



**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 Belize national power grid
Reference of proposed standardized baseline:	ASU_008: Request for update of ASB0005 version 01.0
Name(s) of the Party or Parties to which the proposed standardized baseline applies:	Belize
Name(s) of the proponent(s) of the proposed standardized baseline:	The Designated National Authority (DNA) of Belize
History of the submission & assessment:	<ol style="list-style-type: none"> 1) 02/03/2021: first submission was received <ul style="list-style-type: none"> • 09/03/2021: initial assessment was finalized and the request to update the standardized baseline was uploaded on the UNFCCC website. 2) 19/04/2021: final recommendation was prepared. 3) 08/06/2021: The draft updated standardized baseline 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>10/06/2021</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. This updated ASB0005 applies to the energy industries sector, which includes electricity generation/ consumption in Belize.

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” (version 07.0) (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)	For NCV: 2006 IPCC Guidelines For EF: 2006 IPCC Guidelines
Fuel consumption	Belize Electricity Limited (BEL) Independent Power Producers (IPPs) GHG Inventory Reports
Electricity generation in the national grid	Belize Electricity Limited (BEL) Independent Power Producers (IPPs)
Electricity imports/exports	Belize Electricity Limited (BEL) Independent Power Producers (IPPs)

5. The scope and coverage of the data:

(a) The updated ASB0005 identifies, as part of the relevant electricity system:

- (i) 4 hydropower plants;
- (ii) 3 fossil-fuel fired power plants;
- (iii) 2 bagasse cogeneration plants;
- (iv) 1 solar power plant; and
- (v) Electricity imports from Mexico.

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

(c) The data represent all regions in the country

(d) The data represent three years (2016, 2017 and 2018).

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

7. The development of the updated ASB0005 includes only grid-connected power plants.

8. As the total low-cost/must-run (LCMR) average from 2014 to 2018 is above 50 per cent, Simple Adjusted OM method is applied.

9. The data for 2018 is used for BM calculation.

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 updated ASB0005 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 ASB0005:
 - (a) First submission dated 02/03/2021 included:
 - (i) Approved standardized baseline update request form (CDM-ASU-FORM);
 - (ii) Calculation sheets for GEF for 2016, 2017 and 2018;
 - (iii) QC Report;
 - (iv) PSB form containing the application of the grid tool to the PSB.
 - (b) The additional submission was sufficient to prepare a final recommendation.

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 ASU:
 - (a) QC system was implemented to check the data quality before/during/or after data collection. All primary data come directly from BEL and from the IPPs. The information regarding plants performance (electricity generation, fuel consumption) is monitored continuously by BEL and by the IPPs. The data is archived and maintained in such a way that allow for the reproduction of the calculation of the emission factor of the grid;
 - (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) All relevant documents and data were available for assessment. The data used in the calculation are available in the annual reports prepared by BEL and in internal control files;
 - (d) The data scope was comprehensive enough to produce a “true and fair” representative standardized baseline in the particular sector;
 - (e) The key data and information are consistently presented;

- (f) The data vintage (three years) was met as per the provisions of the grid tool;
 - (g) 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 updated ASB0005.
15. The secretariat concluded that the updated ASB0005 complied with the approach of the grid tool, the detailed assessment can be found in the table below

