applied as per ENEE's requirements.</p>	
--	---	--	--

	<ul style="list-style-type: none"> <li>Please provide a detailed description of the monitoring plan. Describe the operational and management structure that the Project operator will implement in order to monitor emission reductions.</li> <li>The monitoring plan should reflect good monitoring practice appropriate to the type of Project activity. Provide any relevant further background information</li> </ul>		
5	<p><i>Stakeholder consultation.</i></p> <ul style="list-style-type: none"> <li>Please describe the process by which comments by local stakeholders have been invited and compiled. An invitation for comments by local stakeholders shall be made in an open and transparent manner, in a way that facilitates comments to be received from local stakeholders and allows for a reasonable time for comments to be submitted.</li> <li>Project participants shall describe a project activity in a manner which allows the local stakeholders to understand the project activity.</li> </ul>	<p>The process followed by the PD regarding the local stakeholders consultations is describes in section E of the PDD.</p> <p>The description of the project is included in section A. Furthermore section E of the PDD clearly describes the process that was and is being followed by the PD to inform the local stakeholders. For further information on this issue please refer to the PD's</p>	<p>PJRCES reviewed each of the questions and concluded that most of the comments are generic in nature and are not applicable to this project</p>

		website following link: <a href="http://www.mesoamericaenergy.com/en/projects/Honduras">http://www.mesoamericaenergy.com/en/projects/Honduras</a> .	
--	--	--	--

***How DOE has considered the comments received in its validation***

PJRCES has reviewed each of the comment received and has concluded that most of the questions are not applicable to this project activity, specifically those questions asking about the validation of parameters used to demonstrate the additionality based on investment analysis while Cerro de Hula Wind Project has not applied investment analysis. Other questions about the interconnection of the project with CEA grid are also not applicable since the project is not located in India but in Honduras.

While the questions can be considered as irrelevant because all the information is provided in the PDD the PP has provided responses to all questions as applicable to the DOE.

PJRCES has reviewed all the responses provided by the PP and is able to confirm that all relevant comments received during the global stakeholder consultation have been considered and responded in accordance with VVM version 1.2 para. 042 (EB55 Annex 1).

## 5 VALIDATION OPINION

*“Perry Johnson Carbon Emission Services, Inc (PJRCES) has performed a validation of the “Cerro de Hula Wind Project” in Honduras. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, 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 PRJCES with sufficient evidence to determine the fulfillment of stated criteria.*

*The Host Country is Honduras and the Annex I Party is United Kingdom of the Great Britain and Northern Ireland. Both countries fulfill the participation criteria and have approved the project and authorized the project participants. The DNA from Honduras confirmed that the project assists in achieving its sustainable development objectives. 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 Honduras.*

*The project correctly applies ACM0002 version 12.2.0: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”.*

*By generating renewable energy the project will displace fossil fuel based grid electricity in Honduras. The project results in reductions of CO<sub>2</sub> 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 monitoring plan complies with the applied methodology ACM0002 version 12.2.0. Adequate training and monitoring procedures have been developed and will be implemented before the starting date of the crediting period (01 March 2012).*



*The total emission reductions from the project are estimated to be on the average 226,97tCO<sub>2</sub>e per year over the 10 year fixed crediting period. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given that the underlying assumptions do not change.*

*In summary, it is PJRCES's opinion that the "Cerro de Hula Wind Project" in Honduras, as described in the PDD version 8 of "17January 2012", meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0002 version 12.2.0. This DOE thus requests the registration of the project as a CDM project activity."*

## 6 REFERENCES

1.	Cerro de Hula Key Milestone Dates EPC Contract - dated 13 April 2011
2.	Test Energy Projections EPC Contractor - dated 18 April 2010
3.	Project Layout - dated 22 September 2010
4.	Gamesa turbines G87 technical specifications, English version - dated 16 February 2004
5.	PPA Gazette ENEE - EEHSA - dated 1 October 2008 (signed) and 26 March 2009 (approval)
6.	CDM prior consideration letters (January 2009 & January 2011)  Letter sent to the DNA on project commencement and intention to seek CDM status  Notification to UNFCCC on project commencement and intention to seek CDM status
7.	Environmental license issued by SERNA 12 March 2009  Also approval of Qualitative Environmental Analysis

8.	Turnkey EPC Agreement signed EEHSA, Iberdrola Ingeniería y Construcción Mexico and Gamesa Wind US LLC – dated 24 June 2010
9.	Energy Yield Assessment Cerro de Hula Wind Farm, Honduras Mott MacDonald Report – dated May 2010
10.	Gamesa Technical report – 12 May 2010
11.	PDD GSC version 1.2, dated 08 April 2011
12.	PDD version 2, dated 27 April 2011 PDD version 3, dated 27 May 2011 PDD version 3.1, dated 10 June 2011 PDD version 4, dated 5 August 2011 PDD version 5, dated 30 September 2011 PDD version 6, dated 13 October 2011 PDD version 7, dated 09 December 2011
13.	Modalities of communication (MOC) – dated 4 March 2011

14.	Substation and interconnection layout – dated January 2011
15.	Initial contract and second contract between EcoSecurities and EEHSA. - dated 23 February 2006 and 22 March 2010
16.	Letter of Approval - LoA from Honduras dated 5 August 2011
17.	Letter of Approval - LoA from UK dated 12 October 2011
18.	Cerro de Hula GHG reductions & grid emission factor Calculation spreadsheet
19.	Honduras Wind Pin 12-22-00 - dated 22 December 2000, submitted to Prototype Carbon Fund for financing purposes
20.	EEHSA Socialization Program – dated April 2011

21	Law of promotion to electricity generation with renewable resources (Decree 70-2007) - dated 02 October 2007
22	Validation and Verification Manual version 1.2
23	Globelec CdH Maintenance & Services Agreement (Draft) - dated June 2010
24	Consolidated baseline methodology for grid connected electricity generation from renewable sources” Version 12.2.0, EB 65, valid from 17 September 2010 onwards
25	Globelec Mesoamerica Energy Corporate Structure
26	ENEE Annex C-VI - Commercial Metering System Requirements dated 01 October 2008
27	Guidelines for Completing the Project Design Document (CDM-PDD), and the Proposed new Baseline and Monitoring Methodology (CDM-NM)

28.	Executive Decree PCM-016-2008 – Authorization to EEHSA to sale electricity to ENEE- dated 02 July 2008
29.	<p>ENEE Total installed capacity of all power plants connected to the National Interconnected System (SIN) – dated 2009</p> <p>This document describes installed capacity per technology of the power plants connected to the National Interconnected System. It is only a reference that there are no other wind power plants.</p>
30.	<p>Information sources reflecting Honduras Risk Country</p> <p>(<a href="http://www.oecd.org/dataoecd/9/12/35483246.pdf">http://www.oecd.org/dataoecd/9/12/35483246.pdf</a> )</p> <p>(Biomass Users Network. <a href="http://www.bun-ca.org">http://www.bun-ca.org</a>. Principales barreras que enfrenta la inversión de proyectos eólicos en América Central)</p>
31.	<p>ENEE Installed Capacity of each power plant connected to the National Interconnected System – dated 2009</p> <p>This document describes the installed capacity per power plant connected to the National Interconnected System; it is only a reference that there are not other wind power plants.</p>
32.	<p>ENEE Energy Generation – dated 2009</p> <p>This document describes the total electricity generation of all power plans connected to the National Inter-connected System during the period 2008 to 2009</p>
33.	Guidelines on the demonstration and assessment of prior consideration of the CDM

	version 4, (EB 62 Annex 13)
34.	Environmental Impact Study – dated 13 December 2007
35.	Feasibility study Report  Preliminary Feasibility Study, date November 2006  Second feasibility study developed and submitted for approval to the Ministry of Environment (SERNA),dated September 2008
36.	Local stakeholder consultation  Evidences of the meetings which took place on 22 and 23 November 2008 (records, photos, questionnaires and list of attendance)
37.	National Interconnected system CUA6_2009 ENEE
38.	ENEE Fuel Consumption CUA33_2009 2009
39.	US Ex-Im Bank and CABEL approve financing

40.	Organization for Economic Co-operation and Development Honduras
41.	UNFCCC confirmations of the PP forms (CDM prior consideration form - dated 12 January 2009 and 11 January 2011)
42.	Operation contract signed between EEHSA and SERNA
43.	Qualitative Environmental Analysis - dated September 2008
44.	CDM Glossary version 5
45.	“Guidelines on additionality of first-of-its-kind project activities” version 1.0 (EB 63 Annex 11)
46.	PDD version 8, 17 January 2012



47.	“Tool for the demonstration and assessment of additionality”, version 6.0.0
48.	Agreement between Zond Internacional and the Honduran Ministry of Communications, Public Works and Transport (SECOPT) dated 19/03/1996
49.	Eligibility Analysis (Phase 1) of the Greenhouse Gas Emission Reductions Potential of the Cerro de Hula Wind Project, Report prepared by EcoSecurities Report for ENERGÍA EÓLICA DE HONDURAS, S.A. (EEHSA) Honduras 8 November 2006
50.	Validation agreement PJR and PP dated - 4 April 2011
51.	UNFCCC site, global stakeholder consultation Cerro de Hula period of comments: 14 April 2011 - 13 May 2011
52.	Tool to calculate the emission factor for an electricity system” version 2.2.0
53.	Payment to radio Sabana Grande
54.	Guidelines for objective demonstration and assessment of barriers (version 01)
55.	Studies undertaken by Energías Renovables de Mesoamerica (now Globeleq Mesoamerica Energy) in determining the potential for wind resources in the region.
56.	Guidelines for the reporting and validation of plant load factors, version 01, EB48.
57.	Technical Note: PowerLogic ION8600 and ION8650 accuracy verification
58.	Cerro De Hula Monitoring Manual (Draft)

# **APPENDIX A**

## **VALIDATION PROTOCOL**

**Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities**

Requirement	Reference	Conclusion
<b>About Parties</b>		
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
2. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC.	Kyoto Protocol Art.12.2.	OK
3. The project shall have the written approval of voluntary participation from the designated national authority of each Party involved.	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	OK
4. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof.	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	OK
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
6. Parties participating in the CDM shall designate a national authority for the CDM.	CDM Modalities and Procedures §29	OK
7. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol.	CDM Modalities §30/31a	OK
8. The participating Annex I Party's assigned amount shall have been calculated and recorded.	CDM Modalities and Procedures §31b	OK
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

Requirement	Reference	Conclusion
<b>About additionality</b>		
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
<b>About forecast emission reductions and environmental impacts</b>		
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
<b>For large-scale Projects only</b>		
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
<b>About small-scale Project activities (if applicable)</b>		
13. The proposed Project activity shall meet the eligibility criteria for small scale CDM Project activities set out in § 6 (c) of the Marrakech Accords and shall not be a debundled component of a larger Project activity.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	NA
14. The proposed Project activity shall confirm to one of the Project categories defined for small scale CDM Project activities and use the simplified baseline and monitoring methodology for that Project category.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	NA
15. If required by the host country, an analysis of the environmental impacts of the Project activity is carried out and documented.	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	NA
<b>About stakeholder involvement</b>		
16. 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

Requirement	Reference	Conclusion
17. 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
<b>Other</b>		
18. The baseline and monitoring methodology shall be previously approved by the CDM Executive Board.	CDM Modalities and Procedures §37e	OK
19. 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
20. 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
21. The Project design document shall be in conformance with the UNFCCC CDM-PDD format.	CDM Modalities and Procedures Appendix B, EB Decision	OK
22. 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**

