



# ASSESSMENT

## REGARDING POST REGISTRATION CHANGES

### INVERSIONES EÓLICAS DE OROSÍ DOS, S.A.

### OROSI WIND POWER PROJECT

**Report No: 11098 – 14/127**

**Date: 2014-10-27**

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<b>Assessment Report</b> on post registration changes	<b>Report No.</b>	<b>Rev. No.</b>	<b>Date of 1<sup>st</sup> issue:</b>	<b>Date of this rev.</b>
	11098 – 14/127	0	2014-10-27	2014-10-27
<b>Project:</b>	<b>Title:</b>	<b>Registr. date:</b>	<b>UNFCCC-No.:</b>	
	Orosi Wind Power Project	2012-10-14	6652	
<b>Project Participant(s):</b>	<b>Host Country PP – Name:</b>	<b>Host Party:</b>		
	Inversiones Eólicas de Orosí Dos, S.A.	Costa Rica		
	<b>Investor PP(s) – Name(s):</b>	<b>Investor Party(ies)</b>		
	Inversiones Eólicas de Orosí Dos, S.A.	Costa Rica		
<b>Applied methodology/ies:</b>	<b>Title:</b>	<b>No.:</b>	<b>Scope:</b>	
	Consolidated baseline methodology for grid-connected electricity generation from renewable sources	ACM0002 Ver. 12.3.0	1 / 1.2	
<b>Post Registration Changes:</b>	<b>Type of requested changes</b>	<b>Number of changes</b>	<b>Prior Approval required</b>	
	<input type="checkbox"/> Temporary deviations from the MP	-	<input type="checkbox"/>	
	<input type="checkbox"/> Temporary deviations from the MM	-	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Corrections that do not affect the project	1	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Change to the start date of the crediting p.	1	<input checked="" type="checkbox"/>	
	<input type="checkbox"/> Permanent changes from the MP	-	<input type="checkbox"/>	
	<input type="checkbox"/> Permanent changes from the MM	-	<input type="checkbox"/>	
	<input checked="" type="checkbox"/> Design changes to the project activity/PoA	1	<input checked="" type="checkbox"/>	
	<input type="checkbox"/> Changes specific to A/R	-	<input type="checkbox"/>	
<b>Revised PDD:</b>	<b>Title:</b>	<b>Version:</b>	<b>Attached in TC:</b>	<b>Attached clean:</b>
	Orosi Wind Power Project	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<b>Assessment team / Technical Review and Final Approval</b>	<b>Assessment Team:</b>	<b>Technical review:</b>	<b>Final approval:</b>	
	Raul Gonzalez Mitre	Sergio Cruz	Martin Saalman	
<b>Assessment Opinion:</b>	<input checked="" type="checkbox"/>	The post registration changes require prior Approval by the Board		
	<input type="checkbox"/>	The post registration changes do <b>not</b> require prior Approval by the Board		
<b>Document information:</b>	<b>Filename:</b>	<b>No. of pages:</b>		
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## Abbreviations

<b>CA</b>	Corrective Action / Clarification Action
<b>CAR</b>	Corrective Action Request
<b>CDM</b>	Clean Development Mechanism
<b>CER</b>	Certified Emission Reduction
<b>CL</b>	Clarification Request
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>CO<sub>2e</sub></b>	Carbon dioxide equivalent
<b>CP</b>	Certification Program
<b>DNA</b>	Designated National Authority
<b>EB</b>	CDM Executive Board
<b>EPC</b>	Engineering and Procurement Contract
<b>GHG</b>	Greenhouse gas(es)
<b>ICE</b>	Costa Rica's Electricity Institute
<b>IEDO</b>	Inversiones Eólicas de Orosí Dos S.A. (PP)
<b>PA</b>	Project activity
<b>PDD</b>	Project Design Document
<b>PLF</b>	Plant Load Factor
<b>PoA</b>	Programme of Activities
<b>PRC</b>	Post Registration Changes
<b>QC/QA</b>	Quality control/Quality assurance
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>VVS</b>	Validation and Verification Standard
<b>WTG</b>	Wind Turbine Generator

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## 1 OBJECTIVE / SCOPE

Inversiones Eólicas de Orosí Dos, S.A. has commissioned the TÜV NORD JI/CDM Certification Program (CP) to assess post registration changes of the project

*“Orosi Wind Power Project”*

This report serves for all kind of post registration changes as defined in the PS.

This report serves as an annex to the Post-registration changes request form (CDM-PRC-FORM).

## 2 GENERAL CHARACTERISTICS

### 2.1 Project Characteristics

Essential data of the project is presented in the following Table 2-1.

