FINAL VALIDATION REPORT OF THE STANDARDIZED BASELINE FOR THE CO_2 EMISSION FACTOR OF THE ELECTRIC GRID OF HONDURAS

Product 2 of the contract Nº 175/2016

VERSION: 02

AENOR. 6 Génova. 28004 Madrid – Spain.

Telephone +34 914326000 Fax +34 913190581.
www.aenor.com

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Parties involved:	Host Party:	Other involved Parties:	
	Honduras	-	
Client:	In host Party:	In other involved Parties:	
	Empresa Nacional de Energía Eléctrica	-	
Applied methodologies and tools:	Title:	Version:	
	"Tool to calculate the emission factor for an electricity system"	5.0	
	Title:	Version:	
	Table to calculate the emission factor for an electricity system	03.0	

Validated documents:	**Version:**	**Date:**
Formato de Aplicacion CDM-PSB-FORM Honduras	2	08/02/2017
QAQC SBL-GEF Honduras	2	08/02/2017
GEF Honduras	2	08/02/2017

Previous versions of this document:	**Version:**	**Date:**
	1	28/02/2017
	2	
	3	
	4	

Report prepared by:	AENOR

Abbreviations

ENEE	EMPRESA NACIONAL DE ENERGÍA ELÉCTRICA
BM	Build Margin
CAR	Corrective action request
CL	Clarification
CDM	Clean Development Mechanism
CM	Combined Margin
EB	Executive Board of the CDM of the Kyoto Protocol
EF	Emission Factor
GHG	Greenhouse gasses
IPCC	Intergovernmental Panel on Climate Change
MWh	Megawatt hour
OM	Operating Margin
PP	Project participant
tC	Carbon tonne.

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A. Introduction and background

a. Introduction.

This validation concerns the calculation of the "Standardized baseline for the CO_2 emission factor of the electric grid of Honduras in 2014". The objectives of the validation exercise are to confirm that the calculation meets the necessary CDM criteria and follows the "Tool to calculate the emission factor for an electricity system" (version 5.0) approved by UNFCCC.

i. Objective

ENEE has commissioned AENOR to validate the calculation of the "Standardized baseline for the CO_2 emission factor of the electric grid of Honduras in 2014". The purpose of a validation is to have an independent third-party assessment of the calculation carried out. In particular the emission factor calculation, relevant UNFCCC and host country criteria are validated in order to confirm that meet the stated requirements and identified criteria.

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

ii. Scope

The scope of the validation is to assess the determination of the "Standardized baseline for the emission factor CO2 in the electric grid of Honduras in 2014" has been carried out in accordance with the requirements of the "Tool for the calculation of the emission factor of the electricity system" version 5.0. or other new procedures o guidelines that could be approved in the future. All data to be used for updating the calculation must be also updated to the latest official data published at that time.

The following documents were reviewed as part of the scope of the activity:

- "Formato de Aplicacion CDM-PSB-FORM Honduras 8Feb17 V2". /1/
- "QAQC SBL-GEF Honduras 8 Feb17 V2" /2/.
- Spreadsheet "GEF Honduras 8Feb17 V2". /3/
- Tool for the calculation of the emission factor of the electricity system (version 5.0) /4/.
- CDM Validation and Verification Standard (Version 09.0) /5/
- Other complementary documents.

The validation scope is defined as an independent and objective review of Emission Factor Calculation and other relevant documents. The

information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations by AENOR, based on the Specific Instruction for Validation, Verification and Certification of Clean Development Mechanism (CDM) Project Activities (IE/DTC/039).

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

b. Background.

ENEE carried out in 2015 the estimation of the emission factor CO_2 in the electric grid of Honduras" in accordance with the UNFCCC requirements, in order to comply with the indicator "CO_2 emissions from electricity generation in Honduras" and the result "Reduction of Greenhouse Gas Emissions (GHG) from electricity generation" of the " Proyecto de Rehabilitación y Repotenciación del Complejo Hidroeléctrico Cañaveral Río Lindo ". Due to this, ENEE currently required the validation of the Standardized baseline for the CO_2 emission factor of the electric grid of Honduras and the applied methodology, through the contracting of a Designated Operational Entity (DOE), being AENOR selected, as explained in the previous section

B. Methodology and work plan.

a. Methodology.

The calculation assessment aims at being a risk-based approach and is based on the methodology developed in the "CDM Validation and Verification Standard", an initiative of designated and applicant entities, which aims to harmonize the approach and quality of all such assessments

Once the contract was signed in December 2016 by ENEE, the validation of the emission factor began reviewing AENOR the first package of documents which had been received previously. The validation was performed in the manner of an audit, where, a desk review of the EF calculation was undertaken against the latest version approved of the "Tool to calculate the emission factor for an electricity system" (version 5.0).

This methodological tool is used to determine the CO_2 emission factor for the displacement of electricity generated by power plants in an electricity system, by calculating the .combined margin emission factor (CM) of the electricity system. The CM is the result of a weighted average of two emission factors pertaining to the electricity system:

- **Operating margin. (OM)**: the emission factor that refers to the group of existing power plants whose current electricity generation would be affected by a proposed CDM project activity.

- **Build margin. (BM):** the emission factor that refers to the group of prospective power plants whose construction and future operation would be affected by the proposed CDM project activity.

This tool is applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).

b. Appointment of team members and technical reviewers

The list of involved personnel and the qualification status are summarized in the table below:

Name	Qualification	
	Position in the team	Technical areas
Luis Javier ARRIBAS ALONSO	Chief validator	1.2
Freddy Alejandro GARRO FLORES	Technical reviewer	1.2
Richard Daniel GONZÁLES TOLEDO	Technical reviewer	1.2

Technical areas (TA) mentioned above correspond to the following:

TA code	Technical area
TA 1.1	Thermal energy generation from fossil fuels and biomass including thermal electricity from solar (COMPLEX);
TA 1.2	Energy generation from renewable energy sources.
TA 2.1	Electricity distribution;
TA 2.2	Heat distribution
TA 3.1	Energy demand
TA 4. 1	Cement sector (COMPLEX);
TA 4.2	Aluminium (COMPLEX);
TA 4.3	Iron and steel (COMPLEX);
TA 4.4	Refinery (COMPLEX)
TA 5.1	Chemical process industries (COMPLEX).
TA 6.1	Construction.
TA 7.1	Transport.

TA code	Technical area
TA 8.1	Mining and mineral processes, excluding those included in TA 8.2 below;
TA 8.2	Oil and gas industry, coal mine methane recovery and use (COMPLEX).
TA 9.1	Metal production.
TA 10.1	Mining and mineral processes, excluding those included in TA 10.2 below;
TA 10.2	Oil and gas industry, coal mine methane recovery and use (COMPLEX).
TA 11.1	Chemical process industries (COMPLEX);
TA 11.2	GHG capture and destruction.
TA 12.1	Chemical process industries (COMPLEX).
TA 13.1	Waste handling and disposal;
TA 13.2	Animal waste management.
TA 14.1	Forestry
TA 15.1	Agriculture
TA 15.2	Animal waste management.

c. Workplan.

