




**Validation report form for renewal of crediting period 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	Los Cocos II Wind Farm Project UNFCCC #: 7100
Number and duration of the next crediting period	2 nd crediting period 23/01/2020 – 22/01/2027
Version number of the validation report	1
Completion date of the validation report	27/07/2020
Version number of PDD to which this report applies	09
Project participants	Empresa Generadora de Electricidad HAINA (EGE HAINA)
Host Party	Dominican Republic
Applied methodologies and standardized baselines	ACM0002 - Grid-connected electricity generation from renewable sources (version 20.0)
Mandatory sectoral scopes	1 : Energy industries (renewable - / non-renewable sources)
Conditional sectoral scopes, if applicable	N/A
Estimated amount of annual average GHG emission reductions or GHG removals by sinks in the next crediting period	99,490 tCO ₂ e
Name and UNFCCC reference number of the DOE	Earthood Services Private Limited UNFCCC Ref. Number: E-0066
Name, position and signature of the approver of the validation report	 Dr. Kaviraj Singh Managing Director

SECTION A. Executive summary

Brief summary of the project activity

The project activity consists the installation and operation of a windfarm called Los Cocos II, constituted by 26 wind turbines with 2.0 MW each totalizing 52 MW of installed capacity. The wind farm is located in Juancho and Los Cocos towns, in south-western province of Pandemales, in Dominican Republic. The geographical coordinates of the wind turbines are (UTM):

WT	Easting (m)	Northing (m)	WT	Easting (m)	Northing (m)
1	257951	1978318	14	259416	1977586
2	257837	1978475	15	259300	1977741
3	258720	1978516	16	259185	1977897
4	260856	1978343	17	259068	1978053
5	260740	1978493	18	258952	1978208
6	260623	1978645	19	258858	1977062
7	260497	1978808	20	258744	1977219
8	258836	1978364	21	258630	1977376
9	260152	1977943	22	258516	1977533
10	260040	1978097	23	258401	1977690
11	259926	1978254	24	258289	1977850
12	259810	1978414	25	258173	1978002
13	259532*	1977431*	26	258058	1978159

The plant is connected to the Dominican National Interconnected System (SENI) by 138 kV Substation of Commercial Measurement System. This Substation also connects the wind farms Quilvio Cabrera and Los Cocos I Wind Farm. Therefore, the net electricity dispatched to the grid by the project activity is prorated based on individual measurement of each Wind Farm carried out by intermediate Substations. The measurement is dully detailed in the PDD section B.6.2 and assessed in this report, section D.4.

The project activity reduces the GHG emissions through dispatching GHG-free electricity to the Dominican National Interconnected System.

Technical description and equipment:

Turbines:

Wind Farm	WT Model	Quantity	Total Capacity
Los Cocos II Wind Farm	G90	3	3 x 2.0 MW = 6 MW
	G97	23	23 x 2.0 MW = 46 MW
Total	G90 + G97	26	Total = 52MW

The lifetime of the main equipment is 20 years as per evidence provided^{/13/}.

The estimated ERs of the project activity is 99,490 tCO₂e/y and 696,427 tCO₂e for the entire crediting period.

Scope of validation

Empresa Generadora de Electricidad HAINA (EGE HAINA) has contracted ESPL to conduct the validation of the renewal of the crediting period of the project activity "Los Cocos II Wind Farm Project".

The scope of the validation is to establish that:

- the PA is in accordance with all relevant CDM rules and requirements;
- the PA is in accordance with conditions of the latest version of applied methodology ACM0002: Grid connected electricity generation from renewable sources --- Version 20.0;

- the validation of the renewal of crediting period is in accordance with requirements of CDM methodological tool “TOOL11 – Assessment of the validity of the original / current baseline and update of the baseline at the renewal of the crediting period” – version 03.0.1.

Validation process

The validation process involved the following:

- Contract with EGE HAINA for the scope of validation of the renewal of the crediting period of the project activity;
- desk review;
- physical on-site inspection (not applied for this renewal process in accordance with VVS v.02.0 para 31. Instead, other auditing techniques were applied (alternative means) as detailed in section C.2);
- issuance of validation findings;
- reporting, calculation checks, QA/QC and resolution of findings;
- issuance of draft validation report;
- independent technical review of the project documentation;
- issuance of the final validation report;
- submission of the request for renewal, as appropriate.

Conclusion

ESPL has performed the validation of the renewal of the crediting period of the CDM PA “Los Cocos II Wind Farm Project” (UNFCCC Ref. Number: 7100) for the 2nd crediting period.

The validation team has confirmed that it is in accordance with all relevant CDM rules and requirements and conditions of the latest version of applied methodology ACM0002 – version 20.0. In addition, it was confirmed that the monitoring system is feasible and the estimated emission reductions are conservatively calculated.

The PA is expected to generate an annual average of 99,490 tCO₂e in the second crediting period.

The request for renewal of the crediting period of the PA is being submitted in accordance with the CDM procedures.

SECTION B. Validation team, technical reviewer and approver

B.1. Validation 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	Interview(s)	Validation findings
1.	Team Leader	OR	Sebben	Marcelo	Verifit	Y	N	Y	Y
2.	Local Expert	OR	Lopes	Ricardo	Verifit	Y	N	Y	Y
3.	Methodological Expert	OR	Sebben	Marcelo	Verifit	Y	N	Y	Y
4.	Technical Expert	OR	Sebben	Marcelo	Verifit	Y	N	Y	Y

B.2. Technical reviewer and approver of the validation report for RCP

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Garg	Shreya	Central Office
2.	Technical Expert	IR	Garg	Shreya	Central Office
3.	Approver	IR	Singh	Kaviraj	Central Office

SECTION C. Means of validation**C.1. Desk/document review**

A desk review was conducted by the validation team that included:

- a review of the data and information presented to assess its completeness;
- a review of the registered project activity, the applied methodology including applicable tool(s) and, where applicable, the applied standardized baseline;
- a review of supporting documents.

A complete list of documents/evidences reviewed is included as Appendix 3.

C.2. On-site inspection

Duration of on-site inspection:				
No.	Activity performed on-site	Site location	Date	Team member
-	-	-	-	-

A site visit has not been performed for the validation of the renewal of the crediting period as it is not required, in accordance with CDM validation and verification standard for project activities – version 02.0 – paragraph 31, considering that the estimated annual average of ERs is below 100,000 tCO₂e. Moreover, as this is the validation of renewal of the second crediting period, there is no pre-project information that is relevant to the requirements for registration of the project activity which may not be traceable after the registration.

Due to the proximity of the 100,000 tCO₂e/ year estimated for the 2nd CP, in order to be extra careful, the validation team took into consideration the latest information available from 1st CP. It was taken the average of ERs obtained in the last four years monitored (2014 to 2017). The average was 95,634 tCO₂ per year. Even if we apply the highest EF for this period for all years we will have an amount of 97,657 tCO₂ per year. Thus we conclude that it is unlikely that the real ERs overcome the annual average of 100k CO₂/year. Therefore, the exemption of site visit is in accordance with VVS para 31.

In addition, the PPs have provided evidences to show the facilities and equipment (e.g. pictures, equipment manuals) and Project's consultant have been interviewed and operation personnel have provided all necessary information for a clear and precise understanding of the project activity.

