

CDM VALIDATION REPORT

RENEWAL OF CREDITING PERIOD

**INTERNATIONAL BANK FOR
RECONSTRUCTION AND DEVELOPMENT AS
THE TRUSTEE OF THE PROTOTYPE CARBON
FUND**

VALIDATION OF THE PROJECT ACTIVITY:

JEPIRACHI WIND POWER PROJECT

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VALIDATION REPORT

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Client: INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)	
Summary: <p>The Spanish Association for Standardization and Certification (AENOR) has carried out the validation of the renewal of the crediting period of the project titled "JEPIRACHI WIND POWER PROJECT" located in the Department of Guajira, Colombia on the basis of UNFCCC criteria for the CDM, as well as relevant decisions of the EB.</p> <p>The objectives of the validation are to confirm that the project follows the approved methodology and that the PDD presented by the Project Participants will lead to a realistic determination of the emissions reductions of the project activity.</p> <p>The scope of the validation covers the assessment of validity of the original baseline, monitoring plan and other relevant documents.</p> <p>The validation carried out by AENOR, involved a desk study of the PDD, associated documentation and the approved methodology, follow up interviews with project's stakeholders and the resolution of outstanding issues and the issuance on the final validation report and opinion</p> <p>Clarifications and corrective actions on a number of issues were requested by AENOR according to desk review; these were amended satisfactorily by IBRD and resulted in a new version of the original PDD (version 2.0), this version has been modified as a result of the Completeness check process to incorporate the suggestions from that process, resulting in a new version of the original PDD (version 7).</p> <p>In the opinion of AENOR the project meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria, therefore the project shall be recommended for the renewal of the crediting period.</p>	

Report No.: 2010/018/CDM/08	
Report title: VALIDATION REPORT - RENEWAL OF THE CREDITING PERIOD "JEPIRACHI WIND POWER PROJECT"	
Members of the validation team: Luis Javier Arribas Alonso (Chief Validator) Alfonso Medrano Gutiérrez (Validator) Mercedes García Madero (Technical reviewer)	
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Indexing terms

Wind Power Project, CO₂, climate change, CDM project, Colombian National Dispatch Center, GHG emissions.

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Abbreviations

ACM0002 ver. 12.1.0	Consolidated baseline methodology for grid connected electricity generation from renewable sources
BM	Build Margin
CAR	Corrective Action Requested
CL	Clarification
CDM	Clean Development Mechanism
CER	Certified Emission Reductions
CM	Combined Margin
CND	Colombian National Dispatch Center
DECISION 3/CMP.1	Modalities and Procedures for a Clean Development Mechanism as Defined in Article 12 of the Kyoto Protocol
DNA	Designated National Authority
EB	Executive Board of the CDM of the Kyoto Protocol
GHG	Greenhouse Gases
IPCC	Intergovernmental Panel on Climate Change
MBTU	Mega British Thermal Unit
MP	Monitoring Plan
MWh	Mega Watt hour
OM	Operating Margin
PDD	Project Design Document
tCO ₂	Carbon dioxide tonnes
tCO _{2E}	Carbon dioxide equivalent tonnes
TJ	Tera Joules
Tool	Tool for the calculation of the emission factor of the electricity system (version 2)
UNFCCC	United Nations Framework Convention on Climate Change
UPME	Unidad de Planeamiento Minero Energético
VVM	Validation and Verification Manual version 01.2

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1 INTRODUCTION

This validation concerns a project implemented by Empresas Públicas de Medellín (EPM), in Colombia to reduce emissions of CO₂ by generating renewable energy coming from wind resources. The objectives of the validation exercise are to confirm that the original baseline is valid and has been updated taking into account the new applicable data, that the project meets the necessary CDM criteria, that the project follows the latest version of the approved methodology ACM0002, and that the proposals presented in the PDD will lead to a realistic determination of the emissions reductions.

The project implies the installation of 15 wind generators with a rated capacity of 1.3 MW each, manufactured by Nordex, with a total nominal power capacity of 19.5 MW. Electricity delivered to the grid by the project would have otherwise been generated by the operation of grid-connected power plants.

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1.1 Objective

IBRD has commissioned AENOR to perform a revalidation of "**JEPIRACHI WIND POWER PROJECT**". The purpose of a revalidation is to have an independent third party assessment of the project in order to request the renewal of the project's crediting period. This validation opinion summarizes the findings of the revalidation of the project, performed on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent operation, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board, in particular "*Procedures for Renewal of a Crediting Period of a registered CDM project*" (version 05).