ACTIVIDAD	ACTOR	MESES							
			1				2		
1. Contract signing (1)	AENOR COSTUMER								
2. Sending of documentation to AENOR	COSTUMER								
3. Revision of the documentation received	AENOR								
4. Answer to requests (2) (3)	COSTUMER								
5. First draft validation report	AENOR								
6. Answer to requests (3) (4)	COSTUMER								
7. Revision of the documentation received (4)	AENOR								
8. Final validation report and technical review (5)	AENOR								

(1) Contract must be signed by both parties before starting verification activities
(2) If necessary.
(3) Approximate. AENOR does not determine the time needed for the project proponent to resolve Clarifications (CLs), corrective actions (CARs) or any other issue that may arise.
(4) This process can be repeated several times. AENOR does not limit the number of rounds that the costumer may need to resolve all findings.
(5) Following the technical review new issues to be resolved by the PP may arise.

d. Document review

Different version of documents and calculation spreadsheet provided by Empresa Nacional de Energía Eléctrica (ENEE) have been reviewed against the approved methodologies, the latest version of the Tool to calculate the emission factor for an electricity system and against CDM and other relevant criteria.

To address the corrective actions and clarification requests that arose from the desk review, ENEE revised and updated the initial version of the EF calculation and the annexed documents before developing and submitting the final version.

The reviewed documents used during the entire validation process are detailed in section "H" of this report.

e. Findings

As an outcome of the validation process, the team can raise different types of findings according to the "CDM Validation and Verification Standard".

A Clarification Request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Where a non-conformance arises the validation team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;

b) The CDM requirements have not been met;

c) There is a risk that emission reductions cannot be monitored or calculated.

Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

In this validation report, the project participants is requested to address all validation findings and finally provided the validation team with sufficient evidence to determine that the applicable CDM requirements have been met. AENOR has prepared this report based on the documents provided by the project participant.

All the validation findings are documented in more detail in sections C and G of this report.

f. Internal Quality Control

Following the completion of the assessment process by the validation team, all documentation undergoes an internal quality control through a technical review before submission to client. The Technical reviewer is a qualified member of AENOR, independent from the team that carried out the validation of the Emission Factor.

C. Activities developed and results obtained

a. Activities developed

The activities carried out as part of the validation process are indicated below:

- Review of the proposed standardized baseline for the CO_2 emission factor of the electric grid of Honduras, for the assessment of the accuracy, traceability, reproducibility and transparency of the calculations, in accordance with the latest version of the "Tool to calculate the emission factor for an electricity system" (version 5.0) approved by UNFCCC:

    - Electrical grid tool (Spreadsheet "GEF Honduras")
    - Standardized baseline (CDM-PSB-FORM) y
    - Quality control and Quality Assessment Guide of data used to establish the baseline.

    In this review, the audit team has reviewed 3 main documents: "Formato de Aplicacion CDM-PSB-FORM Honduras 8Feb17 V2", "QAQC SBL-GEF Honduras 8 Feb17 V2" and the spreadsheet "GEF Honduras 8Feb17 V2".

    - The first document is the form required by UNFCCC to request the approval of a "proposed standardized baseline", filled with information required on the calculation of the CO_2 emission factor of the electric grid of Honduras in 2014.
    - The second document describes the processes and activities established to assess the quality control of data and formulae used to calculate the CO_2 emission factor of the electric grid of Honduras in 2014.
    - The third document is a spreadsheet with all data and formulae used to calculate the CO_2 emission factor of the electric grid of Honduras in 2014, and the final value of the CO_2 emission factor.

- Communications and electronic interviews with stakeholders of ENEE have been frequently maintained to correct the findings found by AENOR during validation and finally to provide the validation team with the necessary evidence to determine that the applicable CDM requirements have been met.

- Edit the final validation report of the "Standardized baseline for the CO2 emission factor of the electric grid of Honduras in 2014", including the audit findings as clarifications and corrective actions which have been considered in their final resolution.

b. Results obtained.

As a result of the review of the information provided by the PP, the audit team arised several clarification and corrective requests, which are documented in detail in section C and G of this report, and have been solved before the audit team edits this final validation report including a positive validation opinion.

The most significant issues of the calculation of "Standardized baseline for the CO_2 emission factor of the electric grid of Honduras in 2014"are detailed below:

i. Calculation of the emission factor.

The calculations of the emission factor have been carried out by the PPs in the spreadsheet "GEF Honduras 8Feb17 V2", including the calculations of the OM factor, BM factor and CM factor. "Table to calculate the emission factor for an electricity system" /7/ approved by UNFCCC has been used to develop the spreadsheet.

All data used in the calculations has been obtained from other complementary documents and files, provided by official publications such as: government records, national statistics or default values from IPCC or CDM requirements, which have been detailed in the different documents provided. All reviewed documents are detailed in section "H" of this report.

During the validation process, the audit team has evaluated the calculations carried out by the Project Participant, and has checked all information received. The auditing team has reproduced the calculation done by the PPs in the different spreadsheets and similar results have been obtained, however, AENOR has found some clarification and corrective actions requests, which are documented in detail in section "G" of this report and shall be solved before the audit team edits this final validation report including a positive validation opinion

ii. Algorithms and/or formulae used to determine the Emission Factor.

1. Identification of the relevant electricity system

According to the "Tool to calculate the emission factor for an electricity system", version 5.0, the spatial extent of the electricity system in Honduras includes all power plants physically connected to the Interconnected National System of the Hoduras Grid in which a CDM project power plant would be connected to. A list of all plants

connected to the national electricity grid of Honduras in 2014 is included in the sheet "Rawdata" of the spreadsheet "GEF Honduras 8Feb17 V2".

Likewise, all the plants connected to the regional transmission line of the SIEPAC are considered as another electric system connected to the electric system of the project, allowing the transference of electric energy between the countries of Central America.

Therefore, according to the tool, the electric energy transferred from the electric systems connected through the SIEPAC, are considered as imports of the electric system of the project.

For the purpose of determining the operating margin emission factor, the CO_2 emission factor for net electricity imports has been considered 0 tCO_2/MWh.

2. Selecting whether to include off grid power plants in the project electricity system

Option I has been chosen and grid power plants are only included in the calculation.

3. Selection of a method to determine the operating margin (OM)

For the calculation of the OM emission factor ($EF_{grid,OM,y}$), the simple OM emission factor calculation method has been correctly selected because low cost/ must-run projects constitute less than the 50% of the total grid generation in the average of the last five most recent years (48.2% in 2010, 43.8% in 2011, 44.6% in 2012, 42.3% in 2013 and 42.7% in 2014), in accordance with the information provided (table 3 del CDM-PSB-FORM).

Furthermore, the OM emission factor has been calculated using data vintages of the ex-ante option, therefore, a 3 year generation-weighted average based on the most recent data available, 2012, 2013 and 2014, has been considered, as it is indicated specifically in the "Formato de Aplicacion CDM-PSB-FORM Honduras 8Feb17 V2", as well as in the spreadsheet "QAQC SBL-GEF Honduras 8 Feb17 V2" is identified the calculation option selected (sheet "SIMPLE_OM_GRID_OPTION _A_DATA") and the different values of the parameter $EF_{grid,OM,y}$ are shown for each year under consideration and the final average value (sheet "SIMPLE_OM_OPTION_A").