The Validation team conducted the audit process using standard audit techniques as required by VVS for PA, version 02.0 para 29 and in accordance with para 31 of the same standard. These audit techniques have been considered sufficient and credible by the validation team for the purpose of the present validation.

C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Correa	Juliana	MGM Innova	07/05/2020	- General aspects - CDM aspects - EF calculation - ER calculation - Operation of wind farms	Marcelo Sebben
2.	Rosso	Faydern	EGE Haina	07/05/2020	- Operation of wind farm	Marcelo Sebben

C.4. Sampling approach

Not applicable as no sampling has been used during the validation.

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

Area of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	CL 01		
Application and selection of methodologies and standardized baselines			
Validity of original baseline or its update			
Estimated emission reductions or net anthropogenic removals	CL 02	CAR 01	
Validity of monitoring plan			
Crediting period			
Project participants			
Post-registration changes			
Others (issues from previous validation/verification)			
Total	2	1	

SECTION D. Validation findings**D.1. Compliance with PDD form**

Means of validation	The PDD was crosschecked with the CDM-PDD-FORM template available at the UNFCCC website and with the instructions for filling it out. Nevertheless, some issues have been found
Findings	CL 01 <i>Appendix 7: as per instructions for completing the PDD, provide the history of all post-registration changes to the project activity that have been approved by the Board after its registration, its approval reference number and date of approval.</i>
Conclusion	The latest version of the PDD template (CDM-PDD-FORM – version 11.0) available at the UNFCCC website has been used. The issues found were all addressed. It has been filled out in accordance with the instructions.

D.2. Application and selection of methodologies and standardized baselines

Means of validation	The PA applies approved methodology ACM0002 - Grid-connected electricity generation from renewable sources --- Version 20.0, which is latest one available at UNFCCC website.	
	All applicability conditions of the applied methodology and applied tools are met:	
	Applicability Criteria – ACM0002 – v. 20.0	Assessment
	a) Install a Greenfield power plant; b) Involve a capacity addition to (an) existing plant(s); c) Involve a retrofit of (an) existing operating plants/units; d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or e) Involve a replacement of (an) existing plant(s)/unit(s).	The PA complies with the condition (a) as it was a greenfield power plant. It has been evidenced through prior verification process ^{/06/} , which was conducted and approved by EB and operational permit ^{/16/} which helps the validation team to conclude that the PA corresponds to a greenfield power plant.
The methodology is applicable under the following conditions: a) The project activity may include renewable energy power plant/unit of one of the following types: hydro power plant/unit with or without reservoir, wind power plant/unit , geothermal power plant/unit,	The PA complies with the condition (a) as it is composed by one wind power plant. It has been evidenced through operational permit ^{/16/} and pictures ^{/15/} .	

	<p>solar power plant/unit, wave power plant/unit or tidal power plant/unit;</p> <p>b) In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant/unit started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion, retrofit, or rehabilitation of the plant/unit has been undertaken between the start of this minimum historical reference period and the implementation of the project activity.</p>	
	<p>In case of hydro power plants, one of the following conditions shall apply:</p> <p>a) The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or</p> <p>b) The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (3), is greater than 4 W/m²; or</p> <p>c) The project activity results in new single or multiple reservoirs and the power density, calculated using equation (3), is greater than 4 W/m² ; or</p> <p>d) The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (3), is lower than or equal to 4 W/m² ,</p>	Not applied for this PA as it corresponds to wind power plant as evidenced through operational permit ^{16/}
	<p>In the case of integrated hydro power projects, project proponent shall</p> <p>a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or:</p> <p>b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore,</p>	Not applicable, as the PA is not an integrated hydro power project, as evidenced through operational permit ^{16/}

	<p>this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum five years prior to implementation of CDM project activity.</p>						
	<p>The methodology is not applicable to:</p> <p>a) Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site;</p> <p>b) Biomass fired power plants/units.</p>	<p>Not applied for this PA as it corresponds to wind power plant, as evidenced through operational permit^{16/}</p>					
	<p>In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is “the continuation of the current situation, that is to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance”</p>	<p>The PA is not a project with capacity addition, retrofit, replacement or rehabilitation as evidenced by operational permit^{16/}.</p>					
	<p>The applicability conditions of all tools are also met as follows</p>						
	<table><tr><th>Applicability Criteria – TOOL 01</th><th>Assessment</th></tr><tr><td><p>This tool provides for a step-wise approach to demonstrate and assess additionality.</p></td><td><p>The assessment of additionality is not required when renewing the Crediting period. Thus the applicable version of the additionality tool (TOOL01) remains as per valid version of PDD for the 1st CP (TOOL01 version 06.0)</p></td></tr></table>	Applicability Criteria – TOOL 01	Assessment	<p>This tool provides for a step-wise approach to demonstrate and assess additionality.</p>	<p>The assessment of additionality is not required when renewing the Crediting period. Thus the applicable version of the additionality tool (TOOL01) remains as per valid version of PDD for the 1st CP (TOOL01 version 06.0)</p>		
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	<table><tr><th>Applicability Criteria – TOOL 07</th><th>Assessment</th></tr><tr><td><p>This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).</p></td><td><p>The project claims baseline emission by substituting the grid electricity by renewable electricity. Thus, this tool is applicable. As evidence, the validation team refers to operational permit^{16/}</p></td></tr><tr><td><p>Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants.</p></td><td><p>Only grid power plants were included. Therefore, this condition is met. All plants applied in the EF calculations were checked in the Dominican Republic Government website^{18/} and it could be concluded that the calculation consisted only in grid-connected power plants</p></td></tr></table>	Applicability Criteria – TOOL 07	Assessment	<p>This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).</p>	<p>The project claims baseline emission by substituting the grid electricity by renewable electricity. Thus, this tool is applicable. As evidence, the validation team refers to operational permit^{16/}</p>	<p>Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants.</p>	<p>Only grid power plants were included. Therefore, this condition is met. All plants applied in the EF calculations were checked in the Dominican Republic Government website^{18/} and it could be concluded that the calculation consisted only in grid-connected power plants</p>
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<p>Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants.</p>	<p>Only grid power plants were included. Therefore, this condition is met. All plants applied in the EF calculations were checked in the Dominican Republic Government website^{18/} and it could be concluded that the calculation consisted only in grid-connected power plants</p>						