**Table 2-1:** Project Characteristics

Item	Data
Project title	Orosi Wind Power Project
Project type	<input checked="" type="checkbox"/> Standard <input type="checkbox"/> PoA
Project size	<input checked="" type="checkbox"/> Large Scale <input type="checkbox"/> Small Scale
Project Scope (according to UNFCCC sectoral scope numbers for CDM)	<input checked="" type="checkbox"/> 1 Energy Industries (renewable- /non-renewable sources)
	<input type="checkbox"/> 2 Energy distribution
	<input type="checkbox"/> 3 Energy demand
	<input type="checkbox"/> 4 Manufacturing industries
	<input type="checkbox"/> 5 Chemical industry
	<input type="checkbox"/> 6 Construction
	<input type="checkbox"/> 7 Transport
	<input type="checkbox"/> 8 Mining/Mineral production
	<input type="checkbox"/> 9 Metal production
	<input type="checkbox"/> 10 Fugitive emissions from fuels (solid, oil and gas)
	<input type="checkbox"/> 11 Fugitive emissions from production and consumption of halocarbons and hexafluoride
	<input type="checkbox"/> 12 Solvents use
	<input type="checkbox"/> 13 Waste handling and disposal
	<input type="checkbox"/> 14 Afforestation and Reforestation
	<input type="checkbox"/> 15 Agriculture
	<input type="checkbox"/> 16 Carbon capture and storage
Applied Methodology	ACM0002 Ver. 12.3.0
Technical Area(s)	1 / 1.2: Renewables
CDM registration No.	6652
Crediting period	<input checked="" type="checkbox"/> Renewable Crediting Period (7 y) <input type="checkbox"/> Fixed Crediting Period (10 y)

For a detailed project description please refer to the registered PDD and/or the latest verification report.

### 2.2 Overview of Post Registration Changes

Within this report post registration changes as listed in Table 2-2 are assessed.

**Table 2-2:** Overview Post Registration Changes

#	Applicable as of / from - to	Type of post registration change <sup>1)</sup>	Description
1	2013-06-05	CrPDD	Include individual location of WTGs.
2	2015-01-15	ChSD	Change to the start date of the crediting period from: 2014-01-01 to 2015-01-15
3	2013-06-05	CoPD	Change in the WTG type installed (model G80 Vs model

#	Applicable as of / from - to	Type of post registration change <sup>1)</sup>	Description
			G87S).

- <sup>1)</sup>
- TDfrMP : Temporary deviation from registered monitoring plan
  - TDfMM : Temporary deviation from the monitoring methodology
  - CrPDD : Corrections to the registered PDD
  - ChSD : Change to the start date of the crediting period
  - PCfrMP : Permanent changes from registered Monitoring Plan
  - PCfMM : Permanent changes from Monitoring Methodology
  - CoPD : Changes to the project design of a registered project activity / PoA
  - CstAR : Changes specific to afforestation or reforestation

## 2.3 Assessment team members and technical reviewers

On the basis of a competence analysis and individual availabilities a assessment team, consistent of one team leader, was appointed. Furthermore also the personnel for the technical review and the final approval were determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 2-3 below.

**Table 2-3:** Involved Personnel

	Name	Company	Function <sup>1)</sup>	Qualification Status <sup>2)</sup>	Scheme competence <sup>3)</sup>	Technical competence <sup>4)</sup>	Verification competence <sup>5)</sup>	Host country Competence	On-site visit
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Raul Gonzalez Mitre	BRTÜV	TL	SA	<input checked="" type="checkbox"/>	1.2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Sergio Cruz	BRTÜV	TR	LA	<input checked="" type="checkbox"/>	1.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-
<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms.	Martin Saalman	TN CERT	FA	SA	<input checked="" type="checkbox"/>	1.2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	-

<sup>1)</sup> TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

<sup>2)</sup> GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

<sup>3)</sup> GHG auditor status (at least Assessor)

<sup>4)</sup> As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, ...)

<sup>5)</sup> In case of verification projects

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

## 2.4 Assessment Steps

The *assessment of post registration changes* consisted of the following steps:

- Appointment of team members and technical reviewers
- A desk review of the registered and revised PDD<sup>/PDD/</sup> submitted by the client and additional supporting documents
- On-Site assessment (if required)
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Resolution of corrective actions (CARs / CLs) (if any)
- Final reporting
- Technical review
- Final approval.

## 2.5 Review of Documents

The registered as well as the revised PDD and supporting background documents related to the project design and the post registration changes were reviewed.

As far as required the assessment team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

## 2.6 Follow-up Interviews

The validation team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for CDM.

During validation the validation team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in table 2-4.

**Table 2-4:** Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives Project consultant	- Details of the project validation and earlier verifications - Project history

Interviewed Persons / Entities	Interview topics
	<ul style="list-style-type: none"><li>- Technical details of plant</li><li>- Intended / implemented changes from the previous project design</li><li>- Impact of changes on the additionality justification</li><li>- Impact on the monitoring of the project</li><li>- Editorial issues of the revised PDD</li></ul>

A comprehensive list of all interviewed persons is part of section 7 'References'.