All data used for the calculation have been provided by official sources, except the fossil fuel consumptions of the private plants that are communicated by ENEE who obtained them directly from the same plants. Therefore, AENOR considers that the data vintage used is appropriate according to the applied tool.

4. Calculation of the Operating Margin emission factor

The simple OM emission factor ($EF_{grid,OMsimple,y}$), is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation of all generating power plants serving the system, not including low-cost/must-run power plants/units.

Option A has been selected, based on the net electricity generation and a CO_2 emission factor of each power unit, to calculate the simple OM emission factor, as follow:

$$EF_{grid,OMsimple,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where:

$EF_{grid,OMsimple,y}$ = Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)

$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh)

$EF_{EL,m,y}$ = CO_2 emission factor of power unit m in year y (tCO_2/MWh)

m = All power units serving the grid in year y except low-cost/must-run power units.

y = The relevant year as per the data vintage chosen.

According to the applied tool, net electricity imports have been considered as low-cost/must-run units, and in consequence they are not considered in the calculation of the simple OM emission factor.

Once the findings found in relation to the calculations of the $EF_{grid,OMsimple,y}$ were solved, for the parameters mentioned above, it has been validated that are correctly calculated following option A, and the emission factor for each power unit $EF_{EL,m,y}$ has been calculated using option A1, except in cases where the fossil fuel consumption data is not available, using then option A2, since only data on energy generation and fuel Type used is available.

Efficiency factors of power plant have been obtained from the default values of appendix 1 of the "Tool to calculate the emission factor for an electricity system". The emission factors and NCV of the fossil fuel types used in the power plants have been obtained from the 2006 IPCC Guidelines on National GHG Inventories /6/.

Therefore, AENOR has verified that all formulas and factors used to calculate the OM have been properly followed and are considered correct and transparent according to the applied tool, and confirm the OM emission factor ($EF_{grid,OMsimple,y}$) has been calculated in

accordance with the "Tool to calculate the emission factor for an electricity system" version 5.0, correctly, transparently and conservatively.

A summary of the $EF_{grid,OMsimple,y}$ calculation for the ex-ante option is showed in the following table:

	Units	2012	2013	2014
$\sum_m EG_{m,y}$	MWh	4,104,364	4,357,393	4,471,959
$EF_{grid,OMsimple,y}$	ton CO_2 /MWh	0.6421	0.6228	0.6341
% Weight Average	%	31.73%	33.69%	34.58%
$EF_{grid,OM,2014}$	**ton CO_2 /MWh**	**0.6330**		

Summary of the $EF_{Grid,OM,2014}$ calculation for the Ex-ante Option

5. Calculation of the Build Margin emission factor

According to the "Tool to calculate the emission factor for an electricity system" version 5.0, the BM emission factor, $EF_{grid,BM,2014}$ has been calculated based on the most recent information available on plants already built in year 2014.

The sample group of power units used to calculate build margin is defined, according to the tool, as the set of power capacity additions in the electricity system that comprise 20% of the system generation and that have been built most recently instead of the set of five power units because this option comprises the larger annual generation. In fact, although the 20% of the system generation would only include the partial generation of the latest plant (ENERSA), the total generation of this plant has been considered in the calculations, and as result a 30.5% of the system generation has been considered in the calculation.

On the other hand, the power units registered as CDM project activities and the power units which started to supply electricity to the grid more than 10 years ago are excluded in the selected sample group

	Generation (MWh)
$SET_{5\text{-units}}$	43,158
$SET_{\geq 20\%}$	2,044,615.75

Selection of sample group for the $EF_{grid,BM,2014}$ calculation

The BM emission factor $EF_{grid,BM}$ (tCO_2/MWh) is the generation-weighted average emission factor EFgrid,BM (tCO_2/MWh) and it has been calculated according to the tool using the following formula:

$$EF_{grid,BM,y} = \frac{\sum_{m} EG_{m,y} \times EF_{EL,m,y}}{\sum_{m} EG_{m,y}}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO2 emission factor in year y (tCO2/MWh).
$EG_{m,y}$	=	Net quantity of electricity generated and delivered to the grid by power unit m in year y (MWh).
$EF_{EL,m,y}$	=	CO2 emission factor of power unit m in year y (tCO2/MWh).
m	=	Power units included in the build margin.
y	=	Most recent historical year for which power generation data is available. (2014)

As it was indicated previously for the OM, the emission factors and NCV of the fossil fuel types used in the power plants have been obtained from the 2006 IPCC Guidelines on National GHG Inventories.

Once the findings found in relation to the calculations of the $EF_{Grid,BM}$ were solved, AENOR has verified that all data included in the calculation of the parameter $EF_{EL,m,y}$, and all data of the net electricity generated in the considered plants are in accordance with the official data provided. Therefore, formulae and factors used to calculate the Build Margin have been properly followed and are considered correct and transparent according to the applied tool.

The values of $EF_{Grid,BM,2014}$ included in the spreadsheet is **0.6081** tCO_2e/MWh

AENOR confirms that the build margin emission factor $EF_{Grid,BM}$ has been calculated, according to the "Tool to calculate the emission factor for an electricity system" version 5.0, correctly, transparently and conservatively.

6. Calculation of the combined margin (CM) emission factor

The CM emissions factor has been calculated as follows:

$$EF_{Grid,CM,} = EF_{grid,OM} * w_{OM} + EF_{grid,BM} * w_{BM}$$

Where:

$EF_{grid,BM,y}$	=	Build margin CO_2 emission factor in year y (tCO_2/MWh).
$EF_{grid,OM,y}$	=	Operating margin CO_2 emission factor in year y (tCO_2/MWh).

w_{BM} = Weighting of operating margin emissions factor (%).
w_{OM} = Weighting of build margin emissions factor (%).

According to the tool, for solar or wind power generation project activities, the value of the weightings for the first crediting period and subsequent ones are:

w_{OM} = 0.75; w_{BM} = 0.25.

For all other projects, the weighting factors to be applied for the first crediting period are:

w_{OM} = 0.5; w_{BM} = 0.5

and for the second and third crediting period.

w_{OM} = 0.25; w_{BM} = 0.75

A summary of the $EF_{Grid,CM,2014}$ calculation for the Ex-ante Option is showed in the following table:

	Wind and Solar Power Generation Project	**All other Projects**	
		1st crediting period	**2nd and 3rd crediting period**
W_{OM} (%)	0.75	0.5	0.25
W_{BM} (%)	0.25	0.5	0.75
$EF_{grid,OM,2014}$ (tCO2e/MWh)	0.6330		
$EF_{Grid,BM,2014}$ (tCO2e/MWh)	0.6081		
$EF_{grid,CM,2014}$ (tCO2e/MWh)	**0.6268**	**0.6205**	**0.6143**

Summary of the EF_GSummary of the $EFGrid_{,CM,2014}$ calculation for the Ex-ante option

AENOR confirms that the combined margin emission factor $EF_{Grid,CM,2014}$ has been calculated, according to the "Tool to calculate the emission factor for an electricity system" version 5.0, in a correct, transparent and conservative way.