	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country	The electricity system is not located partially or totally in the Annex I country.			
	Under this tool, the value applied to the CO2 emission factor of biofuels is zero	CO2 emissoin factor for biofuels are considered equal to zero. Therefore, this condition is met.			
	<table><tr><th>Applicability Criteria – TOOL 11</th><th>Assessment</th></tr><tr><td>This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 49 (a) of the modalities and procedures of the clean development mechanism.</td><td>The tool is duly used for the renewal of Crediting period of this project activity. Therefore this condition is met.</td></tr></table>	Applicability Criteria – TOOL 11	Assessment	This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 49 (a) of the modalities and procedures of the clean development mechanism.	The tool is duly used for the renewal of Crediting period of this project activity. Therefore this condition is met.
Applicability Criteria – TOOL 11	Assessment				
This tool provides a stepwise procedure to assess the continued validity of the baseline and to update the baseline at the renewal of a crediting period, as required by paragraph 49 (a) of the modalities and procedures of the clean development mechanism.	The tool is duly used for the renewal of Crediting period of this project activity. Therefore this condition is met.				
Findings	N/A				
Conclusion	<p>All applicability conditions of the applied methodology and applied tools are met. The latest versions of applied tools have been used:</p> <ul style="list-style-type: none">a. TOOL01: Tool for the demonstration and assessment of additionality”. (Version 6.0.0). Although this is not the latest available version of the tool, the addicionality is not assessed during this renewal process and the applicable version of the additionality tool used in the PDD is version 06.0.0. Thus the version remains unalteredb. TOOL07: Tool to calculate the emission factor for an electricity system (version 7.0);c. TOOL11 – Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period – version 03.0.1. <p>The methodology and tools are from UNFCCC CDM website.</p>				

D.3. Validity of original baseline or its update

Means of validation	<p>The baseline scenario is given by applied methodology ACM0002 – version 20.0: "the baseline scenario is electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in "TOOL07: Tool to calculate the emission factor for an electricity system" (version 7.0).</p> <p>In addition, in accordance with the directives for the renewal of the crediting period of a registered CDM project activity, the validity of the current baseline shall be reassessed using the latest version of the TOOL11 "Tool to assess the validity of the original/ current baseline and to update the baseline at the renewal of a crediting period" (version 03.0.1).</p> <p>The assessment of TOOL11 is made as follows:</p> <p><u>Step 1: Assess the validity of the current baseline for the next crediting period</u></p> <p><i>Step 1.1: Assess compliance of the current baseline with relevant mandatory national and/or sectoral policies:</i></p> <p>The current baseline scenario complies with all relevant mandatory national/sectoral legislation^{21/}. The latest available version of the Electricity Law was issued in 2015, with no influence in the baseline (reference to electricity generated by solid waste and biomass). The compliance with all national legislation can be evidenced through current operational permit^{16/}</p> <p><i>Step 1.2: Assess the impact of circumstances:</i></p> <p>As the baseline scenario identified at the validation of the project activity was the continuation of the current practice without any investment the PP informed that there was no changes in the Market characteristics that affect the Project activity.</p>
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The conditions used to determine the baseline emissions in the previous crediting period are still valid. It was not observed the availability of new fuels or raw materials in the power plants connected to the grid, neither significant variation of prices in the power generation. The PP provided the list of all applicable legislation^{/21/} and further information related to electricity market in Dominican Republic. Based on these information, it was observed that no changes occur since the registration of the PA that affect the baseline of the project activity.

Step 1.3: Assess whether the continuation of use of current baseline equipment(s) or an investment is the most likely scenario for the crediting period for which renewal is requested:

The baseline scenario is not the continuation of use of current baseline equipment. The PA consists in the installation of a greenfield wind power plant where no power plant was installed before. Thus, this step is not applied.

Step 1.4: Assessment of the validity of the data and parameters:

An assessment regarding the update of fixed parameters to the 2nd CP has been made. According to TOOL07, parameter EF_{grid} are to be updated for the 2nd crediting period. Therefore, the parameters that remained fixed for the 2nd CP (related to EF_{bm} calculation) were updated based on the latest information available (2019) in accordance with TOOL07.

The application of Steps 1.1, 1.2, 1.3 and 1.4 above confirmed that the current baseline remains valid for the subsequent crediting period and that fixed parameters were updated in accordance with applied methodology and tools.

Thus, the baseline emissions were updated for the 2nd crediting period and the Step 2 is assessed below:

Step 2: Update the current baseline and the data and parameters

Step 2.1: Update the current baseline:

Although the current baseline is valid, the baseline emissions were updated in accordance using the latest information available for Grid Emission Factor. The following parameters were kept fixed for the CP:

- **NCV_{i,y}** (Net calorific value (energy content) of fossil fuel type *i* in year *y*) this value was used for calculating the EF_{bm} and was based on most recent information from SENI Coordinating Organization (OC) reports which is a government agency (official values). Values are in accordance with requirements of TOOL07 (national values). Values applied for each plant are based on the official reports and can be checked at EF calculation spreadsheet, tab FUEL DATA. The correctness is duly observed in the evidences provided.
- **EF_{CO2,i,y}** and **EF_{CO2,m,i,y}** CO₂ emission factor of fossil fuel type *i* used in power unit *m* in year *y*): values were used for EF_{bm} calculations and were based on IPCC default values at the lower limit of the uncertainty at a 95% confidence interval. Values are in accordance with requirements of TOOL07. The values applied are the following:

Fuel	Value	Unit
Coal	89.5	tCO ₂ /TJ
Natural Gas	54.3	tCO ₂ /TJ
Fuel Oil Nr. 2	72.6	tCO ₂ /TJ
Fuel Oil Nr. 6	75.5	tCO ₂ /TJ
Fuel Oil Nr. 2 / Fuel Oil Nr. 6	73.8	tCO ₂ /TJ

	<ul style="list-style-type: none"> - $EG_{m,y}$, EG_y, and $EG_{n,h}$; (Net electricity generated by power plant/unit m or n (or in the project electricity system in case of EG_y) in year y or hour h): values were used for calculation of EF_{bm} and were based on Official publications from the Coordinating Organization (OC)^{18/} (government agency) and are considered accurate and in accordance with requirements of TOOL07. Values are duly described in the EF_{BM} calculations spreadsheet for each plant. Refer to it for the individual values. Their correctness is duly observed in the evidences provided. - $FC_{i,m,y}$ and $FC_{i,n,h}$: (Amount of fossil fuel type i consumed by power unit m or n in year y or hour h): values were used for calculation of EF_{bm} and were based on Official publications from the Coordinating Organization (OC)^{18/} (government agency) and are considered accurate and in accordance with requirements of TOOL07. Values are duly described in the EF_{BM} calculations spreadsheet Please refer to it. Their correctness is duly observed in the evidences provided. - EF_{BM} (Build Margin CO₂ emission factor for grid connected power generation in year y) value calculated based on TOOL07 which applied the parameters cited above. The value is equal to 0.5106 tCO₂/MWh and will be kept fixed for the whole CP. The parameter was determined accurately and in accordance with TOOL07 requirements. <p>The parameter EF_{CM} will be calculated annually due to the annual calculation of parameter EF_{OM}.</p> <p><i>Step 2.2: Update the data and parameters:</i></p> <p>All fixed parameters required by applied methodology and tools were updated in accordance with the new version of applied methodology and tools.</p>
Findings	N/A
Conclusion	<p>The baseline scenario remains valid for the new crediting period.</p> <p>The baseline scenario is the one given by the applied methodology ACM0002 – v. 20.0.</p> <p>The baseline emissions were updated taking into account the latest available data for calculating the EF_{grid} provided by the Dominican DNA and the parameter $EG_{facility,y}$ which remained unaltered from the validation phase as it was based on long term wind studies.</p> <p>The calculations are in accordance with CDM rules and requirements.</p>