"**JEPIRACHI WIND POWER PROJECT**" was registered on 01/04/2006 as a CDM project with a renewable 7 years crediting period. The project's first crediting period was from 31st January 2004 to 30th January 2011. The second crediting period corresponds to the period from 31st January 2011 to 30th January 2018.

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1.2 Scope

The validation scope is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information of these documents is reviewed against Kyoto Protocol requirements (especially regarding the renewable of the crediting period), UNFCCC rules and associated interpretations and the Validation and Verification Manual. AENOR has used a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consultancy services to the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the PDD.

1.3 GHG Project Description

Title of the project activity: "JEPIRACHI WIND POWER PROJECT" (Ref n°: 0194).

Host Party: Colombia.

Project participants:

The project participants, as stated in the latest version of the PDD, are the following ones:

- a) Empresas Públicas de Medellín (EPM). Colombia
- b) Government of Canada – Ministry of Foreign Affairs & International Trade
- c) International Bank for Reconstruction and Development as Trustee of the Prototype Carbon Fund (PCF). Finland.
- d) Fortum Corporation. Finland.
- e) Government of Finland - Ministry of Foreign Affairs of Finland. Finland.
- f) GDF SUEZ. France.
- g) RWE Power AG. Germany.
- h) Chubu Electric Power Co., Inc. Japan.
- i) The Chugoku Electric Power Co., Inc. Japan.
- j) Kyushu Electric Power Co., Inc. Japan.
- k) Mitsubishi Corporation. Japan.
- l) MIT Carbon Fund Co., Ltd. Japan.
- m) Shikoku Electric Power Co., Inc. Japan.
- n) Tohoku Electric Power Co., Inc. Japan.
- o) The Tokyo Electric Power Co., Inc. Japan.
- p) Japan International Cooperation Agency (JICA). Japan.
- q) International Bank for Reconstruction and Development as Trustee of the Prototype Carbon Fund (PCF). The Netherlands.
- r) Electrabel N.V. The Netherlands.

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- s) Netherlands' Ministry of Infrastructure and the Environment (IenM)¹. The Netherlands.
- t) Norsk Hydro ASA. Norway.
- u) Government of Norway - Ministry of Foreign Affairs. Norway.
- v) StatoilHydro ASA. Norway.
- w) BP Alternative Energy International Ltd. United Kingdom of Great Britain and Northern Ireland.
- x) Deutsche Bank AG. United Kingdom of Great Britain and Northern Ireland.
- y) Government of Sweden - Swedish Energy Agency. Sweden.

The DOE team has verified by consulting the UNFCCC website that all Project Participants included in the new PDD have the letter of Approval and the Authorization of all the parties involved.

2 METHODOLOGY

The revalidation process was performed in the manner of an audit, where a desk review of the PDD was first undertaken against the latest version of the approved methodology and CDM and other relevant criteria. The desk review was followed by a follow up interviews with key project stakeholders, and finally the resolution of outstanding issues and the issuance of the final validation report and opinion.

2.1 Review of Documents

The Project Design Document submitted by project participants has been completed using the latest approved form (CDM-PDD version 03, EB25, Annex 15). The PDD was reviewed against the latest approved methodology (version 12.1.0 of ACM0002) and against CDM and other relevant criteria. Additional background documents related to the project design and baseline were also made available for the validation team. These documents were also reviewed.

To address the corrective actions and clarification requests that arose from the desk review, the PP revised several times the project design document submitted on 23rd July 2010 and developed a final version (version 07) submitted to the audit team on 1st March 2011.

The final validation findings are presented in this report related to the project as described in the project design document version 07.

The reviewed documents used during all the validation process are detailed in the Chapter 6 of this report.

2.2 Follow-up Interviews

AENOR has conducted between July 2010 and March 2011 several phone interviews with the project participants to confirm selected information and to resolve issues identified in the document review.

¹ Netherlands' Ministry of Infrastructure and the Environment (IenM) is the new name for the previous entity called Netherlands' Ministry of Housing, Spatial Planning and the Environment (VROM). The PP have informed about the change to the UNFCCC by submitting the corresponding MOC and the new Letter of Approval of The Netherlands on 9th February 2011.

