

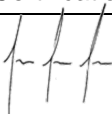


**Verification and certification report form for
CDM project activities
(Version 03.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Jepirachi Wind Power Project
Scale of the project activity	<input checked="" type="checkbox"/> Large-scale <input type="checkbox"/> Small-scale
Version number of the verification and certification report	1
Completion date of the verification and certification report	12/09/2019
Monitoring period number and duration of this monitoring period	3 rd monitoring period of the second crediting period 01/01/2018 – 30/01/2018 (both days included)
Version number of the monitoring report to which this report applies	03.0
Crediting period of the project activity corresponding to this monitoring period	Renewable, 31/01/2011 – 30/01/2018 (both days included), 7 years.
Project participants	<p>Colombia: Empresas Públicas de Medellín;</p> <p>Finland: Fortum Corporation, Government of Finland - Ministry of Foreign Affairs of Finland;</p> <p>France: GDF SUEZ;</p> <p>Germany: RWE Power AG;</p> <p>Japan: Chubu Electric Power Co., Inc, The Chugoku Electric Power Co., Inc, Kyushu Electric Power Co., Inc, Mitsubishi Corporation, Shikoku Electric Power Co., Inc, Tohoku Electric Power Co., Inc, The Tokyo Electric Power Co., Inc, Japan International Cooperation Agency (JICA), Mitsui & Co., Ltd;</p> <p>Netherlands: Electrabel N.V., Netherlands' Ministry of Infrastructure and the Environment (IenM); Netherlands' Ministry of Economic Affairs, Agriculture and Innovation (EL&I)</p> <p>Norway: Norsk Hydro ASA, Government of Norway - Ministry of Foreign Affairs, Statoil ASA;</p> <p>United Kingdom of Great Britain and Northern Ireland: BP Alternative Energy International Ltd, Deutsche Bank AG;</p> <p>Sweden: Government of Sweden – Swedish Energy Agency;</p> <p>Bilateral and Multilateral Funds: Prototype Carbon Fund (PCF) – Managing Company: International Bank for Reconstruction and Development (IBRD) as Trustee of the Prototype Carbon Fund (PCF).</p>
Host Party	Colombia

Applied methodologies and standardized baselines	ACM0002 "Grid-connected electricity generation from renewable sources" (version 12.1.0)
Mandatory sectoral scopes	1 : Energy industries (renewable - / non-renewable sources)
Conditional sectoral scopes, if applicable	N/A
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	2,106 tCO ₂ e
Certified amount of GHG emission reductions or GHG removals for this monitoring period	647 tCO ₂ e
Name and UNFCCC reference number of the DOE	Colombian Institute for Technical Standards and Certification (ICONTEC)
Name, position and signature of the approver of the verification and certification report	 Juan Sebastian Salazar Technical Director

SECTION A. Executive summary

ICONTEC performed the 3rd periodic and consecutive¹ verification of the second crediting period of the registered CDM project Jepirachi Wind Power Project in Colombia on the basis of UNFCCC criteria contained in Article 12 of the Kyoto Protocol and CDM modalities and procedures according to the Marrakech Agreement, the criteria of the CDM Executive Board and the host country, as well as the operational and technical monitoring criteria specific to this type of project.

The proposed project activity under verification process is based on the approved consolidated methodology ACM0002 Grid-connected electricity generation from renewable sources, version 12.1.0. The project activity consists of the development of a wind based generation facility with a nominal power capacity rated at 19.5 MW, located in Wayuu Indigenous Territory in the Northeastern region of the Atlantic Colombian coast.

The project was fully commissioned on January 31, 2004, and has been in continuous operation since that date.

The verification process consisted of the following three phases:

- I. Desk review of the monitoring documentation, registered PDD, validation report and previous verification reports and relevant information
- II. Verification was addressed through documental analysis, onsite inspection and specific interviews with appropriate personnel at general headquarters in Medellín.
- III. Resolution of outstanding issues and the issuance of the final verification and certification report.

The review of the monitoring documentation, approved PDD, validation report, previous verification reports, relevant information and interviews allowed ICONTEC to collect enough evidence to completely assess the verification criteria and determinate that the project has been implemented as planned and as it has been described in the approved PDD version 9. Emission reductions were correctly calculated based on the PDD and the monitoring equipment with an impact on the claimed emission reductions work reliably. The monitoring system is in place and has been calibrated appropriately. ICONTEC can confirm that the GHG emission reductions are calculated without material misstatements.

SECTION B. Verification team, technical reviewer and approver

B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Verification findings
1.	Team Leader Verifier	IR	Santos	Diana	Icontec's employee	X	N/A	X	X
2	Technical Expert	EI	Gómez	Fernando	Freelance	X	N/A	X	X

¹ This was verified by the audit team by means of reviewing on UNFCCC CDM website that the previous monitoring reports have been published.

B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Team Leader and Technical Expert in Sectoral Scope 1.2	EI	Grisales	Cristian	Freelance

SECTION C. Application of materiality**C.1. Consideration of materiality in planning the verification**

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human error in the quantification of emissions	Low	The monitoring data is downloaded directly from the electricity meters located in panel TM 1 at the substation of energy in the area of the Wind Park. so, there is low potential risk of errors/errors, omissions or misstatements.	To cross check 100% of electricity generation stated in Excel ER spreadsheet with the receipts of sales issued by EPM to XM and also with the information available in XM page.
2.	Undue reliance on a designed information system, which may lead to Omissions and misstatements in data transfer from raw data into digital Excel ER spreadsheet	Low	Ineffective quality control of data transferring due to unclear QA/QC procedure.	Check Quality Management procedures and instructive. PP may demonstrate how to transfer data and how this is crosschecked. Conduct interviews with related personnel whether procedure is actually conducted but not adequately described.
3.	Calibration delays on monitoring equipment	Low	Delays were not identified neither at the time of the desk review, nor at the time of the elaboration of the verification report.	It was included the review of all the calibration certificates (100%). The certificates were found valid for the monitoring period.
4.	Missing data due to failure of measurement equipment	Low	The monitoring plan defines emergency procedures in case a meter fails. Besides back-up meters are either installed or available onsite for fast exchange.	Check if related meters are installed as per monitoring plan. Check if emergency procedure is known across related personnel via interviews.

In order to assess possible material misstatements, it was established a threshold based on the provisions stated in the VVS PA/UN2/ paragraph 329 (c), 2 per cent of the emission reductions, for this project activity:

$$647 \text{ tCO}_2\text{e} \times 2\% = 13 \text{ tCO}_2\text{e}$$

C.2. Consideration of materiality in conducting the verification

A risk assessment was undertaken by the verification team by means of document review. The audit team checked the 100% of the possible material misstatements, hence, no sampling plan was required in the monitoring plan. The verification team is able to confirm that all material

misstatements were properly conducted and the required corrections were performed by the PP on the version 03.0 of the MR.

SECTION D. Means of verification

D.1. Desk/document review

The verification of the project documentation provided by the project proponent is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report submitted. Qualitative information comprises information on internal management controls, calculation procedures, and procedures for transfer of data, frequency of emission reports, and review and internal audit of calculations.