D.4. Estimated emission reductions or net anthropogenic removals

Means of validation	<p>All equations, formulas and assumptions were correctly applied as per the applied methodology (ACM0002) and tools.</p> <p>The baseline emissions are calculated by the multiplication of the electricity supplied by the project activity to the grid by the combined margin of CO₂ emission factor as follows:</p> $BE_y = EF_{grid,CM,y} \times EG_{PJ,y}$ <p>Where:</p> <p>BE_y = Baseline emissions in the year y</p> <p>$EF_{grid,CM,y}$ = Combined Margin Emission factor of the grid in the year y</p> <p>$EG_{PJ,y}$ = Net electricity of the power plant delivered to grid in the year y (hourly value aggregated for each year)</p> <p>For the determination of parameter $EG_{PJ,y}$ the following apply:</p> <p>The electricity meters (TR01, TR02, TR03 and TR04) that measure the Electricity that is dispatched to the grid also measure the electricity dispatched by two other power plants; Los Cocos I Wind Farm and Quilvio Cabrera Wind Farm. Thus, the</p>
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parameter $EG_{PJ,y}$ is calculated based on prorating the total electricity generated by each power plant which is measured by individual electricity meters at intermediary substations. The ratio is done as following:

$$EG_{PJ,h} = EG_{SMC,h} \times K_{LC II,h}$$

Where,

$EG_{SMC,h}$ = Quantity of net electricity supplied to the grid at Commercial Measurement System (SMC) by Los Cocos I Wind Farm, Los Cocos II Wind Farm and Quilvio Cabrera Wind Farm in hour h (MWh/h).

$K_{LC II,h}$ = Proportion of the electricity generated by Los Cocos II Wind Farm in hour h (ad), taking into account transformation losses to be able to handle similar voltage levels (From 34.5 kV to 138 kV- network delivery point $EG_{SMC,h}$). Therefore, in order to determine the parameter $K_{LC,h}$ through the formula below, the parameters $EG_{(LCI), L2+L3,h}$, $EG_{(QC),L1,h}$ and $EG_{(LCII), L5+L6+L8+L9,h}$ have to apply the transformation losses mentioned below.

$$K_{LC II,h} = \frac{(EG_{(LCII),L5+L6+L8+L9,h})}{(EG_{(QC),L1,h} + EG_{(LCI),L2+L3,h} + EG_{(LCII),L5+L6+L8+L9,h})}$$

$EG_{(LCII), L5+L6+L8+L9,h}$ = Quantity of net electricity generated by Los Cocos II Wind Farm measured at the 34.5 kV line, representing the generation sum of lines L5, L6, L8 and L9 in hour h (MWh/h). Since the electricity measurement is calculated by means of measurements at 138kV ($EG_{SMC,h}$) transformation losses at the delivery point for electricity generation 138/34.5 kV substation are taken into account, applying the following transformation losses equation to Los Cocos II generation data ($EG_{(LCII), L5+L6+L8+L9,h}$)

$$E(h)_{138\text{ kV}}|LCII = E(h)_{34.5\text{ kV}}|LCII - [53.22 + 0.003988 \times E(h)_{34.5\text{ kV}}|LCII]$$

$EG_{(LCI), L2+L3,h}$ = Quantity of net electricity generated by Los Cocos I Wind Farm, measured by intermediary substation. Since the electricity measurement is calculated by means of measurements at 138kV ($EG_{SMC,h}$) transformation losses at the delivery point for electricity generation 138/34.5 kV substation are taken into account, applying the following transformation losses equation to Los Cocos I generation data ($EG_{(LCI), L2+L3,h}$).

$$E(h)_{138\text{ kV}}|LCI = E(h)_{34.5\text{ kV}}|LCI - [25.59 + 0.003988 \times E(h)_{34.5\text{ kV}}|LCI]$$

$EG_{(QC),L1,h}$ = Quantity of net electricity generated by Quilvio Cabrera Wind Farm measured at the 34.5 kV line, line L1 in hour h (MWh/h). Since the electricity measurement is calculated by means of measurements at 138kV ($EG_{SMC,h}$) transformation losses at the delivery point for electricity generation 138/34.5 kV substation are taken into account, applying the following transformation losses equation to Quilvio Cabrera generation data ($EG_{(QC),L1,h}$).

$$E(h)_{138\text{ kV}}|QC = E(h)_{34.5\text{ kV}}|QC - [8.44 + 0.003988 \times E(h)_{34.5\text{ kV}}|QC]$$

Calculation of Emission Factor:

The emission factor is calculated using "Tool to calculate the emission factor for an electricity system", which uses the following step by step approach to calculate emission factor of the grid for this project:

- STEP 1. Identify the relevant electricity systems: SENI which is the Dominican Republic electricity grid has been identified, in accordance with paragraph 17 of applied TOOL07, option 1.

- STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional): only grid plants were considered as per paragraph 29 of TOOL07
- STEP 3. Select a method to determine the operating margin (OM). The PP has chosen option c) of paragraph 38 of TOOL 07 – Dispatch data analysis OM. This option was chosen as hourly data from each power plant on power generation and fuel type and fuel consumption will be available. For the estimated value during the renewal phase, the latest full year has been taken into account (2019). Nevertheless, during the monitoring, the factor will be determined for each hour which electricity is displaced by the project activity as required by TOOL07 paragraph 63. Therefore, the monitoring of this parameter will be ex-post, as per TOOL07 paragraph . The option chosen is in accordance with TOOL07 based on the available data during the monitoring period.
- STEP 4. Calculate the operating margin emission factor according to the selected method. The EFom was calculated as follows (para 64 of TOOL07):

$$EF_{grid,OM-DD,y} = \frac{\sum h EG_{PJ,h} * EF_{EL,DD,h}}{EG_{PJ,y}}$$

Where:

$EF_{grid,OM-DD,y}$ = Dispatch data analysis operating margin CO₂ emission factor in year y (tCO₂/MWh)

$EG_{PJ,h}$ = Electricity displaced by the project activity in hour h of year y (MWh)

$EF_{EL,DD,h}$ = CO₂ emission factor for grid power units in the top of the dispatch order in hour h in year y (tCO₂/MWh)

$EG_{PJ,y}$ = Total electricity displaced by the project activity in year y (MWh)

h = Hours in year y in which the project activity is displacing grid electricity

y = Year in which the project activity is displacing grid electricity

And for the calculation of $EF_{EL,DD,h}$, the following will be applied (Option A.1 of paragraph 49 of TOOL07):

$$EF_{EF,DD,h} = \frac{\sum_{i,n} FC_{i,n,h} \times NCV_{i,y} \times EF_{CO2,i,y}}{\sum_n EG_{n,h}}$$

Where:

$EF_{EL-DD,h}$ = CO₂ emission factor for grid power units in the top of the dispatch order in hour h in year y (tCO₂/MWh)

$FC_{i,n,h}$ = Amount of fuel type i consumed by grid power unit n in hour h (Mass or volume unit)

$NCV_{i,y}$ = Net calorific value (energy content) of fuel type i in year y (GJ/mass or volume unit)

$EF_{CO2,i,y}$ = CO₂ emission factor of fuel type i in year y (t CO₂/GJ)