D. Contract products

No.	Producto	Status
1	Draft validation report for the CO_2 emission factor of the electric grid of Honduras, in Spanish.	Delivered.
2	Final validation report for the CO_2 emission factor of the electric grid of Honduras, including the technical validation opinion, in Spanish.	Corresponds to this document.

E. Executive summary. Validation opinion.

AENOR has performed the validation of the **"CO_2 Emission Factor of the electric grid of Honduras in 2014"**. The validation was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The validation consisted in two phases: a desk review of the Emission Factor calculation spreadsheet and other reports and data used to determine it and the resolution of outstanding issues and the issuance of the final validation report and opinion.

The first phase was already carried out, when AENOR reviewed the spreadsheet "GEF Honduras RCCBogota July2016" and the complementary files "Formato de Aplicación CDM-PSB-FORM Honduras 7Julio2016-RCC Bogota" and "Borrador QAQC SBL-GEF Honduras July 2016", and found several findings which had to be solved, as it is detailed in section G of this final validation report with a positive validation opinion.

This final validation report has been edited after AENOR has received proper evidence to determine the fulfilment of stated criteria, in accordance with the requirements established in the paragraph 17 of the "Procedure: Development, revision, clarification and update of standardized baselines" version 4 /9/, and AENOR can affirm that:

a) The QA/QC system meets the provisions and data quality objectives determined in the "Guidelines for quality assurance and quality control of data in the establishment of standardized baselines" version 2 /10/.

b) The proposal standardized baseline is consistent with the methodological approach included in the approved methodological tool "Tool to calculate the emission factor for an electricity system" (version 5.0), as it is required in the paragraph 10 of the "Procedure: Development, revision, clarification and update of standardized baselines" and the calculations have been correctly applied and meets the relevant requirements of this tool.

This validation opinion only covers the determination of the emission factor of the grid of Honduras **for the year 2014**. For the following years the EF calculation must be updated according to the latest approved version of the "Tool to calculate the emission factor for an electricity system" or other new procedures or guidelines that could be approved in the future.

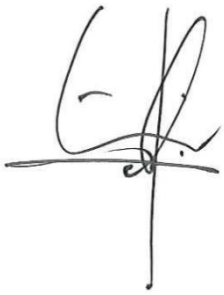
The validation is based on the information made available to AENOR and the engagement conditions detailed in this report.

The validation has been performed using a risk based approach as described above. AENOR cannot be held liable by any part for decisions made or not made based on the validation opinion, which will go beyond the purpose.

06/03/2017

José Magro González

06/03/2017



Luis Javier Arribas Alonso

F. Analysis, comparative tables, charts and figures.

The analysis of the information contained in the different documents reviewed has been included in section C of this report.

In the same section of this report, different tables with the most important information on the results of the calculations of the emission factor carried out:

- *Summary of the $EF_{Grid,OM,2014}$ calculation for the Ex-ante Option*
- *Selection of sample group for the $EF_{grid,BM,2014}$ calculation*
- *Summary of the EFGrid,CM,2014 calculation for the Ex-ante option*

G. Corrective action and clarifications requested

FINDING	Nº 1		
Classification	**CAR** ☐	**CL** ☒	**FAR** ☐
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	**In relation with the calculation of the OM emission factor, in the sheet "SIMPLE_OM_GRID_OPTION_A_DATA" of the spreadsheet, have been found the following issues that shall be clarified:** • **The electrical generation of some plants is result of the substration of two different values, without explaining the source of these data (For example: Cañaveral or Río Lindo in 2014).** • **In the calculation of year 2013, the information of the technology used by the plant "Santa Fe" is not provided to justify the efficiency value.** • **The calculation of the OM of plants with the consumption of two different fossil fuels, using the average value of the NCV values of the different fossil fuels, instead of using the value of the NCV and EF of each fossil fuels, as it is made in the calculations of the BM, and according to the requirement of paragraph 48 of the tool.**		
CLIENT RESPONSE #1	*This section shall be filled by the PP.*		
It shall address the corrective action taken in details	**The electrical generation of some plants is result of the substration of two different values, without explaining the source of these data (For example: Cañaveral or Río Lindo in 2014).** *R: The values have been updated with one value in accordance with the available information of ENEE, the sheet with each plant data (see Rawdata) has been included in the spreadsheet.* *The values that are subtracted in the state plants correspond with the own consumed energy.* **In the calculation of year 2013, the information of the technology used by the plant "Santa Fe" is not provided to justify the efficiency value.** *R: Santa Fe is a thermal plant with diesel motors. This information has been included in the spreadsheet.* **The calculation of the OM of plants with the**		

	consumption of two different fossil fuels, using the average value of the NCV values of the different fossil fuels, instead of using the value of the NCV and EF of each fossil fuels, as it is made in the calculations of the BM, and according to the requirement of paragraph 48 of the tool. *R: According to the paragraph 48 of the " Tool to calculate the emission factor for an electricity system" version 5, when a plant consumes two different types of fossil fuels, the value of NCV and EF_{CO2} lowest has been applied, for example, the plants that consume diesel and bunker, the values of NCV and EF_{CO2} for diesel have been used.*
It shall provide and identified the evidences proposed (if applicable)	Updated spreadsheet (GEF Honduras January 2017 ver 2)
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The generation of some plants have values very different from those provided in the previous Excel file, although the source of data is the same. On the other hand, the source given for the generation data of the Interconnected System, "Annual Operational Report ENEE 2015", provides the data in GWh while in the Excel file they are included in MWh / KWh, which produces certain differences between the source data and those used, for example, in "Las Nieves" plant where the source data is "0" and the value used is "23,135 KWh / 23.14 MWh. The source of the data used in MWh / KWh should be clarified. In addition, the new sheet "Rawdata" included in the Excel file has information in other language different to English. In relation to the determination of the consumption of 2012, the correction indicated as corrective action has not been applied.
CLIENT RESPONSE #2	*This section shall be filled by the PP.*
It shall address the corrective action taken in details	**The generation of some plants have values very different from those provided in the previous Excel file, although the source of data is the same.** R: In the version 1 of the file sent was found some inconsistences in the generation data available publicly in the chart 6 (PDF version). The updated spreadsheet includes the generation data in accordance with the chart 6. The values of BM and OM have changed with these corrections. **On the other hand, the source given for the generation data of the Interconnected**

	System, "Annual Operational Report ENEE 2015", provides the data in GWh while in the Excel file they are included in MWh / KWh, which produces certain differences between the source data and those used, for example, in "Las Nieves" plant where the source data is "0" and the value used is "23,135 KWh / 23.14 MWh. The source of the data used in MWh / KWh should be clarified. R: The updated spreadsheet includes the generation data in accordance with the information of the chart 6. The values of BM and OM have changed with these corrections. **In addition, the new sheet "Rawdata" included in the Excel file has information in other language different to English.** R: All information has been translated to English. **In relation to the determination of the consumption of 2012, the correction indicated as corrective action has not been applied.** R: For plants consuming two types of fuel, the amount and density of each fuel has been used to calculate the "mt" value but the NCV and the lowest emission factor.
It shall provide and identified the evidences proposed (if applicable)	GEF Honduras 30Jan17.xlsm Cuadro 6 Estadisticas_2014.xls (and version PDF)
DOE Assessment #2 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The sheet "Rawdata" included in the spreadsheet still has information in a language different to English. The complete file shall include information only in English.
CLIENT RESPONSE #3	*This section shall be filled by the PP.*
It shall address the corrective action taken in details	All information has been translated to English.
It shall provide and identified the evidences proposed (if applicable)	GEF Honduras 08Feb17
DOE Assessment #3 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	Information included in the latest version of the spreadsheet is considered correct and complete.
Conclusion *Tick the appropriate checkbox*	**CAR/CL CLOSED** ☒ / To be checked during the first periodic verification ☐