## 2.7 Resolution of Clarification and Corrective Action Requests

### 2.7.1 Definition

A **Corrective Action Request (CAR)** will be established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for validation of the intended / implemented changes,
- there is a risk that the changes cannot be approved by the UNFCCC or that emission reductions would not be able to be verified and certified after the implementation of the changes.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

### 2.7.2 Assessment

After reviewing all relevant documents and taken all other relevant information into account, the assessment team issues all findings (in the course of a draft report, if applicable) and hands over the findings to the project proponent in order to respond on the issues raised and to revise the documentation accordingly.

The final reporting step starts after resolution of the raised CARs and CLs. In case the findings from CARs and CLs cannot be resolved by the project proponent or the proposed action related to the FARs raised cannot be assessed as adequate, no positive assessment opinion can be issued by the validation team.

The CAR(s) / CL(s) / FAR(s) are documented in the context of the respective chapters.

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## 2.8 Technical review

Before submission of the final assessment report a technical review is carried out. The technical reviewer is a competent GHG auditor being appointed for the scope this project falls under. The technical reviewer is not considered to be part of the verification team and thus not involved in the decision making process up to the technical review.

As a result of the technical review process the assessment opinion as prepared by the validation team leader may be confirmed or revised. Furthermore reporting improvements might be achieved.

## 2.9 Final approval

After successful technical review of the final report an overall (esp. procedural) assessment of the requested post registration changes will be carried out by a senior assessor located in the accredited premises of TÜV NORD.

Only after this step the notification or the report can be forwarded to the UNFCCC (in case of a positive validation opinion).

### 3 CHANGES THAT DO NOT AFFECT THE PROJECT DESIGN

#### 3.1 Assessment of Changes

##### Requested Deviations / Changes #1

- Type of change(s):
- ☐ Temporary Deviation from Monitoring Plan
  - ☐ Temporary Deviation from Monitoring Methodology
  - ☒ Corrections that do not affect the project design
  - ☐ Permanent Change from Monitoring Plan
  - ☐ Permanent Change from Monitoring Methodology
  - ☐ Changes specific to afforestation or reforestation

##### A. Description of post registration change

<b>Start Date:</b> Please provide the start date of the change	2013-06-05	<b>End Date:</b> Please provide the end date of the change, if applicable	-
<b>Description:</b> Please give a detailed description of the changes	Include individual location of WTGs.		

##### B. Assessment of post registration change – Corrections

<b>Correctness:</b> Please assess whether the corrected information (incl. ex-ante values) is an accurate reflection of actual project information.	The individual location of the 25 WTGs was included as in the registered PDD it was mentioned only one point. The lay-out of the project activity was checked to assess the change in section A.2.4 of the new version of the PDD. Concluding the corrected information is an accurate reflection of actual project information.
<b>MP/MM Compliance :</b> Please check whether the corrected parameters are in accordance with the MM and/or MP	Not applicable as the correction is independent of the monitoring methodology.
<b>Appendix 1 PS:</b> Check whether the change affects the design of the PA.	Not applicable as the change does not affect the design of the Project Activity.

##### C. Revised PDD

<b>Rev. of PDD:</b> Check whether the changes have been fully addressed in a revised PDD.	<input checked="" type="checkbox"/> The changes have correctly been reflected in the revised PDD. <input type="checkbox"/> A revision of the PDD is not required (in case of temp. changes).
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#### Requested Deviations / Changes #1

	<input checked="" type="checkbox"/> The revised PDD has been forwarded in (i) track-change and (ii) clean version.
<b>D. Prior Approval</b>	
<b>Prior approval:</b> Assess whether the change requires prior approval of the board	<input type="checkbox"/> <i>The post registration change requires prior approval</i> <input checked="" type="checkbox"/> <i>The post registration change does not require prior approval</i>

## 3.2 Related Findings

No findings have been identified in this context.