Main documents reviewed during the desk review stage, provided by the project proponent, are:

- Monitoring report as submitted to UNFCCC, version 02.0, dated on July 30th/2019 /2/
- Emission reductions calculation /3/

In addition to the monitoring documentation provided by the project proponent, ICONTEC reviewed:

- Approved PDD, version 9, dated on dated 03/10/2013 /1/
- Previous validation report for Post Registration Changes issued by LRQA, dated on 13/11/2013 /4/
- Approved consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 12.1.0 /UN1/
- Previous verification report for 2nd periodic verification (01/01/2013 to 31/12/2017 (both days included) issued by LRQA, version 5 dated on 22/04/2019 /5/
- CDM validation and verification standard for project activities, version 02.0 /UN2/
- CDM project standard for project activities, version 02.0 /UN3/
- CDM project cycle procedure for project activities, version 02.0 /UN4/
- Guideline on the application of materiality in verifications, version 02.0 /UN5/
- Monitoring report form, version 07.0/UN6/

A compilation of the documents related to the verification activities have been compiled under Appendix 3.

D.2. On-site inspection

Duration of on-site inspection: 03/09/2019 to 05/09/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	<p>Description of Power Plant Operation and Maintenance.</p> <p>Implementation and operation of the project activity as per registered PDD (plant installations, wind turbines generators, electrical substation/s, electricity generation meters, system control/s). (document review and visit to the plant, substation and meters location).</p> <p>Interview with Jepirachi project responsible personnel in charge.</p> <p>Compliance of the project implementation and operation with the registered PDD</p> <ul style="list-style-type: none"> - Operation of the project activity - Maintenance and calibration activities <p>Check monitoring equipment's (calibration, management and on-going maintenance, monitoring practices)</p> <p>Review of shutdowns during the monitoring period</p>	<p>Jepirachi Wind Power Project. Located in Wayuu Indigenous Territory in the Northeastern region of the Atlantic Colombian coast, within the Municipality of Uribe in the Department of Guajira.</p>	03/09/2019	<p>Diana Santos</p> <p>Fernando Gómez</p>
2	<p>Monitoring of data, review of operation flow, aggregating and reporting of monitoring parameters. Interviews with relevant personnel to confirm operational and data collection procedures.</p> <p>Compliance of the project implementation and operation with the registered PDD for 3rd Monitoring Period .</p> <p>Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines</p> <p>Review of QA/QC procedures to identify possible errors or omissions in the reported monitored parameters.</p> <p>Energy control and report of imports and exports to the grid.</p> <p>Interview with metering and registering energy responsible of Jepirachi project</p> <p>Data and cross checking procedures for Jepirachi project</p> <p>Against interview with the responsible personnel in charge</p> <ul style="list-style-type: none"> - Maintenance activities <p>Review of shutdowns during the monitoring period</p>	<p>EPM Office at Carrera 58 # 42 - 125, Medellín, Antioquia, Colombia</p>	04, 05/09/2019	

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Eslava Gallo	Claudia Patricia	Business Operations Professional EPM	09/07/2019	<ul style="list-style-type: none"> • Compliance of monitoring activities with the registered monitoring plan • Assessment of data and calculation of emission reductions • Maintenance activities informed to Colombian regulatory entities, when necessary, during the monitoring period. • Review of shutdowns during the monitoring period • Confirmation of the interconnection point to Colombian electrical grid • Compliance with the calibration frequency requirements for measuring instruments • Maintenance activities reported to Colombian regulatory entities (if apply) during the monitoring period • Review of shutdowns during the monitoring period • Check the record of CDM monitoring Plan. (Information flow, source of data and 	Diana Santos Fernando Gómez
2.	Echavarria	Germán	Operations Professional EPM			
3.	Giraldo Ospina	Isabel Cristina	Planning and Performance Professional EPM			
4.	Correa Giraldo	Luis Fernando	Operations Professional EPM			

					frequency • Compliance of monitoring activities with the registered monitoring plan • QA/QC procedures • Assessment of data and calculation of emission reductions	
5.	Roldán Agudelo,	Gloria María	Management Regulations and Market Professional EPM		• Confirmation of the interconnection point to Colombian electrical grid • Compliance with the calibration frequency requirements for measuring instruments	
6.	García Naranjo,	Gisleny	Electrical Wholesale market professional EPM		• Check the record of CDM monitoring Plan. (Information flow, source of data and frequency) • Compliance of monitoring activities with the registered monitoring plan • QA/QC procedures	

D.4. Sampling approach

ICONTEC checked the 100% of generation data related with claimed emission reductions calculation, hence, no sampling approach was required.

D.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form			
Compliance of the project implementation and operation with the registered PDD	1 (CL 1)		
Post-registration changes			
Compliance of the registered monitoring plan with the methodologies including applicable tools and standardized baselines			
Compliance of monitoring activities with the registered monitoring plan	1 (CL 2)		

Compliance with the calibration frequency requirements for measuring instruments			
Assessment of data and calculation of emission reductions or net removals			
Assessment of reported sustainable development co-benefits			
Global stakeholder consultation			
Others (please specify)			
Total	2		

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means of verification	Monitoring report version 02.0 was delivered to ICONTEC by the project participants on 29/07/2019 and ICONTEC has made this report publicly available on 30/07/2019. Prior to the start of the verification activities on 03/09/2019. No comments were received. Visual comparison between the standard Monitoring Report Form and the Monitoring Report /2/, /UN6/, form currently used was made.
Findings	No finding was raised on this issue.
Conclusion	ICONTEC verified through documental review that the latest version of the MR form for the 3 rd monitoring period was applied. It can be confirmed that the monitoring report is complete, transparent and in accordance with the registered PDD, relevant CDM requirements and applicable monitoring report form. ICONTEC confirms that the MR version 03.0 is free of material misstatements.

E.2. Remaining forward action requests from validation and/or previous verifications

No remaining FARs from previous verification assessment has been found.

E.3. Compliance of the project implementation and operation with the registered project design document

Means of verification	At the time of the desk review, the audit team assessed the implementation of the project reported on MR version 02.0, against the one established on the approved PDD/1/. No inconsistencies were found.				
	During the desk review and on-site visit and interviews, as well as specific interviews with appropriate personnel at general headquarters in Medellín, the correspondence between the actual facilities and operation, as related in the Monitoring Report, with those described in the PDD, was assessed.				
	The status of implementation, progress and operation's starting date for each phase are shown on the next table:				
	Implementation Status				
	Phase/Site	Status of Implementation	Progress	Operation	Comments
	Star of operation: wind-based generation facility with an capacity rated at 19.5	Operation Started	There was no delay in the implementation	The starting date of the project operation was on January 31, 2004, without any abnormal	The project activity is already implemented and it is currently operating as it was

	MW			scenarios during its operation.	described in the approved PDD.
Findings	Through CL1 a clarification was required to the PP: In Section B.1 Description of implemented project activity, It should be explained how "real availability" is defined and how figures shown are obtained.				
Conclusion	<p>Clarification was given by the PP in the Monitoring Report version 03.0.</p> <p>So that, no inconsistencies were found between the project implementation and operation with the approved PDD/1/.</p>				

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents²

No temporary deviations have been approved by the Board for this monitoring period or will be submitted with the request for issuance.

E.4.2. Corrections

There are no corrections to project information or parameters fixed at validation, as was described in the approved PDD made by the project participant during the current monitoring period.

E.4.3. Changes to the start date of the crediting period

No changes to the start date of the crediting period have been requested to the secretariat or approved by the Board during this monitoring period.

E.4.4. Inclusion of a monitoring plan

Inclusion of a monitoring plan has not been approved by the Board during this monitoring period.

E.4.5. Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

There are no permanent changes from the registered monitoring plan and/or methodology identified during the current monitoring period.

E.4.6. Changes to the project design

There are no proposed or actual changes to the project design of the registered CDM project activity reported or identified during the current monitoring period.

² Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

E.4.7. Changes specific to afforestation and reforestation project activities

This kind of changes does not apply to this project activity.