<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
<b>A. General requirements</b>			
<b>A.1 Project description and PDD</b>			
<b>A.1.1</b> Does the PDD sufficiently cover all the relevant elements of the Project activity, is accurate as per the planned and/or implemented scheme, and provides a clear understanding of the nature of the Project activity?	<p>The proposed project "Cerro de Hula Wind Project" will be the first wind farm interconnected to the National Interconnected System (SIN) in Honduras. The project will have 102 MW of installed capacity, consisting of 51 turbines, each with a 2 MW capacity.</p> <p>The project will supply 100MW to the National Interconnected System, the additional 2MW will be installed as back up in cases where a turbine needs to be shut down for periodic maintenance, or the failure of a turbine.</p> <p>The electricity generated will be sold to the national power utility ENEE through a 20 years/100MW Power Purchase Agreement (PPA). The PPA was approved by Honduras' National Congress and published in the Honduran Government Official Gazette on March26, 2009.</p> <p>The validation team has reviewed the project implementation schedule and layouts, and has carried out an on-site visit to assess the Project.</p> <p>It is expected that the project will start operational tests on August 2011 with the electricity production</p>	<p>/3/ /5/ /9/ /15/ /34/ /35/</p>	<p><del>CAR-02-</del>  <del>CAR-03-</del>  <del>CAR-04</del>  <del>CAR-05</del>  <del>CL-01</del>  OK</p>

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
	<p>test; all 51 turbines are expected to be installed by December 2011. The project will start commercial operation on March 2012.</p> <p>The technology to be implemented includes 51 Gamesa wind turbines model G87-2-MW 60Hz, the annual energy production for the maximum contracted capacity (100MW) has been estimated in 345,970 MWh/y based on a net capacity factor is 39.5% with a probability of exceedance of P50 (Net Yield (P50) 20 years MWh/year). This data is available in the Energy Yield Assessment report elaborated by Mott MacDonald for the Export-Import Bank of the United States in May 2010 as part of the due diligence.</p> <p>The geographical coordinates of the project presented in the PDD have been cross checked with the layout DH-PE-000-C-PL-002 Rev 5 (see ref doc /5/), this layout included the geographical coordinates of each of the 51 wind turbines. During the onsite visit the audit team visited the substation construction and wind turbines locations.</p> <p>Mott Mac Donald is the management, engineering and development consultancy. (<a href="http://www.mottmac.com/aboutmottmac/">http://www.mottmac.com/aboutmottmac/</a>)</p> <p>According to the PPA the PP shall design and construct a substation close to the tower 42 of the transmission line Suyapa-Payana (L614), in order to connect the project with the National Interconnected System. This information was confirmed during the</p>		

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
	<p>onsite visit; the validation team has reviewed the Project layout and confirmed it during the interview with ENEE.</p> <p>The project will be located in the Municipality of Santa Ana and San Buena Ventura.</p>		
<b>A.1.2</b> Is the Project a new installation and already commissioned, or does the Project involve alteration of existing installation or process?	<p>The project activity consists of the installation of a new grid-connected renewable plan, the audit team carried out an onsite visit to Santa Ana and San Buenaventura Municipalities (where the Project is located) during April 28, 2011 in order to confirm that the description in the PDD reflects the proposed CDM Project activity.</p> <p>The audit team has reviewed the Feasibility Study Report, Environmental Qualitative Assessment and the Energy Yield Assessment Report in order to confirm that the description in the PDD reflects the proposed CDM project activity.</p>	<p>/1/ /2/ /7/ /8/ /9/</p>	OK
<b>A.1.3</b> What category does the Project activity fall under: <ul style="list-style-type: none"> <li>▪ Large scale CDM Project</li> <li>▪ Non-bundled small scale CDM Project with annual emission reductions more than 15,000 tonnes</li> <li>▪ Bundled small scale with annual emission reductions more than 15,000 tonnes</li> <li>▪ Small scale CDM Project activity with annual emission reductions less than 15,000</li> </ul>	<p>The project activity falls under Large scale CDM Project since the Project will supply 100MW according to the PPA, will have an installed capacity of 102 MW (consisting of 51 turbines, each with a 2 MW capacity) and will reduce 226,978 tCO<sub>2</sub>e annually. (Based on the maximum contracted capacity).</p> <p>The estimated electricity production is 345,970 MWh/year based on the energy Yield Assessment</p>	<p>/9/ /34/ /35/</p>	OK



<b>CDM Validation Requirement</b>	<b>Remarks</b>	<b>Evidence</b>	<b>Conclusion</b>
tonnes Has a site visit been carried out for the Project activity? If not, pl justify	report (a summary of the losses and resulting Net Yield is presented in Table 3-6 page 23 of the Cerro de Hula energy Yield report. ref no. /5/)  The audit team has reviewed the Energy Yield Assessment Report in order to confirm that the description in the PDD reflects the proposed CDM Project activity. The audit team has assessed this information during the onsite visit.		
<b>A.1.4</b> Is the PDD prepared in accordance with the latest guidance from the CDM EB available on the UNFCCC website	The PDD has been prepared in accordance with the latest template and guidance from CDM EB available on the UNFCCC CDM website.	/15/	OK
<b>A.2 Participation and Approval</b>			
<b>A.2.1</b> Pl include and confirm the details of the participating project participants and the Parties involved.	The validation team has confirmed the details of the project participants, section A3 and Annex 1 of the PDD were correctly completed  Name of Party involved ((host) indicates a host Party): Honduras (host) United Kingdom of Great Britain and Northern Ireland  Private entities project participants: Energía Eólica de Honduras, S.A. EcoSecurities International Limited  The Parties involved do not wishes to be considered as project participant	/15/	<del>CAR-01</del> OK

<b>CDM Validation Requirement</b>	<b>Remarks</b>	<b>Evidence</b>	<b>Conclusion</b>
<b>A.2.2</b> Has the participation of each project participant been approved by at least one Party involved, either in a letter of approval or in a separate letter specifically to approve participation?	There will be two approvals, one from the Honduras DNA and another from the Annex I Party. During the onsite visit LoAs were not available. LoA from Honduras DNA(dated of 5 August 2011) and LoA from UK (dated of 12 October 2011) were presented. Both include all the requirements for CDM project activities.	/15/	<del>CAR-01</del> OK
<b>A.2.3</b> Has the letter of approval (LoA) been submitted and reviewed by the DOE? PI confirm if the same was provided by the PP or directly by the DNA of the Party involved?	Honduras DNA (SERNA - Natural Resources and Environment Secretary) and UK DNA (Environmental Agency - Department of Energy & Climate Change) were checked in the UNFCCC site ( <a href="http://cdm.unfccc.int/DNA/index.html">http://cdm.unfccc.int/DNA/index.html</a> )	/15/	<del>CAR-01</del> OK
<b>A.2.4</b> Does the LoA confirm the following:  - Ratification of the Kyoto Protocol - Voluntary participation - The CDM project activity contributes to Host country's sustainable development - Title of the project activity is same as the PDD sent for registration	All required information is in LoAs. Honduras ratified Kyoto Protocol on 25 February 2009.	/15/	<del>CAR-01</del> OK
<b>A.2.5</b> Is the LoA conditional to a specific version of PDD or the validation report?	No. The letter approves Cerro de Hula Wind Project(CDM) project for the purpose of Article 12 the Kyoto Protocol.		<del>CAR-01</del> OK
<b>B. Baseline and monitoring methodology</b>			
<b>B.1 Methodology applicability</b>			
<b>B.1.1</b> Has the Project proponent applied the relevant baseline and monitoring methodology that has been previously	The project proponent has applied the approved baseline and monitoring methodology ACM0002: "Consolidated baseline methodology for grid connected electricity generation from renewable	/29/ /31/	OK

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
approved by the CDM Executive Board?	sources” Version 12.2.0, EB 65, valid from 17 September 2010 onwards, this methodology has been correctly applied since the Project activity consists of the installation of a renewable electricity generation plant (wind farm) that will be installed at a site where no renewable power plant was operated previously.	/32/ /33/	
<b>B.1.2</b> Does the Project activity meet all of the applicability criteria defined in the approved methodology? Pl clarify	<p>The applicability conditions for ACM0002 are met as follow:</p> <p>Applicability: This methodology is applicable to grid-connected renewable power generation project activities that(a) install a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (Greenfield plant);</p> <p>Validation Opinion: the methodology has been correctly applied because the Project activity consists of the installation of a renewable electricity generation plant (wind farm) that will be installed at a site where no renewable power plant was operated previously. The electricity generated will be dispatched to the National Interconnected System (SIN).</p> <p>Condition 1: The project activity is the installation capacity addition, retrofit or replacement of 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.</p>	/1/ /9/ /29/ /31/ /32/ /33/ /34/ /35/	OK

<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
	<p>Justification 1: Project activity involves installation of a wind farm with an installed capacity of 102MW</p> <p>Validation Opinion: The project activity involves the installation of a wind farm; it meets the applicability criteria define in the approved methodology.</p> <p>Condition 2: In case the capacity additions, retrofits or replacements: (except for wind, solar, wave or tidal power capacity addition Projects which use Option 2: on page 10 to calculate the parameter <math>EG_{PJ,y}</math>): the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit of the plant has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.</p> <p>Justification 2: Project activity is not a retrofit or modification of an existing power plant.</p> <p>Validation Opinion: The project activity involves the installation of a new wind farm, this condition is not the case of the project activity.</p> <p>Condition 3: In case of hydro power plants:</p> <ul style="list-style-type: none"> <li>The project activity is implemented in an existing reservoir, with no change in the volume of</li> </ul>		

<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
	<p>reservoir.</p> <ul style="list-style-type: none"> <li>The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project Emissions section, is greater than 4 W/m<sup>2</sup>.</li> <li>The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the Project Emissions section, is greater than 4 W/m<sup>2</sup>.</li> </ul> <p>Justification 3: The project activity is not a hydro power plant.</p> <p>Validation Opinion: The Project activity involves the installation of a new wind farm, this condition is not applicable since the Project is not a hydro power plant.</p> <p>Condition 4 The methodology is not applicable to the following:</p> <ul style="list-style-type: none"> <li>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;</li> <li>Biomass fired power plants;</li> </ul>		

<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
	<p>Hydro power plants that result in new reservoirs or in the increase in existing reservoirs where the power density of the power plant is less than 4 W/m<sup>2</sup>.</p> <p>Justification 4: The project activity does not involve switching from fossil fuels to renewable energy at the site of the Project activity; it is neither a biomass fired power plant nor a hydro plant.</p> <p>Validation Opinion: The project activity involves the installation of a new wind farm, the project activity does not involve switching from fossil fuels to renewable energy at the site of the project activity; it is neither a biomass fired power plant nor a hydro plant.</p>		
<b>B.1.3</b> Does the Project activity involve any emissions within the Project boundary that contribute to more than 1% of the total expected annual average emission reductions which are not addressed/considered in the methodology? Pl explain, if any.	Since the project activity consists of the installation of a renewable electricity generation plant (wind farm) that will be installed at a site where no renewable power plant was operated previously, project activity does not involved any emission within the project boundary that contribute to more than 1% of the total annual average emission reductions which are not considered in the methodology ACM0002 version 12.2.0	/1/ /9/ /29/ /31/ /32/ /33/ /34/ /35/	OK
<b>B.1.4</b> Does the project boundary defined include all emission sources and the clear demarcation on the physical and geographical boundary of the proposed CDM Project activity?	<p>The project boundary defined in the PDD section B3 includes all emission sources, in accordance with the applied methodology ACM0002.</p> <p>For baseline only CO<sub>2</sub> emissions from the grid</p>	/3/ /9/ /10/ /14/ /33/	<del>CAR06</del> OK