$EG_{n,h}$ = Electricity generated and delivered to the grid by grid power unit n in hour h (MWh)

n = Grid Power units in the top of the dispatch.
At each hour, h , stack each grid power unit's electricity generation using the merit order. The group of grid power units n in the dispatch margin includes the units in the top $x\%$ of total electricity dispatched by the hour h , where $x\%$ is equal to the greater of either:
(a) 10%; or
(b) The quantity of electricity displaced by the project activity during hour h divided by the total electricity generation in the grid power plants during that hour h .

i = Fuel types combusted in grid power unit n in year y

	<p>h = Hours in year y in which the project activity is displacing grid electricity</p> <p>y = Year in which the project activity is displacing electricity</p> <p>As stated above, the dispatch data is consistent for the determination of the EF_{om} as per TOOL07, as hourly data is available^{/18/}. During this renewal phase, hourly data has been used for the whole year of 2019 as it was the latest year available. Nevertheless, the calculation will be carried out ex-post as per TOOL07 requirements. The options taken by the PP to determine the EF_{om} and the EF_{EF-DD,h} are appropriate.</p> <ul style="list-style-type: none"> STEP 5. Calculate the build margin emission factor. <p>The parameter EF_{BM} was calculated for the renewal process using the latest available data (2019) and will remain fixed for the crediting period (option 1 of paragraph 72 of TOOL07). The following formula was applied:</p> $EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$ <p>Where</p> <p>EF_{grid,BM,y} = Build margin CO₂ emission factor in year y (tCO₂/MWh)</p> <p>EG_{m,y} = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)</p> <p>EF_{EL,m,y} = CO₂ emission factor of power unit m in year y (tCO₂/MWh)</p> <p>m = Power units included in the build margin</p> <p>y = Most recent historical year for which power generation data is available.</p> <p>The EF_{BM} has been calculated in accordance with TOOL 07 paragraph 75: the Stepwise approach can be duly checked at calculation spreadsheet tab BM. The data presented regarding the start date of each plant and the yearly generation (2019) were duly checked in the evidences provided^{/18/} and are considered correct and accurate by the Validation team. The EF_{bm} calculation was carried out in accordance with TOOL07.</p> <ul style="list-style-type: none"> STEP 6. Calculate the combined margin (CM) emissions factor. <p>The Combined margin emission factor of the grid (EF_{grid,CM,y}) was calculated as follows (using weighted average approach):</p> $EF_{grid,CM,y} = EF_{OM} \times w_{OM} + EF_{BM} \times w_{BM}$ <p>The values of w_{om} and w_{bm} are determined by the TOOL07 for the 2nd crediting period and are equal to 0.75 and 0.25 respectively as per paragraph 86 of TOOL07, considering this project refers to a wind power plant. Therefore, the data is consistent with TOOL requirements.</p> <p>As the plants connected to the SMC substation are not clear in the PDD, a CL has been raised. Moreover, issues were found in the EF calculations. Refer to CAR 1</p>
Findings	<p>CL 02</p> <p><i>As per diagram presented in section B.3, the power plant Larimar also dispatch its electricity through the four meters from SMC (TR1 to TR4). However it is explained in the same section that these meters only measure the power plants Los Cocos I, Los Cocos II and Quilvio Cabrera. It is not clear, though, how the four meters mentioned above, do not consider the electricity generated by Larimar.</i></p> <p>CAR 01</p> <p>EF calculation spreadsheet</p> <ol style="list-style-type: none"> 1. Tab dispatch analysis column K: as per TOOL07, para 69 "At each hour h, stack each grid power unit's electricity generation using the merit order".

	<p>However in the calculations, the merit order has been applied from the latest to the first power unit dispatched, which is not in accordance with TOOL requirements.</p> <p>2. When carrying out the determination of the % of plants that are in the top of the dispatch, not electricity from all grid power units are being taken into account, unlike required by TOOL07 para 69.</p>
Conclusion	<p>The methodology and tools were correctly applied in order to calculate the estimates of emission reductions, with reliable and conservative parameters.</p> <p>For this period, the parameter EF_{OM} will be determined ex-post and the parameter EF_{BM} will be determined ex-ante as required by TOOL07.</p> <p>Considering that the plant consist in a wind power plant, the project emissions were not taken into account.</p> <p>The EF_{OM} and the EF_{BM} were determined based on the latest available data (2019) provided by the Dominican DNA for the ex-ante calculations.</p> <p>The parameters used to calculate the emission reductions are conservative, traceable and from official, public or reliable sources.</p> <p>All findings were duly closed and explanations were considered sufficient for detailing the monitoring of parameter $EG_{facility}$.</p> <p>The parameters are in accordance with applied methodology and tools.</p>

D.5. Validity of monitoring plan

Means of validation	<p>The PDD sets a monitoring plan, which is feasible and in accordance with the applied methodology and tools.</p> <p>The management structure and roles and responsibilities are established for data collection, calibration frequency of meters, data report and data archiving.</p> <p>Moreover, there are procedures set for crosschecking the monitored data.</p> <p>No sampling plan is set to monitor the parameter.</p> <p>The management structure and roles and responsibilities are set for data collection, calibration frequency of monitoring equipment, data report and data archiving. In addition, procedures for quality assurance and quality control are be set, as well as specific training for involved personnel.</p> <p>The parameters fixed are listed in section above and the ones to be monitored necessary for the project activity are listed at the PDD section B.7.1, in accordance with the applied methodology and tools.</p>
Findings	N/A
Conclusion	<p>The parameters required for monitoring are contained in the monitoring plan:</p> <ul style="list-style-type: none"> - $EG_{PJ,h}$: Quantity of net electricity generation supplied by the project plant/unit to the grid in hour h. The value applied for the baseline estimations is equal to 17.94 MWh/h which remains fixed from validation phase in the registered PDD^{105/} and it comes from long term wind studies. This value comes from 162,000 MWh x (100% - 2.97%¹) = 157,189 MWh per year divided by 8,760 hours/year = 17.94 MWh/h. - $EG_{SMC,h}$: Quantity of net electricity supplied to the grid at Commercial Measurement System (SMC) point at the 138/34.5kV substation by Los Cocos, Los Cocos II and Quilvio Cabrera Wind Farms in hour h. The parameter was not used for ex-ante calculations but will be used during crediting period for determining the parameter $EG_{PJ,h}$ - $K_{LC II,h}$: Proportion of the electricity generated by Los Cocos II Wind Farm at each hour h. The parameter was not used for ex-ante calculations but will be used during crediting period for determining the parameter $EG_{PJ,h}$ - $EG_{(QC),L1,h}$: Quantity of net electricity generated by Quilvio Cabrera Wind Farm measured at the 34.5 kV line, line L1. The parameter was not used for ex-ante calculations but will be used during crediting period for determining the parameter $EG_{PJ,h}$ - $EG_{(LCI),L2+L3,h}$: Total quantity of net electricity generated by Los Cocos Wind Farm measured at the 34.5 kV line, representing the generation sum of L2 and L3. The parameter was not used for ex-ante calculations but will be used during crediting period for determining the parameter $EG_{PJ,h}$

