CDM proposed standardized baseline form (Version 01.0)

(To be used by a designated national authority (DNA) when submitting a proposed standardized baseline in accordance with the "Procedure for submission and consideration of standardized baselines".)

SECTION 1: GENERAL INFORMATION	
DNA submitting this form:	Republic of Mauritius
Developer of the standardized baseline: *(Parties, project participants, international industry organizations or admitted observer organizations)*	DNA, Mauritius
Party or Parties to which the standardized baseline applies:	Mauritius
Sector to which the proposed standardized baseline applies: *(the sector according to the definition of sector in the "Guidelines for the establishment of sector specific standardized baselines")*	Energy Industries; Energy demand (all applications that displace grid electricity)

SECTION 2: LIST OF DOCUMENTS TO BE ATTACHED TO THIS FORM *(please check)*

☐ An assessment report presenting how the data was collected, processed and compiled to establish the proposed standardized baselines;

☐ Where the proposed standardized baseline applies to a group of Parties, letters of approval of all the DNAs of the Parties to which the standardized baseline applies;

√ Additional documentation supporting the submission (e.g. relevant data, documentation, statistics, studies, calculation tables, etc.), when applicable.

Name of authorized officer signing for the DNA:	Mrs Sin Lan Ng Yun Wing (Director of Environment)
Date and signature for the DNA:	23 April 2015
Name and contact details of the focal point(s) for any follow up communication: *(all communication regarding procedural or technical issues will be sent to the focal point(s))*	Mr. P. Kallee (Deputy Director, Dept of Environment) rkkallee@govmu.org Mr.J. Seewoobaduth (Divisional Environment Officer) jseewoobaduth@govmu.org Mr. D. S. Chamilall (Environment Officer) Dchamilall@govmu.org

SECTION BELOW TO BE COMPLETED BY THE UNFCCC SECRETARIAT	
CDM-PSB ID number:	
Date when the form was received at UNFCCC secretariat:	
Have <u>all</u> Parties for which the standardized baseline is applicable fewer than 10 registered CDM project activities as of 31 December 2010?	

Have <u>all</u> Parties for which the standardized baseline is applicable fewer than 10 registered CDM project activities as of 31 December 2010? (Y/N):	
CDM-PSB ID number and version: *(to be completed by UNFCCC)*	

CLEAN DEVELOPMENT MECHANISM
PROPOSED STANDARDIZED BASELINE
(CDM-PSB)
(VERSION 01.0)

"Standardized baseline title"

Submission date

Version Number

Source

If the standardized baseline was developed using a methodological approach contained in an approved methodology or tool please provide the name, number (if applicable) and version of the approved methodology or tool used.

If it was developed using the "*Guidelines for the establishment of sector specific standardized baselines*" please state the version of the guidelines used.

If a table of calculation is available for the development of the standardized baseline, please state the version of the table used, and submit it with this form.

CDM Methodological Tool 07 – i.e. "Tool to calculate the emission factor for an electricity system (Version 04.0.0)"

Type of standardized baseline approach

The standardized baseline is developed for:

☐ Additionality demonstration;

☐ Baseline identification;

√ Baseline emission estimation.

Please note that one, two or all three items can be checked.

SECTION A: STANDARDIZED BASELINE DEVELOPED USING THE "GUIDELINES FOR THE ESTABLISHMENT OF SECTOR SPECIFIC STANDARDIZED BASELINES"

This section should only be completed when the standardized baseline is developed using the "Guidelines for the establishment of sector specific standardized baselines".

Applicability of the standardized baseline

Please provide the following information:

- The host country(ies) or region(s) within a host country to which the standardized baseline is applicable. In case of region(s) within a host country, please document transparently the geographical boundaries of the region (e.g. provinces, electric grids, etc).
- The sector(s) to which the standardized baselines is applied. Note that a sector refers to a segment of a national economy that delivers defined output(s) (e.g. clinker production, domestic / household energy supply). The sector is characterized by the output(s) O_i it generates.
- The output(s) to which the standardized baseline is applied, i.e. the goods or services with comparable quality, properties, and application areas (e.g.clinker, lighting, residential cooking).
- The measure to which the standardized baseline is applicable:

  ☐ Fuel and feedstock switch; or

  ☐ Switch of technology with or without change of energy source (including energy efficiency improvement); or

  ☐ Methane destruction; or

  ☐ Methane formation avoidance.