## 4 CHANGE TO THE START DATE OF THE CREDITING PERIOD

### 4.1 Assessment of Changes

Requested Change to the start date of the crediting period			
<b>A. Description of post registration change</b>			
<b>Start Date :</b> Please provide the registered start date of the CP.	2014-01-01	<b>Revised Start Date:</b> Please provide the proposed revised start date of the CP	2015-01-15
<b>Description:</b> Please give a detailed description /reasoning of the requested revision of CP starting date:	Delay of the commercial operation start date due to change in the type of the WTG to be installed. Thus further authorization by the ICE was needed to be given.		
<b>LDC:</b> Please check if the host country is an LDC. In case of LDCs the timeframes of the below defined categories are to be doubled.	<input type="checkbox"/>	The host country is a LDC	
	<input checked="" type="checkbox"/>	The host country is <b>not</b> a LDC	
<b>Categories:</b> Please check under which category - as defined below – the requested changes fall. In case of LDCs the timeframes are to be doubled.	<input type="checkbox"/>	Category A: $> \pm 2$ a	
	<input type="checkbox"/>	Category B: $< \pm 1$ a; not before registration date	
	<input checked="" type="checkbox"/>	Category C: $(SD_{old} \pm 1 \text{ a}) \leq SD_{new} \leq (SD_{old} \pm 2 \text{ a})$	
<b>B. Assessment of post registration change</b>			
<b>Cat. A: <math>&gt; \pm 2</math> a</b> Changes of start date of more than 2 years (4 years for LDCs) are not allowed as per the PS.	<input type="checkbox"/>	The change is a cat. A case. The change of the CP start date as requested by the PP is not allowed as per the PS. Thus a corresponding CAR has been raised.	
<b>Cat. B: <math>&lt; \pm 1</math> a</b> Prior notification is not required if changes of less than 1 year are requested. The CP start date shall not be earlier than the date of the project registration.	<input type="checkbox"/>	The change is a cat. B case. The proposed new CP start date differs less than $\pm 1$ year (2 years in case of LDCs) from the registered CP start date. Furthermore it is confirmed that the proposed new CP start date is not before the registration date of the PA. Thus a prior approval is not required.	
<b>Cat. B: <math>\pm 1 \text{ a} &lt; SD &lt; \pm 2 \text{ a}</math></b> Check whether the project falls under this category. If yes prior approval is	<input checked="" type="checkbox"/>	The change is a cat. C case.	
	<input checked="" type="checkbox"/>	The PPs have provided the assessment team with a sufficient demonstration regarding (i) potential effects on the baseline and (ii) progress made to start the project.	

### Requested Change to the start date of the crediting period

<p>required. The assessment team shall assess on the basis of a demonstration by the PPs whether the conservativeness of the baseline is not affected by changes that have occurred in-between. Further it has to be assessed, whether substantive progress has been made by the PPs to start the project activity.</p>	<input checked="" type="checkbox"/>	<p>On the basis of a detailed analysis of the PP's demonstration as well as background investigation (incl. on-site inspection) the assessment team confirms that no changes have occurred to the PA which would result in a less conservative baseline. This assessment is based on the following considerations:</p> <p>The selected baseline included in the registered PDD was the one given by default by the applied methodology for greenfield project activities:</p> <p><i>"Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the Tool to calculate the emission factor for an electricity system (version 02.2.1)".</i></p> <p>No changes have occurred to the project activity that would result in a less conservative baseline. The baseline of the project activity remains the same as the one included in the registered PDD.</p>
	<input checked="" type="checkbox"/>	<p>On the basis of a detailed analysis of the PP's demonstration as well as background investigation (incl. on-site inspection) the assessment team confirms that substantive progress has been made by the PPs to start the PA. This assessment is based on the following considerations:</p> <ul style="list-style-type: none"> <li>• Start date of construction: 2013-12-11.</li> <li>• Expected start date of commercial operation: 2015-01-15.</li> </ul> <p>During on site visit occurred on 29-09-2014 it was assessed that the project activity is under construction. A general progress of 72% was reported by the PP. Furthermore evidence of all construction phases was also provided<sup>OP/</sup>.</p>

### C. Revised PDD

<p><b>Rev. of PDD:</b> Check whether the changes have been fully addressed in a revised PDD.</p>	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <input checked="" type="checkbox"/>  <input checked="" type="checkbox"/> </div> <div> <p>The change of the CP starting date has correctly been reflected in the revised PDD.</p> <p>The revised PDD has been forwarded in (i) track-change and (ii) clean version.</p> </div> </div>
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### D. Prior Approval

<p><b>Prior approval:</b> Assess whether the change requires prior approval of the board</p>	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 10px;"> <input checked="" type="checkbox"/>  <input type="checkbox"/> </div> <div> <p><i>The post registration change requires prior approval</i></p> <p><i>The post registration change does not require prior approval</i></p> </div> </div>
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## 4.2 Related Findings

No findings have been identified in this context.

## 5 CHANGES TO THE PROJECT / PROGRAMME DESIGN

### 5.1 Assessment of Changes

Requested Changes to the project design #1

Type : ☒ *Changes to the project design*  
☐ *Changes to the PoA design*

#### A. Description of post registration change

##### Start Date:

Please provide the start date of the change

2013-06-05

##### End Date:

Please provide the end date of the change, if applicable

-

##### Description:

Please give a detailed description of the changes esp. with regards to the effect on the project design.