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Table 1 Interview topics

Interviewed organization Person/Position	Interview topics
Project Participant INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND <ul style="list-style-type: none">Manuel Luengo. Carbon Finance Specialist.	<ul style="list-style-type: none">✓ Project design.✓ Baseline determination: OM & BM (power plants, electricity production, start of operation, fuels, efficiencies, most recent data...).

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this revalidation phase is to resolve the requests for corrective actions, clarifications and any other outstanding issues that needed to be clarified for AENOR's positive conclusion for the renewable of the crediting period. The corrective action requests (CARs) and clarification requests (CLs) raised by AENOR were resolved during communications with project participants. To guarantee the transparency of the validation process, the concerns raised and responses given are summarized in chapter 3 below and documented in more detail in the "Resolution of Corrective Action and Clarification Request" in Appendix A.

Since modifications to the project design were necessary to resolve AENOR's concerns, the Client decided to revise several times the documentation and finally resubmitted the project design documentation on 1st March 2011. After reviewing the revised and resubmitted project documentation, AENOR issued this final validation report and opinion.

3 VALIDATION FINDINGS

The main findings of the validation are stated in the following sections. The validation findings for each validation subject are presented as follows:

- 1) The findings from the desk review of the original project design documents and the findings from interviews are summarized.
- 2) Where AENOR had identified issues that needed clarification or that represented a risk to the fulfillment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the "Resolution of Corrective Action and Clarification Request" in Appendix A. During the revalidation process, four Corrective Action and six Clarifications were requested.
- 3) Where Clarification or Corrective Action Requests have been issued, the exchanges between project participants and AENOR to resolve these Clarification or Corrective Action Requests are summarized.
- 4) The conclusions for validation subject are presented.

The final validation findings are related to the project design as documented and described in the revised and resubmitted project design documentation.

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3.1 Participation Requirements

"Jepirachi Wind Power Project" was registered on 01st April 2006 as CDM project activity.

The host Party Colombia meets all relevant participation requirements following detailed:

- Colombia ratified the United Nations Convention on Climate Change through Law 164 of 1994; which was attainable by the Constitutional Court through Veredict. C-073 of February 23, 1995.
- Colombia ratified the Kyoto Protocol through Law 629 of December 27, 2000; which was attainable by the Constitutional Court through Veredict. C-860 of April 15, 2001.
- Colombia has confirmed its voluntary participation and the contribution of the project to the sustainable development through the National Approval of the project (dated on 10th December 2002).

This validation assessment was done for the renewal crediting period (second crediting period) and no change was made in the Parties Involved during the first crediting period: Colombia (Host), Finland, The Netherlands, Canada, Japan, Germany, France, Norway, Sweden and United Kingdom of Great Britain and Northern Ireland.

The DOE team has verified by consulting the UNFCCC website that all Project Participants obtained the letter of Approval and the Authorization of all the parties involved: Colombia (Host), Finland, The Netherlands, Canada, Japan, Germany, France, Norway, Sweden and United Kingdom of Great Britain and Northern Ireland. In accordance with paragraph 5 of the *"Procedures for Renewal of a Crediting Period of a registered CDM project"* (version 05), no new Letter of Approval is required for the new crediting period, and all the documents provided at the moment of requesting registration and during the first crediting period are still valid.

However, at the moment of writing this report, the name of one of the project participants is in process to be changed. Netherlands' Ministry of Infrastructure and the Environment (IenM) is the new name for the previous entity called Netherlands' Ministry of Housing, Spatial Planning and the Environment (VROM). The PP has informed about the change to the UNFCCC by submitting the corresponding MOC and the new Letter of Approval of party involved (The Netherlands) on 9th February 2011.

3.2 Project Design

Since the current validation process is for renewal crediting period of the project already registered, the assessment did not focus on the project design. The project activity is already implemented and it is generating CERs.

The "Jepirachi Wind Power Project" consists in the development of a wind based generation facility, located in Wayuu Indigenous Territory in the Northeastern region of the Atlantic Colombian coast, within the Municipality of Uribia in the Department of Guajira. The project implies the installation of 15 wind generators with a rated capacity of 1.3 MW each, manufactured by Nordex, with a total nominal power capacity of 19.5 MW. The generation of the renewable electricity partly displaces electricity generation based on fossil fuels supplied to the national interconnection grid of Colombia.

The description of the PDD was confirmed by the lead assessor and all the relevant information provided was verified. There is consistency with information provided in all the sections of the PDD.

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In line with the procedures *Procedures for the renewal of the crediting period of a registered CDM project activity* version 5, the project proponents have notified to the EB by email message on 24/07/2010 their intention of getting the crediting period renewed. The email was acknowledged by the EB on 26/07/2010.