Additionality demonstration

Please explain how the "Guidelines for the establishment of sector specific standardized baselines" were applied to demonstrate additionality and develop a positive list of project activities that are deemed additional. Follow the steps and guidance of the "Guidelines for the establishment of sector specific standardized baselines". Document all underlying data, data sources, assumptions, calculation steps and outcomes in a clear and transparent manner.

Baseline identification

Please explain how the "*Guidelines for the establishment of sector specific standardized baselines*" were applied to identify the baseline for the measures. Follow the steps and guidance of the "*Guidelines for the establishment of sector specific standardized baselines*". Document all underlying data, data sources, assumptions, calculation steps and outcomes in a clear and transparent manner.

Baseline emission factor estimation (if applicable)

Please explain how the "*Guidelines for the establishment of sector specific standardized baselines*" were applied to determine a baseline emission factor. Follow the steps and guidance of the "*Guidelines for the establishment of sector specific standardized baselines*". Document all underlying data, data sources, assumptions, calculation steps and outcomes in a clear and transparent manner.

Use of the standardized baseline with an approved methodology

Please explain how the standardized baseline will be used with the relevant approved methodology(ies) or an approved tool, i.e. which (parts of) the approved methodology(ies) or the approved tool are replaced by the standardized baseline. Note that a standardized baseline derived from the *"Guidelines for the establishment of sector specific standardized baselines"* will usually replace the sections on demonstration of additionality, identification of the baseline scenario and the determination of baseline emissions, while the methodology sections on applicability, project boundary, project emissions, leakage emissions and provision to monitor project and leakage emissions may not be affected by the use of the standardized baseline. If an approved methodology is not available, a new methodology should be submitted to be used with the standardized baseline, following the relevant procedures ("*Procedure for the submission and consideration of a proposed new baseline and monitoring methodology for large scale CDM project activities*" or "*Procedures for the submission and consideration of a proposed new small scale methodology*").

Validity of the standardized baseline

Please state the period of time for which the standardized baseline is valid. Please note that Appendix I of the "Guidelines for the establishment of sector specific standardized baselines" provide interim values for data vintage and the frequency of update.

SECTION B: STANDARDIZED BASELINE DEVELOPED USING A METHODOLOGICAL APPROACH CONTAINED IN AN APPROVED METHODOLOGY OR TOOL

This section should only be completed when the standardized baseline is developed using a methodological approach to estimate baseline emissions contained in an approved methodology or tool. An example for this is the application of the "Tool to calculate the emission factor for an electricity system" to estimate the emission factor for a electric grid.

Applicability of the standardized baseline

Please state the host country(ies) or region(s) within a host country to which the standardized baseline is applicable. In case of region(s) within a host country, please document transparently the geographical boundaries of the region (e.g. provinces, electric grids, etc).

Geographical boundaries

The proposed standardized baseline will be applicable to the national electricity system of the island of Mauritius, which is the most populated island of the Republic of Mauritius. The Republic of Mauritius is a group of small islands in the South West Indian Ocean. The total land area of the country is 2040 km^2. The Republic of Mauritius also incorporates the island of Rodrigues, situated some 560 kilometers to the east and is 104 km^2 in area, the Agalega islands situated some 1,000 km to the north of the island of Mauritius (hereafter called Mauritius) and Saint Brandon situated some 430 km to the north-east of Mauritius, both with total land area of 71.2 km^2. It also consists of the Chagos Archipelago (Diego Garcia). The island of Mauritius (i.e. Mauritius) is the most populated part of the Republic of Mauritius followed by the island of Rodrigues and the Agalega islands. The Republic is almost 2000 km off the East Coast of Africa. Its Marine Exclusive Economic Zone, which extends over 2.3 million km^2 is bounded by latitudes five degrees South to twenty degrees South and from longitudes fifty-five to seventy-five degrees East. The geographical location of the Republic of Mauritius is shown in Figure 1.