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

Means of verification	<p>According to the registered PDD/1/, the CDM project activity " Jepirachi Wind Power Project " has to be monitored following the guidelines of the approved consolidated monitoring methodology ACM0002 Grid-connected electricity generation from renewable sources, version 12.1.0 /UN1/.</p> <p>In this concern, it was verified that the monitoring plan involve the variable $EG_{\text{facility},y}$ as required by the monitoring methodology according to the approved consolidated monitoring methodology ACM0002 ver. 12 - Grid-connected electricity generation from renewable sources./UN1/</p>
Findings	No findings were raised regarding to this section.
Conclusion	ICONTEC concludes that the approved monitoring plan stated in the approved PDD /1/ is in accordance with the approved consolidated monitoring methodology ACM0002 Grid-connected electricity generation from renewable sources, version 12.1.0 /UN1/ and its applicable tools.

E.6. Compliance of monitoring activities with the registered monitoring plan**E.6.1. Data and parameters fixed ex ante or at renewal of crediting period**

Means of verification	The parameters fixed ex-ante related to the GHG emission reductions in the project activity have been implemented in accordance with the monitoring plan contained in the approved PDD /1/.			
	The following table describes the parameters that were determined ex-ante and not monitored during the monitoring period:			
	Parameter	Description	Value	Source
	EF _{grid,CM,y}	Combined margin CO ₂ emission factor for grid connected power generation in year y calculated using the latest version of the “Tool to calculate the emission factor for an electricity system” (version 07.0).	0.4441 tCO ₂ /M Wh	This value was calculated once at the request of renewal of crediting period as it was established in the approved PDD.
Findings	No findings were identified for this section.			
Conclusion	ICONTEC can conclude that the parameter fixed ex-ante is appropriate and it was used correctly in ER calculations in the monitoring report version 03.0 and it results in a traceable estimate of the emission reductions.			

E.6.2. Data and parameters monitored

Means of verification	The following table includes all parameters monitored and describes how ICONTEC verified the fulfillment of each parameter with the registered monitoring plan, including the information flow and the values as reported in the MR.				
	Monitored Parameters				
	Monitored Parameter	Description	Value		Means of Verification
	EG _y	Quantity of net	Power Plant	Electricity Generation	Source of Data and Frequency:

		electricity supplied by the project plant/unit to the grid in year y		(MWh)	Net electricity generation is continuously measured and monthly recorded by electronic electricity meters located at the plant substation in the site project.
			Jepirachi	1,458.12	
<p>Used Equipment:</p> <p>ICONTEC verified that, in order to measure the energy delivered from the Jepirachi power plant to the national grid, main and back up meters are currently installed in the plant substation site, at the high tension side of the transformer, as well as on the transmission lines going from Jepirachi power plant to Puerto Bolivar and Cuestecitas substations.</p> <p>Data Cross Checking:</p> <p>In order to verify the data provided by the PP in the spreadsheet used for emission reductions calculations (2018 Jan 1-30 Jepirachi monitoring ER v2), ICONTEC reviewed the electricity generation reported by the PP in the information service about the Colombian Wholesale Power Market operated by XM³. After this review the audit team concluded that the information provided by the PP is reliable, coherent, consistent and traceable with secondary sources of information.</p> <p>Consistency Between the QA/QC Defined in the Methodology:</p>					

³ Available at <http://informacioninteligente10.xm.com.co/oferta/Paginas/HistoricoOferta.aspx>

				<p>According to ACM0002 version 12.1.0 QA/QC procedures consists of Cross checking of measurement results with records for sold electricity. The records for sold energy are issued by XM using the information platform. As it was explained above, the audit team reviewed the information in the information platform managed by XM, hence this requirement is fulfilled.</p> <p>Consistency Between the QA/QC Established by the Project Participants in the PDD:</p> <p>In section B.7.1 of the approved PDD, the methodology and monitoring plan are described as the performance of calibration activities for the measurement equipment. This issue is explained in Section E.7 on this report.</p> <p>ICONTEC verified that according to the monitoring plan approved in the PDD and the methodology ACM0002 version 12.1.0, the data from electricity generation from the project activity can be check and it is available in the XM information platform, on the other hand, this monitoring plan is in accordance with the rules established by Colombian Electrical Authorities.</p> <p>Application of Default Values:</p> <p>Not applicable.</p> <p>Findings:</p> <p>CL2 was raised for this parameter.</p> <p>Conclusions:</p> <p>During the verification, ICONTEC checked that the parameter is properly applied according to the monitoring plan and the approved PDD, and that</p>	
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				the information is consistent with the secondary information source used to verify the information.	
Findings	Through CL2 a clarification was required to the PP, in order to clarify the main monitoring points as indicated in Figure 3, Section C Description of monitoring system.				
Conclusion	<p>CL2 was satisfactory solved and ICONTEC could verify the completeness and integrity of the data used by the project proponents for the emission reductions calculations. During the verification, ICONTEC was able to verify that the parameter is properly measured according to the monitoring plan and the registered PDD, and information is consistent with the secondary information sources used to verify the information.</p> <p>ICONTEC can conclude that, the monitoring parameters related to the GHG emission reductions in the project activity have been implemented in accordance with the monitoring plan contained in the approved PDD /1/.</p> <p>The monitoring has been carried out in accordance with the monitoring plan contained in the approved PDD.</p> <p>All parameters stated in the monitoring plan of the approved PDD have been correctly and sufficiently monitored and listed. The monitored data for required parameters have been verified by ICONTEC and have been found complete, reliable and consistent.</p>				

E.6.3. Implementation of sampling plan

Means of verification	The PP did not apply a sampling approach for the determination of data and parameters monitored.
Findings	N/A
Conclusion	N/A

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	<p>The following table includes the current monitoring equipment for the parameter above mentioned and the information about equipment identification and calibration records. ICONTEC verified that the calibration covered the entire 3rd monitoring period from 01/01/2018 to 30/01/2018 of the second crediting period.</p> <p>The information revised in order to confirm the calibration frequency was compared with the calibration certificates revised through interviews conducted by video conference, which were registered on the following table in column: calibration records:/6/</p> <p style="text-align: center;">Monitoring Equipment</p> <table border="1"> <thead> <tr> <th>Parameter</th><th colspan="2">Equipment</th><th>Calibration Frequency</th><th>Calibration Records</th><th>Date of Calibration</th></tr> </thead> <tbody> <tr> <td>EG_y</td><td>Point #1: Transformador Jeparachi</td><td>Serial Number of Main Measurement Equipment: PT-0809A455-01</td><td>2 years</td><td>Calibration certificate 20666046 - 6-2, issued by accredited EPM's calibration laboratory/6/</td><td>20/12/2017</td></tr> </tbody> </table>					Parameter	Equipment		Calibration Frequency	Calibration Records	Date of Calibration	EG _y	Point #1: Transformador Jeparachi	Serial Number of Main Measurement Equipment: PT-0809A455-01	2 years	Calibration certificate 20666046 - 6-2, issued by accredited EPM's calibration laboratory/6/	20/12/2017
Parameter	Equipment		Calibration Frequency	Calibration Records	Date of Calibration												
EG _y	Point #1: Transformador Jeparachi	Serial Number of Main Measurement Equipment: PT-0809A455-01	2 years	Calibration certificate 20666046 - 6-2, issued by accredited EPM's calibration laboratory/6/	20/12/2017												