<b>CDM Validation Requirement</b>	<b>Remarks</b>	<b>Evidence</b>	<b>Conclusion</b>
Is the selection of all emission sources (baseline, Project and leakage) been justified?	<p>electricity generation (including existing grid-connected power plants and the addition of new grid-connected power plants) have to be accounted.</p> <p>For project activity (Wind electricity production) no greenhouse gas emissions have to be considered.</p> <p>The validation team has reviewed the project lay out including wind turbines and meter location, substation and project interconnection.</p>		
<b>B.2 Baseline Selection</b>			
<b>B.2.1</b> Does the methodology define a specific baseline directly for the project type, or does it refer to a tool for arriving at the baseline for the project activity?	<p>The approved methodology ACM0002 version 12.2.0 defines a specific baseline directly for the windfarm projects.</p> <p>The approved methodology ACM0002 version 12.2.0 states that if the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:</p> <p>Electricity delivered to the Grid by the project 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 calculations (PDD section B.6.1) and emission reduction calculation in PDD section B.6.3 as per the “Tool to calculate the emission factor for an electricity system”.</p> <p>The methodology does not refer to a tool to define the baseline of the project activity for windfarm Projects.</p>	<p>/28/</p> <p>/34/</p>	OK

<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
	The audit team has confirmed during the desk review and onsite visit that the baseline described in the PDD has been correctly applied with the methodology ACM0002 version 12.2.0.		
<b>B.2.2</b> Has the CDM project activity considered all alternatives available to the project proponent?	<p>The approved methodology ACM0002 version 12.2.0 defines a specific baseline for the wind farm projects. The “Tool for the demonstration and assessment of additionality” (Version 06.0.0) requires to identify that there is only other alternative feasible to be implemented in the absence of the project activity for projects using ACM0002.</p> <p>Alternative 1: The proposed project activity without CDM: construction of a wind farm with an installed capacity of 102 MW connected to the Grid, implemented without considering CDM revenues.</p> <p>The Project is first-of-its-kind, and is very unlikely to be implemented in the absence of the CDM. There are no commercial wind farms operating in Honduras, nor it has been proposed in another CDM project activity. This alternative faces the largest number of barriers and add context to the “first-of-its-kind” nature of this project activity.</p> <p>Alternative 2: Continuation of the current situation. Electricity will continue to be provided by the existing</p>	/28/ /34/	<del>CL02</del> OK



<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
	<p>Grid.</p> <p>If the current situation is continued, the project developer would not have to invest any amount of money, and would not face any technological or other barriers. Electricity would continue to be provided by the existing mix of power plants in the Grid (predominantly fossil fuel) as explained below. Hence, this alternative would face the least barriers, and is therefore identified as the baseline scenario.</p> <p>As per ACM 0002 the baseline has been defined as follows: Electricity delivered to the Grid by the project 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 calculations (PDD section B.6.1) and emission reduction calculation in PDD section B.6.3 as per the “Tool to calculate the emission factor for an electricity system”.</p> <p>The baseline described in the PDD is in accordance with the methodology ACM0002 version 12.2.0.</p>		
<p><b>B.2.3</b> Is the documentation of the baseline determination clear w.r.t the following:</p> <ul style="list-style-type: none"> <li>- All assumptions and data used by the Project participants are listed in the PDD and related document to be submitted for registration.</li> <li>- All documentation is relevant as well as correctly quoted and interpreted</li> <li>- Assumptions and data can be deemed</li> </ul>	<p>Information provided by ENEE that confirms in the absence of the project activity, the electricity delivered to the grid 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 information/historical data provided by ENEE used to calculate the CM.</p>	<p>/29/ /31/ /32/</p>	OK

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
<p>reasonable.</p> <ul style="list-style-type: none"> <li>- Relevant national and/or sectoral policies and circumstances are considered and listed in the PDD and the same has been confirmed.</li> <li>- The methodology is correctly applied to identify what would have happened in the absence of the CDM Project activity proposed.</li> </ul>	<p>The methodology ACM0002 has been correctly applied, according to the baseline methodology procedure, if the Project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is "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".</p>		
<p><b>B.2.4</b> Have all the assumptions, calculations, rationale and other sources described in the PDD been verified to determine if the baseline scenario identified is reasonable.</p>	<p>The data provided by ENEE confirms that baseline scenario identified in the PDD is in accordance with the approved methodology ACM0002 version 12.2.0. The validation team can conclude that the assumptions, calculations, rationale and other sources described in the PDD used to determine the baseline scenario are reasonable and have been correctly applied.</p>	<p>/29/ /31/ /32/</p>	<p>OK</p>
<p><b>B.2.5</b> Cross check the information provided in the PDD with other verifiable and credible sources, such as local expert opinion, if available</p>	<p>The information provided in the PDD regarding to the baseline determination and combined margin calculation have been cross checked with the information available from ENEE, this data confirms that in the absence of the Project activity, the electricity delivered to the grid 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 information/historical data.</p>	<p>/29/ /31/ /32/</p>	<p>OK</p>
<b>B.3 Additionality</b>			

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
<p><b>B.3.1</b> Are the tools applied to discuss additionality in line with the CDM tools and documents provided CDM EB and the specific methodology applied for the Project activity?</p>	<p>The Tool for the demonstration and assessment of additionality version 6.0.0, approved by EB 65 /47/ has been applied to demonstrate the additionality of the project as follow:</p> <p>Step 1 Identification of the alternatives to the project activity consistent with the mandatory laws and regulations</p> <p>Based on the above mentioned tool, the alternative scenarios for the project activity consistent with current laws and regulations have been identified in section B.5 of PDD:</p> <p>Two alternatives to the project have been identified and discussed:</p> <p>Alternative 1: The proposed project activity without CDM: construction of a wind farm with an installed capacity of 102 MW connected to the Grid, implemented without considering CDM revenues.</p> <p>The project is first-of-its-kind, therefore it is not considered as a common practice, and is unlikely to be implemented in the absence of the CDM.</p> <p>Alternative 2: Continuation of the current situation. Electricity will continue to be provided by the existing Grid.</p>	<p>/10/ /34/</p>	<p><del>CL-02</del> OK</p>

<b>CDM Validation Requirement</b>	<b>Remarks</b>	<b>Evidence</b>	<b>Conclusion</b>
	<p>If the current situation is continued, electricity would continue to be provided by the existing mix of power plants in the Grid (predominantly fossil fuel) according to the historical data provided by ENEE. Hence, this alternative would face the least barriers, and is therefore identified as the baseline scenario.</p> <p>Other realistic and credible alternative scenario(s) to the proposed CDM project activity that deliver outputs services with comparable quality, properties and application areas, were not taking into account because the project is considered first of its kind which is the barrier that the PP wanted to demonstrated.</p> <p>As per tool for the demonstration and assessment of additionality version 6.0 (page 5 footnote 7) a coal-fired power station or hydropower may not be an alternative for an independent power producer investing in wind energy which is the case of Cerro de Hula Wind Project.</p> <p>Step 2. Investment analysis This step has not been applied, the additionality is demonstrated with barrier analysis.</p> <p>Step 3. Barrier Analysis The following barriers are presented in the PDD:  Prevaling practice barrier (<i>inter alia</i> Project activity is First-of-its-kind) – as the main barrier in the implementation of the project activity</p>		

<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
	<p>Investment barrier – due to specific risks faced by the PP because of Honduras being classified by international independent sources as a high risk country</p> <p>Technological barrier – due to new technology never applied in the country before.</p> <p>Alternatives and barriers have been assessed and discussed in section B.3.4 of this protocol. The Investment and Technology barrier are not relied upon to demonstrate additionality, but merely to provide context.</p> <p>Step 4. Common practice analysis.</p> <p>According to the tool, this step is not applicable since the project is first of its kind.</p> <p>The audit team confirms that all steps of the Tool for the demonstration and assessment of additionality version 6.0 have correctly applied.</p>		
<p><b>B.3.2</b> If the start date of the Project activity prior to the date of publication of the PDD for stakeholder comments it shall be demonstrated that the CDM benefits were considered necessary in the decision to undertake the Project as a proposed CDM Project activity in line with the “<i>Guidelines on the Demonstration and Assessment of prior consideration of the CDM</i>”.</p>	<p>The starting date of the project activity is prior to the date of the publication of the PDD for global stakeholder consultation.</p> <p>The start date 24 June 2010 has been defined as the date when the contract with the turbine supplier and the EPC was signed.</p> <p>According to the CDM glossary the start date of a</p>	<p>/8/ /15/</p>	<p><del>CL-03</del> <del>CL-13</del> OK</p>

<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
	<p>CDM project activity is the earliest date at which either the implementation or construction or real action of a project activity begins, based on this, the audit team confirms that the start date described in the PDD has been correctly applied. Other activities such as feasibility studies are not considered as real action.</p> <p>The audit team has confirmed that this is a new project activity (start date after 02 August 2008), the PP has submitted a letter of prior consideration dated on 09 January 2009 and 07 January 2011, is information is available on the UNFCCC website.</p>		
<b>B.3.3</b> Does the PDD identify all credible alternatives to the Project activity in order to assess additionality, if applicable?	<p>According to the approved methodology ACM0002 version 12.2.0 and Tool for the demonstration and assessment of additionality version 6.0.0:</p> <p>Project activities that apply this tool in context of approved consolidated methodology ACM0002, only need to identify that there is at least one credible and feasible alternative that would be more attractive than the proposed project activity.</p> <p>The following alternatives have been identified:</p> <p>Alternative 1: The proposed project activity without CDM: construction of a wind farm with an installed capacity of 102 MW connected to the Grid, implemented without considering CDM revenues.</p> <p>Alternative 2: Continuation of the current situation.</p>	<p>/29/ /31/ /32/</p>	<p>CL04 OK</p>

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
	<p>Electricity will continue to be provided by the existing Grid.</p> <p>Other realistic and credible alternative scenario(s) to the proposed CDM project activity scenario that deliver outputs services with comparable quality, properties and application areas, were not taking into account because the project is considered first of its kind which is the barrier that the PP wanted to demonstrated.</p>		
<b>B.3.4</b> What are the barriers applicable to the project activity that have been discussed to prove the project additionality?	The PP has selected the barrier analysis to demonstrate the additionality of the proposed Project activity, and is specifically focusing on the First of its Kind barrier.	/21/ /29/ /30/ /31/ /32/	<del>CL14</del> OK
<b>B.3.5 <u>Investment Analysis:</u></b> <p>a) In case of investment cost analysis, please confirm if a suitable indicator has been considered for the remaining alternatives available to the Project activity.</p> <p>b) In case of Benchmark analysis, pl confirm whether the benchmark applied is relevant to the type of the financial indicator</p> <p>c) Is the period of assessment considered for the financials in line with the guidance?</p> <p>d) Are the input values considered in the investment analysis are valid and applicable at the time of the investment decision taken by</p>	NA		OK

<b><i>CDM Validation Requirement</i></b>	<b><i>Remarks</i></b>	<b><i>Evidence</i></b>	<b><i>Conclusion</i></b>
<p>the Project participant?</p> <p>e) In cases where the financials source any input value from Feasibility Study Reports (FSRs) approved by National authorities ensure that the same is in line with the guidance in the VVM. (<i>Paragraph 113 of VVM, ver. 01.2</i>)</p> <p>f) Have any sunk costs, if any, been used for the financials?</p> <p>g) Has the fair value/salvage value been considered at the end of the assessment period? Is the value considered for fair value in line with the guidance?</p> <p>h) Has the depreciation and other non-cash items related to the Project activity, which have been deducted in estimating gross profits on which tax is calculated, are added back to net profits for the purpose of calculating the financial indicators (e.g. IRR, NPV)</p> <p>i) Have any cost of financing expenditures (i.e. loan repayments and interest) included in the calculation of Project IRR? Pl ensure the same is not considered in IRR calculation.</p> <p>j) In case the Project involves calculation of equity IRR, pl ensure that only the portion of investment costs, which is financed by equity is considered as the net cash outflow.</p> <p>k) Has the financials been presented transparently in a separate spreadsheets with formulas readable for the DOE?</p> <p>l) <u>Sensitivity analysis</u>:</p> <ul style="list-style-type: none"> <li>▪ Have all variables, that constitute more than 20% of either total Project costs or total</li> </ul>			



