



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 Antigua and Barbuda
Reference of proposed standardized baseline:	PSB0031: Grid emission factor (GEF) for Antigua and Barbuda
Name(s) of the Party or Parties to which the proposed standardized baseline applies:	Antigua and Barbuda
Name(s) of the proponent(s) of the proposed standardized baseline:	Department of Environment, Ministry of Health, Wellness and the Environment (DNA of Antigua and Barbuda)
History of the submission & assessment:	<ol style="list-style-type: none"> 1) 20/11/2015: first submission was received <ul style="list-style-type: none"> • 10/12/2015: initial assessment was finalized • 18/05/2016: findings submitted to the DNA 2) 07/01/2021: second submission was received <ul style="list-style-type: none"> • 28/01/2021: assessment of the second submission was finalized; • 19/02/2021: stakeholder consultation report was submitted • 24/02/2021: The draft standardized baseline (DSB) was sent to the DNA, which agreed to recommend the DSB to the Board for approval.

<p>Conclusion:</p> <p>(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”</p> <p>(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”:</p>	<p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p><input type="checkbox"/> N/A</p> <p><input checked="" type="checkbox"/> Yes</p> <p><input type="checkbox"/> No</p> <p>One of the four approved approaches:</p> <p><input type="checkbox"/> The “Guidelines for the establishment of sector specific standardized baselines”;</p> <p><input type="checkbox"/> A methodological approach contained in an approved baseline and monitoring methodology;</p> <p><input checked="" type="checkbox"/> A methodological approach contained in an approved methodological tool “TOOL07 : Tool to calculate the emission factor for an electricity system” (version 07.0);</p> <p><input type="checkbox"/> The “Guideline: Establishment of standardized baselines for afforestation and reforestation project activities under the CDM”.</p>
<p>Date when the assessment report is completed:</p>	<p>24/02/2021</p>

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 proposed PSB0031 applies to the energy industries sector, which includes electricity generation/ consumption in Antigua and Barbuda. The grid emission factor is determined separately for the mainland Antigua and for the mainland Barbuda.
3. Projects shall use the standardized baseline together with the approved methodologies where the “TOOL07 : Tool to calculate the emission factor for an electricity system” (hereinafter referred to as “the grid tool”) is referred.

A.2. Description of the proposed standardized baseline

4. Key data parameters and data sources:

Key data parameters	Data sources
Fuel properties (NCV, emission factor)	Lower limit of 95% C.I.: IPCC 2006 Guidelines, Vol. 2, Tables 1.3 and 1.4
Fuel consumption	APUA (Antigua Public Utilities Authority)
Electricity generation in the national grid	APUA (Antigua Public Utilities Authority)

5. The scope and coverage of the data:

(a) The proposed PSB0031 identifies, as part of the relevant electricity systems:

- (i) 4 thermal power plants (3 located in mainland Antigua and 1 located in mainland Barbuda)
- (ii) 3 solar power plants (all located in the mainland Antigua)

(b) The data include key information of each power plant (name, electricity generation and fuel type/consumption)

(c) The data represent the two islands that are part of the country (i.e. Antigua and Barbuda);

(d) The data represent three years (2017, 2018 and 2019).

6. The DNA has its own template to determine the combined margin emission factor.

7. The development of the proposed PSB0031 includes only grid-connected power plants.

8. Since the electricity generated from the solar power plants in mainland Antigua between 2017 and 2019 are significant smaller than the electricity generated by the thermal pants, the average share of low-cost/must-run (LCMR) between 2015-2019 is not expected to be above 50%, therefore the average from 2015 to 2019 is below 50 per cent, Simple OM method is applied.

9. Since Antigua and Barbuda is a small-island developing state (SIDS), the simplified combined margin was calculated based on the provisions of paragraph 90 of the grid tool (i.e. a weight of 1 is assigned to the operating margin and a weight of 0 is assigned to the build margin).

SECTION B. Summary of Assessment**B.1. Assessment process**

10. 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); and ii) to ensure that the proposed PSB0031 complies with the requirements of the grid tool.