					Calibration certificate 20993354-6-2, issued by accredited EPM's calibration laboratory/7/	03/12/2018
			Serial Number of Backup Measurement Equipment: PS-0511A080-01		Calibration certificate 20666046 - 1-2, issued by accredited EPM's calibration laboratory/6/	19/12/2017
					Calibration certificate 20993354-1-2, issued by accredited EPM's calibration laboratory/7/	04/12/2018
		Point #2: Puerto Bolivar	Serial Number of Main Measurement Equipment: PS-0511A082-01		Calibration certificate 20666046-2-2 issued by accredited EPM's calibration laboratory/6/	19/12/2017
					Calibration certificate 20993354-2-2, issued by accredited EPM's calibration laboratory/7/	04/12/2018
			Serial Number of Backup Measurement Equipment: PS-0511A083-01		Calibration certificate 20666046-3-2, issued by accredited EPM's calibration laboratory /6/	18/12/2017

				2 years	Calibration certificate 20993354-3-2, issued by accredited EPM's calibration laboratory /6/,	04/12/2018
		Point #3: Puerto Cuestecitas	Serial Number of Main Measurement Equipment: PS-0511A084-01	2 years	Calibration certificate 20666046-4-2, issued by accredited EPM's calibration laboratory/6.	21/12/2017
					Calibration certificate 20993354-4-2, issued by accredited EPM's calibration laboratory/7/	03/12/2018
					Serial Number of Backup Measurement Equipment: PS-0511A085-01	Calibration certificate 20666046-5-2, issued by accredited EPM's calibration laboratory /6/.
				2 years	Calibration certificate 20993354-5-2, issued by accredited EPM's calibration laboratory /7/.	03/12/2018
<p>ICONTEC validated that calibration activities were carried out by an accredited institution as per consulting the public available information in the Web page of the Colombian National Accreditation Body⁴ /8/. By means of documental review, ICONTEC concluded that the calibration activities for all four electrical measurement equipment were carried out by an accredited institution.</p>						
Findings	No finding was raised on this issued					
Conclusion	<p>Based on the reviewed certifications /6/, /7/ and verifications, ICONTEC provides a positive opinion on the reliability and accuracy of the metering.</p> <p>ICONTEC verified that the calibration frequencies followed by the PP for the</p>					

⁴ ONAC : <http://www.onac.org.co/>

	<p>energy meters of the equipment (1 year) are according to the PDD and project conditions. The metering equipment was properly and conservatively calibrated by EPM at least once every year; despite in the PDD it is possible each 2 years.</p> <p>ICONTEC concluded that the calibration is conducted at the frequency specified by the methodology and monitoring plan of the registered PDD.</p>
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E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	<p>In accordance with ACM0002 /UN1/, the baseline emissions are quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the Jepirachi Wind Power Project in year y (in MWh) multiplied by the combined margin CO₂ emission factor for Colombian grid in year y.</p> $BE_y(tCO_2/yr) = EG_y(MWh/yr) \times EF_y(tCO_2/MWh)$ $BE_y = 1,458 \text{ MWh} \times 0.4441 \text{ tCO}_2\text{e/MWh}$ $BE_y = 647 \text{ tCO}_2 \text{ e}$
Findings	No finding was raised on this issued
Conclusion	<p>ICONTEC concludes that a complete set of data for the specified monitoring period is available, the audit team also concludes that baseline emission reductions have been correctly calculated without material misstatements.</p> <p>The audit team confirmed that monitored parameter $EG_{\text{facility},y}$ involved in the baseline GHG emissions calculation was cross-checked as it was described in Section E.6.2 on this report.</p>

E.8.2. Calculation of project GHG emissions or actual net anthropogenic GHG removals by sinks

Means of verification	In accordance to the applied methodology ACM0002, version /UN1/, emissions by sources of GHG due to the project activity are zero. 12.1.0
Findings	N/A
Conclusion	N/A

E.8.3. Calculation of leakage GHG emissions

Means of verification	In accordance with the provisions of applied methodology ACM0002 version 12.1.0 /UN1/: no leakage effects need to be accounted under this methodology
Findings	There is no finding regarding to this issue
Conclusion	ICONTEC confirms that no leakage needs to be considered.

E.8.4. Summary calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	<p>In accordance with the applied methodology /UN1/ and the description provided in section E.8.1, E.8.2 and E.8.3:</p> $ER_y = EG_y \times EF_y$ $ER_y \text{ January 1st to January 30th} = 1,458 \text{ MWh} \times 0.4441 \text{ tCO}_2\text{e/MWh} = 647 \text{ tCO}_2\text{e}$
Findings	There is no finding regarding to this issue.
Conclusion	The data used for determination of the emission reductions are available and have been monitored in accordance with the registered monitoring plan and methodology ACM 0002, version 12.1.0

	<p>The data used for the calculation of ERs in this monitoring period were verified and they were found consistent with those reported in the approved PDD.</p> <p>The appropriate methods and formulae for calculating baseline emissions, project emissions and leakage were followed in accordance with the approved PDD and applied methodology.</p> <p>The assumptions, emission factors and default values applied in the MR version 02.0 and the calculations were correctly justified.</p>
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E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	ICONTEC verified that the emission reductions achieved during the 3 rd monitoring period of the second crediting period (647 tCO ₂ e) are lower than the ex-ante value (2,106 tCO ₂ e) of emission reductions in the approved PDD.
Findings	No findings were raised for this section.
Conclusion	The actual emission reductions during the monitoring period are lower than the ones anticipated ex-ante in the CDM-PDD hence, there is no need of explanation of any increment.

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	ICONTEC verified that the emission reductions achieved during the 3 rd monitoring period of the second crediting period (647 tCO ₂ e) are lower than the ex-ante value (2,106 tCO ₂ e) of emission reductions in the approved PDD.
Findings	No findings were raised for this section.
Conclusion	The actual emission reductions during the monitoring period are lower than the ones anticipated ex-ante in the CDM-PDD hence no remarks are necessary.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The whole emission reductions of 647 tCO ₂ are reached in the period from 1 January 2013 onwards.
Findings	No finding was raised regarding to this issue
Conclusion	The whole emission reductions of 647 tCO ₂ are reached in the period from 1 January 2013 onwards.

E.9. Assessment of reported sustainable development co-benefits

Means of verification	The project activity has not monitored sustainable development co-benefits.
Findings	No finding was raised on this issue.
Conclusion	Since there is not monitored sustainable development co-benefits of the project activity, it is no necessary to assess this issue by DOE.

E.10. Global stakeholder consultation

Means of verification	<p>The MR version 02.0 /2/ submitted by EPM was made publicly available on the UNFCCC website from 30/07/2019 during the time specified in the Project Cycle Procedure/UN5/ paragraph 183 and 184.</p> <p>Parties, stakeholders and NGOs were invited to provide comments through the website. No comments were received neither during the public consultation nor at the moment of submission of this report for issuance of certified emissions.</p>
Findings	No finding was raised on this issue.
Conclusion	Since, there was no comments in comments in the global stakeholder consultation,

SECTION F. Internal quality control

This report includes the verification findings that underwent a technical review before being submitted to UNFCCC.

The technical review and the quality control process was performed by an internal technical reviewer team in accordance with the ICONTEC's internal procedures for carrying out validation, verification and certification audits of CDM project activities. After this step the submission for requesting for issuance has been conducted.

The technical reviewers are qualified in accordance with the ICONTEC's professional qualification scheme for CDM validation and verification.

SECTION G. Verification opinion

ICONTEC was engaged by Empresas Públicas de Medellín E.S.P. to verify the greenhouse gas (GHG) emission reductions reported by the CDM project Jepirachi Wind Power Project, registration number 0194, owned by PP for the period 01/01/2018 to 30/01/2018, equating to 647 tCO₂e.

ICONTEC confirms that the project is implemented as described in the validated and approved PDD. Installed equipment essential for generating emission reductions are running reliably and calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions as a CDM project.

Empresas Públicas de Medellín E.S.P. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project's monitoring and verification plan.