3.3 Baseline methodology

The project was originally registered based on version 3 of ACM0002. The first version of the PDD submitted to the DOE team, version 02, was checked and the version of the applied methodology was not correct. CAR 1 was raised. The latest version of the PDD and the spreadsheets with baseline calculations were updated to the new version of the Methodology, and CAR 1 was closed. The revised PDD describes the baseline methodology, which is in conformance with the approved baseline methodology ACM0002 (Version 12.1.0) "Consolidated baseline methodology for grid-connected electricity generation from renewable sources".

The applicability of the methodology was re-assessed based on the knowledge of the characteristics and operation of the project since its registration. The project activity meets the requirements and conditions of the methodology:

- a) The project involves 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) The project activity is the installation of a wind power plant.
- c) Geographic and system boundaries for the electricity grid are clearly identified and information on the grid characteristics is available.
- d) The proposed project does not involve an on-site switch from fossil fuel to a renewable source.

The relevant spatial extent of the Jepirachi Wind Power Project boundary is the Colombian National Grid System, SIN. Therefore, the baseline scenario is one where the electricity that could be supplied by the project to the network would have to be generated by other plants currently connected to the network and by new plants added to the System, based on different kind of fuels.

Project boundary is still the same of the first crediting period and in conformance with the relevant methodology, including the wind power plant and the national interconnection grid of Colombia to which the project plant is connected by transmission line.

3.4 Validity of the original baseline scenario and its update

For the second crediting period, the validity of the original baseline has been assessed by the auditing team, according to the *"Procedures for the renewal of the crediting period of a registered CDM project activity"* version 5 and following the steps described in the *"Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period"*.

3.4.1 Step 1 - Asses the validity of the current baseline for the next crediting period

The validity of the current baseline has been assessed using the following substeps in accordance with the procedure:

- Step 1.1 – Asses compliance of the current baseline with relevant mandatory national and/or sectoral policies

The first version of the PDD submitted to the DOE team, version 02, was checked and there was not mention to the compliance of the relevant mandatory or sectoral policies. CL1 was raised in order to clarify

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the existence and the impact of new national mandatory or sectoral policies. The latest version of the PDD has been updated including a brief analysis on how the regulatory framework affect to the project activity.

There are no new national and/or sectoral policies that could affect the baseline scenario during the renewal of the crediting period. Renewable energy projects are always dispatched as they have lower costs in the margin, as it was the case for the first crediting period.

The national electricity market in Colombia is ruled according to the Law 143 of 1994. The law assigns the coordinating and regulatory role to the Commission on Energy and Gas (CREG), and unbundles the provision of transmission and power generation and commercialization services. The only natural monopoly remains in the provision of transmission service, the other services being competitive. The wholesale market is administered at the National Dispatch Center, which belongs to the company in charge of transmission through the national grid.

Small power generators (less than 20 MW) have preferential access to the market, and are always first dispatched. Price is the result of demand and supply for private transactions, and of the auction for the wholesale market (save some charges for securing the minimum generation level). Small generators supplying to the wholesale market have to use the prevailing price at that market. The central dispatch is based on the lower cost to attend daily demand, creating a merit order system. Small generators and low cost, such as Jeparachi Wind Power Project, are always first dispatching.

Therefore, the fundamental elements of the baseline have not changed since the project was first registered, and the market structure, regulatory framework, and functioning remains the same.

- Step 1.2 - Assess the impact of circumstances.

It has been assessed by the auditing team that there is no impact of existing circumstances, at the time of the requesting the renewal of the crediting period, on the current baseline emissions.

- Step 1.3 - Assess whether the continuation of the use of current baseline equipments is technically possible.

This sub-step is applicable to the project activity since the baseline is the continuation of the current practice. It has been assessed that the power grid as an electricity system will maintain its technical possibility for a time longer than the crediting period of the project activity.

- Step 1.4 – Assessment of the validity of the data and parameters

There were some parameters determined in the beginning of the first crediting period that they had not been monitored during that period, and they are not valid any more. According to the applied methodology ACM0002 version 12.1.0, the current baseline has been updated for the second crediting period using the *"Tool to calculate the emission factor for an electricity system (Version 2)"*.