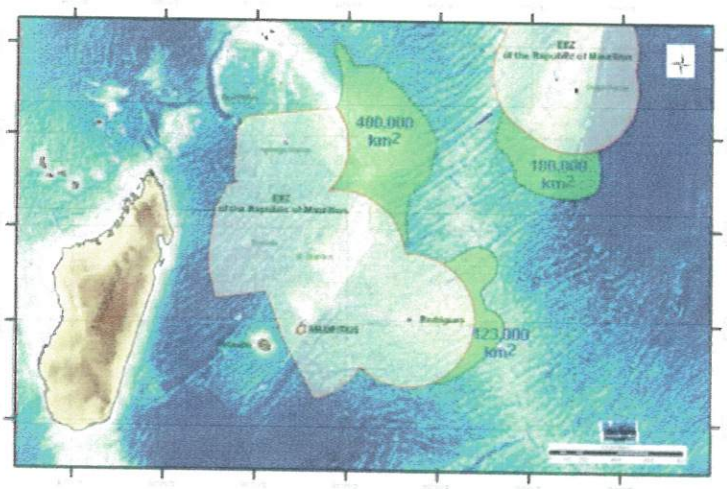

Figure 1: Location Map of Mauritius.

The geographical boundary of the island of Mauritius is shown in Figure 2. which also identifies the relevant electricity systems.

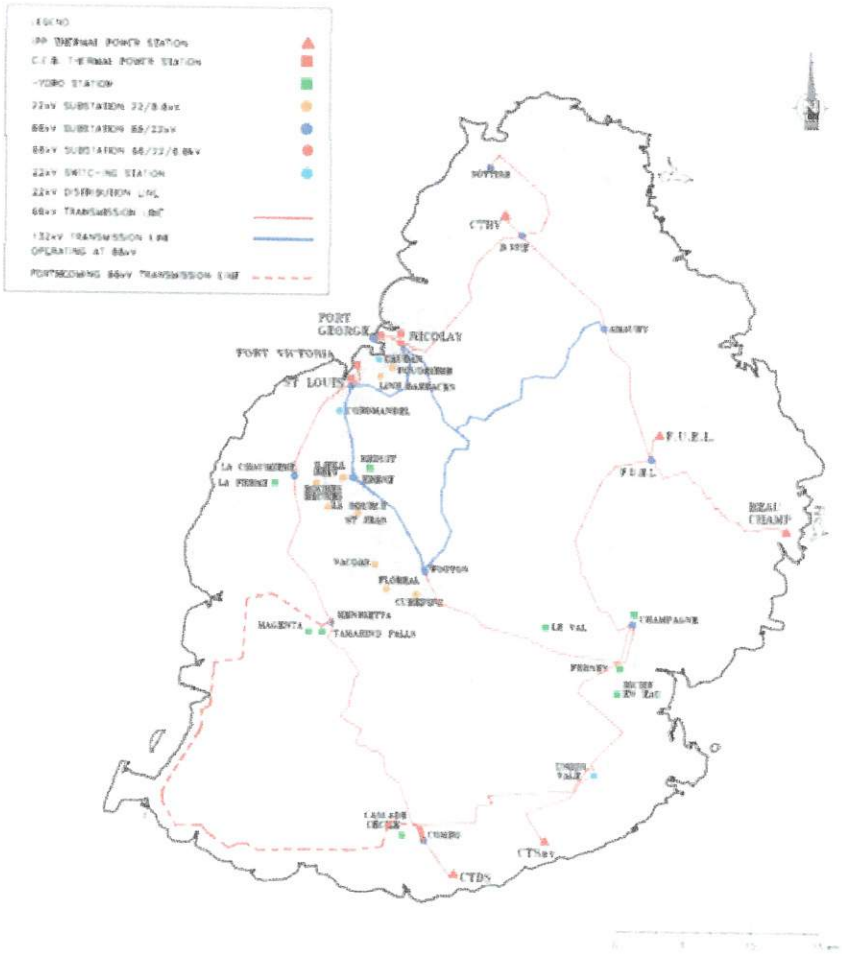

Figure 2: Map of the Mauritian electrical grid (as of 06.08.08)

Baseline emission estimation

Please explain how the methodological approach contained in the approved methodology or tool was applied to estimate the baseline emissions of a project activity in (a) country(ies) or region. Follow the steps and guidance of the approved methodologies or tools. Document all underlying data, data sources, assumptions, calculation steps and outcomes in a clear and transparent manner. Note that the underlying methodology or tool has to provide a methodological approach to derive the baseline emissions for a country or region in order to apply this step. This applies, for example, to the methodological tool "Tool to determine the emission factor of an electricity system".