Empresas Públicas de Medellín E.S.P. is responsible for developing and keeping records and reporting procedures in accordance with the monitoring plan.

ICONTEC received the information and asked for explanations deemed necessary to provide enough evidence about the amount of GHG emissions and the calculation of the GHG emission reductions.

The verification consisted of the three following phases: i) desk review of the PDD, the MR and the monitoring plan ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

It is ICONTEC's responsibility to set an independent GHG verification opinion on the GHG emissions from the project and approved a baseline for the monitoring period.

ICONTEC utilizes a risk-based approach that draws on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate them. ICONTEC's examination process includes test-based assessments of all evidence relevant to the amounts and disclosures of a project's GHG emissions and the calculations of such reductions for the reporting period.

ICONTEC can confirm that the GHG emissions reductions are calculated without material misstatements.

ICONTEC's opinion applies to the project's GHG emissions and the resulting GHG emission reductions reported and related to the validated and registered baseline, as well as the monitoring plan and its associated documents. ICONTEC confirms the following statements:

CDM project: Jepirachi Wind Power Project

Reporting period:	01/01/2018 to 30/01/2018
Baseline emissions:	647 tCO ₂ e
Project emissions:	0 tCO ₂ e
Leakage:	0 tCO ₂ e
Emission Reductions:	647 tCO ₂ e

SECTION H. Certification statement

ICONTEC has been engaged by Empresas Públicas de Medellín E.S.P. to examine the greenhouse gas (GHG) emission reductions reported from Jepirachi Wind Power Project for the corresponding period, equating to 647 tonnes of CO₂ equivalent.

We consider that the project's GHG emissions and resulting GHG emissions reductions reported in the Monitoring Report version 03.0 (12/09/2019) are fairly stated.

The owner of Jepirachi Wind Power Project is responsible for the preparation of the GHG emission data and the reported GHG emission reductions on the basis set out within the project's Monitoring and Verification Plan.

The owner of Jepirachi Wind Power Project is responsible for developing and keeping records and reporting procedures in accordance with the Monitoring Plan.

ICONTEC is responsible to set an independent GHG verification opinion on the GHG emissions from the Project activity and approved baseline for the same period.

For this verification audit ICONTEC was provided the information and asked for explanations we deemed necessary to provide enough evidence that the amount of GHG emission and the calculation of the GHG emission reductions, based on the Monitoring Report, are fairly stated for the reporting period.

Our verification approach was based on the Kyoto Protocol requirements, Marrakech Agreement, as well as those defined by the CDM Executive Board.

ICONTEC's approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate them. Our examination includes review and assessment, of the evidence related to the project's GHG emission and calculations for this reporting period.

ICONTEC is able to certify that the emission reductions from the Jepirachi Wind Power Project during the 3rd verification period of the second crediting period from January 1st/2018 to January 30th/2018 equals to 647 tonnes of CO₂ equivalent.

Appendix 1. Abbreviations

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
ERs	Emission Reductions
CERs	Certified emission reductions
CL	Clarification Request
CNO	Colombian National Electrical Operational Centre (Centro Nacional de Operación)
CO ₂ E	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
EPM	Empresas Publicas de Medellin E.S.P.
GHG	Greenhouse Gases
ICONTEC	Colombian Institute of Technical Standards and Certification (Instituto Colombiano de Normas Técnicas y Certificación)
MoC	Modalities of Communication
ONAC	Colombian national accreditation body (Organismo Nacional de Acreditación)
PDD	Project Design Document
MR	Monitoring Report
UNFCCC	United Nations Framework Convention for Climate Change
VVS	CDM Validation and Verification Standard
PP	Project Participant
IPCC	Intergovernmental Panel on Climate Change
PS	CDM Project Standard
PCP	CDM Project Cycle Procedure
PRC	Post Registration Change
UPME	Colombian Mining and Energy Planning Unit
XM	Colombian wholesale electrical market administrator

Appendix 2. Competence of team members and technical reviewers

DIANA CAROLINA SANTOS CAMARGO

Lead Team Auditor

MAIN PROFESSIONAL EDUCATION

Specialization on Climate Change and Kyoto Protocol OEA 2011-ILC, Latin American, 2011.

Post degree on International cooperation for development Pavia University. Italy - San Buenaventura University, Cartagena, Colombia, 2007.

Clean Production specialization, Los Andes University, Bogotá, Colombia, 2003.

Industrial Engineer, Los Andes University, Bogotá, Colombia, 2002.

ADDITIONAL STUDIES

Lead Auditor Carbon Footprint. ICONTEC. Jun 2012.

Lead Auditor Clean Development Mechanisms. UNFCCC- ICONTEC. Jan 2012

Lead auditor Sello Ambiental Colombiano, Sostenibilidad Turística. ICONTEC.Feb 2011

Quality Management Systems Diploma, ISO 9001, and 14001. ICONTEC. Apr 2010.

Sustainable development indicators. World Bank, CEPAL – United Nations, Los Andes University, Bogotá, Colombia. Jun 2007.

Seminary Development Projects for Latin America. Hilfswerk der Evangelischen Kirchen der Schweiz –HEKZ- Basilea, SUIZA. Apr 2005.

PROFESSIONAL EXPERIENCE

- ICONTEC (October 2008 – Actual)

Sustainable Development. Ensure efficiency and quality when providing climate change services by meeting policies, standards and procedures defined by ICONTEC and the accreditation bodies. Ensure the fulfillment of the UNFCCC accreditation and other schemes requirements in relation to the performance of professionals providing services, non-conforming product and training plans design and implementation focused on professionals' skills improvement, technical criteria unification, and added value increase in the audit process. Coordination of projects to design and develop new services; Research and analysis of new business opportunities, and analysis of the market projections through participation in activities that permit knowing and analyzing the market conditions and their characteristics. Direction of Inter-institute Relations and Special Projects, 2008-2009 my initial work was focused on the Centro American Custom Integration project. I supported the research and development of a unified quality system for the region

- ECLAC –Economic Commission for Latin America and the Caribbean– United Nations Organization – UNO (Mar 2007 - July 2007)

Project: Política social y reducción de la pobreza; Optimizando el gasto social. My functions were as practicum collaborating on the formulation and management of the project, participate on the link enforcement with the UNICEF initiative of public investment for children; support on the management of the project Efectos y Costos de la Desnutrición Infantil en Colombia, currently in process, made in association with the Programa Mundial de Alimentos PMA, lead by CEPAL; y also support other projects for sustainable Development and environment.

- Büro Nosotras – Basilea, Suiza (Sep 2005- Aug 2006)

Project development assistant and Administrative assistant. Nosotras is a NGO supported for the Swiss government to promote integration projects of Latin-American immigrant families in the Swiss society, My function in this organization consisted on the formulation, management and implementation of projects that promote the integration, education projects for women as a vulnerable member of the society, I also did some management work for this organization and social work planning, support on the area of language teaching.

- ODES. Organización para el Desempeño Empresarial Sostenible (Jan 2005- Aug 2005)

Professional on the development and implementation of PGIRS with the Tolima government and the Environmental authority. My duties were the coordination of productive and commercialize projects that were integrated as important elements of the productive chain of solid remainders management service, focused on link and benefit of the vulnerable population that work on recycling in 39 places in Tolima, Colombia.

- CIGRAF – Colciencias (Jan 2005- Apr 2005)

Professional on the development, presentation and execution planning of the project “Competencias Laborales de la Industria Gráfica” for the whole nation.

- Artico Software (Aug 2004- Jan 2005)

Commercial Manager, in charge of market lines and customer care; communication between company and customers; work plan projections.

