



Assessment Report for CDM proposed standardized baseline (Version 01.0)

(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 of Belize
Reference of proposed standardized baseline:	PSB0006
Sector:	Electricity generation sector
Name of DNA:	Belize
Dates Reviewed:	<p>First submission was received on May 23, 2013</p> <p>Second submission was received on August 15, 2013</p> <p>Response to findings of this assessment report was received on December 03, 2013</p>

Summary of Proposed Standardized Baseline:

Scope and application of the proposed standardized baseline (SB):

The proposed SB is submitted for a single Host Party, Belize, and is developed for the purpose of:

- Baseline emissions estimation
- Project and leakage emissions estimation

The sector to which this proposed standardized baseline applies is the energy generation/consumption sector.

Description of the proposed standardized baseline:

The key data parameters related to this proposed standardized baselines are:

- Total annual electricity production per plant;
- Total annual electricity import;
- Net calorific values of fuel;
- Fuel emission factors; and
- Total annual fuel consumption.

The grid emission factor for Belize is determined using the “Tool to calculate the emission factor for an electricity system” (version 03.0.0). For the calculation of carbon dioxide emissions at power plants, data on net calorific values of fuels used, power generation and fuel consumption were provided by the Belize Electricity Limited, whereas the information on the imported electricity from Mexico, data is provided by the Secretariat of energy of Mexico.

The relevant project electricity system is the Belize national electricity system which is connected to the Mexican National Electricity System (SEN) through the 115 kV transmission line that has a capacity of 40 MW. Belize imports electricity from Mexico and for years 2009 2010 and 2011 the respective electricity import is respectively 216,233, 159,876 and 170,611.93 MWh.

As no national carbon dioxide emission factors and net calorific values for different fuel types are available; the IPCC 2006 default values at the lower limit of uncertainty at a 95 per cent confidence interval were applied and in the absence of some values conservative default values from the “Tool to calculate the emission factor for an electricity system” were applied. The low cost/must run plants constitute 90 per cent of total electricity generation in the average of the five most recent years (2007 – 2011). This is more than 50 per cent of the Belize grid generation therefore the operating margin is calculated using the Average OM method in line with the requirement of applied methodological tool.

The build margin is calculated using the data for five most recent power plants, which total electricity generation in 2011 was 192,920.11 MWh, or 59.87 per cent of the total generation in Belize. The list of power plants does not include plants older than 10 years and registered CDM projects.

Data vintage requirement (three successive years of plant data for each power plant) is met.

Complete and up-to-date information and data on the operation of the Belize power grid, including power generation and fuel consumption by individual plants is maintained by Belize Electricity Limited (BEL), which is state owned company controlling the distribution and transmission of the electricity and managing overall the grid BEL processes complete, accurate and traceable information on the operation of the energy sector.

Assessment methodology

The assessment consisted of the following:

- Initial desk review and findings – first and second rounds of submissions;
- Review of the third round of submission based on initial findings;
- Issue of the draft assessment report including clarifications;
- Resolution of clarifications;
- Issue of the final assessment report.

Review of documents

A desk review was performed on the below data/information submitted as part of the proposed standardized baseline:

- First submission dated 23 May 2013:
 - Submission letter dated 21 March 2013;
 - Proposed standardized baseline (F-CDM-PSB) dated 21 March 2013 (version 01);
 - Grid Emission Factor report of Belize 2009 - 2011 dated January 2013;
 - Calculation of Combined Margin Emission Factor 2009 – 2011 – excel file.
- Second submission dated 15 August 2013:
 - Davis, D., 2002. Hydroelectric power development in Belize: Focus on the Mollejon Hydro Project. Presentation from Belize Electricity Limited;
 - Memorandum on validation of data used in Grid Emission Factor;
 - Belize Electricity Limited, 2004. Annual Report 2003. Belize Electricity Limited. Retrieved June 26, 2013 from http://www.bel.com.bz/annual_reports.aspx
 - Belize Electricity Limited, 2007. Annual Report 2006. Belize Electricity Limited. Retrieved June 26, 2013 from http://www.bel.com.bz/annual_reports.aspx
 - Belize Electricity Limited, 2010. Annual Report 2009. Belize Electricity Limited. Retrieved June 26, 2013 from http://www.bel.com.bz/annual_reports.aspx
 - Belize Electricity Limited, 2011. Annual Report 2010. Belize Electricity Limited. Retrieved June 26, 2013 from http://www.bel.com.bz/annual_reports.aspx
- Third submission dated 03 December 2013:
 - Certification letter by Belize Electricity Limited dated 03 December 2013.