¹ Medium voltage losses and auxiliary consumption

	<ul style="list-style-type: none"> - EG (LCII), L5+L6+L8+L9,h: Total quantity of net electricity generated by Los Cocos II Wind Farm measured at the 34.5 kV line, adding generation of lines L5 – L6 – L8 and L9. The parameter was not used for ex-ante calculations but will be used during crediting period for determining the parameter EG_{P,J,h} - NCV_{i,y}: Net calorific value (energy content) of fossil fuel type <i>i</i> in year <i>y</i>: the parameters are based on national values or IPCC default values. - EF_{CO2,i,y} and EF_{CO2,m,i,y}: CO₂ emission factor of fossil fuel type <i>i</i> used in power unit <i>m</i> in year <i>y</i>: <i>IPCC default values</i> at the lower limit of the uncertainty at a 95% confidence interval will be applied as national values are not available - EG_{m,y}, EG_y, and EG_{n,h}: Net electricity generated by power plant/unit <i>m</i> or <i>n</i> (or in the project electricity system in case of EG_y) in year <i>y</i> or hour <i>h</i>: values of parameter based on data provided by the official public sources. - FC_{i,m,y} and FC_{i,n,h}: Amount of fossil fuel type <i>i</i> consumed by power unit <i>m</i> or <i>n</i> in year <i>y</i> or hour <i>h</i>: values of parameter based on data provided by the official public sources. - EF_{CM,y}: Combined margin CO₂ emission factor for grid connected power generation in year <i>y</i> calculated using version 7.0 of the “<i>Tool to calculate the emission factor for an electricity system</i>”. – the value applied for the estimations is equal to 0.632930 tCO₂/MWh and are based on calculations using the latest data available provided by official data from Dominican Republic. This value will be monitored ex-post. <p>The monitoring plan of the PA is in accordance with the approved monitoring methodology and the means of monitoring of the parameters contained in the monitoring plan are feasible.</p>
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D.6. Crediting period

Means of validation	The crediting period is 7 years renewable. This is the 2 nd crediting period and its start date is 23/01/2020, which is the first date after the end of the 1 st crediting period and it ends on 22/01/2027.
Findings	-
Conclusion	The 2 nd crediting period is from 23/01/2020 to 22/01/2027– the request for renewal of the crediting period is being done in accordance provisions of PCP paragraph 278 “...Such a submission shall be made no earlier than 270 days prior to, but no later than one year after, the expiry of the crediting period.”, Therefore, the project activity is in accordance with CDM requirements and procedures.

D.7. Project participants

Means of validation	The project participants are: Empresa Generadora de Electricidad HAINA (EGE HAINA) (private and public entity) ²
Findings	N/A
Conclusion	The name of the project participant included in the updated PDD were assessed in accordance with the applicable validation requirements related to the renewal of crediting period. All information is in accordance with UNFCCC website.

D.8. Post-registration changes

Type of post-registration changes (PRCs)	Confirmation (Y/N)	Validation report for PRCs	
		Version	Completion date
Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents ³	N		

² The company is partially public and partially private entity

³ 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).

Corrections	N		
Change to the start date of the crediting period	N		
Inclusion of a monitoring plan	N		
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents	N		
Changes to the project design	N		
Changes specific to afforestation and reforestation project activities	N		

SECTION E. Internal quality control

The draft validation report that is prepared by validation team is reviewed by an independent technical review team (one or more members) to confirm if the internal procedures established and implemented by ESPL were duly complied with and such opinion/conclusion is reached in an objective manner that complies with the applicable CDM rules/requirements.

The technical review team is collectively required to possess the technical expertise of all the technical area/sectoral scope to which the project activity is related. All members of technical review team are independent of the validation team.

During the technical review process, additional findings may be identified or the closed-out findings may be opened, which needs to be satisfactorily resolved before the request for the renewal of the crediting period is submitted to UNFCCC. The independent technical reviewer may either approve the report as such or reject/return the same, in such case, providing the comments/findings/issues that needs to be resolved by the validation team. The decision taken by the technical reviewer is final and is authorized on behalf of ESPL.

SECTION F. Validation opinion

ESPL, contracted by Empresa Generadora de Electricidad HAINA (EGE HAINA), has performed the independent validation of the renewal of crediting period of the project “Los Cocos II Wind Farm Project”, with UNFCCC Ref. Number: 7100.

ESPL commenced the validation based on the baseline and monitoring methodology ACM0002 – version 20.0, the registered PDD (from previous crediting period) and draft PDD (for the 2nd crediting period).

ESPL's validation approach is based on the understanding of the risks associated with reporting the project activity, estimates of GHG emission data and the controls to be implemented to mitigate these. ESPL planned and performed the validation by obtaining evidence, other information and explanations that ESPL considered necessary to give reasonable assurance that the estimated GHG emission reductions are fairly to be achieved.

The validation team confirms, based on final version of revised PDD for the 2nd crediting period, that:

- the original baseline is still valid as it is given by the applied methodology;
- the project additionality is valid for the renewal of the crediting period. No regulatory surplus has been identified. The project is in accordance with all applicable regulations and legislations;
- the project description is in accordance with the characteristics identified on site;
- the monitoring plan is adequate to the project activity and it is in accordance with the applied methodology;

at this 2nd crediting period, the project activity is likely to achieve the estimated of 99,490 tCO_{2e} per year.

Appendix 1. Abbreviations

Abbreviations	Full texts
ACM	Approved Consolidated Methodology
BE	Baseline Emission
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CL	Clarification Request
CM	Combined Margin
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CP	Crediting Period
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	Executive Board
EIA	Environmental Impact Assessment
ESPL	Earthood Services Private Limited
FAR	Forward Action Request
GHG	Green House Gas
GSC/GSP	Global Stakeholder Consultation Process
IPCC	Intergovernmental Panel on Climate Change
KP	Kyoto Protocol
kW	kilo Watt
kWh	kilo Watt hour
LoA	Letter of Approval/Authorization
MoC	Modalities of Communication
MP	Monitoring Plan
MW	Mega Watt
MWh	Mega Watt hour
OM	Operating Margin
PA	Project Activity
PCP	Project Cycle Procedure
PDD	Project Design Document
PE	Project Emission
PLF	Plant Load Factor
PP	Project Participant
PS	Project Standard
tCO ₂ e	Tonnes of Carbon dioxide equivalent
UNFCCC	United Nations Framework Convention on Climate Change
VT	Validation Team
VVS	Validation and Verification Standard

Appendix 2. Competence of team members and technical reviewers

Competence Statement			
Name	Marcelo Sebben		
Country	Brazil		
Education	M.Sc. (Sustainable Energy System) B. Eng. (Chemical Engineering)		
Experience	+12.5 Years		
Field	Chemical process industry, CDM, Energy, Climate Change		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	Yes (ACM0001, ACM0002, ACM0006, AM0065, AMS ID, AMS-I.E, AMS-I.C, AM0026, AMS-I.A, AMS-I.F, AMS-III.H, AMS-III.I. GS: Ecologically Sound Fuel Switch to Biomass with Reduced Energy Requirement, GS: Technologies and Practices to Displace Decentralized Thermal Energy Consumption)		
Local expert	Brazil, Chile, Honduras, Colombia		
Financial Expert	Yes		
Technical Reviewer	No		
TA Expert	Yes (TA 1.1, 1.2, 4.1, 5.1, 9.1, 13.1)		
Reviewed by	Shreya Garg	Date	05/03/2020
Approved by	Anshika Gupta	Date	05/03/2020