Methodological tool

The grid emission factor for the national electricity system has been calculated using the CDM Methodological Tool 07 – i.e. "Tool to calculate the emission factor for an electricity system (Version 04.0)".[1]

Statistical data: sources, quality assurance (QA) and quality control (QC)

The calculation of the grid emission factor uses statistical data on electricity generation and power plant fuel consumption for 2012, 2013 and 2014. The share of renewable electricity in the national electricity mix was also calculated using generation statistics for 2010 and 2011. Statistics for 2010, 2011, 2012 and 2013 were taken from officially published data by Statistics Mauritius – i.e. Digest of Energy and Water Statistics 2013.[2] Data for 2014 was provided by the Central Electricity Board (CEB). The generation data for 2014 is contained in the worksheet labelled 'list of power plants' that is found in the Excel calculator named 'Grid Emission Factor of Mauritius 2014 – Combined Margin – 20 March 2015.xlsx'.[3] The CEB has an internal data quality control and quality assurance system. The data are obtained through calibrated meter and verified internally at the production Department of the CEB. They are then circulated to other CEB departments on a monthly basis in the form of a Generation Progress Report (GPR) and Operation Report (OR). Verification of the data is also carried out on a daily basis at the system control section of the CEB. The Independent Power Producers (IPPs) submit their data to the CEB as part of their obligations under the Power Purchase Agreements (PPAs) signed with the CEB.[4]

It is pointed out that all the data related to fuel consumption and electricity generation for the national grid from the CEB is provided to Statistics Mauritius for onward dissemination. Similar data are also published in the CEB's Annual Report. Hence, the data used to calculate the combined margin grid emission factor are publicly available.[5]

Methodological approach: applying the methodological tool

The combined margin grid emission factor is calculated as a weighted average of the operating margin emission factor and the build margin emission factor through a series of six steps. The grid emission factor is calculated from the perspective of a project activity that will either produce grid-connected renewable electricity or reduce the quantity of grid electricity consumed through energy efficiency measures. Different crediting periods are also considered.

Step 1 - Identifying the relevant electricity system

Figure 2 (above) shows that the electrical grid of the island of Mauritius is interconnected – i.e. power plants are physically connected through transmission and distribution lines to the project activity.

[1] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf - accessed 12 December 2013.

[2] Statistics Mauritius. (2014). Digest of Energy and Water Statistics - 2013, Port Louis, Mauritius: Ministry of Finance and Economic Development (http://statsmauritius.govmu.org/English/Publications/Documents/Regular%20Reports/energy%20and%20water/Energy2013.pdf - accessed 9 April 2015).

[3] The Excel calculator has been submitted as accompanying documentation with this application.

[4] The CEB has already provided an official letter dated 17 February 2014 that explains the QC and QA system that is in place to ensure the quality of statistical data. The letter has already been submitted to the UNFCCC Secretariat and is being submitted again as supporting documentation.

[5] Data for 2014 will be published by Statistics Mauritius on 11 June 2015 (http://statsmauritius.govmu.org/English/Publications/Pages/Publication-Programme.aspx - accessed 9 April 2015).

Therefore, the relevant electric power system is the national grid, which is managed by the CEB. There are no off-grid power plants.

STEP 2 : Choose whether to include off-grid power plants in the project electricity system (optional).
The tool allows selecting one of the following two options to calculate the operating margin (OM) and build margin (BM) emission factor:

Option 1: Only grid power plants are included in the calculation.

Option 2: Both grid power plants and off-grid power plants are included in the calculation.

Since there are no off-grid power plants in Mauritius. **Option 1** is selected for the calculation of both the OM and BM emission factors.

Step 3 - Select a method to determine the operating margin (OM).
The calculation of the operating margin emission factor ($EF_{grid,OM,y}$) is based on one of the following methods:

(a) Simple OM, or
(b) Simple adjusted OM, or
(c) Dispatch Data Analysis OM, or
(d) Average OM.

The method (c) requires the detailed operation and hourly dispatch data of power plants in the grid. To date, there is no publicly available dispatch data with that level of details for the grid on the island of Mauritius. Method (c) is therefore not applicable. The method (b) needs the annual load duration curve of the grid that is also not available publicly. Therefore, method (b) is also not applicable. In order to choose between method (a) or method (d), the share of low-cost/must run in the total power generation has to be calculated. Method (a) [or (d)] is used when low-cost/must run resources constitute less [or more] than 50% of the total amount of power generation on the grid. Table 1 shows the share (%) of low cost/must run renewable electricity in the national electricity grid of the island of Mauritius. As explained above, statistical data for 2010 to 2013 was taken from the Digest of Water and Energy Statistics - 2013, while data for 2014 was provided by the CEB. The data in brackets are the equivalent electricity generated in GWh.