- Corporación Somos Más (Jul 2004- Nov 2004)

Formulation Project Assessor. Specifically for the project www.somosmas.org - This Project shows the civil organization work for more than 1.200 organizations, this Project was made in association with the Bogota Major office, United Nations Volunteer Program, Los Andes University and important local NGO's.

- Industrial Engineering Department, Los Andes University. (2003)

Research group leader. Responsibilities: Coordination of a research group about the viability of a transportation enterprise as an alternative solution to the problematic of the population working with the animal-driven vehicles and recycling in Bogotá city. Achievement: Exposition of the formulated solution to the Bogotá's Major Antanas Mockus Sivickas.

- Bogotá Council. (2002)

Debate assessor of the councilor David Luna. Responsibilities: Exposition of the social problematic related with the population working with animal-driven vehicles and formulation of solution alternatives.

EXPERIENCE IN CDM ACTIVITIES**Lead Auditor and Specialist:**

1. Verification of Carbon Footprint –Pacific Rubiales
2. Verification of Carbon Footprint –Biorganicos S.A.S.
3. Verification of Carbon Footprint –Colcafé S.A.S.
4. Verification of Carbon Footprint –Compañía De Galletas Noel S.A.S.
5. Verification of Carbon Footprint –Europharma
6. Verification of Carbon Footprint – Empresa De Acueducto Y Alcantarillado De Bogotá EAAB
7. Verification of Carbon Footprint –Tropical Coffee Company S.A.S.- Colcafé
8. Verification of Carbon Footprint –Celsia S.A E.S.P.
9. Verification of Carbon Footprint –Supercerdo Paisa S.A.S.
10. Verification of Carbon Footprint –Profafor S.A
11. Verification of Carbon Footprint –Industrias Japan
12. Verification of Carbon Footprint –Coltanques
13. Verification of Carbon Footprint – Ladrillera La Clay
14. Verification of Carbon Footprint – Red De Salud Ladera
15. Verification of Carbon Footprint – Univesidad Autonoma De Cali
16. Verification of Carbon Footprint – Reii
17. Verification of Carbon Footprint – Eternil
18. Verification of Carbon Footprint – Isagen
19. Verification of Carbon Footprint – Pacific Rubiales
20. Verification of Carbon Footprint –Proalco
21. Verification of Carbon Footprint – Corpbanca
22. Verification of Carbon Footprint –Industrias Japan
23. Verification of Carbon Footprint –Profafor
24. Verification of Carbon Footprint – Colombia de Extrusión SAS
25. Verification of Carbon Footprint – Freskaleche SAS
26. Verification of Carbon Footprint – Instituto del corazón Bucaramanga SA
27. Verification of Carbon Footprint – Zona Franca Santander SA.
28. Verification of Carbon Footprint – Compañía de Galletas Pozuelo DCR, S.A.
29. Verification of Santa Ana Hydroelectric Plant
30. Verification of La Venta II
31. Verification of Proyecto Forestal Co2cero
32. Verification of La Venta II

Technical reviewer

1. Verification of Energy Efficiency and Partial Fuel Switch at Ladrillera Alcarraza
2. Verification of Co-composting of EFB and POME project
3. Verification of A joint venture project of cogeneration of electricity and hot water using natural gas and biogas produced from on-site wastewater biodigesters
4. Verification of Reduction of energy consumption during the production of hydraulic lime for the construction industry through the addition of non-calcined mineral components and additives
5. Verification of Fertinal Nitrous Oxide Abatement Project
6. Verification of GEA Small Hydropower (SHP) Run-of-the-River CDM Project Bundle
7. Verification of Agua Fresca Multipurpose and Environmental Services
8. Verification of Methane recovery and effective use of power generation project Norte III-B Landfill
9. Verification of CELSIA
10. Validation of N2O Abatement at Austin Bacis Mexico Nitric Acid Plant
11. Validation of Project LRT system in tunis
12. Validation of Doña Teresa Small Hydro Power Plant
13. Validation of San Nicolas CDM Reforestation Project
14. Validation of Providencia I: 1.8MW Small Hydro Power Generation Plant
15. Validation of Providencia III: 9.11MW Small Hydro Power Generation Plant

16. Validation Gold Standard: Consorcio Eólico Amayo, S.A.
17. Validation VCS: Grouped Project for Commercial Forest Plantations initiatives in the department of Vichada.
18. Validation CCB: Grouped Project for Commercial Forest Plantations initiatives in the department of Vichada.

FERNANDO GÓMEZ GÓMEZ

Sector Specialist (Scope 1.2)

MAIN PROFESSIONAL EDUCATION

Financial Specialist. EAFIT University. Colombia, 1984.

Master of Power Systems. Instituto Tecnológico de Monterrey. Mexico, 1970.

Electrical Engineer. National University of Colombia Bogotá. 1967.

PROFESSIONAL EXPERIENCE

- ENVISERVICES SAS. (2014)

Technical and Energy Advisory in registering hydro power generation projects into the UPME (Mining and Energy Planning Unit) catalog of projects for long term Colombian national expansion plan.

- PERSONAL CONTRACT for BID (Interamerican Development Bank). (2014)

As an Expert in Energy Economics to review the study “Vulnerabilidad al Cambio Climático de los sistemas de producción hidroeléctrica en Centroamérica y sus opciones de adaptación” (Vulnerability of the Central American hydroelectric systems to the Climate Change and adaptation options), commissioned by OLADE (Latin America Energy Organization) to the Incam Group.

- ICONTEC (from 2006 to present)

Specialist Scope 1. CDM Activities (Attached)

- GESTION Y AUDITORIAS ESPECIALIZADAS - GAE LTDA. Technical and Economic Advisory (November 2004 – May 2005)

Technical and Economic Advisory to Superintendencia de Servicios Públicos Domiciliarios (Superintendent of Public Services) in integral auditing to EPM (Medellín Public Services Utility) management of energy and gas services.

- ECONOMETRÍA S.S. - Technical Advisory (October 2002 - March 2003)

Technical Advisory to Unidad de Planeación Minero Energética to incorporate international electrical interconnections into the Colombian electrical planning carried by UPME, (including use of SUPEROLADE, MPODE, NEPLAN and REAL models).

- ECOENERGIA S.S. ESP - Founding Member and Manager

Management of private projects of generation, distribution and commercialization of power.

- UNIDAD DE PLANEACIÓN MINERO ENERGÉTICA – UPME (October 1996 - October 1997)

Elaboration of Catalog of Generation Projects for National Energy Plan.

- AUDITORES ENERGÉTICOS - AENE LTDA (October 1994 - March 1995)

Advisory to the company in the application of the new regulatory scheme of Colombian electrical sector to private and public entrepreneurial management through the following studies:

- CORELCA: Determination of marginal costs and development of innovative rate structures for power generation companies and big industrial customers, October 1994 - March 1995.
- CORELCA: Development and application of rate models to prepare proposal on power sale in the wholesale market, July 1995 - September 1995.
- Empresa de Energía de Cundinamarca - EEC: Advisory in convoking and long-term power contracting, July 1995 - September 1995.
- Instituto Nacional de Ciencias Nucleares y Energías Alternativas - INEA: Development of tutorial model for financial assessment of energy projects in the industry, April 1995 - September 1995.
- Consorcio Nacional de Energía CNE : Consortium Management. Elaboration of studies on power commercialization in Colombia and competitive strategies. Interpretation and application of the Code of Commerce, Code of Networks and other power regulatory standards - commercial activity in Colombia, October 1995 - March 1996.
- EMPRESA DE ENERGIA DE BOGOTÁ – EEB (1978 – 1994)

Positions:

- Chief of the Department of generation planning, interconnection and sub-transmission, 1978 - 1979.
- Chief of Electric Planning Division, 1979 - 1986.
- Assistant for Technical Sub-management, 1986 - 1987
- Chief of Special Projects Division, 1987
- Chief of expansion and Development Division, 1987 - 1994
- Management Advisor, 1994
- INTERCONEXIÓN ELÉCTRICA S.A - ISA (1976 – 1978)

Engineer Specialist in electric planning Research and development of models for planning and operation of electric systems.