Competence Statement			
Name	Ricardo Lopes		
Country	Brazil		
Education	Technical Diploma in Data Processing		
Experience	12 years		
Field	CDM, Energy, Environment		
Approved Roles			
Team Leader	Yes		
Validator	Yes		
Verifier	Yes		
Methodology Expert	Yes (ACM0001, ACM0002, AM0026, AMS ID, AMS III.H, AMS III.F)		
Local expert	Brazil, Argentina, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, Honduras, Mexico, Nicaragua, Uruguay		
Financial Expert	Yes		
Technical Reviewer	No		
TA Expert	Yes (1.2, 13.1)		
Reviewed by	Shreya Garg	Date	04/06/2019
Approved by	Anshika Gupta	Date	04/06/2019

Competence Statement			
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Name	Shreya Garg		
Country	India		
Education	M.Sc. (Climate Science & Policy), TERI University		
Experience	6 Years +		
Field	Climate Change		
Approved Roles			
Team Leader	YES		
Validator	YES		
Verifier	YES		
Methodology Expert	AMS.I.A., AMS.I.C., AMS.I.D., AMS.I.F., AMS.II.D., AMS.II.G., AMS.II.J., AMS.III.AV., ACM0002, ACM0012		
Local expert	YES (India)		
Financial Expert	NO		
Technical Reviewer	YES		
TA Expert	YES (TA 1.2, TA 3.1)		
Reviewed by	Abhishek Mahawar	Date	01/03/2018
Approved by	Ashok Gautam	Date	01/03/2018

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1.	UNFCCC	Standard: CDM PS for PA	version 02.0	Other
2.	UNFCCC	Standard: CDM PCP for PA	version 02.0	Other
3.	UNFCCC	Standard: CDM VVS for PA	version 02.0	Other
4.	UNFCCC	Form: CDM-PDD-FORM	version 11	Other
5.	UNFCCC	Registered Project design document (latest valid version)	version 6 – 28/02/2019	PP
6.	UNFCCC	Latest verification report – issued by ICONTEC (1 st MP of 1 st CP)	Version 02.0 – 06/05/2019	
7.	PP	Project design document (draft)	version 7 – 30/03/2020	PP
8.	PP	Project design document (revised/final)	version 08: 01/06/2020 Version 09: 24/07/2020 (final)	PP
9.	PP	ER and EF Calculation Spreadsheet (draft)	version 1	PP
10.	PP	ER and EF calculation Spreadsheet (revised/final)	version 2 version 3 (final)	PP
11.	UNFCCC	<u>Methodology</u> : ACM0002: Grid-connected electricity generation from renewable sources	version 20.0	Other
12.	UNFCCC	<u>Methodological tools</u> : 1. “TOOL01: Tool for the demonstration and assessment of additionality” (tool applicable in the validation phase as additionality is not being assessed during this renewal process). 2. TOOL07 – Tool to calculate the emission factor for an electricity system 3. TOOL 11 – Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period	version 06.0.0 version 07.0 version 03.0.1	Other
13.	Garrad Hassan - DNV	<u>Project Lifetime</u> : Certification reports by GL Garrad Hassan and Det Norske Veritas (DNV) – 20 years		PP
14.	PP	<u>Estimated EG_{facility,y}</u> - Registered PDD - Punto 1. Energy production assessment of the Juancho – Los Cocos II – Technical note - document provided by GL	08/02/2012	

		Garrad Hassan # 236024-MXQU-T-01		
15.	PP	<u>Technical description:</u> 1. Technical information on the Wind turbines: Turnkey Supply, Construction and Installation Agreement between Empresa Generadora de Electricidad Haina S.A. and Urbaenergía, S.L. y Energía y Recursos Ambientales Internacional, S.L. Unión Temporal de Empresas Ley 18/1982 (abreviadamente UTE Los Cocos) - Punto 2. EPC Agreement Los Cocos II 2. General Characteristics Manual issued by Gamesa 3. Pictures of plant Pictures wind turbines	30/12/2011 02/05/2011 05/2020	PP
16.	Ministry of Environment and Natural Resources	<u>Operational licensing</u> Operational Permit # 1340-11 dated on 18/01/2017 valid for 5 years	Expiring date: 17/01/2022	
17.	National Law Dominican Republic	<u>Calibration procedures</u> To be carried out in accordance with Regulation for the application of the General Electricity Law 125-01 (Law 125 – 01 of 2001 modified on 2007 – Law 186-07 General electricity Law) – every 2 years		Others
18.	EF	<u>EFgrid calculations</u> Data provided by the Dominican Government regarding EFgrid calculations - Parameter $NCV_{i,y}$ - $EF_{CO2,i,y}$ and $EF_{CO2,m,i,y}$	http://www.oc.org.do/ IPCC Guidelines for National Greenhouse Gas Inventories, Reference Manual, Volume 2 (2006), chapter 1. Table 1.4. IPCC default values at the lower limit of the uncertainty at a 95% confidence interval	PP

		<ul style="list-style-type: none"> - <i>EG_{m,y}, EG_y, and EG_n</i>, - <i>FC_{i,m,y} and FC_{i,n,h}</i> 	http://www.oc.org.do/ http://www.oc.org.do/	
19.	PP	<u>Installed capacity evidences</u> <ul style="list-style-type: none"> - Technical information on the Wind turbines: Turnkey Supply, Construction and Installation Agreement between Empresa Generadora de Electricidad Haina S.A. and Urbaenergía, S.L. y Energía y Recursos Ambientales Internacional, S.L. Unión Temporal de Empresas Ley 18/1982 (abreviadamente UTE Los Cocos) - Punto 2. EPC Agreement Los Cocos II 	30/12/2011	PP
20.	Power Climber Wind	<u>Trainings and Duties of Personnel:</u> <ol style="list-style-type: none"> 1. Operator: Faydern Alberto Rosso Castillo - SD2 Model TSL Maintenance Course 	12/11/2015	PP
21.	National Law Dominican Republic	<ul style="list-style-type: none"> - Law 57-07 of 2007 – about Renewable energies and its incentives. - New Law 115-15 about modification to Law 57-07. (Articles 10.12 and 23 of this law were modified in 2012 not impacting the baseline. Decree 253-12 Eliminate some incentives offered by Law No.57-07) - Law 125 – 01 of 2001 modified on 2007 – Law 186-07 General electricity Law 		
22.	-	IPCC publications	www.ipcc-nggip.iges.or.jp	Other
23.	-	UNFCCC	http://cdm.unfccc.int	Other