<b>CDM Validation Requirement</b>	<b>Remarks</b>	<b>Evidence</b>	<b>Conclusion</b>
<p>Project revenues subjected to reasonable variation?</p> <ul style="list-style-type: none"> <li>▪ Have the results of this variation presented in the PDD and the spreadsheets (reproducible manner)?</li> <li>▪ Has a reasonable variation been considered in the sensitivity analysis in the Project context?</li> </ul>			
<p><b>B.3.6</b> Have the data, rationales, assumptions, justifications and documentation provided by Project Participants to demonstrate the additionality of the Project been assessed and verified for the reliability and credibility? Assess the presented evidence using local knowledge and sectoral and financial expertise.</p>	NA		OK
<p><b>B.3.7 <u>Barrier Analysis:</u></b></p> <p>a) Has it clearly been demonstrated that the issues identified in Project implementation prevent a potential investor from pursuing the implementation of the proposed Project activity without the Project being registered as a CDM Project activity?</p> <p>b) Do any of the issues identified have a clear direct impact on the financial returns of the Project activity, except in cases of issues related to risk (like technical risks), or barriers related to unavailability of sources of finance, been discussed?</p> <p>c) Pl conclude if the barriers discussed are ‘real</p>	<p>Barriers that would prevent the implementation of the proposed CDM project activity:</p> <p><b>First-of-its-kind barrier</b></p> <p>Based on the historical data provided by ENEE, the historical data shows that project activity is the first-of-its-kind project in the region. Furthermore, the project complies with the criteria established in the FOIK guidelines agreed at EB63 as follows:</p> <p>(a) The project technology has not been in commercial operation in the applicable geographical area; and</p> <p>(b) The project technology has not been proposed in another CDM project activity in the applicable</p>	<p>/21/ /29/ /30/ /31/ /32/</p>	<p><del>CL-05</del> <del>CL-06</del> <del>CL-07</del> <del>CL-14</del> <del>CL-15</del> OK</p>

<b>CDM Validation Requirement</b>	<b>Remarks</b>	<b>Evidence</b>	<b>Conclusion</b>
<i>and prevent the implementation of the Project but not prevent at least one of the possible alternatives’?</i>	<p>geographical area (Host Country - Honduras) and published in the CDM-PDD by a DOE for public comments. The validation team has checked the CDM project activities in the UNFCCC site.</p> <p>The PDD table “Historical electricity generation 2008 and 2009 in the grid” shows that the renewable energy in Honduras is increasing, the validation team has reviewed the last power plants added to the grid and has found that for example from the newest (2005-2009) 12 hydropower plants, 11 have been registered as CDM, this information provided by ENEE has been cross checked with the projects registered in the UNFCCC website, this information confirms the importance of the CDM for renewable power plants projects in Honduras.</p> <p><b>Investment barrier:</b></p> <p>On 25 November 1998, the Law of Incentives for electricity Generation with National Renewable Resources (Decree 267-98) was approved and published with the intention to promote renewable energy generation; this Law has clearly not resulted in sufficient economic support because there are no Wind projects in the host country being that wind resource availability has been proven. Another important issue is the country risk and political instability, according to the Organization for Economic Co-operation and Development Honduras has a risk classification of 6 (where 7 is the higher</p>		

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
	<p>classification) /41/.In 2009 the president of Honduras was removed and forced into exile, this result in an immediate suspension of international lending into Honduras and the contraction of the economy since 2009, by reason not only of the recession in the United States, the country's principal trading partner, but also because of a drop in public and private investment and in household consumption, in the aftermath of the political events.</p> <p>Additionally since the project will be the first wind power project in Honduras the lack of trained labour represents a barrier to the project that result in higher financial requirements compare with other technologies... With respect to the lack of trained labour, it is important to mention that Gamesa Wind US will be responsible of operation and maintenance during the first two years of project operation /8/.</p> <p>Technological barrier:</p> <p>Technical Difficulties - Since the project is the first wind power project, it will face barrier related to technology and skilled labour, EEHSA does not have experience in wind power Projects for this reason EEHSA has signed an EPC contract with Iberdrola Ingeniería and Construcción México and GAMESA Wind US /8/. Both companies have extensive experience in wind power Projects, the Project will</p>		

<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
	<p>result in technology and knowledge transfer to the host country since technology and labour are from other countries. During the feasibility study EEHSA performed measurements up to 80m high with measuring devices at 30, 60 and 80 m, because there was minimal wind resource data available.</p> <p>The project will be developed in the mountains of the Municipalities Santa Ana and San Buena Ventura which are areas that are difficult in relation to the transportation of the machinery and materials required during the construction and installation of the wind turbines.</p> <p>It is clear that since this project will be the first wind project in Honduras, it will face barriers in relation to the technology.</p> <p>In line with the requirements of the 'Guidelines on additionality of first-of-its-kind project activities (EB 63 Annex 11).</p> <p><b>Show that the identified barriers would not prevent the implementation of at least one of the alternatives (except the proposed activity):</b></p> <p>Alternative 2 (Continuation of the current situation.) is considered viable, because based on the historical data in relation to energy production in Honduras, the continuation of the current situation would not require additional investment or risk capital, and importantly would not face any other barriers.</p>		

<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
	<p>Therefore there is one realistic and credible alternative is alternative 2, which is not prevented by barriers.</p> <p>Moreover, it must be noticed that as per paragraph 39 of the EB 65, Annex 21, for barriers due to project being first of its kind, it is <b><u>not required</u></b> to demonstrate that CDM alleviates the identified barriers for the implementation of the project. Also, first of its kind activities are <b><u>not required</u></b> to demonstrate that the identified barriers would prevent potential project proponents from carrying out the proposed project activity undertaken without being registered as a CDM project activity.</p>		
<p><b>B.3.8 Common practice analysis:</b> Has a common practice analysis been carried out as a credibility check of the other available evidence used by the Project participants to demonstrate additionality, in case of large-scale CDM Project activities (unless the proposed Project type is first-of-its kind). PI confirm this is in line with the VVM and the additionality tools.</p>	<p>According to the Tool for the demonstration and assessment of additionality Common practice analysis is not applicable as there are no wind farms commercially operational in the country.</p>	<p>/29/ /31/ /32/</p>	OK
<b>B.4 Emission Reduction Calculations</b>			
<b>B.4.1 Baseline Emissions</b>			
<p>B.4.1.1 Are correct equations and parameters used in accordance with the approved methodology selected in calculating the baseline emissions?</p>	<p>Baseline emission calculations have been presented in a excel spreadsheet.</p> <p>Baseline emissions of the project have been calculated through the multiplication between the net electricity supplied to the grid and the combined emission factor of the Honduras grid.</p>	<p>/9/ /35/</p>	<p><del>CL-08</del></p> <p><del>CAR-07</del></p> <p>OK</p>

<i>CDM Validation Requirement</i>	<i>Remarks</i>	<i>Evidence</i>	<i>Conclusion</i>
	<p>The electricity generation has been calculated based on the 50 turbines (equivalent to 100MW) and the plant factor of 39.5%.</p> <p>The audit team has reviewed the following documents in order to confirm that the electricity generation has been estimated in a conservative manner:</p> <p>Yield Energy Assessment Feasibility study Gamesa Wind Turbines technical information</p> <p>The annual electricity generation has been estimated in 226,978 MWh/year, based on a installed capacity of 100MW as per PPA.</p>		
B.4.1.2 In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM Project activity and will result in a conservative estimate of the emission reductions ( <i>less baseline emissions</i> )	<p>The combined emission factor of the Honduras Grid will remain fixed throughout the crediting period and it has been calculated as the weighted average of operating margin (OM) and build margin (BM). The PP has used the latest data available/provided by ENEE (<a href="http://www.enee.hn/">http://www.enee.hn/</a>) at the time of submission to DOE. The weighting of OM is 0.75 and the weighting of BM is 0.25. The above calculations are in line with the “tool to calculate the emission factor for an electricity system” and in a complete and transparent manner. A spreadsheet has been submitted with all calculations.</p> <p>The audit team confirms that all ex-ante values, assumptions and data used by the project participant are listed in the PDD and their reference and sources</p>	<p>/36/ /37/</p>	<p><del>CL-09</del> OK</p>

<b>CDM Validation Requirement</b>	<b>Remarks</b>	<b>Evidence</b>	<b>Conclusion</b>
	are appropriate, this Official statistical data is publicly available at ENEE website.		
<b>B.4.2 Project Emission</b>			
B.4.2.1 Are correct equations and parameters used in accordance with the approved methodology selected in calculating the Project emissions?	According to the approved methodology ACM0002 version 12.2.0 project emission PEy = 0.	/28/	OK
B.4.2.2 In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM Project activity and will result in a conservative estimate of the emission reductions ( <i>higher Project emissions</i> )	N/A		OK
<b>B.4.3 Leakage Emissions</b>			
B.4.3.1 Are correct equations and parameters used in accordance with the approved methodology selected?	According to the approved methodology ACM0002 version 12.2.0 No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector Projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are neglected.	/28/	OK
B.4.3.2 In case of data and parameters that are not monitored throughout the crediting period, and have already been determined and will remain fixed throughout the crediting	NA		OK

<b>CDM Validation Requirement</b>	<b>Remarks</b>	<b>Evidence</b>	<b>Conclusion</b>
period, assess that all data sources and assumptions are appropriate and calculations are correct, applicable to the proposed CDM Project activity and will result in a conservative estimate of the emission reductions ( <i>less baseline emissions</i> )			
<b>B.4.4</b> Pl mention the expected emission reductions generated from implementation of the project activity.	Expected emission reductions during the crediting period 2,269,779 tCO <sub>2</sub> e Expected annual emission reductions: 226,978 tCO <sub>2</sub> e.	/9/	<del>CAR-07</del> OK
<b>B.5 Monitoring Plan</b>			
<b>B.5.5</b> Does the monitoring plan defined in the PDD, contain all necessary parameters required for calculating ' <i>baseline emissions</i> ' in line with the methodology?	<p>The monitoring plan described in the PDD includes the quantity of net electricity generation supplied by the project plant/unit to the grid in year and it will be monitored in accordance with monitoring methodology of the approved methodology ACM0002 version 12.2.0.</p> <p>The project consists of 10 zones where the wind turbines will be located and 5 circuits that will connect the zones to the substation, each circuit will be monitored using an electricity meter, these five meters will be part of the internal control and will not be used to monitoring the net electricity.</p> <p>According to PPA, the net electricity "EGy" will be monitored using a bidirectional meter (meter both exports and imports. There will be one main and one backup meter with an accuracy level compliant with ENEE's requirements (0.3s or better). Meters will be calibrated as per manufacturer's specifications by a</p>	/26/	<del>CL-10</del> OK



<b>CDM Validation Requirement</b>	<b>Remarks</b>	<b>Evidence</b>	<b>Conclusion</b>
	third party approved by ENEE and the PP. According to the PPA, ENEE will invoice and will carry out the electricity payment in a monthly basis.		
<b>B.5.6</b> Does the monitoring plan defined in the PDD, contain all necessary parameters required for calculating 'Project emissions' in line with the methodology?	According to the approved methodology ACM 0002 version 12.2.0 project emission P <sub>Ey</sub> = 0.	/28/	OK
<b>B.5.7</b> Does the monitoring plan defined in the PDD, contain all necessary parameters required for calculating 'leakage emissions' in line with the methodology?	According to the approved methodology ACM0002 version 12.2.0 No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, and transport). These emissions sources are neglected.	/28/	OK
<b>B.5.8</b> Has the feasibility of the monitoring arrangements within the project design been confirmed through interviews and physical visits to the site, where required?	Based on the onsite visit and project design, the audit team can confirm the feasibility of the monitoring.  The project consists of 10 zones where the wind turbines will be located and 5 circuits that will connect the zones to the substation, each circuit will be monitored using an electricity meter, these five meters will be part of the internal control and will not be used to monitoring the net electricity.  According to the PPA, the net electricity "EG <sub>y</sub> " will be monitored using one main and one backup bidirectional meter.  The total installed capacity of 102MW will be	/3/ /26/	<del>CL-10</del> OK