FINDING	Nº 2		
Classification	**CAR** ☐	**CL** ☒	**FAR** ☐
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	**The PP shall provide a copy of:** • **The information provided to RCC – Bogotá of the fuel consumptions of the private plants.** • **Spreadsheet indicated in section "References and any other relevant information" of "Formato de Aplicación CDM-PSB-FORM Honduras 7Julio2016-RCC Bogota", which contain the final information afterwards the feedback provided by ENEE (net generation and fuel consumption for each year and operating date of each plant).**		
CLIENT RESPONSE #1	*This section shall be filled by the PP.*		
It shall address the corrective action taken in details	**The information provided to RCC – Bogotá of the fuel consumptions of the private plants .** *R: The sheet with the information of each plant, including the operating date has been included with the name of "rawdata"* **Spreadsheet indicated in section "References and any other relevant information" of "Formato de Aplicación CDM-PSB-FORM Honduras 7Julio2016-RCC Bogota", which contain the final information afterwards the feedback provided by ENEE (net generation and fuel consumption for each year and operating date of each plant).** *R: The sheet with the information of each plant, including the operating date has been included with the name of "rawdata".* *The references to the name of the documents have been changed.*		
It shall provide and identified the evidences proposed (if applicable)	Updated documents: Formato de Aplicacion CDM-PSB-FORM Honduras 19 Jan17.doc GEF Honduras 19Jan17.xlsm QAQC SBL-GEF Honduras 19Jan17.doc		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The clarifications and corrections carried out in the final version of the updated documents ("Formato de Aplicacion CDM-PSB-FORM Honduras 8Feb17 V2", el "QAQC SBL-GEF Honduras 8 Feb17 V2" y la hoja de cálculo "GEF Honduras 8Feb17 V2") are proper.		
Conclusion *Tick the appropriate checkbox*	**CAR/CL CLOSED** ☒	To be checked during the first periodic verification ☐	

FINDING	Nº 3		
Classification	**CAR** ☐	**CL** ☒	**FAR** ☐
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	**In the document "Borrador QAQC SBL-GEF Honduras July 2016" shall be indicated the normative or regulations that establish the on-site control of the electric meters that ENEE shall carried out in the different plants.**		
CLIENT RESPONSE #1	*This section shall be filled by the PP.*		
It shall address the corrective action taken in details	Honduras does not have a regulation for the onsite control of electric meters, but if it has adequate procedures necessary to carry out the measurement reliably and safely. The measuring equipment and associated equipment are calibrated under the ANSI-NEMA standard for each of the generators connected to the electric grid of Honduras.		
It shall provide and identified the evidences proposed (if applicable)	QAQC SBL-GEF Honduras 19Jan17.doc		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The clarification included in the final version of the document "QAQC SBL-GEF Honduras» (version 2 del 8/02/2017) is considered sufficient and adequate		
Conclusion *Tick the appropriate checkbox*	**CAR/CL CLOSED** ☒	To be checked during the first periodic verification ☐	

FINDING	Nº 1		
Classification	**CAR** ☒	**CL** ☐	**FAR** ☐
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	**In several sheets of the spreadsheet with the calculation of the CO_2 emission factor, some mistakes have been found or data without identifying correctly:** • **Columns L, M, N and O in the sheet called "INPUT_OUTPUT".** • **Columns R, S and T in the sheet called "SIMPLE_OM_OPTION_A".** • **Information included in the sheet "INPUT_OUTPUT" is also included in the sheet "RESULTS"**		
CLIENT RESPONSE #1	*This section shall be filled by the PP.*		
It shall address the corrective action taken in details	**Columns L, M, N and O in the sheet called "INPUT_OUTPUT".** *R: These values are not used in the calculations.* **Columns R, S and T in the sheet called "SIMPLE_OM_OPTION_A".** *R: These values have been deleted without any impact on the spreadsheet.* **Information included in the sheet "INPUT_OUTPUT" is also included in the sheet "RESULTS"** *R: The intention is to have the values of the emission factor of electricity of more accessible form since the tool does not show the two values depending the type of plant of simultaneous form.*		
It shall provide and identified the evidences proposed (if applicable)			
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	In the case of keeping data of sheet "RESULTS", it should be clarified that they correspond to the first crediting period or include, as in the sheet "INPUT_OUTPUT" the values for the following periods. This issue shall also be clarified in the "Formato de Aplicacion CDM-PSB-FORM Honduras 19 Jan17".		
CLIENT RESPONSE #2	*This section shall be filled by the PP.*		
It shall address the corrective action taken in details	**In the case of keeping data of sheet "RESULTS", it should be clarified that they correspond to the first crediting period or include, as in the sheet "INPUT_OUTPUT" the values for the following periods.**		

	R: The following notes were included in the sheet "results" Note: 1 The values shall be the same as the values showed in INPUT_OUTPUT sheet Note: 2 Note: For CDM - The values can be used for new CDM projects and CDM projects requesting renewal f crediting period, for fixed ex-ante purposes (after the approval of the value as standardized baseline). In addition, these can be used for registered CDM projects that chose in its PDD to monitor the grid emission factor (ex-post). **This issue shall also be clarified in the "Formato de Aplicacion CDM-PSB-FORM Honduras 19 Jan17".** R: The following note has been included in page 9: *Note: For CDM - The values can be used for new CDM projects and CDM projects requesting renewal f crediting period, for fixed ex-ante purposes (after the approval of the value as standardized baseline). In addition, these can be used for registered CDM projects that chose in its PDD to monitor the grid emission factor (ex-post).*
It shall provide and identified the evidences proposed (if applicable)	Formato de Aplicacion CDM-PSB-FORM Honduras 30 Jan17.doc GEF Honduras 30Jan17.xlsm
DOE Assessment #2 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The information of the note 2 is not consistent with the values calculated, as the EF_{OM} is being calculated based on the option ex-post of the tool. The option ex-ante of the tool requires that the EF_{OM} is calculated as the weighted average of the generation of the three most recent years available. Moreover, in the same note, the indication of using the option ex-post of the calculation of the emission factor of the grid is not consistent with the information included in the document «Formato de Aplicacion CDM-PSB-FORM Honduras 30 Jan17» where it is indicated that: «The proposed grid emission factor is calculated using the ex-ante option"
CLIENT RESPONSE #3	*This section shall be filled by the PP.*
It shall address the corrective action taken in details	The calculation of the EF_{OM} has been made based on the option ex-ante, using data of the three most recent years available, 2014, 2013 y 2012. In the Excel spreadsheet and in the Application Format, the note has been corrected to avoid

	confusion as: Note: 2 Note: For CDM - The values can be used for new CDM projects and CDM projects requesting renewal for crediting period.	
It shall provide and indentified the evidences proposed (if applicable)	"Formato de Aplicacion CDM-PSB-FORM Honduras 8Feb17 V2" Hoja de cálculo "GEF Honduras 8Feb17 V2"	
DOE Assessment #3 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The proper clarifications and corrections included in the final version of the updated documents.	
Conclusion *Tick the appropriate checkbox*	**CAR/CL** **CLOSED** ☒	To be checked during the first periodic verification ☐