The update includes the parameters used for the calculation of the Grid Emission Factor, (Operating Margin Emission Factor ($EF_{grid, OM}$), Build Margin Emission factor ($EF_{grid, BM}$) and Combined Margin Emissions Factor ($EF_{grid, CM}$) and the Emission Factor of Fossil Fuel Type (2006 IPCC Guidelines).

Conclusion on step 1

The assessment of the application of Steps 1.1, 1.2, 1.3 confirmed that the current baseline is valid for the second crediting period; however the assessment of the application of the step 1.4 indicates that it should be necessary to update the data and parameters used for the calculation of the grid emission factor for the second crediting period.

3.4.2 Step 2 - Update the current baseline and the data and parameters

- Step 2.1 – Update the current baseline

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The baseline emissions for the second crediting period have been updated, without reassessing the baseline scenario, based on the latest approved version of the methodology ACM0002. This update was applied in the context of the sectoral policies and circumstances that are applicable at the time of requesting for renewal of the crediting period.

- Step 2.2 – Update the data and parameters

As it has been explained above in step 1.4, there were some parameters determined in the beginning of the first crediting period that they had not been monitored during that period, thus they have not been included for the second crediting period, and they are not valid anymore.

According to the applied methodology ACM0002 version 12.1.0, the current baseline has been updated for the second crediting period using the “Tool to calculate the emission factor for an electricity system (Version 2).” The update includes the parameters used for the calculation of the Grid Emission Factor, $EF_{grid, CM}$, $EF_{grid, OM}$ and $EF_{grid, BM}$.

The option chosen for the operating and build margin calculation is *ex ante* and is based on the most recent data available at the time of submission of the PDD, data of 2009. Only grid power plants have been included in the calculation.

The Operating Margin Emission Factor ($EF_{grid, OM}$) has been calculated using method (b) Simple Adjusted Method, and employing the ex-ante vintage option. The average $EF_{grid, OM}$ was calculated for 2007-2009, using hourly data provided by official sources.

The calculation of the Emission Factor of Fossil Fuel Type ($EF_{CO_2, i, y}$) has been done using the IPCC default values at the lower limit of the uncertainty at a 95% confidence interval as provided in table 1.4 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines for National GHG Inventories. For those power plants with information on the heat rate from CND, it has been calculated the EF following the Tool. For those without information on the heat rate, it has been taken the official values from UPME, which also follow the Tool.

The Build Margin Emission factor ($EF_{grid, BM}$) has been calculated ex ante, based on the most recent information available on the plants built or additions to the sample m (Option 1 of the “Tool to calculate the emission factor for an electricity system.v2”) by 2009. Option b.- the set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently. This option has been selected as project participants should use the set of power units that comprises the larger annual generation.

According to the “Tool to calculate the emission factor for an electricity system.v2”, for the Build Margin calculation, power plants registered as CDM project activities should be excluded from the sample group m. However, if the group of power units, not registered as CDM project activity, identified for estimating the build margin emission factor includes power unit(s) that is(are) built more than 10 years ago then:

- (i) Exclude power unit(s) that is (are) built more than 10 years ago from the group; and
- (ii) Include grid connected power projects registered as CDM project activities, which are dispatched by dispatching authority to the electricity system.

In Jepirachi’s case, excluding the power units built more than 10 years ago, and adding the grid connected CDM project activities, was not enough to account for the 20% of the system generation. Therefore, the project participant has included the last two plants built at the end of 1998 to the m sample.

The $EF_{grid, CM}$ has been calculated, as follows:

$$EF_{grid, CM, y} = EF_{grid, OM, y} * W_{OM} + EF_{grid, BM, y} * W_{BM}$$

According to the “Tool to calculate the emission factor for an electricity system.v2”, and taking into account that Jepirachi Wind Power Project is a wind power generation project, to the weights W_{OM} and W_{BM} it has been given the default values of 0.75 and 0.25, respectively.

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The final results of the calculation of the Emission Factor are the following:

- $EF_{\text{grid, OM, 2007-2009}} = 0.4853 \text{ tCO}_2/\text{MWh}$
- $EF_{\text{grid, BM, 2009}} = 0.3206 \text{ tCO}_2/\text{MWh}$
- **$EF_{\text{grid, CM, 2009}} = 0.4441 \text{ tCO}_2/\text{MWh}$**

AENOR has determined that the calculations, parameters and options adopted in the PDD have been correctly applied in line with the applied methodology. The first version of the PDD submitted to the auditing team did not specify the version of the *"Tool to calculate the emission factor for an electricity system"* used to calculate the baseline, so CAR2 was raised. The latest version of the PDD was updated including the current version of the tool used, so CAR2 was closed.