The initial findings and observations were communicated to the DNA on 24 September 2013, in response to which the DNA submitted additional documentation and clarification on 03 December 2013.

Assessment findings and resolution

Findings related to data collection, process and compilation to establish the proposed standardized baselines are identified in Appendix-1.

Summary of Assessment:	
Requirements	Explanation
The data quality was checked before/during/or after data collection:	Data quality has been checked during the data collection, aggregation and processing.
(a) QC system (resource/procedure) was implemented.	All primary raw data are provided by the individual power plants using established data delivery protocols. Belize Electricity Limited performs aggregation of data and conducts review of the data sets for consistency and accuracy in accordance with internally established QC/QA system. The data received from Belize Electricity Limited are screened and technically reviewed by experts from the Belize DNA. 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 was clearly documented (e.g. QC report).	
Were all required documents and data available for assessment?	All the data were easily available and accessible for assessment.
The proposed standardized baselines were established through consultation processes:	The primary data used for the SB were established through consultation process as explained below.
(a) The sector or data providers were engaged and communicated enough to provide valid inputs/data.	All power plants submit data to Belize Electricity Limited in pre-set form of data delivery protocols.
(b) Stakeholders were invited to provide inputs and comments where applicable.	Stakeholders' inputs were invited by making reports including the data used publicly available. In addition to that expert feedback on the data, data compilation and management was obtained.
(c) The public consultation report was clearly documented if applicable.	Some of the data used for the standardized baseline were made public and are accessible at http://www.bel.com.bz/annual_reports.aspx , whereas others were not made public but expert feedback was provided on the data gathering process and calculation of grid emission factor.
The data quality objectives and the general provisions of the QA/QC Guidelines, were met. If the QC report is available, this session can be skipped unless further explanation is needed (when conservative approaches were taken, further explanation is required):	The data quality objectives and QA/QC guidelines version 1.0 were met as explained below:

<p>(a) Relevant data were used to the establishment of sector-specific standardized baselines.</p>	<p>The key data collected are electricity generation, fuel consumption per type of fuel, NCV of each fuel for all power plants in the country.</p> <p>(1) Electricity generation was measured using calibrated and certified meters located at each plant.</p> <p>(2) Fuel consumption data were measured either with flow meters (in the case of natural gas) or with scales (for coal and heavy fuel oil). All meters are certified as per relevant national standards.</p> <p>(3) The NCV for the fuel used in each power plant were derived from IPCC 2006 default values at the lower limit of uncertainty at a 95 per cent confidence interval.</p> <p>(4) The efficiency of one of the plant uses the conservative default from the tool.</p> <p>Based on the above justification from SB developers it can be concluded that the relevant data is used in SB.</p>
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<p>(b) The data scope was comprehensive enough to produce “true and fair” representative standardized baselines in the particular sector.</p>	<p>The comprehensiveness of the data scope to produce “true and fair” representative standardized baseline by applying a clear procedure (explained in steps below) with the aim of only capturing data and information which would be representative and credible with regard to emissions associated with the electricity generation.</p> <p>Step 1: Selection of the scope of data to be collected</p> <p>The data were requested from all existing grid-connected plants in Belize and electricity import to Belize from SEN. For consistency the data received were checked by the DNA against the reports of all existing power plants and report of electricity import data from SEN. There were no cases of omissions and non-reporting.</p> <p>Step 2: Collection of data</p> <p>The data were collected according to a specified data format valid for all power plants. The data format predefined the type of data, the units in which the data should be reported and the data vintage.</p> <p>The raw data were screened internally and aggregated every month, every three months and annually by Belize Electricity Limited. The annual report preparation involved also review of entire data set for consistency and accuracy.</p> <p>Step 3: Review of data</p> <p>The aggregated data received from Belize Electricity Limited were reviewed by Belize DNA and its technical experts. The data were compared against data from previous years and checked for any inconsistencies.</p> <p>Step 4: Handling of missing data</p> <p>There were no missing data. Net calorific values and emission factors for fossil fuels were derived from IPCC 2006 default values at the lower limit of uncertainty at a 95 per cent confidence interval.</p>
<p>(c) The key data and information are consistently presented.</p>	<p>It can be concluded that the procedure is followed to check the consistency of the data used in SB based on the following explanations from SB developer:</p> <p>All data were collected and aggregated into the same format to make the datasets compatible with other related data and to allow comparison.</p> <p>The data for electricity generation which was metered was cross-checked against invoices for payment of electricity delivered to the grid.</p> <p>The data for fuel consumption which was measured by flow meters or scales were compared with quantities as per the fuel purchase invoices.</p>