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
	connected to the same meter.		
<b>B.5.9</b> The implementation of the monitoring plan, quality assurance and quality control procedures are verifiable	The implementation of the monitoring plan, quality assurance and quality control are according to ENEE requirements, The PPA clearly describes the responsibilities of the PP and ENEE regarding to the project operation, maintenance and calibration of monitoring equipment, frequency recording and control of records.	/26/	OK
<b>C. Crediting Period</b>			
<b>1.2</b> Has the start date of the Project activity been defined in line with the latest EB guidance? What has been defined as the start date of the Project activity?	The stating date of the project activity is 24 June 2010 –the date when the contract with the turbine supplier and EPC was signed. According to the CDM glossary the start date of a CDM project activity means the earliest date at which either the implementation or construction or real action of a project activity begins, based on this, the audit team confirms that the start date described in the PDD has been correctly applied.	/8/	<del>CAR-09</del> OK
<b>1.3</b> Has a crediting period been clearly defined in the PDD?	Fixed crediting period has been chosen as per requirement from the “First-of-its-Kind” approach.	/12/	OK
<b>2. Local stakeholder consultation</b>			
<b>D.1</b> Have all relevant stakeholders been identified for the Project activity?	<p>The stakeholders includes: land owners, Environmental Agency SERNA, Local Authorities, Energy Agency ENEE.</p> <p>The PP has carried out two local stakeholder consultations in the Municipalities where is project is located, on 22 November 2008 in San Buenaventura Municipality and 23 November 2008 in Santa Ana Municipality.</p>	/36/	<del>CAR-10</del> OK

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
	<p>Attendance list, photos and presentations are available as evidence, stakeholders were invited by the PP and the Municipalities, the events were announced by invitations, Radio and Mesoamerica website.</p> <p>The Audit team has interview the following persons during the onsite visit:</p> <p>Remberto L. Barahona/ Vice Mayor of San Buenaventura Municipality</p> <p>Maria Sofia Martinez / Land owner at area 6 Leticia Lopez and Karla Lopez / Land owner at area 6 Ricardo Matute /Manager Department ENEE Jose Jorge Canales / Planner ENEE Gerardo Salgado / Planner Director ENEE</p> <p>Rigoberto Cuellar / Minister SERNA</p> <p>The validation team has received positive comments about the Project; the validation team can confirm that all relevant authorities and neighbors are involved in the project.</p>		
<b>D.2</b> What means have been used for the inviting comments from the stakeholders?	Stakeholders were invited by the PP and the Municipalities, the events were announced by invitations, Radio and Mesoamerica website.	/36/	<del>CL-11</del> OK
<b>D.3</b> Does the PDD include a summary of the comments received from the stakeholders?	The PDD includes questions and comments received during the two stakeholder meetings.	/36/	OK

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
<b>D.4</b> Has a report on the due account taken of any comments received been described clearly in the PDD?	<p>No negative comments were received during the local stakeholder consultation according to the records provided by the PP, furthermore, the audit team do not received any negative comments during the interviews done during the onsite visit.</p> <p>The audit team can confirm that relevant stakeholder are involved in the Project because the PP has signed a leasing contract with the land owners, the Environmental Agency SERNA has issued the environmental license and the Energy Agency ENEE has signed a PPA in order to purchase the electricity, the interview persons during the onsite visited provide positives comments</p> <p>The PP has carried several meeting to inform the land owners and Municipality about the status of the project, this information has been reported in EEHS socialization Program.</p>	/36/ /20/	OK
<b>E. Environmental impacts Assessment</b>			
<b>E.1</b> Have the Project participants undertaken an analysis of environmental impacts and if the host country requires and environmental?	The PP has presented a report with a Qualitative Environmental Analysis dated September 2008, the Environmental Agency SERNA has issued an environmental license dated 12 March, 2009 which valid during the operation contract PPA (20 years)	/7/ /34/	<del>CL 12</del> OK
<b>E.2</b> Does the Project create any adverse environmental effects? Have the same been recorded in the PDD?	According to Honduras legislation, only the Qualitative Environmental Analysis is required, other analysis such as noise, bird risk assessments have done additionally by the PP but are not required by	/7/ /34/	OK

<i><b>CDM Validation Requirement</b></i>	<i><b>Remarks</b></i>	<i><b>Evidence</b></i>	<i><b>Conclusion</b></i>
	SERNA. According to the interview with SERNA Minister Mr. Rigoberto Cuellar, the Project will be the first Wind Project so the Honduras legislation does not consider any other additional analysis or assessment more that the Qualitative Environmental Analysis.		
<b>E.3</b> Does the Project comply with environmental legislation in the host country?	<p>The license issued by SERNA dated March 12, 2009 confirms that the Project complies with the environmental legislation in Honduras.</p> <p>The audit team has interviewed the SERNA Minister Mr. Rigoberto Cuellar and he has confirmed that license is evidence that the Project complies with the environmental legislation of Honduras.</p>	<p>/7/</p> <p>/34/</p>	OK

**Table 3: Resolution of issues identified in table 2 of the validation protocol**

<b><i>Draft report clarification requests, corrective action requests and forward action request</i></b>	<b><i>Ref.</i></b>	<b><i>Summary of Project owner response</i></b>	<b><i>Validation team conclusion</i></b>
<b>CAR 01:</b> The LoA from the DNA of Honduras has not been obtained.  The LoA from the DNA of United Kingdom of Great Britain and Northern Ireland has not been obtained.	A.2.1 A.2.2 A.2.3 A.2.4 A.2.5 Table 1	Both LoAs from Honduras and UK have been submitted to PJR.	Validation team received the LoAs and could confirm that both are from the DNAs and contain the requirements as per VVM.  CAR 01 is closed.
<b>CAR 02</b>  Section A2 Description of the project activity shall be complete based on the EB 41 Annex 12 “ <i>Guidelines for completing the Project Design Document (CDM-PDD) page 6</i> ”.	A.1.1	The following information has been added to the section: The scenario existing prior to the start of the implementation of the project activity The baseline scenario, as identified in section B.4 In accordance with the “ <i>Guidelines for completing the Project Design Document (CDM-PDD)</i> ”	The project developer has updated the section but some details regarding the capacity installed (102 MW as per 51 turbines 2 MW) and the reference in the PPA is not clear yet.  CAR 02 remains open.
<b>CAR 02 still open</b>  The project description is discussing 102MW capacity, while the PDD in later stages says that the PPA is signed with 100 MW only. For all calculation and description purpose is needed to consider the 100 MW only. Please provide clear information about that		Calculations have been made considering 100MW (please refer to spreadsheet as well as parameter <b><i>Contracted capacity</i></b> in section B.6.2 in PDD)	PP revised the PDD and presented more evidence (ER calculation spreadsheets) that confirmed the calculation was made considering the contracted capacity 100 MW.  Updated documents were reviewed by validation team and it was clear that the value

in the applicable section of the PDD

100 MW has been used.

CAR02 is closed.

### **CAR 03**

The details of the implementation regarding to operation tests date, complete implementation date, commercial operation date shall be included in the PDD.

A.1.1 A table was included on Section A.2. of the PDD summarizing the main milestones for the implementation and commissioning of the project.

The details of the implementation regarding to operation tests date (August 2011), complete implementation date (December 2011), commercial operation date (March 2012) have been included in the PDD.

### **CAR 03 still open**

PDD version 4 states different dates and terms for commercial operation (March 2012), commercial operation completion (December 2011) and final completion (March 2012). PP is requested to clarify these terms and confirms dates including dates for tests which were stated to be done in August 2011.

This has been clarified and the table dates have been updated to the latest schedule in the latest version of the PDD.

CAR 03 remains open  
PP reviewed and updated tables. It is clear that the civil works shall be complete in December 2011 while full commercial operations shall start by March 2012.

CAR 03 is closed.

### **CAR 04**

Section A.4.4 the total number of crediting years shall be 7 (years).

A.1.1 This has been changed.

On section A.4.4 of the revised PDD the total number of crediting years has been corrected.

CAR04 is closed.

After the CAR was closed the PP has changed the crediting period for 10 years fixed in line with the updated guidelines on First-of-its-Kind. Please refer to the latest version of the PDD.

## CAR 05

Section A.4.3 Technology to be employed by the project activity shall be completed based on the EB 41 Annex 12 “*Guidelines for completing the Project Design Document (CDM-PDD) page 8*”. (This description shall also include electricity meter location and specifications according to ENEE).

A.1.1 Information regarding technology to be employed by the project activity including relevant information about electricity meter location and specifications from ENEE has been included.

Even the revised PDD, Section A.4.3 Technology to be employed by the project activity has been revised it is still missing information regarding the monitoring equipment and their location.

CAR05 remains open.

## CAR 05 - still open

PP is required to:

- a) provide information regarding the monitoring equipment and their location
- b) clarify the capacity factor and probability of exceedance
- c) clarify, if only contracted 100 MW will be verified, how the generation of additional 2 MW will not be taken off

Missing information has been included in latest version of PDD

- a) Additional information of the monitoring equipment has been provided
- b) Capacity factor has been included (as determined in Energy Yield Report (P50) capacity factor 39.5% The seasonal energy yield profile has been applied to the expected annual net yield (P50) to produce long term average monthly net yield projections. The 39.5% capacity factor was considered taking into account the fact the project lifetime of the equipment which according to the technology provider is of at least 20 years.
- c) No electricity other the one contemplated in the PPA (for 100MW) will be considered for emission reductions

Validation team assessment

- a) PP has include information regarding the monitoring equipment in section A.4.3 and has clarified the metering system in section B.7.2 of the revised PDD .
- b) Capacity factor of 39.5% determination has been clarified and included in the revised PDD. For this capacity factor the probability of exceedance is P50 as presented in the document (reference 9) available for validation team.
- c) More information for the ER calculations has been included in the revised PDD which clarified that no more than 100 MW will be used in the ER calculations.

CAR 05 is closed.



## **CAR 06**

The flow diagram on PDD section B.3 shall include all the zones where wind turbines are located, circuit connections, electricity meters, substation and transmission line according to the project layout and PPA.

## **CAR 06 - still open**

Although PP has included a layout in Appendix C and provide some information notes the items below are not enough clarified:

- a) the wind farm has a one meter or group of meters (layout Appendix C provides only an illustration for meters)
- b) if the additional (102-100) 2 MW is not connected to the same meter or meters
- c) each WTG will have an individual meter or they have only one meter for all the 51 WTGs at the substation or if it just one meter at the substation, are we clear if there are no other WTGs (non project) in the area which are connected to the

B.1.4 The flow diagram has been modified to specify transmission lines, electricity meters and substation location. Furthermore a footnote has been added to refer to figure 2 on section A.4.3 for turbine location and Appendix C – Project layout has been created. The footnote makes reference to Appendix C as well.

It has been specified that there will be “two bidirectional meters installed at the substation of the project site. One will be the main meter and second as the back-up meter. The bidirectional meters will measure both electricity generated (imports) that is being imported to the grid and discount electricity that is consumed by the project (exports).”

The flow diagram on PDD section B.3 includes all the zones where wind turbines are located, circuit connections, electricity meters, substation and transmission line according to the project layout and PPA. Net electricity will be metered using two bidirectional meters (main and back up) with accuracy 0.2s, which comply with ENEE’s requirements (0.3s or better) will be installed in the substation (Cerro de Hula) that will be constructed as part of the project activity.

CAR06 remains open

The explanations made by PP and inclusions in the revised PDD regarding meters and metering point clarified this issue.