Table 1: Share (%) of low-cost/must run renewable electricity in the national grid of the island of Mauritius. The data in brackets are the equivalent electricity generated in GWh.

Renewable source	2010	2011	2012	2013	2014
Hydropower	4.2 (100.7)	2.3 (56.5)	3.0 (74.1)	(94.8)	(90.8)
Bagasse	14.4 (342.8)	14.5 (352.6)	13.8 (344.0)	(346.5)	(328.3)
Photovoltaic	-	-	0.0(0.3)	(1.24)	(20.4)
Landfill gas	-	0.1 (3.1)	0.7 (17.8)	(20.0)	(21.3)
Total RE	18.6 (443.5)	16.9 (412.2)	17.5 (436.8)	18.0 (462.5)	17.5 (460.8)
Total grid electricity	(2,376.1)	(2,433.2)	(2,495.5)	(2,575.5)	(2,633.2)

Sources: *For 2010 to 2013, please see Statistics Mauritius (2014) Digest of Energy and Water Statistics – 2013, Table 3.3 (pg 46) for hydropower and Table 3.4 (pg 46) for electricity from bagasse, landfill gas, and photovoltaic. For 2014, please see Excel calculator named 'Grid Emission Factor for Mauritius – Combined Margin – 20 March 2015.xlsx'.*

The Simple OM method is chosen since low-cost/must run resources constituted on average 17.7% of the total amount of the power generation on the grid between 2010 and 2014.

Step 4 - Calculate the operating margin emission factor according to the selected method.

According to the tool, the simple OM emission factor (*EFOM,simple,y*) is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units. The simple OM may be calculated in two ways:

(a) **Option A:** Based on the net electricity generation and a CO_2 emission factor of each power unit; or

(b) **Option B:** Based on the total net electricity generation of all power plants serving the system and the fuel types and total fuel consumption of the project electricity system.

According to the tool, Option B can only be used if:

(a) The necessary data for Option A is not available; and

(b) Only nuclear and renewable power generation are considered as low-cost/must-run power sources and the quantity of electricity supplied to the grid by these sources is known; and

(c) Off-grid power plants are not included in the calculation (i.e., if Option I - only grid power plants are included in the calculation- has been chosen in **Step 2**).

Data for Option A is not available in official statistics as can be gathered from official sources.[6] Further, power generated from bagasse, hydro, PV and LFG is considered low-cost/must-run and the quantity of electricity supplied to the grid by these sources is known as shown in Table 1. Finally, as mentioned in Step 1, there are no off-grid power plants in Mauritius. Given these conditions, Option B is used to calculate the OM emission factor. Under this option, the simple OM emission factor is calculated based on the net electricity supplied to the grid by all power plants serving the system, not including low-cost/must-run power plants/units, and based on the fuel type(s) and total fuel consumption of the project electricity system, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_i FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}}{EG_y} \quad (1)$$

Where:

$EF_{grid,OMsimple,y}$ = Simple operating margin CO_2 emission factor in year y ($t\ CO_2/MWh$);
$FC_{i,y}$ = Amount of fuel type i consumed in the project electricity system in year y (mass or volume unit);
$NCV_{i,y}$ = Net calorific value (energy content) of fuel type i in year y (GJ/mass or volume unit);
$EF_{CO2,i,y}$ = CO_2 emission factor of fuel type i in year y ($t\ CO_2/GJ$);
EG_y = Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year y (MWh);
i = All fuel types combusted in power sources in the project electricity system in year y;
y = The relevant year as per the data vintage chosen in Step 3.

For the calculation of the OM emission factor, the consumption data for each fossil fuel used to power the different power plants were obtained from the CEB. The calculation of the OM is based on data for the

[6] Please refer to: Statistics Mauritius (2014) Digest of Energy and Water Statistics – 2013.

years 2012, 2013 and 2014. Local values of NCV_i and IPCC default values of $EF_{CO2,i}$ are used. Table 2 and Table 3 summarize the data used to calculate the OM emission factor. As explained above, data for 2012 and 2013 are taken from officially published statistics, while data for 2014 are drawn from the CEB.

