	Assessment Report for CDM proposed standardized baseline (Version 02.0)

*(To be **used** by the **UNFCCC secretariat** in assessing the quality of a proposed standardized baseline only when requested by eligible DNAs.)*

Title of proposed standardized baseline:	Grid emission factor for the Dominican Republic
Reference of proposed standardized baseline:	PSB0048
Name(s) of the Party or Parties to which the proposed standardized baseline applies:	Dominican Republic
Name(s) of the proponent(s) of the proposed standardized baseline:	National Council for Climate Change and Clean Development Mechanism (CNCCMDL)
History of the submission & assessment:	1) 04/02/2019: first submission was received 13/03/2019: initial assessment was finalized 02/05/2019: its assessment was finalized 2) 01/08/2019: second submission was received 03/12/2019: its assessment was finalized

Conclusion:

(a) **The quality assurance and quality control system complied with the provisions and data quality objectives of the valid "Guidelines for quality assurance and quality control of data in the establishment of standardized baselines"**

☒ Yes

☐ No

☐ N/A

(b) **The approach used by this proposed standardized baseline complied with one of the approaches referred to in the valid "Procedure for development, revision, clarification and update of standardized baselines":**

☒ One of the four approved approaches:

☐ The "Guidelines for the establishment of sector specific standardized baselines";

☐ A methodological approach contained in an approved baseline and monitoring methodology;

☒ A methodological approach contained in an approved methodological tool;

☐ The "Guideline: Establishment of standardized baselines for afforestation and reforestation project activities under the CDM".

Date when the assessment report is completed:	03/12/2019

SECTION A. Summary of Proposed Standardized Baseline

A.1.   Scope and application of the proposed standardized baseline

1.   The proposed standardized baseline (PSB) is developed for

   (a)   ☐ Additionality demonstration;

   (b)   ☐ Baseline identification;

   (c)   ☒ Baseline emission estimation

2.   The sector to which this PSB applies is industries sector, which includes electricity generation/consumption.

3.   The PSB applies to the following measures:

   (a)   ☐ Fuel and feedstock switch;

   (b)   ☒ Switch of technology with or without change of energy source (including energy efficiency improvement);

   (c)   ☐ Methane destruction;

   (d)   ☐ Methane avoidance

4.   Projects shall use standardized baseline together with the approved methodologies which refer the "TOOL07 : Tool to calculate the emission factor for an electricity system".

A.2.   Description of the proposed standardized baseline

5.   Key data parameters and data sources:

Key data parameters *(e.g. total production of output, kiln technology, fuel type & consumption etc.)*	Data sources *(e.g. individual facilities, government documents, literature etc.)*
Total net annual electricity generation by each power plant connected to the SENI	Reports from the National Grid Coordinating Entity of the Dominican Republic (OC-SENI). Cross-checked against distributor companies.
Total fuel consumption by each power plant connected to the SENU	Reports from the National Grid Coordinating Entity of the Dominican Republic (OC-SENI). Cross-checked against reports from generator companies.
Net Calorific Value of the different fuel types consumed	US Energy Information Administration
Fuel CO_2 emission factor	IPCC 2006

6.   The scope and coverage of the data: (*Note: modify the contents below as it suits to submission*)

(a) The data include key information of each power plant, such as name, installed capacity, start of commercial operation, technology of the power plant, fuel consumed (type and quantity), net electricity generated.

(b) The data represent all power plants connected to the SENI, which covers the entire country;

(c) The data represent three years (2014, 2015 & 2016). This vintage is in line with the requirements of data currency since the SB was submitted in 2019 – most recent year of the coverage period is 2016.

    (i) For Operating Margin (OM) calculation, as low cost/must run plants constitute less than 20 per cent of total electricity generation during the five most recent years (2016 – 2012), the Simple OM method is selected;

    (ii) The Build Margin (BM) is calculated using the data for power plants that comprises 24.2 % of generation

7. The DNA uses a data template in accordance with the TOOL07.

8. The PSB applies the following assumptions (and/or conservative approaches) in order to process the data

(a) densities of liquid fuels are sourced from the latest OLADE Energy Statistics Manual (2017)[1];

(b) for natural gas, applied values are at standard temperature and pressure (15°C, 760 mmHG), using a specific web tool[2];

(c) data of bituminous coal is used due it's the common type of carbon utilized for local plants (ITABO).

