

Finding Report

"Calculation of the Emission Factor of the Electricity System of the Southern African Power Pool

**Report N° CCL/VS/SAPP/09102011
Revision N° 01**

TABLE 3 RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

Corrective action and/ or clarification requests	Reference to Table 2	Response by GEF Evaluators	Validation Conclusion
CL 1 The Title of both doc submitted (PDF & word) differs, Clarify the Title of Document and scope of study undertaken and represented.	A.1.1	The title is as follows: Calculation of the Emission Factor of the Electricity System of the Southern African Power Pool The PDF file is not subject to validation.	OK
CL 2 The evidence that the spot market price for electricity and the difference in electricity prices (without transmission and distribution costs) of more than 5 % between the systems during 60 % or more of the hours of the year; has not been provided	A.2.4	<p>The 60%/5% criterion was discussed with the responsible expert at the SAPP Coordination Centre (CC). The findings are:</p> <p>Approx 99% of power trades are bilateral trades for which the SAPP CC has only a coordinating role. The prices and volumes are negotiated directly between the power companies.</p> <p>Approx. 1% of power trades are actual spot market trades (classified by Day Ahead Market, DAM). The prices of the DAM are strictly confidential and are not disclosed by the SAPP CC as this may lead to market distortions.</p> <p>It is concluded, that the information, required to evaluate the 60%/5% criterion is not available.</p> <p>The analysis consequently follows the 90%/90% criterion. This criterion is applicable to those project electricity systems, which do not have power pools.</p> <p>Considering that a) the SAPP CC does not disclose the required information, b) the DAM amounts to only 1% of power</p>	<p>Transmission constraint has been evaluated based on the operation of transmission line at 90% or more of its rated capacity during 90% or more of the hours of the year.</p> <p>Justification provided by PP is found to be appropriate by validation team.</p> <p>CL 2 is successfully closed.</p>

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CL3 It has been assumed that only few categories of power plants constitute as low cost must run. Power plants like fossil fuel fired plants may constitute to be low cost must run (in some cases) and these have not been explained or justified. Also The category of low cost must run power plant has been identified based on average of most recent three years and Not Five most recent years as stipulated/ required by the tool.	A.3.5	trades in the SAPP region and c) the Secretariat allows PPs to apply own criteria (See footnote 1 of the GEF tool), the 90%/90% criterion was applied for the evaluation of transmission constraints. Additional argumentation provided in Step3, p6. Re five years NMR/MR generation data: Table 2 was amended.	OK
CL4 It is NOT evident from the data base that if some of the power units at the site of the power plant are low-cost/must-run units and some are not then all Power plants at the site are considered/ included to belong to the group of low-cost/must-run units	B.2.1.3	Additional information was provided in Step 3, p6. The argumentation in step 3 was expanded by <ul style="list-style-type: none"> ▪ Discussing the options where fossil fuel power units have to be classified as MR ▪ And by showing that these options do not apply to the PES QA procedures were applied to ensure the consistency of the definition. These procedures were additionally described in Step 3 (i.e. complementing the existing information).	From the available database the definition of low-cost-must-run is broadly considered and assessed to evaluate the inclusion of fossil fuel based power plants as must –run. Based on above, It is concluded that no fossil fuel based power plant constitute to form part of PES and hence justification provided is found deemed appropriate. CL 4 is closed out.
CL5 It is not evident if an import from a connected	B.2.1.6	As illustrated by Figure 1, and documented by the new information in	The scope of SAPP GEF is de-limited to PES and the effect of import from CES (if

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electricity system considered as one power source.		step 1, p7, there are no transmission lines between the PES and the CES. Consequently electricity imports do not exist.	any) is not considered. Justification provided is deemed appropriate.
CL 6 It is not evident if the power plants constituting the set of 20% and older than 10 years have been replaced by power plant registered as CDM project.	B.2.2.4	The excel file, sheet 'base data' column T shows that there are no commissioned, grid connected power plants, developed under the CDM. Consequently these were not included in the BM group to replace those power plants which are older than 10 years. Additional information provided in Step 5, page 13.	OK
CL 7 Please clarify and explain How Consistency of the Database with CDM Methodologies is justified. (Data of different power plant have been recorded / estimated for the same time period/ vintage)		No inconsistencies could be found between the most recent excel file (document No 3) and the GEF document (document No 1). Differences between the above documents and the UNEP report (i.e. pdf document) and corresponding excel model (document No 4) arise, as for some power plants measured, Tier 3 data was used if favourable. If not, IPCC default values were applied. This mistake was corrected by using Tier 3 data, whenever available. This lead to a reduction of the CM and is considered to be conservative. It was clarified that ZESA's Harare PP did not operate in 2010. It was clarified that the data from Morupule PP was not converted correctly from fiscal year to calendar year. This	Data base provided (SAPP data.zip) only provides a record of data compiled by the project proponent; however it does not provide the access to the DOE to all/any data sources to facilitate transparent verification of completeness and correctness of the data. Moreover, 2. Spread sheet provided is not allowing the reader to navigate through the sheet for analysing, filtering, sorting etc. for the verification of the data sheet. CL 7 is open Validation team performed a site visit to SAPP Co-ordination Centre headquarters Harare, Zimbabwe to verify the consistency of the data used and applied in calculation of EF with database available at SAPP headquarter.