Change in the WTG type installed (Model G80 Vs Model G87S).  
The main characteristics of both models of WTG are described below.  
For clarity purposes the differences between WTG types are marked in yellow below:

Description	G80 (as PDD)	G87S (New)
Manufacturer	Gamesa	<b>Gamesa</b>
Hub heights	78 m	<b>78 m</b>
Cut-in wind speed	4 m/s	<b>4 m/s</b>
Design life time	20 years	<b>20 years</b>
Nominal capacity	2.0 MW	<b>2.0 MW</b>
Platform type	G8X	<b>G9X</b>
Rotor diameter	80 m	<b>87 m</b>
Resistant to turbulence	16%	<b>18%</b>

The new manufacturer platform (G9X) allows the installed WTGs an increased generation compared to the previous platform (G8X) from 216.4 GWh/year to 226.2 GWh/year. This represents a total increase of 4.5% compared with the previous estimation. The new model G9X has a greater resistance to turbulence due to the improved design and materials used in its construction. Furthermore as the rotor diameter changed from 80m to 87m, the WTG is able to produce more energy although the nominal installed capacity is the same (2.0 MW).

#### B. Applicability and application of the Approved Baseline Methodology

## Requested Changes to the project design #1

### Description:

Please give a detailed description on how the changes affect the applicability and application of the approved Baseline Methodology. Check if the actual changes would adversely affect the conclusions during validation.

The proposed changes only refer to the type of technology installed (which allows an increased energy generation amount). The methodology does not restrict the type of technology to be installed or the amount of energy generation that a project activity can deliver. Thus the changes do not affect the applicability and the application of the approved baseline methodology. Concluding the project activity still meets all applicability conditions of the applied methodology.

The information checked is an accurate reflection of actual project information considering:

- **When the changes occurred:** the changes occurred on 2013-06-05 when the ICE approved the change of equipment.
- **Reasons for those changes taking place:** according to IEDO (PP) during the development of the project a new version of WTG (G87S) became available. The manufacturer Gamesa provided a quotation on 2012-06-07. Then feedback on the new available technology was asked to Garrad Hassan on 2013-01-21. The wind study shown the opportunity for an increase in the amount of energy generation to be delivered by the project activity. After this IEDO asked on 2013-01-28 to the ICE its authorization to change the WTG type. Finally on 2013-06-05 the ICE approved the change of the equipment.
- **Whether the changes would have been known prior to registration of the project activity:** no, as the project activity was registered on 2012-10-14 and technical information issued by Garrad Hassan regarding the wind availability and energy production using the new WTG was only available on 2013-01-21. This information was necessary to take the decision on the change. Furthermore authorization given by the ICE was given on 2013-06-05.
- **How the changes would impact the overall operation/ability of the project activity to deliver emission reductions:** the proposed changes will increase the energy generation capacity. Therefore the emission reduction will also increase from 76,352 tCO<sub>2</sub>/year to 79,787 tCO<sub>2</sub>/year. The proposed change will not lead to a reduction in the accuracy of the ER calculation.



Requested Changes to the project design #1

	<p>As part of the change on the installed capacity, the PP has updated/ the following information which is part of the change to the project design:</p> <ul style="list-style-type: none"><li>a) Section A.1: project description;</li><li>b) Section A.3: technical information of the new type of WTG and energy to be generated;</li><li>c) Section B.5: revised calculation of the IRR considering the G87s model</li><li>d) Section B.6.3: energy generated;</li><li>e) Section B.6.4: summary of ex ante estimates of emission reductions;</li><li>f) Section B.7.1: Update value of parameter <math>EG_{facility}</math>;</li><li>g) Appendix 4: Update summary of post registration changes;</li><li>h) Inclusion of new references to support the information.</li></ul> <p>Furthermore other sections were needed to be included considering the new version of the PDD template. In this case section F was added.</p>
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C. Additionality assesement

## Requested Changes to the project design #1

### Description:

Please give a detailed description re-assessment of additionality. Check whether the actual changes would adversely affect the conclusions during validation. If required please make use of the assessment tables in the annex.

### Methodology:

In the original project documentation the additionality was justified in line with the requirements of ACM0002 ver. 12.3.0 This methodology requires making use of the additionality tool.

### Decisive Route of Additionality Justification

During the original validation of the project the additionality was justified on the basis of a financial analysis. A corresponding Excel file was presented and attached to the validation report. The IRR of this project activity used for validation purposes was determined to be 9.55%.

### Re-Assessment of Additionality

During this validation regarding changes a revised version of the original validated Excel spreadsheet was considered which was provided by the PPs and considered by the validation team. The modifications mainly reflect the design changes done.

### Result of Additionality Re-Assessment

The revised Excel sheet shows that the updated IRR of 8.87% remains below the UNFCCC default benchmark of 12%. Furthermore a sensitivity analysis was also performed under the same conditions under validation. Thus all justifications included in the Validation Report remains valid as the new IRR is even below the original IRR calculated under validation. Concluding that the Orosi Wind Power Project remains additional.

