**Quality Control (QC) report**

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| **Sector** | Power |
| **Name of DNA** | DNA of São Tomé and Principe  (Directorate General for the Environment, Ministry of Public Works and Natural Resources) |
| **Primary Person Responsible for QC Procedures** | Mr. Madival Alva das Neves |
| **Contact info of the Primary Person Responsible** | Direção Geral do Ambiente  Avenda Kwame N’kruma  C.P. 1023, São Tomé  São Tomé e Principe  Email: [Madaval15@hotmail.com](mailto:Madaval15@hotmail.com)  Telephone: (+239) 222 5323  Fax: (+239) 222 7156 |
| **Implementation Dates of QC Procedures** | From the date of submission of the SBL “Grid Emission Factor for São Tomé and Principe” in November 2013 and for the duration of the SBL after approval. The same will be applicable for the renewal process of the SBL. |
| **Please describe how your QC procedures were implemented** | |
| All data sources have been provided in the São Tomé and Principe GEF Calculation Report and the GEF calculation sheet submitted with the CDM-PSB form. All data on electricity generation and fossil fuel consumption are provided by the state's Water and Electricity Company (EMAE) of São Tomé and Principe.  The data and information that were checked are as follows:   |  |  |  | | --- | --- | --- | | **Data** | **Source** | **Cross checking method** | | Identification and detail information of grid connected power plants in São Tomé and Principe | EMAE | * Check at power plants operated by EMAE; * Check at power plants operated by Grupo F.I.S.I. (private operator) | | Power generation, fuel type and fuel consumption data of every power plant for different vintage years | EMAE | * Check at power plants operated by EMAE; * Check at power plants operated by Grupo F.I.S.I. (private operator) | | Fuel specifications such as NCV and EF | IPCC 2006 | Not relevant |   All the above data will be archived and maintained electronically at least for five years by EMAE. The information regarding plants performance (electricity generation, fuel consumption) are monitored continuously by EMAE and Grupo F.I.S.I. plant operators and periodically transmitted to EMAE Direçao de Electricidade. 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.  EMAE is the ultimate authority in São Tomé and Principe that keep track of power generation and distribution in the country and keeps accurate data on the following fields:   * Information on the São Tomé and Principe national grid, its connections; * Information on each plants’ name, operators, fuel types, installed capacity and history of rehabilitation; * Information on each plant’s annual net generation and fuel consumption;   The DNA of São Tomé and Principe got support from UNEP RISOE in relations to data preparation, data collection, data management and GEF calculation. 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. UNEP RISOE has also verified the data collection process of the EMAE through interviews and review of records.  The generation and fuel consumption statistics preparation of EMAE follows the sequence below:   * Generation and fuel consumption data of each unit are collected manually by plant operators, using log sheets. * This information is then transferred to excel files to produce station reports. * Each plant report is checked by the Section Head responsible for the plant. The section head will prepare a report using excel, for the plant(s) that s/he is responsible for, and send the report to the Distribution Engineer. * The Distribution Engineer reviews the reports from the Section Heads and checks for anomalies. The Distribution Engineer also receives sales figures from EMAE. The Distribution Engineer then compiles one report of all generation and fuel consumption statistics and sends to the Senior Planning Engineer for review. * Once this review is completed, the generation and fuel consumption statistics are published on a monthly basis using an excel file.   EMAE publishes annual report every year. The last available report covers 2014 business year. | |
| **Please specify how the credibility of the data sources was checked.** | |
| The data supplied are from EMAE the only and most credible and reputable authority in the power sector in São Tomé and Principe.  The data used in the calculation were verifiable by third party as they are available at EMAE office. Annual reports containing electricity generation, fuel consumption and sales data are publicly available few months after the end of reporting period. All information presented on EMAE’s annual reports are subject to independent auditing by the government and certified hard copies of the annual reports are maintained with the finance department of EMAE.  DNA considers that the data is comprehensive and reliable as it is well documented in the annual reports of EMAE. | |
| **Please specify how the accuracy of the data was checked.** | |