Data and parameters updated were checked by the auditing team and some inconsistencies were found. CL3, CL5, CL6, CAR3 and CAR4 were raised. The latest version of the PDD and the spreadsheets solved these inconsistencies, so CL3, CL5, CL6, CAR3 and CAR4 were closed. The calculations were reproduced by the auditing team and were found correct. The validation team consider that the equations and parameters have been applied in accordance with the methodology and tool.

The auditing team has assessed that all calculations have been carried out in a transparent and conservative manner and all data used for calculation have been provided by official sources such as Energy and Mines Planning Unit (UPME) and the National Dispatch Center of Colombia (CND).

Therefore, according to the *"Tool to assess the validity of the original|current baseline and to update the baseline at the renewal of a crediting period"* (EB 46, Annex 11), the current baseline complies with all relevant mandatory national and sectoral policies which have come into effect after the submission of the project activity for validation and are applicable at this moment, the time of requesting renewal of crediting period.

3.5 Monitoring Plan

As stated above, the project uses the approved monitoring methodology ACM0002 version 12.1.0. Parameters and data available at validation were cross-checked with official sources and it was found consistent with the methodology.

The monitoring plan proposed follows the same monitoring approach that in the first crediting period, and it was considered adequate. Authority and responsibilities are well defined and Quality Assurance and Quality Control procedures are managed in order to reduce the uncertainties of the emissions reduction monitored.

3.6 Calculation of GHG Emissions

The methodology for calculating emission reductions is transparently documented and it complies with existing good practice. The calculation methods applied to the determination of emission reduction are explained in detail in the PDD and they follow the procedures laid down in the approved methodology ACM0002 (version 12.1.0).

The estimated amount of emission reductions for the second crediting period is **179,416 tCO₂e** (25,630 tCO₂e/year) in accordance with the documentation submitted and verified by the validation team.

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3.7 Environmental Impacts

The project activity is still complying with the environmental legislation in Colombia as it was crosschecked against the relevant regulation in the scope.

3.8 Comments by Local Stakeholders

In accordance with the *"Procedures for Renewal of a Crediting Period of a registered CDM project"* (version 05) local stakeholders consultation is not applicable for the second crediting period.

3.9 Quality Control

AENOR has performed an internal quality control of the present validation report by a reviewer independent from the validation team.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

In accordance with the *"Procedures for Renewal of a Crediting Period of a registered CDM project"* (version 05) parties and NGOs consultation is not applicable for the second crediting period.

5 VALIDATION OPINION

AENOR has performed a revalidation of the **"Jepirachi Wind Power Project"**. The revalidation was performed on the basis of UNFCCC criteria 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 to AENOR enough evidences to determine the fulfillment of stated criteria. In our opinion, the project meets the UNFCCC requirements for the renewal of the crediting period. Hence, AENOR will recommend the renewal of the crediting period of the project.

The estimated amount of emission reductions for the second crediting period (31st January 2011 to 30th January 2018) is **179,416 tCO₂e** (25,630 tCO₂e/year) in accordance with the documentation submitted and verified by the validation team.

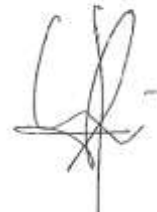
The revalidation is based on the information made available to us and the engagement conditions detailed in this report.



03/03/2011

Luis Robles

Head of Climate Change Unit



03/03/2011

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Validation Team Leader

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6 REFERENCES

Category 1 documents: Documents provided by the project proponents that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the determination conclusions.

Category 2 documents: Background documents related to the design and/or methodologies employed in the design or other reference documents. Where applicable, Category 2 documents have been used to check project assumptions and confirm the validity of information given in the category 1 documents.