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		<p>data in the GEF was corrected and now corresponds to the calendar year.</p> <p>This was done based on monthly electricity generation- and fuel consumption data provided directly from Morupule power station which was also provided to the DOE.</p> <p>Also all data for all other power plants was checked and verified. This includes electricity generation, fuel consumption EFs as well as NCVs.</p> <p>In this context, it was found that the power plant Port Rex showed <u>unreasonably high</u> emission levels due to high fuel consumption data. Though the input data is conformed with the data published by ESKOM, the power plant was set at A2 calculation approach (i.e. calculating the plant's emission level without fuel consumption, based on default efficiencies). This lead to a decrease of the CM and hence is conservative.</p>	<p>Random samples taken for assessment e.g. plant number 23 (BPC-Morupule A) and plant number 50 (ZESA- Harare) indicate inconsistency.</p> <p>Based on justification provided by the PP and subsequent review of the same corrective action taken is found to be acceptable by the validation team.</p> <p>CL 7 is successfully closed.</p>
CL 8 The Excel Worksheet does not provide data on "Transfers" between the inter-Grid and cross-border power transfers.		Please refer to response re CL5.	OK, Please refer closure of CL 5.
CL 9 The Data base does not indicate the list of power plants not accounted for and excluded from the database (Eg. small power plant less than ... a threshold Limit etc.)		There is one single power plant which is not included in the GEF calculation. This power plant (SSC hydro) is located in DRC and supplies an isolated grid. All other power plants have been included. No threshold was applied.	OK

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<p>CL 10</p> <p>Please Clarify, the use of additional assumptions in order to reduce several complexities associated with the methodological tool, in relation to the Excel sheet provided by EB 63 to facilitate the calculation of GEF.</p>		<p>We are aware of the Secretariat's excel sheet, still we consider the application of the Secretariat's sheet as non binding.</p> <p>The Secretariat's version was not published at the time of GEF development. Hence we applied the excel file developed by the Institute for Global Environmental Strategies. The template as well as an example are available at http://www.iges.or.jp/en/cdm/report.html</p> <p>Go to 'Grid Emission Factors Data'</p> <p>Go to 'CDM Grid Emission Factor Calculation Sheet'.</p> <p>The template provides some general guidance.</p> <p>We have followed strictly the sheet. The only modifications were done in order to a) accommodate a larger set of power plants and b) in order to use measured Tier 3 data instead of IPCC default values.</p> <p>Conservativeness was ensured by using a) most accurate, measured data, by using published for all ESKOM power plants (including their EFs and NCVs) and by c) using the lower boundaries of the 95% confidence interval for all IPCC default NCVs and EF.</p>	<p>Conservativeness of the value arrived is one of the foremost criteria for the emission factor calculation. The provided document does not describe what all assumptions, procedures, steps etc. are applied and followed to ensure conservativeness.</p> <p>Accordingly validation team is unable to conclude to validate the value of emission factor provided is conservative.</p> <p>Moreover, Sources for all the data where specific values of emission factor are used, needs to clearly identified and submitted to the DOE. Table 3 (page 09) of the report provides with the list of only 10 plants where approach A1 for emission factor calculation has been used, while the spread sheet provided indicates 17 plants (compare base data sheet).</p> <p>CL 10 is open</p> <p>Measured data by Dr. Zhou et al of the selected power plants are compared with IPCC default value and IPCC default values are found conservative.</p> <p>Revised proposed report¹¹ is verified and cross-checked with the IPCC default value. The same is found to be satisfactory by the validation team and hence CL 10 is closed successfully.</p>
<p>CL 11</p>		<p>The primary data provided by the power</p>	<p>Deemed ok</p>