SECTION B. Summary of Assessment

B.1. Assessment process

9. The purpose of assessment conducted by the secretariat is: i) to ensure that the QA/QC system implemented by the DNA complies with the provisions and data quality objectives of the "Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines" (hereinafter referred to as QA/QC guidelines); ii) to ensure that the PSB complies with the approach from the "TOOL07 : Tool to calculate the emission factor for an electricity system".

10. The assessment consisted of the following: (*Note: delete irrelevant steps below*)

(a) Review of the documents submitted,

(b) Identification of issues (assessment findings) and draft of the assessment "findings and resolution" note,

(c) Communication of assessment findings with DNA and request for their resolution and response,

(d) Direct communication with DNA,

(e) Review of the additional documents and/or responses provided by DNA,

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[1] Available at http://biblioteca.olade.org/opac-tmpl/Documentos/old0380.pdf
[2] Available at: http://unitrove.com/engineering/tools/gas/natural-gas-density

(f)   Closing the findings,

(g)   Conclusion of the assessment report.

11.   A desk review was performed on the following data/information submitted as part of the PSB.

    (a)   First submission dated 04/02/2019 which was successful in the initial assessment included:

        (i)   PSB form (F-CDM-PSB), version 1.0 dated 20/01/2019;

        (ii)   Report "DETERMINATION OF CO2 EMISSIONS FACTOR FOR THE POWER SECTOR - DOMINICAN REPUBLIC", dated 30/05/2018;

        (iii)   QC Report, dated 25/01/2019;

        (iv)   Grid emission factor calculation spreadsheet "DR_Grid_EF_Rev_May-2018.xlsm" (not dated);

        (v)   Stakeholder consultation report, dated 10/11/2018.

    (b)   Assessment findings were communicated to the DNA on 02/05/2019

    (c)   Second submission dated 01/08/2019 included:

        (i)   A revised report "DETERMINATION OF CO_2 EMISSIONS FACTOR FOR THE POWER SECTOR - DOMINICAN REPUBLIC", dated 30/07/2019;

        (ii)   A revised QC report dated 25/01/2019;

        (iii)   a revised Grid emission factor calculation spreadsheet "DR_Grid_EF_Rev_May-2018.xlsm", addressing the findings (not dated);

        (iv)   A revised PSB form, dated 20/01/2019 addressing the findings.

B.2.   Assessment opinion:

12.   In accordance with the QA/QC guidelines, the secretariat concluded that the all following requirements were met by this PSB:

    (a)   QC system (resource/procedure) was implemented to check the data quality before/during/or after data collection.

        (i)   Data on electricity generated, type and quantity of fuel consumed, technology and start of commercial operation for each power plant are obtained from the National Grid Coordinating Entity of the Dominican Republic (OC-SENI);

        (ii)   All data collected as part of monitoring will be archived electronically and will be maintained for at least 5 years by the DNA;

        (iii)   OC-SENI is a government agency which coordinates the operation of the generation, transmission and distribution companies in the Dominican Republic;

        (iv)   OC-SENI keeps accurate records of:

            a.   Each plant / unit to the grid connected generation;

            b.   Plants included in the build margin and the operating margin;

(v)   The data will be presented in such a way that allows for the reproduction of the calculation of the emission factor of build and operating margins of the grid;

(vi)   OC-SENI has 24/7 monitoring system. Generation information is transmitted to OC-SENI in real time via radio frequency (or data is alternatively entered via live interface), and this data is used to prepare the annual report. In the monthly reports, OC-SENI uses distribution data. In the weekly report, power generators report fuel type and heat rate to OC-SENI via email;

(vii)   There is a standard format for generator companies and distributors to report to OC-SENI. Time is given by report type, so that the generator makes corrections to their reports, but the annual report is the most accurate because this is based on billing and payment made;

(viii) OC-SENI publishes its reports per year since 2000;

(ix)   Therefore, it can be concluded that a QC system was implemented in accordance with 'Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines';

(b)   QC activities were clearly documented (in the QC report).

(c)   Consultation process was clearly documented and conducted on 10/11/2018. According to the consultation report, stakeholders (such as representatives from academic, public and private sector business associations with relations to the electric system, Ministry of Environment, the Dominical Oil Refinery and the Ministry of Mines and Energy) were invited to provide inputs and comments.

(d)   All relevant documents and data were available for assessment.

(e)   The data key sources were government authorities, which collected credible data in accordance with their national standards and procedures.