There will be 2 meters (main and back up) and one metering point.

CAR 06 is closed.

same feeder and the meter.

#### **CAR 07**

Baseline calculation shall be estimated based on the 100MW PPA contract and not based on the total capacity of the project.

B.4.1.1 The PDD and spreadsheet have been  
B.4.4 updated. The baseline calculation and  
emission reductions have been calculated  
based on the installed capacity of 100MW  
in accordance with the PPA.

PJRCES has confirmed that the emission  
reduction calculations have been  
estimated based on the installed capacity  
of 100MW.

The annual electricity generation has been  
estimated in the Energy Yield Assessment  
/9/, this assessment was prepared by the  
third party Mott MacDonald that was  
asked to carry out an assessment of the  
energy yield for the project as part of a  
due diligence assignment.

CAR07 is closed.

#### **CAR 08**

PP shall complete the description of the  
monitoring plan based on “*guidelines for  
completing the Project Design Document  
(CDM-PDD) EB41 Annex 12*”. The  
description shall be in accordance with the  
ENEE requirements and PPA.

B.5.9 PDD section B.7.2. *Description of the  
monitoring plan* has been completed  
according to the information provided by the  
PD and in accordance with ENEE’s  
requirements and PPA.

Section B.7.2 of the PDD has been updated  
but it is not clear yet how many meters will  
be used.

CAR08 remains open.

#### **CAR 08 still open**

It is not clear yet the meters/ metering point.  
The section in PDD states “the” metering  
point and then “the data will be read  
primarily from the main meter at **each**  
Metering Point”. Clarify.

PDD has been changed, there will be only one  
metering point with 2 bidirectional meters (a  
main meter and a back-up meter).

Calibrations will be performed as specified by  
ENEE (for further info please refer to Section  
B.7.2 *Calibration of Meters and Metering*)

Electricity supplied to the grid by the project  
will be monitored at the Metering Point  
through a Metering System. Initially, the  
Metering Point will be located at the 230kV  
terminals of the power transformer at the  
interconnecting substation (*Cerro de Hula*).  
The metering arrangements and the required

Calibrations details as per their frequency are not presented

The following text was added to Section B.7.2: *“The frequency of calibration for the meters is established by the manufacturer’s specifications.”*

quality control procedures to ensure accuracy are defined within the Power Purchase Agreement between EEHSA and Empresa Nacional de Energía Eléctrica – ENEE. PP has included information regarding calibration frequency in the revised PDD.

CAR 08 is closed.

#### **CAR 09**

On section C.1.2 of the PDD please refer the technology technical life time

C.1 A reference from the turbine manufacturer has been included that states that the average life span of these wind turbines is at least 20 years.

Revised PDD refers to the technology technical life time.

PJRCES has reviewed the information provided by Gamesa and has concluded that an average life span of at least 20 years is in accordance with the requirements.

CAR09 is closed.

#### **CAR 10**

Comments received during the Global Stakeholder Consultation shall be responded by the PP.

D.1 Answers to stakeholder Leo ([leonarddecap@gmail.com](mailto:leonarddecap@gmail.com)) were provided. Some of the questions were not relevant for the project activity.

Questions and responses have been submitted to the DOE.

During the global stakeholder consultation the project received one comment with 55 questions.

PJRCES has reviewed each of the questions and has concluded that most of the questions are not applicable to Cerro de Hula Wind Project, specifically those questions asking about the validation of parameters used to demonstrate the additionality based on Investment analysis while Cerro de Hula Wind Project has not applied investment analysis. Other questions about the interconnection of the project with CEA grid are not applicable since the project is not

## CAR 11

Due to the Guidelines on additionality of first-of-its-kind project activities (EB 63 Annex 11), to apply the condition of "first of its kind" it is necessary to be a fixed crediting period (paragraph 5 b) and this project is applying a 7 year period renewable. Please justify.

B.5 The project originally considered a 7 year twice renewable crediting period (for a total crediting period of up to 21 yrs) nevertheless during the validation process the *Guidelines on Additionality of First-of-its-kind project activities* was published and it limits the crediting period to "a maximum of 10 years with no option of renewal", therefore this has been considered. In the event that a change in such guideline is approved, EEHSA shall pursue a change on the crediting period as originally planned.

located in India, the project activity is located in Honduras.

Even though the questions can be considered irrelevant because all the information is provided in the PDD, the PP has responded all questions as applicable to the DOE and to Mr. Leo via email; PJRCES has reviewed all responses provided by the PP. and confirms that all relevant comments received during the global stakeholder consultation have been considered in accordance with VVM version 1.2 para. 42.

See section 5 of this report for additional information about questions and PP responses.

CAR10 is closed.

PP has revised the PDD in order to keep the classification "first-of-its-kind". As the mentioned Guidelines, paragraph 6: "A proposed project activity that was identified as the First-of-its-kind project activity is additional."

Changing the crediting period for 10 years fixed, the project is first-of-its-kind and is additional.

CAR 11 is closed.

## CL 01

Please clarify which kind of probability of exceedance (P50, P75, P90 etc) has been considered to estimate the net capacity factor of 39.5? and please clarify who is Mott Mac Donald (footnote 4).

## CL 01 still open

PP include the information and mention it is based on the Mott Mac Donald's website (footnote 8 but it is not stated how they reach the capacity factor (P50).

## CL 02

Please clarify, why hasn't the PP considered alternatives like other fossil fuel, hydro etc while defining alternatives to the project?

A.1.1 Probability of exceedance is now specified in the PDD (P50).

Additional text (including the link to Mott Mac Donald's website) has been included as footnote explaining the nature of the company.

Please refer to explanation in CAR 05 above.

B.2.2 The project participant has not included other alternatives such as hydro, fossil fuel as the identification of the baseline scenario is given in section 11 of ACM0002, V.12.2.0 - which clearly states that "If the project activity is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following: 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."

Now, referring to "Tool for the demonstration and assessment of additionality" (Version 6.0) , page 1, point (iv) - project activities that apply this tool in context of approved

PJRCES has reviewed the report prepared by third party Engineering company Mott Mac Donald that has been prepared as part of the due diligence of the project /9/.

CL01 remains open.

Capacity factor has been clarified in CAR 05 and the explanation was considered acceptable by the validation team.

CL 01 is closed.

As per Tool for the demonstration and assessment of additionality version 6.0 the a coal-fired power station or hydropower may not be an alternative for an independent power producer investing in wind energy which is the case of Cerro de Hula Wind and its project developer project.

PJRCES has concluded that the two alternatives presented in section B.5 of the PDD are in compliance with the "Tool for the demonstration and assessment of additionality" version 6.0 and the applied methodology ACM0002 version 12.2.0.

CL02 is closed.

consolidated methodology ACM0002, only need to identify that there is at least one credible and feasible alternative that would be more attractive than the proposed project activity"

Thus, in section B.5 of the PDD, only two alternatives have been defined as follows:

- Alternative 1: The proposed project activity without CDM: construction of a wind farm with an installed capacity of 102 MW connected to the Grid, implemented without considering CDM revenues.
- Alternative 2: Continuation of the current situation. Electricity will continue to be provided by the existing Grid.

These two alternatives are then discussed and assessed to prove that the project is additional.

### CL 03

The start date of the project is 24 June 2010. However, the communication to the UNFCCC was submitted only 07 January 2011 (after 6 months) and there was also another notification on 09 January 2009. What kind of intimation was made to UNFCCC? Please submit the letters of intimation.

The requirement is intimation to both UNFCCC and their DNA. Please submit the

B.3.2 Letters of intimation to the UNFCCC and their DNA have been provided to the validator. The notification submitted on 2009 was only submitted to UNFCCC as the guide that applied back then (EB 41 Annex 46) required so.

The second notification (the one submitted on 2011) was to inform the status of the project (as per "Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM" v4 para. 5. (EB62 Annex13)). This

PJRCES has reviewed the letters provided by the project developer to the DNA and UNFCCC, the letters considered the total installed capacity of 102MW.

The notification submitted on 2009 (09 January 2009) was submitted to UNFCCC in accordance with the applied version of Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM version 1 EB 41 annex 46 (valid for the date of the communication).

letters of intimation.

Also the CDM consideration presented in section B.5 – is that related to 102 MW capacity or does it include the enhanced capacity?

In discussing the chronology, the PP has mentioned only years in section B.5. PP is required to include specific dates.

PP shall submit all the information available regarding the communication between EcoSecurities and the PP dated February 2006.

### **CL 03 still open**

Although PP revised Appendix A and include some dates there it is not clear what happen between the period from December 2000 and May 2005.

PP is asked to include a state regarding the chosen starting date in section

### **CL 04**

PP shall conclude/ describe that alternatives presented in the PDD are the most credible and feasible alternatives.

was submitted to both EB and Host Country DNA as stated in paragraph 2 of the same Guidelines.

The prior CDM consideration only refers to the 102MW installed capacity. Although it was known that there is additional wind potential for more installed capacity before the CDM considerations was presented, Phase 2 was thought about later.

Relevant specific dates were included, furthermore a table is presented in Appendix A stating all relevant dates  
Information regarding communication between EEHSA and EcoSecurities has been provided (an e-mail from April 2007 including an initial proposal from November 2006).

A statement regarding the chosen start date has been included in both section B.5 and Appendix A (text in parenthesis).

The second communication to the UNFCCC and DNA was submitted on 07 January 2011 within 6 months after the project starting date 24 June 2010, using the Prior Consideration of the CDM form version 3(EB49 Annex 22)

Evidence of the communication between EcoSecurities and PP has been submitted but relevant dates are not clear yet.

CL03 remains open.

The update of the PDD and the statement included regarding the start date make it clear.

Project start date 24 June 2010.

CL 03 is closed.

B.3.3 In section B.5 a paragraph has been included as a conclusion of *Sub-step 1a. Define alternatives to the project activity.*

PDD includes a conclusion that alternatives presented in the PDD are the most credible and feasible alternatives.

PP stated that both alternatives can be credible and feasible alternatives. The PP would unlikely implement a first-of-its-kind technology (electricity by wind generation) for Honduras, but would rather let BAU situation for electricity generation in

Honduras prevail as it is the alternative facing the least amount of barriers..

CL04 is closed.

## CL 05

Please clarify the following information provided in the barrier analysis:

Investment barrier: PDD mentions difficulties in accessing sources of investment – Clarify what kind of proofs have been provided, if there are any loan rejections and if the project financing has been provided based on the CDM revenue consideration.

PP is also required to clarify: what are the certain limited incentives being available for such project mentioned in PDD

Clarify what are the decisive comparative advantage on hydro and biomass alternatives that PP had decided to go for wind power.

There is mention of significant effort being gone into mapping of wind potential in the area and who has carried out this or if the PP has been involved in this.

Conclusion:

The PDD states “It can be noticed that most of the private renewable energy generation projects that have come up recently have

B.3.7 To clarify how CDM alleviates the Investment barrier the *Guidelines for objective demonstration and assessment of barriers* were followed.

On difficulties in accessing sources of investment: the documents “Appendix - Background information on country current situation” and “News about political turmoil in Honduras” were submitted for PJR’s consideration. It is worth noting that CABI suspended all lending into Honduras when the last president was removed from office. This happened in the middle of the time financing was being negotiated with the project.

More importantly, the project is a FIOK activity and as per paragraph 39 of the EB 65, Annex 21, for barriers due to project being first of its kind, it is not required to demonstrate that CDM alleviates the identified barriers for the implementation of the project. Also, first of its kind activities are **not required** to demonstrate that the identified barriers would prevent potential project proponents from carrying out the proposed project activity undertaken without being registered as a CDM project activity.

## Investment Barrier

PJRCES has reviewed the “Law of Promotion to Electricity Generation with Renewable Resources” (Decree 70-2007) /21/ which replace the previous Law that was promoted in 1998. It was found in the PPA that the project will have the incentives of this law so it is not possible to consider this law as an investment barrier.