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<p>Assumptions made to calculate net generation from data of gross generation and in which auxiliary consumption was not monitored is not indicated/ very clear.</p>		<p>companies indicates NET electricity generation. Consequently, there was no need for assumptions to adopt gross to net electricity generation.</p> <p>We have noted that the power plants, especially ESKOM did not indicate auxiliary fuels. Upon explicit request, we have been informed, that no auxiliary fuels are used.</p>	
<p>CL 12 Page 4/25 states refer to EB 63 however the document itself refers to EB 60</p>		<p>The reference was corrected at various locations to EB63.</p>	OK
<p>CL 13 Page 4/25 gives contact details, but only Martin ... appears in the table</p>		<p>Page 2 lists all contributing authors. Martin Burian, as Project Coordinator, is listed as corresponding author. He is the focal point for any technical requests regarding the GEF.</p> <p>If the DOE requires the contract details of the study team members in the course of validation, these may be provided upon request.</p>	OK

Appendix 3

ASSESSMENT REPORT

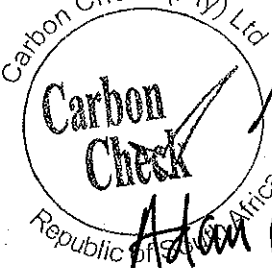
Sector	<i>Electricity</i>		
Name of Institution	<i>Secretariat of the Southern African Power Pool</i>		
Name of Reviewer	<i>Adam Simcock</i>		
Contact of Reviewer	<i>adam@carboncheck.co.za</i>		
Dates Reviewed	<i>09/11/2011~23/02/2012</i>		
Criterion	Definition	Yes/ No	Explanation
System Availability	Is a 'standardized' data system currently in place?	<i>NA</i>	<i>Although the QA/QC guideline (EB 66 Annex 49) came after the completion of validation, however, the QA/QC procedures and system is in coherence with the tool to calculate the emission factor for an electricity system version 02.2.1.</i>
	Has a procedure for reporting activities conducted as part of the QC system been developed and implemented?	<i>NA</i>	<i>Although the QA/QC guideline (EB 66 Annex 49) came after the completion of validation, however, the QA/QC procedures and system is in coherence with the tool to calculate the emission factor for an electricity system version 02.2.1.</i>
Conformity	Did the QA/QC system/procedures meet the data quality objectives of the QA/QC Guidelines?	<i>NA</i>	<i>Although the QA/QC guideline (EB 66 Annex 49) came after the completion of validation, however, the QA/QC procedures and system is in coherence with the tool to calculate the emission factor for an electricity system version 02.2.1.</i>
	Did the QA/QC system/procedures meet the general provisions of the QA/QC Guidelines?	<i>NA</i>	<i>Please see the explanation above</i>
	Were the approaches taken by	<i>Yes</i>	<i>Based on the onsite</i>

	DNAs conservative? Were the conservative approaches applied consistently?		inspection of the SAPP Co-ordination Centre, interview with the DNAs official, it can be concluded that approaches taken by DNAs is conservative. However, please refer finding report attached.
Traceability	Were all data and information relating to the datasets and procedures clearly documented?	Yes	Please refer finding report attached.
	Was the QC report clearly documented in accordance with the QA/QC Guidelines?	NA	QA/QC guideline (EB 66 Annex 49) came after the completion of validation.
Responsiveness	Were all required documents available for assessment?	Yes	Please refer finding report attached.
	Did the data delivery protocol meet the provisions of the QA/QC Guidelines?	Yes	Please refer finding report attached.
	Was the communication of the DNA with data providers timely and efficient?	Yes	Validation team performed a site visit to SAPP Co-ordination Centre headquarters Harare, Zimbabwe and interviewed the personnel to verify the consistency of the data used and applied in calculation of EF with database available at SAPP headquarter their level of co-ordination with the respective DNAs. The same was found to be appropriate.
Adaptability	Was the system through its procedures modified in order to address the major issues identified?	NA	Although the QA/QC guideline (EB 66 Annex 49) came after the completion of validation, however, the QA/QC procedures and system is in coherence with the

			<i>tool to calculate the emission factor for an electricity system version 02.2.1.</i>
	Did the modified system meet the data quality objectives and the provisions of the QA/QC Guidelines?	<i>NA</i>	<i>Please see explanation above</i>
Security	Is a security system for data management in place and has it operated effectively?	<i>NA</i>	<i>Please see explanation above</i>
	Have any issues related to security occurred?	<i>NO</i>	<i>Please refer the finding report attached.</i>
Error Tolerance	Were there established procedures to minimize errors proactively? Were these procedures implemented effectively?	<i>NA</i>	<i>Although the QA/QC guideline (EB 66 Annex 49) came after the completion of validation, however, the QA/QC procedures and system is in coherence with the tool to calculate the emission factor for an electricity system version 02.2.1.</i>
Summary of Findings		Please see the finding report attached.	
Responses and Corrective Actions of SAPP Secretariat		Please refer the finding report attached.	
Submission Date to DNA		25-04-2012	

Signature by DOE

Signature by SAPP Secretariat

Carbon Check (Pty) Ltd

Adam Simcock
 CEO - Carbon Check
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