FINDING	Nº 2		
Classification	**CAR** ☒	**CL** ☐	**FAR** ☐
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	**In relation with the calculation of the OM emission factor, in the sheet "SIMPLE_OM_GRID_OPTION_A_DATA" of the spreadsheet the following issues have been found that shall be changed:** • **In the 2012 data, for the General Electric plant (La Puerta MEX), the option used to calculate the parameter "$EF_{EL,m,y}$"is not identified.** • **The values of the parameter "$EF_{CO2,m,i,y}$" are not correct for the plants "Alsthom Vetasa" and "Elcatex" in 2012.** • **The values of the parameter NCV used in 2012 are different to the values used in 2013 and 2014. Moreover, the values of NCV are also different to the values of the provided source (IPCC).** • **The units of the values of the parameter FC are not the same for all plants, (for example, Celsur Carbón, Envasa or Geen Valley).** • **The operation date of plants that select the option A2 is not provided. Therefore, it is not possible to determine the efficiency value of plants in accordance with the appendix 1 of the tool, depending on whether the plant started operating before the year 2000 or after.** • **The values of the imports are being considered in the calculations, although they should be excluded because they are considered as "low cost/must run" plants.**		
CLIENT RESPONSE #1	*This section shall be filled by the PP.*		
It shall address the corrective action taken in details	**In the 2012 data, for the General Electric plant (La Puerta MEX), the option used to calculate the parameter "EFEL,m,y"is not identified.** *R: In the revised spreadsheet has been included the selected option.* **The values of the parameter "EFCO2,m,i,y" are not correct for the plants "Alsthom Vetasa" and "Elcatex" in 2012.** *R: The values of the parameter "EFCO2,m,i,y" have been changed for these plants in accordance with the fuel used.* **The values of the parameter NCV used in 2012 are different to the values used in 2013 and 2014. Moreover, the values of NCV are also**		

	different to the values of the provided source (IPCC). *R: The values of NCV in 2012 have been changed.* **The units of the values of the parameter FC are not the same for all plants, (for example, Celsur Carbón, Envasa or Geen Valley).** *R: For plants that consume coal, it is estimated that ton is equivalent to metric ton.* **The operation date of plants that select the option A2 is not provided. Therefore, it is not possible to determine the efficiency value of plants in accordance with the appendix 1 of the tool, depending on whether the plant started operating before the year 2000 or after.** *R: In the updated spreadsheet (GEF Honuras 19Jan17.xlsm) has been included the operation starting date. The efficiency values have been reviewed and comments with the justification of the values applied have been included.* **The values of the imports are being considered in the calculations, although they should be excluded because they are considered as "low cost/must run" plants.** R: According to the definition of the latest version of the "Tool to calculate the emission factor for an electricity system", imports have been considered as "low cost/must run" and have been excluded in the calculation of the OM.	
It shall provide and identified the evidences proposed (if applicable)	Updated spreadsheet: *GEF Honduras 19Jan17.xlsm*	
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The information included in the final version of the documents provided (spreadsheet "GEF Honduras 8Feb17 V2") is considered adequate and in accordance with the tool applied.	
Conclusion *Tick the appropriate checkbox*	**CAR/CL** **CLOSED** ☒	To be checked during the first periodic verification ☐

FINDING	Nº 3		
Classification	**CAR** ☒	**CL** ☐	**FAR** ☐
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	**In relation with the calculation of the BM, in the sheet "BUILD_MARGIN_DATA" of the spreadsheet, have been found the following issues that shall be changed:** • **The plant "Cortecito" is not identified as CDM Project and its generation value has been included in the calculation.** • **In 2014, the total generation of the electric system of Honduras and the generation of the CDM plants are not indicated.**		
CLIENT RESPONSE #1	*This section shall be filled by the PP.*		
It shall address the corrective action taken in details	**The plant "Cortecito" is not identified as CDM Project and its generation value has been included in the calculation.** R: The plant "Cortecito" has been considered as CDM Project and it has been excluded in the calculation. **In 2014, the total generation of the electric system of Honduras and the generation of the CDM plants are not indicated.** R: In the spreadsheet "*GEF Honduras 19Jan17.xlsm' the electrical generation has been included without the generation of the CDM plants.*		
It shall provide and identified the evidences proposed (if applicable)			
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The generation value of 2014 is not correct due to the identification of the CDM plants is not correct. So, the plant "Coronado" is not considered as CDM project although it is identified in the sheet "BUILD_MARGIN_DATA" whereas the plant "San Marcos" is considered as CDM Project although it is not identified in the sheet "BUILD_MARGIN_DATA".		
CLIENT RESPONSE #2	*This section shall be filled by the PP.*		
It shall address the corrective action taken in details	**The generation value of 2014 is not correct due to the identification of the CDM plants is not correct. So, the plant "Coronado" is not considered as CDM project although it is identified in the sheet "BUILD_MARGIN_DATA" whereas the plant "San Marcos" is considered as CDM Project although it is not identified in the sheet "BUILD_MARGIN_DATA".**		

	R: The plants of "Coronado" and "Cortecito" have been excluded of the calculation of BM.	
It shall provide and identified the evidences proposed (if applicable)	GEF Honduras 30Jan17.xlsm	
DOE Assessment #2 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The value calculated in cell C33 of the sheet «BUILD_MARGIN_DATA» is not correct, as it includes the generation of the CDM plants.	
CLIENT RESPONSE #3	*This section shall be filled by the PP.*	
It shall address the corrective action taken in details	Cell 33 has been updated and the CDM projects identified in the sheets "rawdata" and "Build Margin data" now is identical.	
It shall provide and identified the evidences proposed (if applicable)	Formato de Aplicacion CDM-PSB-FORM Honduras 06 Feb17.doc GEF Honduras 06Feb17.xlsm	
DOE Assessment #3 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	In the final version of the documents provided ("Formato de Aplicacion CDM-PSB-FORM Honduras 8Feb17 V2" and spreadsheet "GEF Honduras 8Feb17 V2"), the information included is already considered correct, complete and adequate.	
Conclusion *Tick the appropriate checkbox*	**CAR/CL CLOSED** ☒	To be checked during the first periodic verification ☐