PJRCES has requested to the PP to exclude this law from the investment barrier. PJRCES can confirm that this information has been excluded.

PJRCES has confirm that one important issue is the country risk and political instability, according to the Organization for Economic Co-operation and Development Honduras has a risk classification of 6 (where 7 is the higher classification) /41/ and in 2009 the president of Honduras was removed and forced into exile, this result in the contraction of the economy since 2009, by reason not only of the recession in the United States, the country's principal trading partner, but also because of a drop in public and private investment and in household consumption, in



pursued CDM revenues. Please provide details of it.

The limited incentives referred to in the PDD are specifically those included in the “Law of Promotion to Electricity Generation with Renewable Resources” (Decree 70-2007), that only apply for Projects below 50MW:

- Exemption of VAT and other related taxes for 10 years starting on the commercial operation of the plant date.
- The payment of an extra 10% of the agreed price (as per Contract) for 15 yrs starting on the commercial operation of the plant date.

On bank and the financial support needed in the initial years: sentence has been reworded.

The rationale for the statements on “decisive comparative advantage on hydro and biomass alternatives” is that for both cases the technology has been widely proven in the country (as it can be seen in Table 6), opposite to wind generation.

Technical difficulties (mapping of wind potential) - a paragraph has been included stating the PDs involvement on those studies as they were not available and had to be generated and/or reinforced.

Conclusion: a table has been included showing all privately owned renewable electricity generating plants in Honduras and CDM reference numbers (only 2 out of 24 projects did not consider CDM revenues in

the aftermath of the political events.

The PD signed a credit agreement with CABEL - provided an offer to acquire the CERs of the projects dated July 2010, this offer evidences that CABEL was aware of CERs revenues as a lender, and the PD has integrated CDM financing from a very early stage in the project’s development.

### **Barrier due to prevailing practice**

PJRCEs has confirmed during the interview held with ENEE during the onsite visit that there are not wind power plants in commercial operation in Honduras. Furthermore, it was confirmed by ENEE that there are not any other wind power projects even under construction in Honduras. (Additionally see <http://www.enee.hn/renovables.htm> section 4 refers to the future wind projects, only this Cerro de Hula Wind Project under consideration).

### **Technological Barrier**

Technical Difficulties  
The feasibility study/35/ submitted by the project participant describes the additional wind resources studies carried out by EEHSA after the acquisition of Zond.

According to the feasibility study, the measurements carried out by Zond were done at a 30m height and EEHSA carried out measurements up to 80m high with measuring

2002 and 2004 respectively).

devices at 30, 60 and 80 m because the actual size of the turbines and in order to minimize technical risks and avoid the need to make correlations.

The technological barrier is confirmed by the guidelines on additionality of first-of-its-kind project activities (EB63 Annex 11).

The PDD includes a table showing that most of the private renewable energy generation projects that have come up recently have applied CDM.

PJRCES has concluded that the barriers presented in the PDD are real and supported with sufficient evidence.

PJRCES confirms that the project is first-of-its-kind project activity

CDM alleviates the identified barriers that prevent the proposed from occurring.

Since the project is FIOK, then, as per paragraph 39 of the EB 65, Annex 21, for barriers due to project being first of its kind, it is **not required** to demonstrate that CDM alleviates the identified barriers for the implementation of the project. Also, first of its kind activities are **not required** to demonstrate that the identified barriers would prevent potential project proponents from carrying out the proposed project activity undertaken without being registered as a CDM project activity.

CL 05 is closed.

#### CL06

PP shall submit an organization chart including all companies included in the consortium in order to demonstrate the technological barrier.

While demonstrating barriers related to technologies and skilled labour, information please clarify nature of company, organization and its ownership, and previous experience with similar project (that is under consideration for CDM) in other locations.

#### CL07

Please confirm in the PDD that the project activity is in accordance with the following criteria: In the absence of a specific definition in an approved baseline and monitoring methodology, the barrier “first-of-its-kind” shall apply if:

(a) The project technology has not been in commercial operation in the applicable geographical area; and

(b) The project technology has not been proposed in another CDM project activity in the applicable geographical area and published in the CDM-PDD by a DOE for public comments.

B.3.7 The requested organization chart including all companies included in the Mesoamerica Group has been provided. Regarding previous experience with similar projects only one of the companies of the Group (Plantas Eólicas, SRL) has an operational project but with a completely different technology as the project was built more than 12 years ago. This project was not built by GlobeleqMesoamerica Energy but they bought the operating project in 2004. Additional information regarding the structure of the company is included in the company's website:

<http://www.mesoamericaenergy.com>

B.3.7 a) The geographic area has been defined as the whole country: Honduras.

b) It is now stated in the PDD that the project technology has not yet been proposed in another CDM project activity in Honduras.

Additionally a paragraph was added in *Section B.5./ Step 1. Identification of alternatives to the Project activity consistent with current laws and regulations/* Sub-step 1a. Define alternatives to the project activity, confirming both of the above statements.

Finally a satellite image with the polygon of the project activity has been included in the PDD (section A.4.1.4) and provided to PJR.

The organization chart of EEHSA and Globeleq Mesoamerica Energy has been submitted, As part of the EPC contract /8/ signed between EEHSA, Iberdrola and Gamesa Wind US, Gamesa Wind US will be responsible for maintenance and project operation during the first two years of the projects. .

CL06 is closed.

PJRCES confirms that based on the note of the barrier first of its kind (MP 34 annex 10) Cerro de Hula Wind power complies with the requirements of first of its kind as follow:

(a) The project technology has not been in commercial operation in the applicable geographical area;

During the interview held with ENEE, PJRCES has validated that there are no wind power plants in the Honduras, the list of all power plants connected to the grid is publicly available in ENEE's website.

and

(b) The project technology has not been

Baseline and monitoring methodologies should clearly define the applicable geographical area. The latter can be the global level, a country or a region within a country. In the absence of a specific definition of the applicable geographical area in the approved baseline and monitoring methodology, the host country should be used as default.

proposed in another CDM Project activity in the applicable geographical area and published in the CDM-PDD by a DOE for public comments.

PJRCES has checked the UNFCCC website and concluded that there were no other wind power projects published for GSC when Cerro de Hula Wind Power Project PDD was published for GSC on 14 April 2011.

The geographical area has been defined as the host country Honduras.

CL 07 is closed.

#### **CL 08**

Page 18 – section B.6.1 step 2 – Please include the name of the grid selected for the Project activity

B.4.1.1 The name of the selected grid National Interconnected System (Sistema Interconectado Nacional or SIN) has been included.

The name of the grid “Sistema Interconectado Nacional” (SIN) has been included in section B.6.1 step 2.

PJRCES confirms that the project will be connected to SIN.

CL08 is closed

#### **CL 09**

Please provide complete information regarding to the fuel consumption of the power plants connected to the grid used to calculate the CM.

B.4.1.2 Complete information regarding fuel consumptions and raw data for the CEF calculation has been specified in the spreadsheet and provided to PJR. The sources of the fuel consumption are the following (in order of relevance):

- 1- ENEE’s published data
- 2- Information provided by personnel from ENEE
- 3- Calculation of fuel consumption for

Information about fuel consumption of all power plants included in the calculation of the electricity emission factor have been submitted to PJRCES.

PJRCES has confirmed that this data has been prepared by ENEE and it was found that the electricity emission factor has been calculated in a conservative manner in accordance with the applied tool “Tool to calculate the emission factor for an electricity system”

		two plant for which no fuel consumption data is available (Ampac & ElCatex)	version 2.2.0 CL 09 is closed.
<b>CL 10</b>  PP shall clarify and include in the PDD how the net electricity will be monitored; the accuracy of the meters based on ENEE requirements and the frequency of monitoring, all parameters shall be included in the monitoring plan.  During the onsite visit the audit team has found that part of the imported electricity will be monitored separately, please clarify on PDD and included in the monitoring plan.	B.5.5 B.5.8	Section B.7.2. <i>Description of the monitoring plan</i> has been changed completely according to the specifications provided by the project developer and in compliance with ENEE's requirements.	The monitoring plan has been described in accordance with the PPA and ENEE's requirements.  The electricity will be monitored using two bidirectional meters (main and back up) that will be installed in the substation "Cerro de Hula" that will be constructed as part of the project activity.  There will be only one parameter since the net electricity will be monitored using bidirectional meters. A main and back meter will be installed and it is stated in the revised section B.7 of the PDD.
<b>CL 11</b>  Please provide evidence of contract/ payment done to Radio Sabana Grande to announce the events.	D.2	An invoice for the amount of 448.00 HNL dated on the 20 November 2008 paid to Radio Sabana Grande, has been provided as evidence.	CL10 is closed. The evidence has been submitted and reviewed by PJRCES.  CL11 is closed.
<b>CL 12</b>  Please rearrange the measures with the reference to the identified impacts presented on section D.1  Describe how the noise from the wind turbines is considered to be within acceptable parameters, what is the distance of community to the project activity and what is its impact with reference to decibel level	E.1	The measures have been rearranged so that each impact corresponds to one measure.  A description from the technology used by the tech provider has been included describing the system developed by them which complies with noise standards. Also specifications from the impact of the decibel volumes have been included from information from the Environmental Assessment.	The measures have been rearranged with the reference to the identified impacts presented on section D.1.  Noise study is not required by the environmental regulation of Honduras, HGC engineering was contracted to carried out a noise study.  The G87-2.0 MW wind turbine is supplied in

measured.

Finally the document Environmental Category table (“Tabla de Categorización Ambiental”) from SERNA has been submitted to PJR as evidence that the project is in compliance according to the Honduran National Environmental regulations (see pg 5 Section 6).

different low-noise versions: 104 dB (A), 103dB (A), 102dB (A), 101dB (A) , and all of them comply with the IEC standard IEC 61400-11 .

The report prepared by HGC engineering states that based on a noise contour map of the area surrounding the facility produced by Cadna/A based on the octave band sound power levels corresponding to the overall 108.4 dBA sound power level of the wind turbines, the predictions indicate that sound levels at the considered receptors will be between 32 and 60 dBA due to the operation of the wind turbines under maximum power.

Additionally, based on the technical data, Gamesa has developed the Gamesa NRSTM noise control system, which permits programming the noise emissions according to criteria such as date, time or wind direction. This achieves the goals of local regulation compliance as well as maximum production.

PJRCES confirms that the project activity is in accordance with the SERNA/ Environmental regulations of Honduras country.

CL12 is closed.