Category	Document Name	Date	Author/Competent Authority
1	PDD Jeparachi Wind Power Project Version 02	23/07/2010	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
1	PDD Jeparachi Wind Power Project Version 03	13/09/2010	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
1	PDD Jeparachi Wind Power Project Version 04	08/11/2010	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
1	PDD Jeparachi Wind Power Project Version 05	07/01/2011	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
1	PDD Jeparachi Wind Power Project Version 06	24/02/2011	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
1	PDD Jeparachi Wind Power Project Version 07	01/03/2011	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
1	Combined OM BM EF Lambda method July 23 2010	23/07/2010	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
1	Combined OM BM EF Lambda method September 13 2010	13/09/2010	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
1	Combined OM BM EF Lambda method Nov 8 2010	08/11/2010	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
1	Combined_OM_BM_EF_Lambda_method_Jan 7_2011	07/01/2011	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
1	Combined_OM_BM_EF_Lambda_method_Feb 24_2011	24/02/2011	INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT AS THE TRUSTEE OF THE PROTOTYPE CARBON FUND. (IBRD)
2	ACM0002 (V3) Consolidated methodology for grid-connected electricity generation from renewable sources --- Version 3	29/09/2005	CDM - EXECUTIVE BOARD

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Category	Document Name	Date	Author/Competent Authority
2	ACM0002 (V11) Consolidated baseline methodology for grid-connected electricity generation from renewable sources.	12/02/2010	CDM - EXECUTIVE BOARD
2	ACM0002 (V12) Consolidated baseline methodology for grid-connected electricity generation from renewable sources.	17/09/2010	CDM - EXECUTIVE BOARD
2	ACM0002 (V12.1.0) Consolidated baseline methodology for grid-connected electricity generation from renewable sources.	26/11/2010	CDM - EXECUTIVE BOARD
2	Procedures for Renewal of Crediting Period of a Registered CDM project activity.	25/03/2009	CDM - EXECUTIVE BOARD
2	Tool to calculate the emission factor for an electricity system - Version 2	16/10/2009	CDM - EXECUTIVE BOARD
2	CDM EB Procedures for Renewal of the crediting period of a registered CDM project Activity (v. 05) EB 46 Annex 11	25/03/2009	CDM - EXECUTIVE BOARD
2	2006 IPCC Guidelines for National Greenhouse Gas Inventories	2006	INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE
2	Factores conversion Hid-Heat rate term	07/01/2011	COLOMBIAN NATIONAL DISPATCH CENTER
2	Entrada proyectos 1998 - 2010	08/11/2010	COLOMBIAN NATIONAL DISPATCH CENTER
2	Cálculo del Factor de Emisión de CO ₂ del Sistema Eléctrico Interconectado Colombiano. Versión 2009.3	-	UNIDAD DE PLANEAMIENTO MINERO ENERGÉTICO. MINISTERIO DE MINAS Y ENERGÍA. COLOMBIA

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APPENDIX A

RESOLUTION OF CORRECTIVE ACTION AND CLARIFICATION REQUESTS

Draft report clarifications and corrective action requests by validation team	Summary of project owner response	Validation team conclusion
CL1 It shall be clarified how the PP has assessed the compliance of the current baseline with relevant mandatory national or sectoral policies. (Step 1.1 "Tool to assess the validity of the original/current baseline and to update the baseline at the renewal of a crediting period"). Relevant legislation should be added to demonstrate the validity original/current baseline.	Relevant legislations and an analysis on how the original conditions of the baseline are not modified and the project is in compliance with relevant national and sectoral policies, is added to the PDD. Please refer to Section B.4 of the revised PDD.	CL1 is closed
CL2 There has been detected some inconsistencies, in different parts of the PDD, regarding to the justification of the applied methodology.	Section B.6.1. and Section B.2 now have identical justifications in the revised PDD.	The justification of the applied methodology described in paragraph B.6.1 is not the same as the justification included in paragraph B.2. CL2 is closed
CL3 It shall be provided to the DOE the official data used to calculate the EF _{grid, CM, 2009} or the link to have access to them via internet. The links provided in the spreadsheet do not work properly.	The following link http://sv04.xm.com.co/neonweb/ does work fine. The hard copy for the same is attached for DOE reference.	CL3 is closed
CL4 It shall be clarified the year of updating the PDD for the second crediting period specified in paragraph B.8	The year of updating the PDD has been included on page 24, section B.8.	CL4 is closed
CL5 It shall be clarified the selection of the power plants which have been considered as low cost - must run in the calculation of the EF _{grid, OM, 2007-2009}	The Tool to calculate the emission factor for an electricity system defines the Low-Cost/Must Run resources "as power plants with low marginal generation costs or power plants that are dispatched independently of the daily or seasonal load of the	It is not clear that plants up to 20MW in capacity are always dispatched independently on the costs. The evidences "Resolution 055 of 1994. Art, 11" and "Resolution 086 of 1996" do not clarify this