National Coordinator of Colombian electric system planning in the project "Study of Electric Power Sector (Estudio del Sector de Energía Eléctrica), ESEE" winner of the National Award of Engineering.

Technical Expert

1. Validation of Thuan Nhien Phong Wind Farm
2. Validation of Phuong Mai 3 Wind Power Project
3. Validation of Fossil Fuel replacement by Biomass in the Brick Manufacturing Industry (Group 1)
4. Validation of CTR Rosario Landfill Gas Project
5. Validation of SHP Itaguacu CDM Project (JUN 1146), Brazil
6. Validation of Palmaceite Wastewater Treatment and Biogas Utilization Project
7. Validation of Agua Fresca Multipurpose and Environmental Services
8. Validation of CTR Feira de Santana Landfill Gas Project
9. Validation of SHP Morro Azul CDM Project (JUN1164)

10. Validation of Biogas recovery and heat generation from Palm Oil Mill Effluent (POME), Coopeagropal.
11. Validation of EPM Grouped Natural Gas Project
12. Validation of Caruquia 9.76 MW hydroelectric project
13. Validation of Cervecería Hondureña Methane Capture Project
14. Validation of El Bote Small Hydroelectric Plant project
15. Validation of Guanaquitas 9.74 MW hydroelectric project
16. Validation of Rio Amoyá Run-of-River Hydro Project
17. Validation of Fuel Switching through change of furnaces at Imusa S.A.
18. Validation of Installation of a high-pressure/high-efficiency bagasse boiler to cogenerate heat and power
19. Validation of Macano Small Hydro Power Plant
20. Validation of Cueva Maria Hydroelectric Expansion Project
21. Validation of La Vegona Hydroelectric project
22. Validation of Chamelecón 280 Hydroelectric project
23. Validation of Pardos Small Hydro Plant and LOGICarbon CDM Project
24. Validation of Cambará and Embaúba SHPs and LOGICarbon CDM Project
25. Validation of Bonyic hydroelectric project
26. Validation of Tunjita Diversion Hydroelectric Project
27. Validation of METALDOM Fossil fuel switch from reheat furnace.
28. Validation of Providencia Sugar Mill Cogeneration Project
29. Validation of Toachi – Pilaton Hydroelectric Project
30. Validation of El Toqui wind power project
31. Validation of Paramonga Bagasse Boiler Project
32. Validation of Ferreira Gomes Hydro Power Plant Cdm Project Activity
33. Validation of Providencia I: 1.8MW Small Hydro Power Generation Plant
34. Validation of Providencia III: 9.11MW Small Hydro Power Generation Plant
35. Validation of Marañon Hydroelectric Project
36. Validation of Ventana, Suba and Usaquén Hydroelectric CDM Bundled
37. Validation of EMGEA Small Hydropower (SHP) Run-of-the-River CDM Project Bundle
38. Validation of Inversiones Hondurenas Cogeneration Project
39. Validation of Panuco Bagasse Cogeneration Project
40. Validation of Pequi and Sucupira SHPs and LOGICarbon CDM Project
41. Validation of Santa Rita Hydroelectric Plant
42. Validation of Tres Valles Cogeneration Project
43. Validation of La Calera Biodigesters Project
44. Verification of Agua Fresca Multipurpose and Environmental Services
45. Verification of La Cascada 2.3 MW Hydroelectric Project
46. Verification of La Venta II
47. Verification of RIMA Fuel Switch in Bocaiúva
48. Verification of Agua Fresca Multipurpose and Environmental Services
49. Verification of Biogas Project, Olmeca III, Tecun Uman
50. Verification of Jepirachi Wind Power Project
51. Verification of A joint venture project of cogeneration of electricity and hot water using natural gas and biogas produced from on-site wastewater biodigesters
52. Verification of Santa Ana Hydroelectric Plant
53. Verification of Los Algarrobos hydroelectric project
54. Verification of La Joya Hidroelectric project
55. Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-
56. Verification of Agua Fresca Multipurpose and Environmental Services
57. Verification of La Joya Hidroelectric project
58. Verification of Biogas energy plant from palm oil mill effluent
59. Verification of Incauca S. A. Fuel Switch from Coal to Green Harvest Residues CDM Project
60. Verification of Cervecería Hondureña Methane Capture Project
61. Verification of Inversiones Hondurenas Cogeneration Project

62. Verification of La Venta II

CRISTIAN GRISALES
Technical Reviewer**Education:**

Master Executive in Renewable Energies
EOI-Madrid, Spain
February 2015

Certified ISO 14001
ICONTEC
May 2013

Certified ISO 9001
ICONTEC
August 2012

Electrical Engineer
National University of Colombia
Bogotá – Colombia
July 2009

Professional Background:

Professional of Climate Change
ICONTEC
May 2012 - Today

Professional on developing validation and verification on CDM projects as lead auditor and as technical expert in the energy sector.

Electrical Maintenance Engineer
EMGESA S.A ESP. Colombia
November 2009 - May 2012

Electrical maintenance engineer in the Bogotá River Hydroelectric plants. Executing preventive, predictive and corrective maintenance of the generators, auxiliary services, power transformers and electrical substation. Developed the investment projects' inventory in accordance with the annual operating budget. Implementation of RCM maintenance programs. Monthly service availability in the plant, and full-time availability in failure care. Electrical testing of generators, transformers, motors and substation equipment.

Employment link with the institute has been since 2012 and change in 2015 to external professional.

CDM Experience**Auditor and Specialist:**

- Validation of Biogas Project, Olmeca I, Santa Rosa, Guatemala
- Validation of CGR Catanduva Landfill Gas Project, Brazil
- Validation of Macaubas Landfill Gas Project, Brazil
- Validation of Taurichuco Hydropower Project, Perú
- Validation of Teresina Landfill Gas Project, Brazil
- Validation of Maceio Landfill Gas Project, Brazil
- Verification of Amaime Minor Hydroelectric Power Plant, Colombia
- Validation of Doña Teresa Small Hydro Power Plant, Colombia

- Verification of the Ciudad Juarez Landfill Gas Project, Mexico
- Verification and Renewal of the Crediting Period of LaGeo Geothermal Project, Salvador
- Verification of Santa Ana Hydro Power Project, Colombia.
- Validation of SHPS Tambaú, Das Pedras and Rio Do Sapo Cdm Project (JUN1132), Brazil
- Validation of SHPs Poço Fundo and Providência CDM Project (JUN1133), Brazil
- Verification of Conversion of Open Cycle Gas Turbines to Combined Cycle at Kallpa Thermoelectric Power Plant
- Verification of Biogas project, Olmeca III, Tecún Uman
- Verification of DOÑA JUANA LANDFILL GAS-TO-ENERGY PROJECT
- Verification of Combined Cycle at Loma de la Lata Thermo Unit Project, Argentina.
- Validation Cururos Wind Farm Project
- Validation Rio Amoya Run River Hydro Project
-

Technical Reviewer:

- Validation of Thuan Nien Phong Wind Farm, Vietnam
- Validation of Phuong Mai 3 Wind Power Project, Viet Nam
- Validation of Chamelecón 280 Hydroelectric project, Honduras
- Validation of Providencia I: 1.8MW Small Hydro Power Generation Plant, Colombia
- Validation of Providencia III: 9.11MW Small Hydro Power Generation Plant, Colombia
- Validation of SHP Itaguacu CDM Project (JUN 1146), Brazil, Brazil
- Renewal of Aguafresca Multipurpose and Environmental Service Project, Colombia
- Validation of Feira de Santana Landfill Gas Project, Brazil
- Validation of SHP Morro Azul CDM Project (JUN1164), Colombia
- Verification of Santa Ana Hydroelectric Plant, Colombia
- Verification of Methane recovery and effective use of power generation project Norte III-B Landfill, Argentina
- Verification of DOÑA JUANA LANDFILL GAS-TO-ENERGY PROJECT, Colombia
- Validation of Suba and Usaquen hydroelectric CDM umbrella project, Colombia
- VCS Validation of Hydroelectric Project Ituango, Colombia
- Verification of La Venta II Wind Power Project, México
- Validation of Panuco Bagasse Cogeneration Project, Brazil
- GS Validation of BK ENERGIA ITACOATIARA PROJECT, Brazil
- Verification of MIO Cali, Colombia
- VCS Validation of HYDROELECTRIC PROJECT EL EDÉN, Colombia
- Verification of Biogas energy plant from palm oil mill effluent, Guatemala
- Verification of Agua Fresca Multipurpose and environmental services project, Colombia
- GS Validation of PARAMONGA BAGASSE BOILER PROJECT, Brazil
- Renewal of Crediting Period Poechos II hydroelectric plant project
- Renewal of Crediting Period Xacbal Hydroelectric Project
- Renewal of Crediting Period Queluz Renewable Energy Project
- Verification La Vuelta and La Herradura Hydroelectric Project
- Verification Orosí
- Validation VCS PUBLIC LIGHTING SERVICE IN THE MUNICIPALITY OF SAN SALVADOR delta
- Validation VCS ESCUELA DE MINAS
- Validation VCS Larimar Wind Farm Project
- Verification La Vuelta and La Herradura Hydroelectric Project

- Verification DOÑA JUANA LANDFILL GAS-TO-ENERGY PROJECT
- Verification Sogamoso Hydroelectric Project
- Validation Poechos I Project
- Verification Agua fresca multipurpose and environmental services project

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	Empresas Publicas de Medellin E.S.P	Approved Project Design Document (PDD)	version 9, dated on dated 03/10/2013	UNFCCC web page
2	Empresas Publicas de Medellin E.S.P.	Monitoring Report for 3 rd period (01/01/2018 – 30/01/2018) Jepirachi Wind Power Project	version 02.0, dated on July 30 th /2019 Version 03.0, dated on September 12 th /2019	Empresas Publicas de Medellin E.S.P.
3	Empresas Publicas de Medellin E.S.P.	Emission reduction calculation file	2018 Jan 1 - 30 Jepirachi monitoring ER v2.xlsx	Empresas Publicas de Medellin E.S.P.
4	Earthood Services Private Limited DOE	Previous validation report	dated on 11/04/2019	UNFCCC web page
5	LRQA DOE	Previous verification report for 2 nd periodic verification (01/01/2013 to 31/12/2017 (both days included)	version 5 dated on 22/04/2019	UNFCCC web page
6	Calibration and testing laboratory for energy and gas measurement equipment 2017 Empresas Publicas de Medellin E.S.P.	Calibration certificate No. 20666046 -6-2, Calibration certificate No. 20666046 -1-2, Calibration certificate No. 20666046-2-2 Calibration certificate No. 20666046-3-2, Calibration certificate No. 20666046-4-2, Calibration certificate No.20666046-5-2,	Dated on 20/12/2017 Dated on 19/12/2017 Dated on 19/12/2017 Dated on 18/12/2017 Dated on 21/12/2017 Dated on 20/12/2017	Empresas Publicas de Medellin E.S.P.
7	Calibration and testing laboratory for energy and gas	Calibration certificate No. 20993354-6-2. Calibration certificate No. 20993354-1-2, Calibration certificate No. 20993354-2-2, Calibration certificate	Dated on 03/12/2018 Dated on 04/12/2018 Dated on 04/12/2018 Dated on	Empresas Publicas de

	measurement equipment 2018, Empresas Publicas de Medellin E.S.P.	No.20993354-3-2,	04/12/2018	Medellín E.S.P.
		Calibration certificate No. 20993354-4-2	Dated on 03/12/2018	
		Calibration certificate No.20993354-5-2	Dated on 03/12/2018	
8	EPM laboratory accreditation by ONAC	Accreditation No. L3704	Issued on 2016-01-18	Empresas Publicas de Medellin E.S.P.
/UN1/	UNFCCC	Approved consolidated baseline methodology for grid-connected electricity generation from renewable sources, version 12.1.0		UNFCCC web page
/UN2/	UNFCCC	CDM validation and verification standard for project activities, version 02.0		UNFCCC web page
/UN3/	UNFCCC	CDM project standard for project activities, version 02.0		UNFCCC web page
/UN4/	UNFCCC	CDM project cycle procedure for project activities, version 02.0		UNFCCC web page
/UN5/	UNFCCC	Guideline on the application of materiality in verifications, version 02.0		UNFCCC web page
/UN6/	UNFCCC	Monitoring report form, version 07.0		UNFCCC web page

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verifications

FAR ID	xx	Section no.	Date: DD/MM/YYYY
Description of FAR			
N/A			
Project participant response			Date: DD/MM/YYYY
Documentation provided by project participant			
DOE assessment			Date: DD/MM/YYYY

Table 2. CL from this verification

CL ID	1	Section no.	Date: 04/09/2019
Description of CL			
In Section B.1 Description of implemented project activity			
It should be explained how “real availability” is defined and how figures shown are obtained.			
Project participant response			Date: 12/09/2019
The definition of “real availability” as well as the explanation about how those figures were obtained, are included in section B.1 Description of implemented project activity, in MR version 03.0, according to the information given by the personnel responsible for the power plants operation and maintenance.			
Documentation provided by project participant			

2018 MR Jepirachi Jan31-Dec31 v3	
DOE assessment	Date: 04/10/2019
The "real availability" and how the figures shown were used were suitably explained and defined. Closed.	

CL ID	2	Section no.	Date: Date: 04/09/2019
Description of CL			
In Section C Description of monitoring system			
In Figure 3. Jepirachi Electricity Generation Scheme, the main monitoring points: #1 Transformador Jepirachi 1(A) & (B), #2 Puerto Bolívar and #3 Puerto Cuestecitas are to be indicated.			
Project participant response			Project participant response
The paragraph below “electricity generation” subtitle (“ <i>The following diagram (Figure 3) shows how the project is connected to the national power grid, as well as the main monitoring measurement points: #1 Transformador Jepirachi 1(A) & (B), #2 Puerto Bolívar and #3 Puerto Cuestecitas. It</i> ”) is replaced just by:			
The following scheme (Figure 3) shows the power plant, the substation and the metering points.			
Documentation provided by project participant			
2018 MR Jepirachi Jan31-Dec31 v3			
DOE assessment			Date: 04/10/2019
Correction was suitably made. Closed.			

Table 3. CAR from this verification

CAR ID	xx	Section no.		Date: DD/MM/YYYY
Description of CAR				
N/A				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY

Table 4. FAR from this verification

FAR ID	xx	Section No.		Date: DD/MM/YYYY
Description of FAR				
N/A				
Project participant response				Date: DD/MM/YYYY
Documentation provided by project participant				
DOE assessment				Date: DD/MM/YYYY