| EMAE is a governmental organization whose accuracy is a key for the operation and performance of the São Tomé and Principe national grid for the purpose of power dispatch as well as distribution to end users. EMAE follows national standards that assure stable performance of grid connected power plants as well as the grid in a synchronized manner.  The accuracy of the data received from EMAE was cross checked against the detail plants’ data and no significant differences were observed.  DNA assures that the set of data available is complete and sufficient for the calculation of the grid emission factor. | |
| **Please specify how the consistency was achieved in particular where multiple secondary data sources were used** | |
| The consistency of the data has been checked against generation statistics from for previous years. The data proved to be completely consistent. The correctness of data was checked and the latest available data vintage was from 2014, thus the São Tomé and Principe GEF has been calculated by using the data from years 2012, 2013 and 2014. | |
| **Please specify how the “Standard for data coverage and validity of standardized baselines” was complied**  **with.** | |
| The São Tomé and Principe GEF calculation has been based on 2012-2014 power generation data, and has used the UNFCCC’s Methodological Tool *“Tool to calculate the emission factor for an electricity system*” (version 4.0.0)  Data used are from the latest grid information retrieved from EMAE 2010, 2011, 2012, 2013 and 2014 annual reports. These include data vintage from 2012, 2013 and 2014 including total and low-cost-must-run data from 2010 and 2011. Coverage period and currentness of data follow the requirements specified in the methodological tool and the standard. | |
| **Please specify how the completeness was achieved.** | |
| The calculation process and approach follows the latest approved version of the methodology “Tool to calculate emission factor of an electricity system”. The methodology asks for specific parameters, data and information for the calculation of the emission factor. These data and information were all available through the above mentioned official sources in São Tomé and Principe. The data source used (i.e. EMAE annual reports) include all relevant data and information in aggregate to produce “true and fair” representative standardized baselines. Since EMAE conducts necessary checks, verification and audit before publishing the annual reports, no missing data issue is found in the available information. | |
| **Please specify how the transparency was achieved.** | |
| The DNA of São Tomé and Principe with the support from UNEP RISOE has held meetings with the power sector operators in relations to data preparation, data collection, data management, and GEF calculation and renewal of the São Tomé and Principe GEF as a SBL. Through the meetings, 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.  The transparency was also achieved during data collection activities, calculation of GEF by the UNEP RISOE and their constant reporting to the DNA through the following steps:   * The official sources and specifically the São Tomé and Principe power authority (EMAE) was clearly available in person and through phone calls to share the documented and well managed grid data sources with the DNA; * The required data was made available by the EMAE representatives and the consultant could meet with the focal points for further information or clarification of any raised issue; * EMAE representatives and DNA officials had the utmost cooperation during the GEF calculation with the visiting UNEP RISOE consultant that could check the data collection and GEF calculation process; * EMAE and DNA representative attended meetings on how the same process can be maintained for renewal of GEF calculation and respectively the SBL.   The DNA also had the opportunity to cross check the data and calculation processes through the UNFCCC Regional Collaboration Centre in Lome’. | |
| **Please specify major issues and uncertainties identified during the QC procedures.** | |
| No major uncertainties are identified. | |
| **Please specify major corrective actions taken during the QC procedures.** | |
| None. Besides minor issues related to the GEF calculations that was solved rapidly through the consultants and with the help from the UNFCCC Regional Collaboration Centre in Lomé. | |
| **Please justify the conservativeness of the approaches taken during the QC procedures** | |
| The approach follows an approved UNFCCC tool “Tool to calculate grid emission factor of an electricity system” thus all conservative measures are already taken into account within the applied tool/methodology. | |
| **Please summarize key findings and present a plan to improve the data quality in future** | |
| The current data management system implemented by EMAE in São Tomé and Principe is sufficient to renew the GEF calculations for São Tomé and Principe.  Further suggestions were given during capacity building meetings in 2013 and along the SBL development period, where specific data templates were given to EMAE and DNA and other present stakeholders in order to facilitate a smoother and further timely calculation of the future GEFs. These meeting were coordinated by UNEP RISOE and the UNFCCC Regional Collaboration Centre of Lomé. | |

**Date to of QC report finalization Signature of the DNA**

03/11/2015 Mr. Madival Alva das Neves