11. The assessment consisted of the following:

- (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;
 - (f) Closing the findings;
 - (g) Conclusion of the assessment report.
12. A desk review was performed on the following data/information submitted as part of the updated PSB0031:
- (a) First submission dated 20/11/2015 included:
 - (i) Proposed Standardized Baseline development form (CDM-PSB-FORM), dated 20/11/2015. The standardized baseline was developed applying the ‘Guidelines for establishment of sector specific standardized baselines’ (version 2.0);
 - (ii) Calculation sheets for GEF for 2012, 2013 and 2014, not dated;
 - (iii) ‘Antigua Transmission Network.pdf’, not dated;
 - (iv) ‘Grid Map_11kv network.pdf’, not dated;
 - (v) QC Report, dated 21/11/2015.
 - (b) Assessment findings (as shown in Appendix 1 of this report) were communicated to the DNA on 18/05/2016. In the communication, the DNA was informed that the proposed SB should be revised to apply the provisions from the grid tool instead of the ‘Guidelines for establishment of sector specific standardized baselines’, based on guidance provided by the CDM-EB during the approval process of the ASB00021 and the recommendation by the methodologies panel (MP).
 - (c) Second submission dated 07/01/2021 included the responses to the findings in the Appendix 1 of this report, a revised Excel calculation sheet containing data from 2017 to 2019, and a revised Quality Control report. The stakeholder consultation report was submitted on 19/02/2021. This submission clarified all issues raised by the secretariat.

B.2. Assessment opinion:

13. In accordance with the QA/QC guidelines, the secretariat concluded that the all the following requirements were met by this PSB:
- (a) QC system was implemented to check the data quality before/during/or after data collection. All primary data come directly from APUA (Antigua Public Utility Authority);
 - (b) QC activities were clearly documented in the QC report. Data templates were presented to the power sector through which the required data for the GEF calculation and renewal may be maintained and submitted to DNA to facilitate further transparency and quality control;
 - (c) Consultation process took place virtually on 17/12/2020.

- (d) All relevant documents and data were available for assessment. The data used in the calculation are available at APUA;
 - (e) The data scope was comprehensive enough to produce a “true and fair” representative standardized baseline in the particular sector;
 - (f) The key data and information are consistently presented;
 - (g) The data vintage (three years – 2017, 2018 and 2019) was met as per the provisions of the grid tool;
 - (h) The assumptions and conservative approaches for data processing and calculations were justified;
14. No issues (assessment findings) were identified by the secretariat during the assessment of the proposed PSB0031.
15. The secretariat concluded that the proposed PSB0031 complied with the approach of the grid tool, the detailed assessment can be found in the table below

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	Project electricity systems and power plants: (i) Please clarify if there are two independent (not interconnected) electric systems in the country, one for Antigua island and other for Barbuda island. (ii) Please clarify which are the power plants connected to the electric system(s), since there are inconsistencies among the information provided in the following documents: a. PSB form: 4 power plants (Barbuda power plant, Wadadli Power Plant, APC Plant and Black Pine); b. APUA web-site (http://www.apua.ag/power-plant-production-summaries/): 3 plants (Barbuda power plant, Wadadli Power Plant and Friar's Hills Power Plant); c. Supporting file "Antigua Transmission Network.pdf": 2 generation stations (Friar Hill's and CRABBS, being the last one with 2 acronyms, APC and WPP);	Traceability Paragraph 15 (k) of the QA/QC Guidelines version 2.0.	There are two independent electric systems in the country. One is on mainland Antigua and the other is on mainland Barbuda. All power plants and RE installations are connected to the electric systems. There are three thermal power plants in Antigua, i.e. APC Plant, Black Pine Plant and Wadadli Power Plant. There is one power plant in Barbuda, i.e. Barbuda Power Plant.	OK. The response addressed the clarification.
2	Information sources: For traceability, reference documents of electricity generation data and fuel consumption data for each plant for 3 years should be submitted (e.g. copies of relevant report from APUA). This will help to expedite data review/validation.	Traceability Paragraph 15 (k) of the QA/QC Guidelines version 2.0.	The data that is submitted in the attached report (<i>20201112 Revised PSB0031 - GEF calculation (Tool) 01092020 v2-Antigua.xlsx</i>) was obtained directly from the Antigua Public Utilities Authority (APUA). The data is not published publicly.	OK. Since the data is not publicly available, this issue can be closed.
3	Public consultation report: In accordance with the "Quality assurance and quality control of data used in the establishment of standardized baselines", it is recommended that the DNA should provide a public consultation report.	Transparency and Documentation provisions Paragraph 15 (j) and 31 (d) of the QA/QC Guidelines version 2.0.	A public consultation will be arranged with representatives from the Ministry of Energy as well as from the APUA.	A public consultation took place virtually on 17/12/2020 and the public consultation report was submitted by the

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)
	Please note: public consultation report can be included in the QC report.			DNA. Therefore, this issue can be closed.
4	<p>Electricity generation data</p> <p>The figures of electricity generation for the Barbuda Power Plant for different years (2012, 2013 and 2014) in the Excel spreadsheet are the same.</p> <p>The DNA is requested justify the reasons why the exact same value is reported or to correct the value according to the source of the information.</p>	<p>Completeness</p> <p>Paragraph 15 (b) of the QA/QC Guidelines version 2.0.</p>	The revised set of data that is submitted is from 2017, 2018 and 2019. The issue raised for clarification has been addressed with the revised submission.	OK. The DNA submitted revised data of electricity generated, between 2017-2019. Therefore, the response addressed the clarification.