STEP FROM THE GRID TOOL	ASSESSMENT
<p>Step 1: Identify the relevant electricity systems</p>	<p>The project electric system is the BEL National Electricity Grid System, determined by the electric utility of Belize (hereinafter “electric grid of Belize”).</p> <p>The electric grid of Belize is composed by 10 power plants, where 7 are of renewable nature (4 hydro, 2 bagasse cogeneration and 1 solar) and 3 are fossil-fuel fired (diesel and fuel oil). In 2018, the generation from renewables accounted for 344 GWh (around 86% of the total generation) whereas the generation from the fossil fuel fired power plants accounted for 54 GWh (14% of all generation).</p> <p>The electric grid of Belize imported around 37% of the total electricity consumed in 2018 from Mexico that is considered as a connected electricity system. The emission factors equal to 0.458 tCO₂/MWh for 2016, 0.582 tCO₂/MWh for 2017 and 0.527 tCO₂/MWh for 2018 were sourced from the Federal Electricity Commission from Mexico and used to determine the OM and the CM of the BEL National Electricity Grid System.</p>
<p>Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)</p>	<p>The DNA selected Option I (“Only grid power plants are included in the calculation”)</p>
<p>Step 3: Select a method to determine the operating margin (OM)</p>	<p>Low-cost/must-run (LCMR) resources constituted more than 50% of the total grid generation in average of the five most recent years (2014-2018). LCMR power plants include all renewable plants (bagasse cogeneration, solar and hydro) and the imports from Mexico.</p>
<p>Step 4: Calculate the operating margin emission factor according to the selected method</p>	<p>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>Since the data to plot the load duration curve was not available, the parameter “lambda” was determined based on the default values (Approach 1), specifically through the Option 1, i.e. based</p>

	<p>on the share of electricity generation from low-cost/must-run in total generation from the average of the five most recent years. Since the average share of LCMR over the 5 most recent years of data was equal to 94.74%, the lambda applied in this SB was equal to 0.70.</p> <p>The OM calculated for the period 2016-2018 is equal to 0.49 tCO₂/MWh.</p>																					
<p>Step 5: Calculate the build margin (BM) emission factor</p>	<p>The set of 5 most recently built power plants ($SET_{5-units}$) include the following units:</p> <table border="1"> <thead> <tr> <th>Power Plant</th> <th>Commissioning Year</th> <th>Electricity generated 2019 (GWh)</th> </tr> </thead> <tbody> <tr> <td>Santander Sugar Energy Limited (SSEL)</td> <td>2017</td> <td>21.9</td> </tr> <tr> <td>JICA Solar Farm</td> <td>2012</td> <td>0.60</td> </tr> <tr> <td>BECOL - Vaca</td> <td>2010</td> <td>78.6</td> </tr> <tr> <td>Blair Athol Power Company Limited (BAPCOL)</td> <td>2009</td> <td>37.0</td> </tr> <tr> <td>Belcogen</td> <td>2009</td> <td>71.9</td> </tr> <tr> <td>TOTAL</td> <td></td> <td>210</td> </tr> </tbody> </table> <p>The electricity generated by these set of plants in 2018 ($AEG_{SET-5 units}$) was equal to 210 GWh.</p> <p>The set of power plants that comprises 20% of the generation in 2018 ($SET_{\geq 20 per cent}$) include the 3 power plants from the top of the table above (highlighted in yellow), and the total generation from this set of units ($AEG_{SET \geq 20 per cent}$) is equal to 101 GWh. Therefore, BM was determined based on the set of 5 power units that started to supply electricity to the grid most recently.</p>	Power Plant	Commissioning Year	Electricity generated 2019 (GWh)	Santander Sugar Energy Limited (SSEL)	2017	21.9	JICA Solar Farm	2012	0.60	BECOL - Vaca	2010	78.6	Blair Athol Power Company Limited (BAPCOL)	2009	37.0	Belcogen	2009	71.9	TOTAL		210
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	The secretariat confirmed that the calculation of the emission factor was made in line with equation 15 of the grid tool. The value of BM determined for 2018 was equal to 0.21 tCO ₂ /MWh.
Step 6: Calculate the combined margin emissions factor	<p>The combined margin emission factor was determined by applying different weights for OM and BM as follows:</p> <ul style="list-style-type: none"> - wind and solar: OM = 0.75; BM = 0.25 - other plants 1st crediting period: OM = 0.5; BM = 0.5 - other plants 2nd and 3rd crediting periods: OM = 0.25; BM = 0.75

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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

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