FINDING	Nº 4		
Classification	**CAR** ☒	**CL** ☐	**FAR** ☐
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	**In the document "formato de Aplicación CDM-PSB-FORM Honduras 7Julio2016-RCC Bogota" has been found the following information inconsistent with the other documents:** • **The contact telephone of DNA is different to the one indicated in the document "Borrador QAQC SBL-GEF Honduras July 2016".** • **The title of the project indicated in the page 3 is different to the title indicated in the spreadsheet.** • **The "submission date" indicated in page 3 is different to the date indicated in the spreadsheet.** • **The values of OM, BM and CM indicated in page 9 are different to the values indicated in the spreadsheet.** • **On page 9, there is no unambiguous reference (title and version) to the enclosed report containing all calculation steps, data used, assumptions and results.** • **The capacity values of the private plants, state hydroelectric plants and the quantity of state hydroelectric plants indicated in the table 1 are different to the values indicated in the table 4 of the "Borrador QAQC SBL-GEF Honduras July 2016".** • **The import data for the year 2014 indicated in the note 4 is different to the value indicated in the sheet "SIMPLE_OM_GRID_OPTION_A_DATA" of the spreadsheet.** • **The source of the values of the Generation % indicated in the table 1 is not correct.** • **Table 2 refers to coal in Spanish instead of English.** • **The reference included in page 11 to the column D of the sheet "SIMPLE_OM_OPTION_A" in the spreadsheet on the net generation data is not correct.** • **The reference included in page 12 to the columns E-H of the sheet "BUILD_MARGIN_DATA" in the spreadsheet on the fuel consumption is not correct.** • **Information regarding the option selected to calculate the OM (exante or expost) is not included.** • **The "GEF calculation Honduras" spreadsheet referred to in "References and any other relevant information" does not correspond to that provided to the DOE.**		

CLIENT RESPONSE #1	*This section shall be filled by the PP.*
	The contact telephone of DNA is different to the one indicated in the document "Borrador QAQC SBL-GEF Honduras July 2016". *R: The telephone number has been updated: +504 22321386* **The title of the project indicated in the page 3 is different to the title indicated in the spreadsheet.** *R: The title has been changed* **The "submission date" indicated in page 3 is different to the date indicated in the spreadsheet.** *R: The submission date has been updated in accordance with the documents presented.* **The values of OM, BM and CM indicated in page 9 are different to the values indicated in the spreadsheet.** *R: The values have been updated in accordance with the spreadsheet "GEF Honduras 19Jan17.xlsm "*
It shall address the corrective action taken in details	**On page 9, there is no unambiguous reference (title and version) to the enclosed report containing all calculation steps, data used, assumptions and results.** *R: The reference to the spreadsheet which contains all information has been included: GEF Honduras 19Jan17.xlsm* **The capacity values of the private plants, state hydroelectric plants and the quantity of state hydroelectric plants indicated in the table 1 are different to the values indicated in the table 4 of the "Borrador QAQC SBL-GEF Honduras July 2016".** *R: This table has been deleted as the same information is already included in the file "GEF Honduras 19Jan17.xlsm"* **The import data for the year 2014 indicated in the note 4 is different to the value indicated in the sheet "SIMPLE_OM_GRID_OPTION_A_DATA" of the spreadsheet.** R: Import data has been changed. **The source of the values of the Generation % indicated in the table 1 is not correct.**

	R: The source of the table 1 has been changed. **Table 2 refers to coal in Spanish instead of English.** **The reference included in page 11 to the column D of the sheet "SIMPLE_OM_OPTION_A" in the spreadsheet on the net generation data is not correct.** R: The reference has been changed **The reference included in page 12 to the columns E-H of the sheet "BUILD_MARGIN_DATA" in the spreadsheet on the fuel consumption is not correct.** R: The reference has been changed **Information regarding the option selected to calculate the OM (ex-ante or ex-post) is not included.** R: Information regarding the option selected to calculate the OM (ex-post) has been included. **The "GEF calculation Honduras" spreadsheet referred to in "References and any other relevant information" does not correspond to that provided to the DOE.** R: The reference to the file "*GEF Honduras 19Jan17.xlsm* « has been changed.
It shall provide and identified the evidences proposed (if applicable)	
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The import data for the year 2014 indicated in the note 4 (278.5 GWh) is still different to the value indicated in the spreadsheet (320,360,340 KWh). Table 2 still refers to coal in Spanish instead of English. The information included in the document "Formato de Aplicación CDM-PSB-FORM Honduras 19Jan17" regarding the option selected to calculate the OM is not correct, as the option selected has been the ex-ante option instead of the ex-post option.
CLIENT RESPONSE #2	*This section shall be filled by the PP.*
It shall address the corrective action taken in details	**The import data for the year 2014 indicated in the note 4 (278.5 GWh) is still different to the value indicated in the spreadsheet (320,360,340 KWh).** R: The electricity imported has been changed in the spreadsheet (see raw data) **Table 2 still refers to coal in Spanish instead of**

	English. R: Changed for "coal" **The information included in the document "Formato de Aplicación CDM-PSB-FORM Honduras 19Jan17" regarding the option selected to calculate the OM is not correct, as the option selected has been the ex-ante option instead of the ex-post option.** R: The option ex-ante has been used in the calculation of the emission factor, based in historical data of electricity generation and fuel consumptions.
It shall provide and identified the evidences proposed (if applicable)	Formato de Aplicacion CDM-PSB-FORM Honduras 30 Jan17.doc GEF Honduras 30Jan17.xlsm
DOE Assessment #2 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	It has not been possible to verify that the option ex-ante has been used in the calculation of the emission factor, based in historical data of electricity generation and fuel consumptions. Moreover, there are still inconsistences in the information provided, as the document «Formato de Aplicacion CDM-PSB-FORM Honduras 30 Jan17» indicates that: • *Build margin (BM) – Option 1 (ex-ante, most recent information available in plants)* • *The proposed grid emission factor is calculated using the ex-ante option.* • *For CDM - The values can be used for new CDM projects and CDM projects requesting renewal f crediting period, for fixed ex-ante purposes.* However, the value of the EFOM2014(0.6116) corresponds to the value calculated with the option ex-post of the tool (the emission factor is determined for the year in which the project activity displaces grid electricity), as the value obtained with the option ex-ante should have been calculated using the 3-year generation-weighted average, based on the most recent data available). On the other hand, the information included in the document regarding the following issue: «*In addition, these can be used for registered CDM projects that chose in its PDD to monitor the grid emission factor (ex-post)*» It is not consistent with the selection of the option ex-ante to calculate the EF_{BM}.
CLIENT RESPONSE #3	*This section shall be filled by the PP.*
It shall address the corrective action taken in	The calculation of the EF_{OM} has been carried out using

details	the historical values of 2014, 2013 and 2012, which are the latest date available, whereas the 2014 data has been used to calculate of the BM. This justifies the calculation ex-ante of the OM and BM. The comment "«*In addition, these can be used for registered CDM projects that chose in its PDD to monitor the grid emission factor (ex-post)*» , has been deleted to avoid confusions.	
It shall provide and identified the evidences proposed (if applicable)	"Formato de Aplicacion CDM-PSB-FORM Honduras 8Feb17 V2" Hoja de cálculo "GEF Honduras 8Feb17 V2"	
DOE Assessment #3 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	Information included in the latest version of the documents provided is considered adequate.	
Conclusion *Tick the appropriate checkbox*	**CAR/CL CLOSED** ☒	To be checked during the first periodic verification ☐