STEP FROM THE GRID TOOL	ASSESSMENT
Step 1: Identify the relevant electricity systems	<p>Antigua and Barbuda is an insular nation, composed by two islands: the island of Antigua and the island of Barbuda. Each island has its own electric grid, which are neither interconnected among themselves nor connected to an electric grid from another country.</p> <p>Therefore, the electric systems are (i) the electric grid of Antigua, and (ii) the electric grid of Barbuda.</p>
Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)	<p><u>Electric grid of Antigua</u> The DNA selected Option I ("Only grid power plants are included in the calculation")</p> <p><u>Electric grid of Barbuda</u> The DNA selected Option I ("Only grid power plants are included in the calculation")</p>
Step 3: Select a method to determine the operating margin (OM)	<p><u>Electric grid of Antigua</u> The electric grid of Antigua is composed by the following 6 power plants:</p> <ul style="list-style-type: none"> • Antigua Power Company (APC Plant) – consumes diesel • Antigua Power Company (Black Pine) – consumes diesel • Wadadli Power Plant – consumes diesel • Airport Solar Farm • Bethesda Solar Farm • Airport Rooftop Solar <p>The solar power plants entered in operation only after 2016, and the electricity generated over the period 2017-2019 represents an average of 1.38%, meaning the share of low-cost/must-run (LCMR) resources constituted less than 50% of the total grid generation. Therefore, the Simple-OM method was selected.</p> <p><u>Electric grid of Barbuda</u></p>

	<p>This Barbuda electric grid is composed solely by Barbuda power plant, that consumes diesel. Therefore, the Simple-OM method was selected since there are no LCMR plants connected to the island's grid.</p>
<p>Step 4: Calculate the operating margin emission factor according to the selected method</p>	<p><u>Electric grid of Antigua</u> The calculation of the OM was performed through Option A (Based on the net electricity generation and a CO₂ emission factor of each power unit) and the $EF_{EL,m,y}$ was determined based on option A1 (data on fuel consumed and electricity generated by each power plant is available).</p> <p>The list of power plants and the data of electricity generated and fuel consumed by each power plant were provided by APUA. The NCV of the fuel consumed and the CO₂ emission factor of the fuel were sourced from the IPCC.</p> <p>The OM calculated for the period 2017-2019 is equal to 0.62 tCO₂/MWh.</p> <p><u>Electric grid of Barbuda</u> The calculation of the OM was performed through Option A (Based on the net electricity generation and a CO₂ emission factor of each power unit) and the $EF_{EL,m,y}$ was determined based on option A1 (data on fuel consumed and electricity generated by each power plant is available).</p> <p>The details of the power plant including the data of electricity generated and fuel consumed were provided by APUA. The NCV of the fuel consumed and the CO₂ emission factor of the fuel were sourced from the IPCC.</p> <p>The OM calculated for the period 2017-2019 is equal to 0.96 tCO₂/MWh.</p>
<p>Step 5: Calculate the build margin (BM) emission factor</p>	<p>For both electric grid of Antigua and electric grid of Barbuda, the combined margin was determined based on the simplified approach of paragraph 90 of the grid tool, i.e. applying a weight of 1 to the operating margin and 0 to the build margin since Antigua and Barbuda is a small island developing state. Therefore, there is no need to determine the build margin.</p>

<p>Step 6: Calculate the combined margin emissions factor</p>	<p><u>Electric grid of Antigua</u> The simplified combined margin emission factor was determined by applying a weight of 1 to the OM and 0 to the BM. The result is equal to 0.62 tCO₂/MWh.</p> <p><u>Electric grid of Barbuda</u> The simplified combined margin emission factor was determined by applying a weight of 1 to the OM and 0 to the BM. The result is equal to 0.96 tCO₂/MWh.</p>
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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	27 May 2013	Initial publication
02.0	01 June 2015	Modified in order to take into account the Board's decision and improve clarity and consistency
Decision Class: Regulatory Document Type: Form, (for Secretariat use only) Business Function: Methodology Keywords: Assessment, Standardized baselines, Methodologies		