<p>(d) The credibility of the data sources was ensured.</p>	<p>The data gathering involves primary data sources – power plants in the country. The data are collected and cross-checked through Supervisory Control and Data Acquisition network and it’s Electronic Metering System.</p> <p>The data were checked by Belize Electricity Limited, which is a national entity that processes full, complete, accurate and traceable information on the operation of the energy sector.</p> <p>The data were reviewed by Belize DNA and its technical experts.</p> <p>Based on the above explanation from SB developers it can be concluded that the data used in SB is credible.</p>
<p>(e) The most recent available data were utilized. If applicable, the pre-determined data vintage was met.</p>	<p>Data vintage cover the period of 2009 –2011 which can be considered current and therefore the dataset meets the quality objective of currentness. The standardized baseline is to be updated every three years which will ensure the currentness of the future updates.</p> <p>Based on the above justification from SB developers this can be concluded that the most recent available data is used in SB.</p>
<p>(f) Duplications and errors were avoided or corrected.</p>	<p>The Belize Electricity Limited collected and processed raw data in accordance with internal QA/QC procedures which address the treatment of duplication and errors.</p> <p>The Belize DNA also reviewed data sets and if any inconsistencies were identified these were corrected in consultations with Belize Electricity Limited.</p> <p>With the above explanation from SB developers it can be concluded that the accuracy of the data is justified.</p>
<p>(g) If any, assumptions or interpretations for data processing/ calculations were justifiable.</p>	<p>Based on the information and justification provided by SB developers it can be concluded that the assumptions or interpretations for data processing/ calculations used in SB are justifiable.</p>

<p>(h) The security of datasets including confidentiality was well maintained in accordance with pre-established procedures if requested.</p>	<p>The sources of the data used for the calculations identified in the excel sheet were arrived from a database maintained by Belize Electricity Limited, even as the underlying database is not publicly available.</p> <p>Based on this information submitted by SB developers it can be concluded that the security of database is maintained.</p>
<p>The assessment is concluded successfully, based on the overall evaluation.</p>	<p>The data used for the development of SB is meeting the data quality objectives and general provisions of 'Guidelines for quality assurance and quality control of data used in the establishment of standardized baselines'.</p>
<p>Date the assessment is sent to the focal point:</p>	

Appendix-1: Findings and resolution

CL No.	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
1	<p>As per paragraph 37 (f) of the QA/QC Guidelines version 1.0 regarding the documentation requirements, whenever a data source is used as reference or raw data for the establishment of standardized baseline, the data sources and all the issues related to data quality should be documented.</p> <p>In reference to above requirement, it is noted that the DNA has provided list of references through email dated 15th August 2013. However linkage between these references to the data and/or related information provided under worksheet named 'Belize 2009-2011' in excel sheet titled 'GEF 2009-2011.xls' and Annex 1 of the document titled 'Grid emission factor of Belize 2009 – 2011.pdf' could not be established. The DNA is requested to provide reference to data cells in above mentioned worksheet as already provided in the other worksheet named 'Annex Mexico 2009-2011'.</p>	<p>Documentation provisions, data quality for use of secondary data, data traceability paragraph 11 (a) to (k) of the QA/QC Guidelines version 1.0.</p>	<p>Belize Electricity Limited (BEL) hereby certifies that the data contained in the file entitled Calculation of the Combined Margin Emission Factor 2009-2011 stated in cell D51 through to cell L58 is true and accurate. BEL, being the source of data, operates Belize's transmission grid through its Control Room, situated at its Corporate Headquarters, 2 ½ Miles Philip Goldson Highway, Belize City, Belize. BEL's Control Room records energy data on an hourly basis using its Supervisory Control and Data Acquisition network and its Electronic Metering System to monitor energy consumption in mega-watt hours. The data is logged for reporting and forecasting purposes.</p>	<p>Closed</p> <p>The submission received from Belize DNA confirms that the data and/or related information provided under worksheet named 'Belize 2009-2011' in excel sheet titled 'GEF 2009-2011.xls' is correct and accurate and same information was provided into Annex 1 of the document titled 'Grid emission factor of Belize 2009 – 2011.pdf'.</p>

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	10 September 2013	Initial publication.

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