The assessment of the revised PDD and Excel spread sheet and additional documents related to changes to the project design; the subsequent background investigation and follow-up interviews have provided TÜV NORD JI/CDM CP with sufficient evidences for an assessment.

Concluding the validation team has arrived at the conclusion that the additionality of the project is not affected by the technical changes carried out as a deviation from the project design originally validated and registered. For further details please refer to table A-1 located in appendix 2.

## D. Scale of the Project activity

### Description:

Please give a detailed description regarding the effect of the changes on the scale of the PA (i.e. LSC or SSC).

This is a large scale project activity; therefore this criterion is not applicable in this case.

## E. Revised PDD

## Requested Changes to the project design #1

### Rev. of PDD:

Check whether the changes have been fully addressed in a revised PDD. In this context pl. refer to

- Changes in the effective output capacity.
- Addition of components or extension of technology
- In case of multiple site projects: Removal or addition of sites
- Operational parameters under the control of PPs differing from expected parameters
- Changes to the baseline Meth (e.g. addition of a new Meth or change of the BL scenario.
- Effects with regards to B, C and D above incl. compliance with the MP and level of accuracy and completeness of monitoring.

The post registration change has correctly been reflected in the revised PDD. This assessment is based on the following considerations:

- The installed capacity has not been changed. It remains in 50 MW.
- No changes to the baseline methodology and the baseline scenario have been observed.
- ☒ - There are no effects with regard to the applicability and application of the approved baseline methodology.
- No effects with regard to the additionality of the project activity and the scale of the project activity have been identified.
- The changes to the project design are in compliance with the Monitoring Plan.
- The level of accuracy and completeness of monitoring is considered as plausible.

### Traceability:

Check if the PPs have provided a revised PDD in both clean and track-change version.

- ☒ The revised PDD has been forwarded in (i) track-change and (ii) clean version.

## F. Prior Approval

### Prior approval:

Assess whether the change requires prior approval of the board.

The changes do not raise concerns with respect to aspects outlined in the PS:

- ☒
  - a. applicability and application of the Approved Baseline Methodology under which the project activity has been registered.
  - b. additionality of the project
  - c. scale of the CDM project activity and

Prior Approval by the Board is not required. Nevertheless as this report is not submitted during verification, approval of changes is submitted prior to the commencement of verification.

- ☒ The post registration change requires prior approval.

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## 5.2 Related Findings

No findings have been identified in this context.

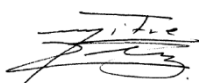
## 6 SUMMARY OF ASSESSMENT OPINIONS

The below listed changes have occurred after the registration of the project / PoA.

Type of Change occurred	Total No. of changes	No. of changes which require prior approval
<input type="checkbox"/> Temporary deviations from the MP		
<input type="checkbox"/> Temporary deviations from the MM		
<input checked="" type="checkbox"/> Corrections that do not affect the project	1	0
<input checked="" type="checkbox"/> Change to the start date of the crediting p.	1	1
<input type="checkbox"/> Permanent changes from the MP		
<input type="checkbox"/> Permanent changes from the MM		
<input checked="" type="checkbox"/> Design changes to the project activity / PoA	1	1
<input type="checkbox"/> Changes specific to AR projects		

The above listed post registration changes require prior approval of the Board.

Essen, 2014-10-27



Raul Gonzalez Mitre  
TÜV NORD JI/CDM CP  
Assessment Team Leader

Essen, 2014-10-27



Martin Saalman  
TÜV NORD JI/CDM CP  
Final Approval

## 7 REFERENCES

**Table 7-1:** Documents provided by the project participant

Reference	Document
<b>/PDD1/</b>	Project Design Document named "Orosi Wind Power Project " registered 2012-10-14
<b>/PDD2/</b>	Revised PDD reflecting the intended / implemented changes named "Orosi Wind Power Project" dated on 2014-09-15, version 4.
<b>/FD/</b>	<p><u>Evidence of changes:</u></p> <ul style="list-style-type: none"> <li>a) Gamesa Supply Proposal Num. GD155635-es dated on 2012-06-07.</li> <li>b) Technical note by Garrad Hassan Num. 236125-MXQU-T-01 dated on 2013-01-21, version B.</li> <li>c) Letter Num. ORO2-20130128-001 to ICE requesting authorization of the change on the WTG type dated on 2013-01-28.</li> <li>d) Letter Num. 0690-421-2013 from ICE authorizing the change on the WTG type dated on 2013-06-05.</li> <li>e) Turnkey EPC Agreement by and between IEDO and Gamesa Wind US LLC for the Orosi Wind Project, 2013-11-22.</li> <li>f) Calculation spread sheet of the yearly O&amp;M costs ("Orosi O&amp;M budget.xls") (<b>same source used under validation</b>)</li> <li>g) Report "The Economics of Wind Energy" issued by the European Wind Energy Association in March 2009.</li> <li>h) Annual Operating Plan 2015</li> </ul>
<b>/LIC/</b>	Generation concession given through legal resolution Num. RJD-104-2013 dated on 2013-08-22.
<b>/OPI/</b>	Weekly (Construction Progress) Report Num. ORO-IEDO-RS-37 by Orosi Wind Project, including photos of construction progress.
<b>/PPA/</b>	Operation Contract for electricity generation Num. 2013000037 dated on 2013-08-01.
<b>/SD/</b>	Lay-out of the project activity
<b>/XLS/</b>	IRR revised calculation sheet