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

Table 1. CL from this validation

CL ID	01	Section no.	D.1	Date : 11/05/2020
Description of CL				
<i>Appendix 7: as per instructions for completing the PDD, provide the history of all post-registration changes to the project activity that have been approved by the Board after its registration, its approval reference number and date of approval.</i>				
Project participant response				Date : 24/07/2020
<i>Appendix 7 has been updated as per instructions for completing the PDD, provide the history of all post-registration changes to the project activity that have been approved by the Board after its registration. The Effective approval date of this changes was: 22/09/2019 and approved on 23/09/2019 The PRC reference for the project is: PRC-7100-002</i>				
Documentation provided by project participant				
<i>24 07 2020 Los Cocos II - PDD v9.0 - CCv2 24 07 2020 Los Cocos II - PDD v9.0 – Clean See web page: https://cdm.unfccc.int/PRCContainer/DB/prcp801093624/view</i>				
DOE assessment				Date : 27/07/2020
All changes that occurred since registration of the PA are duly explained in Appendix 7 of the revised PDD. The changes refer to the construction of other wind power plants that would be measured by the same boundary meter, to which a proportional calculation has to be carried in order to obtain the net electricity generated by each one of the installed power plants. Moreover, electricity meters were installed by each power plant in order to measure each individual generation. And to these electricity generated, equations that account for transformation losses were also taken into account. The explanation given is clear and this permanent change was duly approved under PRC-7100-002 on 23/09/2019.				
CL is closed				

CL ID	02	Section no.	D.4	Date : 11/05/2020
Description of CL				
<i>As per diagram presented in section B.3, the power plant Larimar also dispatch its electricity through the four meters from SMC (TR1 to TR4). However it is explained in the same section that these meters only measure the power plants Los Cocos I, Los Cocos II and Quilvio Cabrera. It is not clear, though, how the four meters mentioned above, do not consider the electricity generated by Larimar.</i>				
Project participant response				Date : 01/06/2020
<i>It is important to clarify that even though Larimar Wind Farm is part of the whole Eolic system as can be seen in Figure 9, the wind farm generation data reported to the SENI is measured in the commercial measurement points recognized by the OC-SENI on the side of 34.5 kV located in Lines L10 and L11; which allows to manage Larimar independently from the generations of Quilvio Cabrera, Los Cocos and Los Cocos II Wind Farms. Taking this into account the public generation data and economical transactions reports performed by the OC SENI for Larimar Wind Farm (includes Larimar I and Larimar II), are always presented separated from the rest of the Wind Farm System.</i>				
Documentation provided by project participant				
<i>61_Memoria Generacion 2019 OC-GC-14-IMTE1912-200123-V0.pdf page 9 PDD (version 10) - 01 06 2020 Los Cocos I - PDD v11.0.doc</i>				
DOE assessment				Date : 24/06/2020

The public generation data referred to in the evidence provided^{/22/} states that the Larimar Wind Farm has its net electricity dispatched presented separately from Los Cocos wind Complex (which comprehends Los Cocos I, Los Cocos II and Quilvio Cabrera wind farms). It is important to point out that the meters that measure the electricity dispatched to the grid from Los Cocos Complex are part of the Commercial Measurement System - SMC point, and their raw measurements are not within PP's Control. The information from electricity generation of the complex are directly given by this system (which belongs to OC-SENI – Coordinator of Electricity system), which already excludes the generation of Larimar Wind Farm. Then, considering that the provided values for electricity generation comprehend the whole Los Cocos Complex, the electricity dispatched by Los Cocos I is pro-rated. The formulas and the calculation is duly demonstrated in the revised PDD.

Thus, it is concluded that the parameter EG_{facility} is determined in accordance with TOOL03 and the meters responsible for its measurement will be duly controlled by the calibration procedures mentioned in the PDD.

CL is closed

Table 2. CAR from this validation

CAR ID	01	Section no.	D.3	Date :	09/03/2020
Description of CAR					
<i>EF calculation spreadsheet</i>					
3. <i>Tab dispatch analysis column K: as per TOOL07, para 69 "At each hour h, stack each grid power unit's electricity generation using the merit order". However in the calculations, the merit order has been applied from the latest to the first power unit dispatched, which is not in accordance with TOOL requirements.</i>					
4. <i>When carrying out the determination of the % of plants that are in the top of the dispatch, not electricity from all grid power units are being taken into account, unlike required by TOOL07 para 69.</i>					
Project participant response				Date :	01/06/2020

1. The merit order in Dominican Republic is based on the total cost of each plant, so in this case the merit order N°1 is the cheaper generation unit of the day and the last one is the most expensive; that's why in the EF calculation the top of the dispatch is shown as the top (most expensive) generation that the project is going to displace in each day.

This decision is based on para 68 of the Tool "To determinate the set of grid power units n in the top of the dispatch..... b) The amount of power (MWh) that is dispatched from all grid power units in the system during each hour h that the project is displacing electricity", this shows that the most expensive units are the ones that the project generation is going to displace. So, the top of the dispatch is taken as the most expensive units.

In the formula for the Dispatch data analysis shown below always talk about the energy that the project is displacing, so, the generation that the project is going to displace is the one that is most expensive that's why the most expensive are in the top of the dispatch and that units are used for the 10 percent.

The formula for the Dispatch data analysis OM emission factor ($EF_{grid,OM-DD,y}$) is shown in the paragraph 66 of the Tool.

$$EF_{grid,OM-DD,y} = \frac{\sum h EG_{PJ,h} * EF_{EL,DD,h}}{EG_{PJ,y}} \quad (1)$$

Where:

- $EF_{grid,OM-DD,y}$ = Dispatch data analysis operating margin CO₂ emission factor in year y (tCO₂/MWh)
- $EG_{PJ,h}$ = Electricity displaced by the project activity in hour h of year y (MWh)
- $EF_{EL,DD,h}$ = CO₂ emission factor for grid power units in the top of the dispatch order in hour h in year y (tCO₂/MWh)
- $EG_{PJ,y}$ = Total electricity displaced by the project activity in year y (MWh)
- h = Hours in year y in which the project activity is displacing grid electricity
- y = Year in which the project activity is displacing grid electricity

2. Electricity from all grid power units is now being taken into account when determining the % of units that are in the top of the dispatch.

Documentation provided by project participant

PDD (version 08) - 01 06 2020 Los Cocos II - PDD v11.0.doc

General Electricity Law - Ley 125-01 - Reglamento.Ley_.No_.125-01.pdf article 202.

DOE assessment

Date: 24/06/2020

1. It is well explained that the top of the dispatch order refers first to the more costly power plants and then driving towards the less costly ones. The more costly are to be replaced by the project plant when calculating the EF_{om-DD}. The calculations are done in accordance with TOOL07. The information is justified and no changes were carried out in the EF_{om-DD} calculations in this regard.
2. The group of grid power units in the dispatch margin is being determined in accordance with TOOL07 para 69.

The EF is being calculated in accordance with TOOL07.

CAR is closed

Table 3. FAR from previous validation/verification

FAR ID	Section no.	Date :
Description of FAR		
Not applied		
Project participant response		Date :
Documentation provided by project participant		
DOE assessment		Date:

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
03.0	31 May 2019	Revision to: <ul style="list-style-type: none">• Ensure consistency with version 02.0 of the “CDM validation and verification standard for project activities” (CDM-EB93-A05-STAN) and version 02.0 of the “CDM project cycle procedure for project activities” (CDM-EB93-A06-PROC);• Make editorial improvements.
02.0	31 October 2017	Revision to align with the requirements of the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
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