

QUALITY CONTROL (QC) REPORT

Sector	Energy generation
Name of DNA	Mrs. Diann Black-Layne
Primary Person Responsible for QC Procedures	Bryan Nicholas Chief Mechanical Engineer
Contact of the Primary Person Responsible	bryan@apua.ag
Implementation Dates of QC Procedures	From the date of adoption of standardized baseline.

Please describe how your QC procedures were implemented

All sources for data were given in the Table of calculation, version 01.0 submitted with PSB form which clearly outlined data type, unit, description, source and frequency.

Table: Key data parameters

<i>Data</i>	<i>Source</i>	<i>Method of Cross checking</i>
Total annual generation	APUA	Antigua and Barbuda Central Statistics office
Total fuel consumption	APUA	Antigua and Barbuda Central Statistics office
NCV	IPCC 2006	-
Fuel emission factor	IPCC 2006	-

All data collected as part of monitoring will be archived electronically and will be maintained for at least 3 years by the DNA. All these data should be monitored, unless otherwise stated in the methodologies that are used by specific projects. Some parameters need to be monitored continuously, or need to be monitored periodically. The data will be archived and maintained in such a way that allow for the reproduction of the calculation of the emission factor of the grid.

The Antigua Public Utilities Authority (APUA) is a tripartite government statutory agency. APUA is the sole provider of electricity to Antigua and Barbuda. APUA started operations in July 1973.

APUA keeps records of:

- Each plant / unit to the grid connected generation:
 - Information to clearly identify the plant / unit;
 - The start date (commercial);
 - The technology and the type of fuel used;
 - The net amount of electricity generated in the relevant years;
 - The consumption of each fuel type in the relevant years;

The data will be presented in such a way that allow for the reproduction of the calculation of the emission factor of the grid.

The information on electricity generation and fuel consumption was obtained from APUA and communicated to the DNA to calculate the emission factor, to comply with the QA/QC requirements. Initial data transfer occurred in 06 November 2015 and final/complete data transfer took place 13 November 2015.

There is a standard format for generators and distributors to report to APUA. Time is given by report type (daily, weekly and monthly), so that the generators make corrections to their reports, but the Financial Report is the most accurate because this is based on billing and

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payment made.

- Most generation data is collected manually by plant operators, using log sheets.
- This information is then transferred to excel files to produce plant reports.
- Each station report is checked by the Section Head responsible for the plant. The section head will prepare a report using excel, for the stations that he is responsible for, and send the report to the Distribution Engineer.
- The Distribution Engineer will review the reports from the three Section Heads and check for anomalies. The Distribution Engineer will also receive sales figures from the Customer Services Department. The Distribution Engineer will then compile one report of all generation statistics and send to the Senior Planning Engineer for review. Data is also sent to the Central Statistics office for review and checks.
- Once this review is completed, the Generation statistics are published on a monthly basis using an Excel file.

Please specify how the credibility of the data sources was checked.

DNA considers that the data is comprehensive and reliable.

Please specify how the accuracy of the data was checked.

All data would be cross check with the statistical department.

Relevance:

The key data used for the grid emission factor calculation is relevant. Both electricity generation and fuel consumption data are collected from APUA. NCV and fuel emission factor are sourced from IPCC 2006 Guidelines.

Completeness/Comprehensiveness:

DNA assures the completeness of the data as data available is sufficient for the calculation of the grid emission factor. Generation data for 2012, 2013 and 2014 was accessed.

Consistency:

APUA confirms data collected by cross checking with internal auditing reports and central statistics office data.

Credibility:

DNA has carried out a cross checking activity for the aggregate electricity generation and fuel consumption data by comparing the data collected with the generation and distribution companies and found the collected data to be credible.

Please specify how the consistency was achieved and how the data vintage provision was met.

The most recent three year (2012 – 2014) data at the time of calculation were used. The latest complete annual data available is for 2014.

Please specify how the completeness was achieved.

All Calculations followed the "Guidelines for the establishment of sector specific standardized baselines," version 02.0, CDM EB 65, Annex 23 and data available fulfil sufficiently and adequately.

APUA performs frequent and necessary checks and verification during generation. Even stand-by plants undergo similar processes.

Please specify how the transparency was achieved.

There was sufficient available information to calculate this factor, in an efficient, conservative and transparent manner. APUA (<http://www.apua.ag>) keeps statistics on the operation of the power plants connected to the grid. All data and documents collected are



also reported to the corporate communication department who disseminates the information to the general public. Some monthly generation reports are also publically available on the website.
Please specify major issues and uncertainties identified during the QC procedures.
Not applicable since data used in the calculation are cross checked directly with APUA since publically available information is not complete.
Please specify major corrective actions taken during the QC procedures.
Addendum internal report and replacement of faulty monitoring devices
Please justify the conservativeness of the approaches taken during the QC procedures.
Off grid power plants are not accounted for in this calculation. As of date there is no CDM project activities registered in Antigua and Barbuda.
Please summarize key findings and present a plan to improve the data quality in the future.
<p>The data and parameters defined in the monitoring protocol, allows keeping the calculation with sufficient rigor and quality.</p> <p>The following is suggested to improve data quality in the future:</p> <ul style="list-style-type: none"> • Prepare a separate study to estimate emissions from off-grid power as the units not connected to the national grid, can significantly increase the calculated emission factor.

Mr. Bryan Nicholas, Chief Mechanical Engineer at APUA, confirms that this information provided above is valid and true to comply with Q/C requirements through according to APUA's procedures as well.

Date to finalize this report

Signature of DNA

21 November 2015

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