(f)   The data scope was comprehensive enough to produce "true and fair" representative SB in the particular sector.

(g)   The key data and information are consistently presented.

(h)   The data vintage (3 years) was met as per the provisions of the "Standard for data coverage and validity of standardized baselines".

(i)   The assumptions and conservative approaches for data processing and calculations were justified.

(j)   There were no confidential data but the data file would be presented in an anonymous form.

13.   The details of issues (assessment findings) identified by the secretariat and the responses provided by the DNA are provided in Appendix-1 to this document.

14.   The calculation of emission factor of the grid presented in PSB is in accordance with the applicability and the provisions of "TOOL07 : Tool to calculate the emission factor for an electricity system" (version 7.0). Therefore, the emission factors (OM, BM and CM) derived in the PSB is assessed to be accurate.

Appendix 1. Findings and resolutions

CL No.	Request for Clarification (CL)	Reference to general provisions of guidelines on quality assurance and quality control of data used for sector-specific standardized baselines	Responses and corrective actions of DNA	Conclusion (open/closed)
1	**Default efficiencies of power plants** The CO_2 emission factor of power plants that only have information on the electricity generated and type of fuel consumed can be determined based on Option A2 of the grid tool, i.e. based on default efficiencies of the power units that are sourced from the "TOOL09 : Methodological tool: Determining the baseline efficiency of thermal or electric energy generation systems". These default efficiencies depend on the type of the generation technology and the commissioning year of the power plant. It was observed that default efficiencies have been applied in 2014 for the power plants Río San Juan, San Lorenzo 1 and Quisqueya 1, and in 2015 for the power plants Río San Juan and Haina 4. However, the year of commissioning and the type of generation technology for these plants have not been properly indicated. The DNA is requested to justify the default efficiencies applied.	Conservativeness (Para 15h) of the QA/QC Guidelines version 2.0.	Regarding the type of generation technologies and fuels for Río San Juan, San Lorenzo 1, Quisqueya 1 and Haina 4 units, please see the report "*Emissions Factor for Power Sector - Dominican Republic*", table 2 (p.6). Regarding default efficiencies, we can confirm the commissioning date of following plants: • Rio San Juan: 1/6/2008. Source: OC-SENI report 2008, table 8, p.26. • San Lorenzo 1: 7/3/2012. Source: OC-SENI report 2012, table 4, p.20. (type of technology is indicated on table 11, p.34). • Quisqueya 1: 1/9/2013. Source: OC-SENI report 2013, table 11, p.28. (labeled as "PVDC autoproductor" in the mentioned OC report) • Haina 4: preivous to 2001 (the year which was adopted the current legal framework for the porwer sector in the Dominican Republic). Source: OC-SENI report 2000, table 1, p.30. The technology of this unit is Stean Turbines.	CLOSED

CL No.	Request for Clarification (CL)	Reference to general provisions of guidelines on quality assurance and quality control of data used for sector-specific standardized baselines	Responses and corrective actions of DNA	Conclusion (open/closed)
			With the above mentioned data, and following of table 2 of "TOOL09: Methodological tool: Determining the baseline efficiency of thermal or electric energy generation systems" applied default efficiencies are justified as follows: Rio San Juan (39.5%); San Lorenzo 1 (39.5%); Quisqueya 1 (42%) and Haina 4 (37.5%)	
2	**Missing power plant** The report *"Emissions Factor for Power Sector - Dominican Republic"* provides a list of power plants connected to the SENI in Table 2, including the power plant "Estrella del Mar". However, this power plant could not be identified in the sheet *"SIMPLE_OM_GRID_OPTION_A_DATA"* of the file *"DR_Grid_EF_Rev_May-2018.xls"*. The DNA is requested to explain why the plant is excluded in the sheet for the calculation of emission factor.	Consistency (Para 15c) of the QA/QC Guidelines version 2.0.	Please see unit_numer (m) 28 in 2014 (row 91), when "Estrella del Mar" plant is identified. Also, please see the report "*Emissions Factor for Power Sector - Dominican Republic*", table 3 (p.9) which states the power generation of this power unit in 2015 and 2016 is equal to 0.	CLOSED
3	**Amount of natural gas** Page 10 of the report *"Emissions Factor for Power Sector - Dominican Republic"* indicates that the amount of natural gas consumed in m^3 is calculated based on the density of the gas, that is sourced from a specific web tool. However, the amount of	Consistency (Para 15c) of the QA/QC Guidelines version 2.0.	This aspect was updated after to review this CL. For natural gas, the fuel consumption is reported in MM BTU so, the amount of natural gas is (in m^3) is determined multiplying the fuel consumption (MM BTU) by the energy density (m^3/MM BTU). Applied value of energy density is 27.3166 m^3/MM	CLOSED