## **CLs Raised During Technical Review**

<b><i>Draft report clarification requests, corrective action requests and forward action request</i></b>	<b><i>Ref.</i></b>	<b><i>Summary of Project owner response</i></b>	<b><i>Validation team conclusion</i></b>
<b>CL 13</b>  Prior consideration: there is time gap between 1995 and 2005 and it is not substantiated what exactly happened in this ten years period. Provide information in the PDD and also provide DOE the evidence that the project was stalled for what reasons  The FSR is not mentioned in section B.5.  Table in appendix A should be included in the main body of the PD.	B.3.2	Section B.5 has been reorganized to show more clearly the events that happened previous to the CDM Start Date and after it. Explanation on why the project was stalled has been provided as well.  FSR is now included in the text in B.5.  Appendix A has been removed and the table it contained has been included in the revised of PDD. The table was split into milestones pre CDM start date and CDM Start date onwards to make it more clear.	Validation team evaluated the updated information provided in the revised PDD .  PP has included a timeline in section B.5 that illustrates well the timeline of this project and the choice the start date of the project activity.  The 10 year period without progress on the project's development is due to the political situation in Honduras which generated an environment of instability and resulted in additional difficulties to close financing.  CL13 is closed.
<b>CL 14</b>  The investment barrier is not pointing towards any barriers which are investment related. Explain what were the specific investment barriers and how these are alleviated by CDM.	B.3.4  B.3.7	Within the reorganization of section B.5. the investment barrier has been enriched. Information on the "historical country risk classification" has been added with all the relevant references to make clear the risky environment for investors prevailing in Honduras.	Barriers analysis section has been rewritten by the PP and information regarding the specific investment barriers were provided. As per there is no other similar project in the host country it was sufficiently demonstrated that the project is first-of-its-kind and in is accordance with the "Guidelines on additionality of first-of-its-kind project activities" v1.0 (EB63 Annex11).  CL14 is closed
<b>CL 15</b>  Explain how technological barriers were alleviated by CDM.	B.3.4  B.3.7	This explanation is included in the revised PDD, additionality section.  The project faced delays due to the difficulties to close financing due to technological risks associated with the project	Information in the revised PDD is sufficiently detailed indicating the specific technological barriers faced by the project activity. Indicated barrier demonstrated that the one of the reason for the considerable delays in the implementation of the project is technological

		being the first wind power project in the country. Specific technological barriers indicated project developer lacked wind data information in the region in order to analyze the feasibility of the project and also the complete lack of technical knowledge and know-how for implementing and operating wind turbines. These barriers are indicated to be further increased because of the location of the project activity which is characterized by complex terrain, tropical weather conditions with landslides.	barriers which are alleviated due to additional revenue from CDM enabling project developer to establish better contacts with and hence, seek technical support from specialized agencies.  CL15 is closed.
<b>CL 16</b>  Crediting period Starting date is in the past. Please review.	C.1.2	Starting date is set to 01 March 2012. In addition all tables and texts referring to previous starting date were modified accordingly. Additionally in section C.2.1 the legend “The crediting period will start on 01/03/2012 or the date of registration whichever occurs the latest” to avoid further modifications in tables due to the project start date.	The start date in the revised PDD has been changed to a future date. Section C.2.1 was properly updated in the revised PDD.  CL16 is closed.



## APPENDIX B

### VALIDATION TEAM DETAILS

<i>Team Member Name</i>	<i>Role</i>	<i>Experience</i>
<i>Daniel Galván Pérez</i>	CDM Lead Validator	Lead validator and lead verifier mainly for renewable energy and landfill projects.
<i>Cláudia Freitas</i>	CDM Lead Validator (since September 2011 in this project)	Lead validator and lead verifier mainly for renewable energy and landfill projects.
<i>Hetalkumar Shah</i>	CDM Technical Expert	Lead validator and lead verifier mainly for renewable energy projects.
<i>Mathsy Kutty</i>	Technical reviewer	Internal technical reviewer for renewable energy and waste projects.

## **Eng. Daniel Galvan**

### **Education:**

Instituto de Investigaciones en Procesos de Calidad - Master's degree: Quality Management Systems - 2011-2012

Universidad Autonoma de Nuevo Leon - Bachelor degree: Mechanical Engineering & Administration - 1997-2002

### **Work Experience:**

Perry Johnson Registrars, CES

Validator/ Verificator - Reviewer

- Factory Inspector TUV SUD Product Service: Electrical, Telecom, Electronic and Mechanical products.
- Testing and reporting: Mechanical and Electrical safety.
- Auditing (Compliance audits based on: QMS ISO 9001:2000 and ISO/IEC 17025:2005, HACCP).
- Volkswagen auditor for “Dr Ghost Project” Mystery Shopper for VW, SEAT and AUDI dealers.
- Clean Development Mechanism (CDM UNFCCC) Validation and Verification Auditor (scopes: Energy, Waste, Industrial and Agriculture).
- Risk assessments.
- Project planning and execution.
- Product Development, Marketing and Sales.
- Annual Budgets and Monthly financial reports.

Green Point Energy/ Canromex - April, 2008 to January 2011

#### Project Director of Landfill Gas to Energy

Green Point Energy is a technology and environmental consulting supplier focused on landfill gas to energy projects, the company has successfully implemented the CDM project 1123 (Ciudad Juarez Landfill Gas to Energy Project) using SmartSoil Energy technology from Canada.

Site Assessments / Landfill Inspector, Exploration Campaigns Coordinator, Preparation of economic and technical proposals for tenders, executive projects and technical reports.

CDM – Baseline calculations and Project Design Documents.

Financial Projections for investors and carbon funds

CDM Project Validation and Registration support.

ERPA contracts reviewer

Presentations and conferences.Cd Juarez Landfill

Huilango Landfill (Cuautitlan)

Peñasco and Santa Rita Landfill

Atizapan Landfill

Monclova Landfill

Saltillo Landfill

Picachos Landfill

Oaxaca Landfill

Santa Catarina Landfill

San luis Potosi – (Peñasco and Santa Rita)

Oaxaca

Huilango (Cuautitlan)

Green Point Energy Huilango Landfill Gas to Energy Project  
(expected registration date Jun 2011).

Atizapan Landfill

Huilango Landfill (Cuautitlan)

Huilango Landfill (Cuautitlan)

## **Eng. Cláudia Virgínia Mistrorigo de Freitas**

### **Summary of qualifications:**

Lead auditor and expert in climate change (Science and Technology Ministry and UN) – validation and verification of green house gases and clean development mechanism – CDM

Lead auditor in environmental management systems – standard ISO 14001:2004

Graduation in Chemical Engineering with MBA at Getúlio Vargas Foundation, postgraduation in Industrial Administration and specialization in instruments of environmental management in Germany.

### **Professional Background:**

PERRY JOHNSON REGISTRARS Carbon Emissions Services, Inc – 2011 - Present

- Internal Technical Reviewer
- Lead Validator /Verifier

Lloyd's Register Quality Assurance – LRQA – 2009 - 2010

Lead Auditor

Audit in climate change projects:

- Clean development mechanism - verification and validation of companies to obtain greenhouse gases credits. Projects evaluated: Cabrera Energética, Yguazu, Embralixo, Estre Pedreira and Terrestre.
- Verification and certification of greenhouse gases inventory (ISO 14064 standard and others as GHG Protocol). Company verified: Embraer.

CSN - National Steel Company - 2008 - 2009

Coordinator of Environmental Management Systems

- Development and implementation of environmental management systems in all companies of CSN group, involving mining and steel, to obtain certification of the standard ISO 14.001:2004 - Environmental management systems;
- Studies and consolidation of environmental indicators for the different industrial segments of the company.

#### Bureau Veritas Certification – BVC (ex-BVQI) - 2005 - 2008

##### Lead Auditor

- Certification of companies to obtain ISO 14001:2004 standard - Environmental management systems. Some companies audited: Tractebel Energy, Vale, Villares Metals, IBM Brasil, Tower Automotive, Furnas, Eletronorte, Solvay, Cemig, Hp, Cabot, 3M, Elektro and Hydro Power Plant Guilman-Amorim.
- Companies verification and validation to obtain greenhouse gases credits. Projects validated/verified: Santa Edwiges I and II, Paraíso, Brascan, Global Carbon, Jalles Machado, Lucélia, Ecoinvest Agroceres and Toray.

#### Andrade & Canellas Consultoria e Engenharia Ltda. - 2001 – 2005

##### Senior Consultant

- Elaboration of technical specification for contract services as Environmental Impact Studies, Environment Impact Report and Environmental Basic Project for hydro power plants and transmission lines;
- Negotiation with governmental institutions to obtain environmental licenses for construction and operation of enterprises;
- Technical support to the execution of the environmental programs during implantation and operation of hydro power plants and transmission lines;
- Analysis of proposals and contracts management. Participation in the undertakings: Hydro Power Plants Machadinho, Barra Grande, Capim Branco, Serra do Facão, Estreito, Serra Quebrada, Santa Isabel and Transmission Line Campos Novos-Santa Marta.

## **Mr. Hetalkumar Shah**

Mr. Hetalkumar Shah is a post graduate in Machine Design Engineering (1998), with 14 years of experience in managing the business operations. He is Deputy General Manager – Business Development with Reliance Power Limited since 2008. He has an extensive experience in setting up and managing business operations which require deep understanding of critical business drivers in multiple markets and industries; highly successful in building relationships with upper-level decision makers and business partners. He is a proactive leader and planner with cross functional expertise in planning, market penetration, and competitor / market analysis. His core competencies in sales and marketing include strategic planning, techno-commercial operations and business development. He is actively involved in business planning/analysis for assessing the revenue potential in business opportunities. Identifying and developing new streams for long-term revenue growth and maintaining relationships with customers to achieve repeat/referral business. He is involved in effectuating pre-planned sales strategies for accomplishment of performance milestones. Identifying and networking with prospective clients generate business from the existing accounts and achieve profitability and increased sales growth. Participating in project tenders floated by prospective clients and negotiating with the clients for securing the project. Executing projects from land acquisition to commissioning.

He is involved in exploring and developing new clients, accelerating growth & achieving desired goals. Analyzing market trends to provide critical inputs for business development initiatives and formulation of business development strategies. Identifying and developing potential clients in the targeted industries and sectors ensuring maximum customer satisfaction by providing delivery on time.

From 2005 till 2008, he was Senior Manager – Business Development with Reliance Energy Limited. He was Assistant Manager with Suzlon Energy Limited from 2000-2005. He was Project Planning and Quality Engineer with Design Solutions Ltd. from 1999-2000.

His qualification as a Technical Expert for validation of wind based energy projects is thus sufficiently demonstrated through his educational qualification and industry experience.

## Eng. Mathsy Kutty

### Education

Masters Degree (2005) - Sikkim Manipal Univ., India - Environment and Ecology

Bachelor of Engineering (2002) - Visveswariah Tech Univ., India - Environmental Engineering

### Work Experience

- Around 3 years of experience in the area of climate change
  - Renewable Energy (hydropower, biomass, geothermal & wind energy projects)
  - Waste management & Disposal (landfill gas/methane capture & utilization projects)
  - Blended cement projects
  - Waste water treatment project (methane capture and utilization projects)
  - Coal Mine Methane projects (CMM)
  - Waste heat recovery projects
- Worked with *Det Norske Veritas As* on multiple roles as a **Project manager, Team leader, GHG Auditor, CDM validator** and **Technical Reviewer** for the validation of numerous CDM projects in South America, South East Asia, South Africa, Egypt, India and China.
- Reviewer for the determination of Joint Implementation projects in Russia including hydropower projects, renewable energy projects
- Worked with Chess Management Services Pvt. Ltd., as LCM Environmental Executive, helping clients with system based addressing of all the EHS related compliance requirements.
- Worked with Stellar Management Consultants Pvt. Ltd., as Environmental consultant, helping clients implement management systems like ISO 9001, 14001.
- Worked as a research assistant for a project on “Environmental Decontamination of Pesticides using Super Critical Carbon dioxide”. This project was conducted at Central Food & Technological Research Institute (CFTRI, Mysore) under the guidance of Dr.Udayshankar, CFTRI and Mr.Dayanand, HOD, Environmental Engg, VVCE.

DET NORSKE VERITAS AS (Aug 2006 – till date)

## Core Responsibilities for Climate Change Services

- Assessment of the project design, in particular, the project's baseline, monitoring plan, and the project's compliance with relevant UNFCCC and host Party criteria to confirm that the project design is in compliance with the required criteria
- Technical review of the baseline determination of the project to confirm correct applicability and implementation of UNFCCC methodology.
- Review of the financial analysis of the project activity to confirm that the project faces investment barriers.
- Auditing of CDM projects and inventory verification / Provide guidance and verification issues to onsite DNV GHG auditors to conduct CDM audits.
- Focal point of contact for client interaction and coordination's in CDM validation project activity
- Report writing and submission of complied documents to UNFCCC
- Give presentations during conferences and technical working groups on CDM & JI project experience.
- Conducting GHG auditors, Advanced CDM validators training course for DNV.