**Table 7-2:** Background investigation and assessment documents

Reference	Document
<b>/ACM02/</b>	ACM0002 : Consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 12
<b>/CPM/</b>	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
<b>/PDD-T/</b>	Project Design Document Form (F-CDM_PDD) - Version 5.0
<b>/TA/</b>	Tool for the demonstration and assessment of additionality (Ver. 7).
<b>/VVS/</b>	CDM Validation and Verification Standard (Version 7)

**Table 7-3:** Websites used

Reference	Link	Organisation
/dna/	<a href="http://www.minae.go.cr/">http://www.minae.go.cr/</a>	MINAET web site
/unfccc/	<a href="http://cdm.unfccc.int">http://cdm.unfccc.int</a>	UNFCCC

**Table 7-4:** List of interviewed persons

Reference	Mol <sup>1</sup>		Name	Organisation / Function
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Leonel Umana	Development Management – Globeleq Mesoamerica Energy
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Jelle Hettinga	Financial Analyst – Globeleq Mesoamerica Energy
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Manuel Dobles	Project Manager – Globeleq Mesoamerica Energy
/IM01/	V	<input checked="" type="checkbox"/> Mr. <input type="checkbox"/> Ms	Alejandro Jimenez	Financial Analyst – Globeleq Mesoamerica Energy
/IM02/	V	<input type="checkbox"/> Mr. <input checked="" type="checkbox"/> Ms	Sofia Castro	Consultant – GeoIngenieria

<sup>1)</sup> Means of Interview: (Telephone, E-Mail, Visit)

# APPENDIX

- A1:** Assessment of Financial Parameters
- A2:** Assessment of Barrier analysis
- A3:** Competence statements of involved personnel

## APPENDIX 1: ASSESSMENT OF FINANCIAL PARAMETERS

**Table A-1:** Assessment of Financial Parameters\* (VVS, §§ 120, 121 / in case financial parameters stem from FSR §122)

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of key financial parameters affected by the actual modifications to the project activity see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
EPC: Turbines and supplies	95.72	Mio USD	Exhibit G-1 - Contract Price – Turnkey EPC Agreement by and between IEDO and Gamesa Wind US LLC for the Orosi Wind Project, 2013-11-22 (page 2).	/FD-e/	<input checked="" type="checkbox"/>	<p>The source used for the updated turbines and supplies amount is the last version signed of the EPC contract. The value used by the PP is correct.</p> <p>The original value of turbines and supplies used for validation of the project activity was 89.5 Mio USD (source: Non-Binding Turnkey Engineer, Procurement and Construction Commitment Agreement signed between GAMESA and Inversiones Eolicas de Orosi Dos, S.A. on 2011/09/01).</p> <p>The new WTG investment represents an increase of 7% over the last amount used under validation. This was correctly reflected in the IRR calculation.</p> <p>The total project investment used for validation purposes was US\$127.65 Mio. This represented a project investment per installed MW of 2.55 Mio USD. The new total project investment</p>

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of key financial parameters affected by the actual modifications to the project activity see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						<p>considering the new WTG is US\$133.70 Mio. This represents a project investment per installed MW of <b>2.67 Mio USD</b>.</p> <p>The same cross-check procedure used under validation considering the cost per installed MW of registered CDM projects in Latin America at the time of validation of the project activity was performed.</p> <p>The resulting cross-check of total investment per installed MW goes from 1.88 to 2.89 Mio USD. The project activity new investment per installed MW (2.67 Mio USD) remains still between such range. For further detail regarding the projects used for this cross check, please refer to the original validation report.</p> <p>Hence, applying a project investment of <b>2.67 Mio USD/MW</b> for the project activity is considered appropriate.</p>
Plant Load Factor	51.63	%	Technical note by Garrad Hassan Num. 236125-MXQU-T-01 dated on 2013-01-21 – <b>(page 3)</b>	/FD-b/	<input checked="" type="checkbox"/>	<p>The source used for the updated PLF is the Technical note elaborated by Garrad Hassan considering the WTG G87S. Garrad Hassan is a worldwide leading company in wind yield assessment and certification. The value used by the PP is correct. Therefore determination of PLF is considered reliable and absolutely in line with UNFCCC requirements (EB48 Annex 11). The original value</p>