CL No.	Request for Clarification (CL)	Reference to general provisions of guidelines on quality assurance and quality control of data used for sector-specific standardized baselines	Responses and corrective actions of DNA	Conclusion (open/closed)
	gas consumed indicated in the sheet *"SIMPLE_OM_GRID_OPTION_A_DATA"* of the file *"DR_Grid_EF_Rev_May-2018.xls"* is determined by multiplying the MMBTU measured (sourced from the file *"Consumo de Combustible Anual 2001-2016.xls"*) by 27.3065 m^3/MMBTU (sourced from the US Energy Information Administration). In addition, the QC report states that Net calorific value of the Natural Gas is sourced from IPCC 2006. The DNA is requested to clarify how the amount of natural gas is determined.		BTU, as is reported by the U.S. Energy Information Administration[3]. Also, as 1 MM BTU = 0.9478 GJ, a NCV of natural gas is calculated as 0.3469 GJ/m^3 (0.9478 GJ/MM BTU ÷ 27.3166 m^3/ MM BTU). Relevant documents and excel were updated to reflect these corrections. For further detail, please see notes on track changes versions.	
4	**Consumption of more than one fuel** With respect to the power plants Haina 4 and Haina TG, rows 42, 44 and 48 of the sheet "2016" from the file *"Consumo de Combustible Anual 2001-2016.xls"* contains values of consumption of coal, gas oil and fuel oil. However: (i) the calculation of the grid emission factor does not contain data of such fuels consumed for 2016, and (ii) the information on power generation by Haina 4 was not provided. The DNA is requested to clarify the reasons for not including these fuels in the	Consistency (Para 15c) of the QA/QC Guidelines version 2.0.	Haina TG [G3HAINAG] corresponds to row 43 (Fuel Oil No.2 / Gas Oil). The row 42 (coal) to Barahona Carbon [G3BARAHC] and row 48 (Fuel Oil / Fuel Oil No.6) to Quisqueya 2 [G3QUISQ2], Sultana del Este [*G3SESTE*] and San Pedro Vapor [G3SPEDRV] units. (iii) calculation of the grid emissions factor does not contain data of diferents fuels for Haina TG due to this unit uses Fuel Oil No.2 / Gas Oil; please see the report "*Emissions Factor for Power Sector - Dominican Republic*", table 3 (p.9) which states the power generation of this unit in 2016 is equal to 0 so it was not included.	CLOSED

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[3] available at https://www.eia.gov/energyexplained/index.php?page=about_energy_conversion_calculator

CL No.	Request for Clarification (CL)	Reference to general provisions of guidelines on quality assurance and quality control of data used for sector-specific standardized baselines	Responses and corrective actions of DNA	Conclusion (open/closed)
	calculation of the grid emission factor.			
5	**Outliers emission factors** Some outliers OM emission factors were observed for the following power plants: - CESPM 1+2+3 (year 2015) - Metaldom (year 2016) - Los origenes (year 2015) - Estrella del mar (year 2015) The DNA is required to explain the reason for these outliers.	Consistency (Para 15c) of the QA/QC Guidelines version 2.0.	CESPM 1+2+3 (year 2015): after to review the calculated OM (1.36 CO_2/MWh) and check its right, its concluded that this power plant has a low efficiency, due to its high fuel consumption in relationship to its power generation/delivery. Metaldom (year 2016): calculated OM for this unit is reasonable due to produce 237,548.08 MWh in 2016, a similar amount of electricity than 2014 (217,131.9451 MWh) and 2015 (237,156.3337 MWh), but whith a lower fuel consumption. After to check generation and fuel consumptions are right, it can be concluded this lower OM results of a eventual efficiency of the unit or a better measurement. Los origenes (year 2015): as this power plant reports two types of fuel consumption (Natural Gas and Fuel Oil No.6), per guidance of the "TOOL07 : Methodological tool: Tool to calculate the emission factor for an electricity system" is used the fuel type with lowest CO_2 emission factor (Natural Gas) so the OM results on a real lower value (0.21 tCO_2/MWh). Estrella del mar **2** (year 2015): as this power plant reports two types of fuel consumption (Natural Gas and Fuel Oil No.6), per guidance of the "TOOL07 : Methodological tool: Tool to calculate the emission factor for an electricity system" is used the fuel type	CLOSED