FINDING	Nº 5		
Classification	**CAR** ☒	**CL** ☐	**FAR** ☐
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	**The justification provided to consider as "low cost/must run" plants the renewable private plants and not the renewable state plants is not in accordance with the definition included in the tool:** **"Low-cost/must-run (LCMR) resources - are defined as power plants with low marginal generation costs or dispatched independently of the daily or seasonal load of the grid. <u>They include hydro, geothermal, wind, low-cost biomass, nuclear and solar generation.</u> If a fossil fuel plant is dispatched independently of the daily or seasonal load of the grid and if this can be demonstrated based on the publicly available data, it should be considered as a low-cost/must-run. Electricity imports shall be treated as one LCMR power plant"**		
CLIENT RESPONSE #1	*This section shall be filled by the PP.*		
It shall address the corrective action taken in details	**The justification provided to consider as "low cost/must run" plants the renewable private plants and not the renewable state plants is not in accordance with the definition included in the tool.** R: The renewable plants have been considered as "low cost/must run" plants, according to the definition of the tool.		
It shall provide and identified the evidences proposed (if applicable)			
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The document "Formato de Aplicacion CDM-PSB-FORM Honduras 19Jan17" still indicates that the only the renewable private plants are considered "low cost/must run", and the percentages indicated to justify the option selected to calculate the OM have been calculated without considering all "low cost/must run" plants.		
CLIENT RESPONSE #2	*This section shall be filled by the PP.*		
It shall address the corrective action taken in details	**The document "Formato de Aplicacion CDM-PSB-FORM Honduras 19Jan17" still indicates that the only the renewable private plants are considered "low cost/must run", and the percentages indicated to justify the option selected to calculate the OM have been calculated without considering all "low cost/must run" plants.**		

	R: The percentages of LCMR have been updated and the calculation of these percentages has been included in the spreadsheet.
It shall provide and identified the evidences proposed (if applicable)	Formato de Aplicacion CDM-PSB-FORM Honduras 30 Jan17.doc GEF Honduras 30Jan17.xlsm
DOE Assessment #2 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The calculation of the percentages of the LCMR has not considered the imports as LCMR. Moreover, the total generation values used is not correct either, as it is included the value of deviations (Export-import) and energy sold (exports) which are already included in the generation of all plants of the national interconnected system.
CLIENT RESPONSE #3	*This section shall be filled by the PP.*
It shall address the corrective action taken in details	LCMR values have been updated (including imports). The total energy generated by the system has been updated. The current calculation considers neither deviations nor energy sold, as they are already considered in the total generation of the electric system.
It shall provide and identified the evidences proposed (if applicable)	"Formato de Aplicacion CDM-PSB-FORM Honduras 8Feb17 V2" Hoja de cálculo "GEF Honduras 8Feb17 V2"
DOE Assessment #3 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	Information included in the latest version of the documents provided is considered adequate.
Conclusion *Tick the appropriate checkbox*	**CAR/CL CLOSED** ☒ / To be checked during the first periodic verification ☐

FINDING	Nº 6		
Classification	**CAR** ☒	**CL** ☐	**FAR** ☐
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	**In the document "Borrador QAQC SBL-GEF Honduras July 2016", the version 4 of the tool is referred, indicating that this version is valid until November 2016, and this date is not correct.** **On the other hand, the approach applied in the calculation of the fuel consumption of the plants that consume different fuels and are considered in the calculations of the OM has not been described in section where other "approaches" considered in the QC procedures are justified.**		
CLIENT RESPONSE #1	*Esta sección debe ser completada por el PP.*		
It shall address the corrective action taken in details	**In the document "Borrador QAQC SBL-GEF Honduras July 2016", the version 4 of the tool is referred, indicating that this version is valid until November 2016, and this date is not correct.** *R: The version of the tool has been updated.* **On the other hand, the approach applied in the calculation of the fuel consumption of the plants that consume different fuels and are considered in the calculations of the OM has not been described in section where other "approaches" considered in the QC procedures are justified.** *R: The following paragraph has been included:* *"Where several fuel types are used in the power unit, the fuel type with the lowest CO2 emission factor for EFCO2,m,i,y has been applied"*		
It shall provide and identified the evidences proposed (if applicable)			
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure additional corrective action and DOE assessments (#2, #3, etc.) shall be added*	The corrections included in the final version of the document "QAQC SBL-GEF Honduras 8 Feb17 V2" are considered adequate.		
Conclusion *Tick the appropriate checkbox*	**CAR/CL CLOSED** ☒	To be checked during the first periodic verification ☐	

H. References

Ref	Document Name	Author/Competent Authority
1	"Formato de Aplicacion CDM-PSB-FORM Honduras 8Feb17 V2".	ENEE
2	QAQC SBL-GEF Honduras 8 Feb17 V2	ENEE
3	Spreadsheet "GEF Honduras 8Feb17 V2"	ENEE
4	Tool for the calculation of the emission factor of the electricity system (version 5.0)	EB
5	CDM Validation and Verification Standard (Version 09.0)	EB
6	2006 IPCC Guidelines on National GHG Inventories	IPCC
7	Table to calculate the emission factor for an electricity system	EB
8	Cuadro 6 ESTADISTICAS_ 2014	ENEE
9	Procedure: Development, revision, clarification and update of standardized baselines (version 4)	EB
10	Guidelines for quality assurance and quality control of data in the establishment of standardized baselines (version 2)	EB

ANNEX 1: CERTIFICATES OF QUALIFICATION

CERTIFICATE OF QUALIFICATION

Asunto: Validation and Technical Review Team for "CO2 Emission factor of the Electric System in Honduras for 2014"

Madrid, 06/03/2017

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the verification process of the above mentioned project activity:

Name: **Luis Javier ARRIBAS ALONSO**

CDM Chief Validator: Si

CDM Validator: Si

CDM Chief Verifier: N/A

CDM Verifier: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

TA1.2: Energy generation from renewable energy sources.

Mª Carmen González Galán
Technology Coordinator

CERTIFICATE OF QUALIFICATION

Asunto: Validation and Technical Review Team for "CO2 Emission factor of the Electric System in Honduras for 2014"

Madrid, 06/03/2017

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the verification process of the above mentioned project activity:

Name: **Freddy Alejandro GARRO FLORES**

CDM Chief Validator: Si

CDM Validator: Si

CDM Chief Verifier: N/A

CDM Verifier: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

TA1.2: Energy generation from renewable energy sources.

Mª Carmen González Galán
Technology Coordinator

CERTIFICATE OF QUALIFICATION

Asunto: Validation and Technical Review Team for "CO2 Emission factor of the Electric System in Honduras for 2014"

Madrid, 06/03/2017

Hereby I confirm the following records of qualification, according with AENOR internal instruction "Validation, Verification and Certification of Clean Development Mechanism (CDM) project activities" IE-DTC-039, and in relation with the verification process of the above mentioned project activity:

Name: **Richard Daniel GONZÁLES TOLEDO**

CDM Chief Validator: Si

CDM Validator: Si

CDM Chief Verifier: N/A

CDM Verifier: N/A

External Technical Expert: N/A

Technical areas related with the project activity:

TA1.2: Energy generation from renewable energy sources.

Mª Carmen González Galán
Technology Coordinator