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of key financial parameters affected by the actual modifications to the project activity see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						of PLF used for registration of the project activity was 49.41%.  The new PLF represents an increase of 2.22% over the last PLF used under validation. This was correctly reflected in the IRR calculation.
Operational (Maintenance) costs	3.31	USD Mio/ year	Calculation spread sheet of the yearly O&M <b>(same source used under validation)</b>  The Economics of Wind Power (Part III, page 205-206)  Annual Operating Plan 2015 (tab: Summary)	/FD-f/  /FD-g/  /FD-h/	<input checked="" type="checkbox"/>	The source used for the updated operation and maintenance amount is the same assumption used under validation applied to the new generation of the project activity. The original source was a benchmark for other wind farm Plantas Eolicas SRL – PESRL (23 MW) property of the PP. The value used by the PP is correct.  The original value of operational costs used for validation of the project activity was 3.17 USD Mio/ year. The new value of operational costs is 3.31 USD Mio/ year. This represents an increase of 4% over the original amount used under validation.  The new operational cost represents a cost of 1.4 USD cents (cUSD) per kWh (= 1.15 euro cents (c€) per kWh).  The Economics publications of Wind Energy are issued by the European Wind Energy Association (EWEA). These reports are considered an appropriate source as the EWEA is the voice of the

<input type="checkbox"/>	No financial parameters are used for additionality justification					
<input checked="" type="checkbox"/>	Assessment of key financial parameters affected by the actual modifications to the project activity see below					
Parameter	Value applied	Unit	Source of Information (please indicate document and page)	Reference	DOE ASSESSMENT	
					Correctness of value applied	Comment
						<p>wind industry, actively promoting the utilization of wind power in Europe and worldwide. Therefore, information published by the EWEA is considered as a third party trustable data about the wind energy sector worldwide. According to the Economics publications of Wind Energy, Operational Costs are generally estimated to be around 1.2 to 1.5 euro cents (c€) per kWh of wind power produced over the total lifetime of a turbine. Therefore the value used by the PP (1.15 euro cents (c€) per kWh) is considered conservative.</p> <p>The real operational and maintenance value for year 2015 is 3.89 USD Mio/ year. The source is the Annual Operating Plan. For conservative purposes this source is not used here as it is more conservative to use a lower value for operational and maintenance.</p> <p>Concluding the value used for operational costs is considered appropriate.</p>

\* For conservative purposes only key expenses parameters were modified in the original spread sheet. Lower the expenses are, higher the IRR is.

## APPENDIX 2: ASSESSMENT OF BARRIER ANALYSIS

**Table A-2:** Assessment of Barrier Analysis (VVS, §§ 124-127)

<input checked="" type="checkbox"/>		No barrier parameters are used for additionality justification		
<input type="checkbox"/>		Assessment of barriers see below		
Kind of Barrier (invest, tech, other)	Description of Barrier	Evidence used	Assessment of validation team	
			Appropriateness of information source	Explanation of final result
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	
			<input checked="" type="checkbox"/>	



APPENDIX 3: STATEMENTS OF COMPETENCE OF INVOLVED PERSONNEL

**Statement of Competence**  
Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

**Mr. Raul Gonzalez Mitre**

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification)	2015-06-27
VCS / ISO 14064-2	Senior Assessor	2015-06-27

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies
13.1	Waste handling and disposal

082 - Rev. 4, Date: 2012-06-16

082\_S01-F003\_2012-06-16\_rev4.doc

S01-F003 rev2 / 2012-04-05

**Statement of Competence**  
Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

**Mr. Sergio Cruz**

SCHEME	STATUS	VALID UNTIL
CDM	Lead Assessor (Validation, Verification)	2015-08-02
VCS / ISO 14064-2	Lead Assessor	2015-08-02

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA
1.2	Renewable Energies
13.1	Waste handling and disposal

185 - Rev. 2, Date: 2012-08-03

185\_S01-F003\_2012-08-03\_rev2.doc

S01-F003 rev2 / 2012-04-05

**Statement of Competence**  
Appointment and authorization according to the procedures of the TÜV NORD JI/CDM Certification Program

**Mr. Martin Saalman**

SCHEME	STATUS	VALID UNTIL
CDM	Senior Assessor (Validation, Verification) Technical Reviewer	2015-05-15
Ji	Senior Assessor Technical Reviewer	2015-05-15
VCS / ISO 14064-2	Senior Assessor Technical Reviewer	2015-05-15

Authorization status for technical areas within sectoral scopes:

CODE	TECHNICAL AREA	TR SUBCATEGORIES
1.2	Renewable energies	1.2.4 Solar
13.1	Waste management and disposal	13.1.1 Waste management 13.1.2 Waste water management

022 - Rev. 4, Date: 2012-05-16

022\_S01-F003\_2012-05-16\_rev4

S01-F003 rev2 / 2012-04-05