CL No.	Request for Clarification (CL)	Reference to general provisions of guidelines on quality assurance and quality control of data used for sector-specific standardized baselines	Responses and corrective actions of DNA	Conclusion (open/closed)
			with lowest CO_2 emission factor (Natural Gas) so the OM results on a real lower value (0.09 tCO_2/MWh).	
6	**Name of power plants** Tab sheet "2016" from the file *"Consumo de Combustible Anual 2001-2016.xls"* contains the names of power plants that do no correspond with the power plants included in row C of the master calculation spreadsheet (tab sheet "SIMPLE_OM_GRID_OPTION_A_DATA"). The DNA is requested to explain to which power plants from the sheet "2016" the data of fuel consumed correspond to.	Completeness (Para 15b) of the QA/QC Guidelines version 2.0.	Tab sheet "2016" from the file "Consumo de Combustible Anual 2001-2016.xls" include a unified code for all units but these such codes are not included in OC reports as the name of the unit (which is diferent for Tab sheet "2015" contains the codes and names of the units). However, all code/units for 2016 are listed below for reference purposes: - G3AANDRE ➔ AES ANDRES - G3RSJUAN ➔ RIO SAN JUAN - G3CEPP1 ➔ CEPP 1 - G3CEPP2 ➔ CEPP 2 - G3CESPM1 ➔ CESPM 1 - G3CESPM2 ➔ CESPM 2 - G3CESPM3 ➔ CESPM 3 - G3METALD ➔ METALDOM - G3LMINA5 ➔ LOS MINA 5 - G3LMINA6 ➔ LOS MINA 6 - G3BARAHC ➔ BARAHONA CARBON - G3HAINAG ➔ HAINA TG - G3SESTE ➔ SULTANA DEL ESTE - G3ITABO1 ➔ ITABO 1 - G3ITABO2 ➔ ITABO 2 - G3LVEGA ➔ LA VEGA - G3PALAMA ➔ PALAMARA - G3SFELIP ➔ SAN FELIPE - G3PIMEN1 ➔ PIMENTEL 1 - G3PIMEN2 ➔ PIMENTEL 2 - G3PIMEN3 ➔ PIMENTEL 3	CLOSED

CL No.	Request for Clarification (CL)	Reference to general provisions of guidelines on quality assurance and quality control of data used for sector-specific standardized baselines	Responses and corrective actions of DNA	Conclusion (open/closed)
			- G3LOPPLA ➜ LOS ORIGENES - G3IKM22 ➜ INCA KM22 - G3BERSAL ➜ BERSAL - G3LOPPLA ➜ LOS ORIGENES - G3MRIO ➜ MONTE RIO - G3QUISQ1 ➜ QUISQUEYA 1 - G3EM2CGN ➜ ESTRELLA DEL MAR 2 NG - G3EM2CFO ➜ ESTRELLA DEL MAR 2 FO	
7	**Different CO_2 emission factors between OM and BM for the same power plant** The CO_2 emission factor of the power plants Los Orígenes and Estrella del Mar 2 have different values between OM and BM for 2016. The DNA is requested to explain this difference.	Consistency (Para 15c) of the QA/QC Guidelines version 2.0.	This is explained as a condition of the Excel provided by the "TOOL07 : Methodological tool: Tool to calculate the emission factor for an electricity system" for cases where two or more fuel types are used by a power plant. In the OM is used the fuel type with lowest CO_2 emission factor but in the BM, the Excel allows to include several types of fuels for the same unit, so the calculated CO_2 emissiosn factor for one unit with several fuels results diferent for both parameters. This case represents an opportunity to improve future versions of the tool, to include several fuel types on same unit in OM as is possible in BM.	CLOSED
8	**Cogeneration plants** The DNA is requested to clarify whether there are cogeneration power plants (where the heat generated is not fully used to produce electricity) connected to the grid.	Completeness (Para 15b) of the QA/QC Guidelines version 2.0.	There are no cogeneration plants connected to the grid. Please see the report "*Emissions Factor for Power Sector-Dominican Republic*", table 1 (p.6) which include the tyepes of technologies for all power plants connected to the grid in 2014-2016 period.	CLOSED

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