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	<p>grid. They typically include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation." In the EF calculation, these plants include all hydro, and wind plants.</p> <p>It has been excluded the plants up to 20 MW from the must – run category in the EF calculation.</p>	<p>issue at all.</p> <p>The DOE team needs more evidences to clarify that plants up to 20 MW are always dispatched first.</p> <p>CL5 is closed.</p>
<p>CL6</p> <p>There is an inconsistency between the information about the calculation of EF_{EL, m, y} and EF_{EL, k, y} included in the PDD and the information included in Annex 3.</p>	<p>There is no inconsistency. The Annex 3 however, included the formula to calculate the BM emission factor, and did not include the Lambda calculation for the OM. To avoid confusion, the equation from Annex 3 in the PDD has been eliminated.</p> <p>The formulae have been added to the Excel Spreadsheet Model.</p> <p>For those power plants with information on the heat rate from XM, it has been calculated the EF following the Tool. For those without information on the heat rate, it has been taken the official values from UPME, which also follow the Tool. Annex 3 have been modified to clarify the different sources of information.</p>	<p>There is no formula for the calculation of "Plant EF (tCO₂/MWh)" in "Combined OM BM Lambda method November 8 2010.</p> <p>The data of "Plant EF (tCO₂/MWh)" in the spreadsheet are not the same than data included in Annex 3 of the PDD.</p> <p>The PDD cites that the calculation of EF_{EL, m} has been done according to the Tool (Simple Method, Option A2), however Annex 3 (tables 1 and 2) includes data for EF_{EL, m} provided by UPME.</p> <p>CL6 is closed</p>
<p>CAR1</p> <p>It shall be corrected the version number of the applied methodology included in the PDD.</p>	<p>OK. PDD has been corrected to show the right methodology ACM0002 v.12.1.0</p>	<p>CAR1 is closed</p>
<p>CAR2</p> <p>It shall be included the current version of the "Tool to calculate the emission factor for an electricity system" in the PDD.</p>	<p>It has been included throughout.</p>	<p>CAR2 is closed</p>
<p>CAR3</p> <p>There is additional background information on baseline data provided in Annex 3. This information is not consistent with data presented by other sections of the PDD.</p>	<p>This section presents the data used for performing the calculations,</p> <p>The BM value is corrected as per CAR4 and the updated value is 0.3206 tCo₂/MWh. Error has been corrected in the PDD</p>	<p>The value of the EF_{grid, OM, 2007-2009} included in Annex 3 is different from the value included in page 22 of the PDD.</p> <p>CAR3 is closed</p>

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<p>CAR4</p> <p>The following mistakes have been detected in the spreadsheet "Combined OM BM Lambda method July 23 2010":</p> <ol style="list-style-type: none"> 1. The calculation of the $EF_{grid, BM, 2009}$ is not correct. 2. There is an error in the column data "total GEN 2009" included in the worksheet "EF BM UPME". 3. There is an error in the sum of the column data "GEN20%" included in the worksheet "EF BM UPME". 4. The subscript y (the most recent historical year for which power generation data is available) for the BM is not correct. 5. Data of 2006 have not been used to calculate $EF_{grid, OM, 2009}$ so is not necessary to include them in the spreadsheet. 6. It shall be clarified how the PP has calculated Lamda (λ_y). It is not clear how the PP has calculated the intersection point between load duration curve and the horizontal line of low cost-must run generation. 7. There is an inconsistency between the value of "Average generation level (total generation in 2009)" included in the worksheet "ER" and the 2009 generation data included in the other worksheets. 8. It shall be included the formulae used for all the calculations done in the spreadsheet. 9. It shall be included, in all the worksheets, the sources of all the data used in the calculations. 	<ol style="list-style-type: none"> 1. Error has been corrected, as resulting numbers in the calculations and data references in the PDD. 2. Corrected 3. Corrected 4. Corrected 5. 2006 data have been eliminated from spreadsheet 6. This is explained in the PDD (as stated by the Tool). The point of intersection is selected as the point where the low cost-must run generation gets nearer to the cumulative calculated area below the curve. 7. It has been clarified in the spreadsheet 8. The spreadsheet has been revised to show the calculation of the EF of the plants and the various sources. 9. All the sources have been included. 	<ol style="list-style-type: none"> 1. Closed 2. Closed 3. Closed 4. Closed 5. Closed 6. Closed 7. Closed 8. There is no formula for the calculation of "Plant EF (tCO₂/MWh)" in "Combined OM BM Lambda method November 8 2010". Closed 9. Closed <p>CAR4 is closed.</p>
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