Table 2: Data for fuel consumption and electricity delivered to grid from different fuel sources, 2012 – 2014

Fuel Source	Fuel Consumption (FC, t)			Electricity delivered to grid (EG, MWh)		
	2012	2013	2014	2012	2013	2014
Coal	649,157	683,207	696,038	1,021,400	1,067,200	1,125,400
HFO†	207,874	210,055	215,615	1,026,823	1,043,976	1,045,001
Kerosene	3,437	645	676	10,984	1,668	1,991

† Includes diesel inputs.

Sources of data: *For 2012 and 2013, Statistics Mauritius. (2014). Digest of Energy and Water Statistics – 2013, Table 3.3 (pg. 46) for HFO&diesel, and kerosene electricity generation, Table 3.4 (pg. 46) for coal electricity delivered to the grid, and Table 3.7 (pg. 49) for fossil fuel input in electricity generated. For 2014, please see Excel calculator named 'Grid Emission Factor for Mauritius – Combined Margin – 20 March 2015.xlsx'.*

Table 3: Net calorific value and emission factor of fuel sources

Fuel Source	NCV (GJ/t(fuel))	EF (tCO_2/TJ)	EF ($tCO_2/t(fuel)$)†
Coal	25.5	87.3	2.226
HFO	40.19	75.5	3.034
Kerosene	43.4	69.7	3.025

† *EF ($tCO_2/t(fuel)$) = [NCV (GJ/t(fuel)) X EF (tCO_2/TJ)] / 1000*

The emission factors for the fossil combustibles were taken from Table 2.2 – Chapter 2 – Stationary Combustion, 2006 IPCC Guidelines for National Greenhouse Gas Inventories. The values correspond to the lower bound default emission factors for CO_2.

Using the data in Table 2 and Table 3, the calculated OM is: **EF_{OM} = 1.0170 tCO_2/MWh**. Details of this calculation are as follows:

Calculation of the 3-year average fuel consumption, tonne (t)

Table 4: 3-year average fuel consumption, t.

Fuel Source	Fuel Consumption (FC, t)			3-year average fuel consumption (t)
	2010	2011	2012	
Coal	649,157	683,207	696,038	(649,157+683,207+696,038)/3 = **676,134.0**
HFO	207,874	210,055	215,615	(207,874+210,055+215,615)/3 = **211,181.3**
Kerosene	3,437	645	676	(3,437+645+676)/3 = **1,586.0**

Sum of the 3-year average electricity generated, MWh

Table 5: 3-year average of electricity generated, MWh

Fuel Source	Electricity delivered to grid (EG, MWh)	3-year average electricity generated (MWh)

	2010	2011	2012	
Coal	1,021,400	1,067,200	1,125,400	(1,021,400+1,067,200+1,125,400)/3 = **1,071,333.3**
HFO	1,026,823	1,043,976	1,045,001	(1,026,823+1,043,976+1,045,001)/3 = **1,038,600.0**
Kerosene	10,984	1,668	1,991	(10,984+1,668+1,991)/3 = **4,881.0**

The total 3-year average electricity generated = (1,071,333.3+1,038,600.0+4,881.0) = **2,114,814.3 MWh.**

Calculating the OM Emission Factor, EF_{OM}
Using data in Tables 3, and 5, we have

EF_{OM} = [(676,134 X 2.226)+(211,181.3 X 3.034)+(1,586 X 3.025)] (tCO_2) / 2,114,814.3 (MWh) = 1.0170 tCO_2/MWh.

Step 5 - Calculate the build margin (BM) emission factor
According to the "*Tool to calculate emissions factor for an electricity system*", project participants should use the set of power units that comprises the larger annual generation. The build margin consists of either:

(a) The set of five power units ($SET_{5\text{-units}}$) that have been built most recently (excluding registered CDM projects), or

(b) The set of power capacity additions in the electricity system that comprise 20% of the system generation (in MWh) and that have been built most recently ($SET_{\geq 20 \text{ per cent}}$).

If electricity generated by $SET_{5\text{-units}}$ is larger than electricity generated by $SET_{\geq 20 \text{ per cent}}$, then the sample set of plants used to calculate the BM emission factor, $SET_{sample} = SET_{5\text{-units}}$. Else, $SET_{sample} = SET_{\geq 20 \text{ per cent}}$. According to the methodological tool, the sample group of power units used to calculate the build margin should follow the procedure shown in Figure 3.

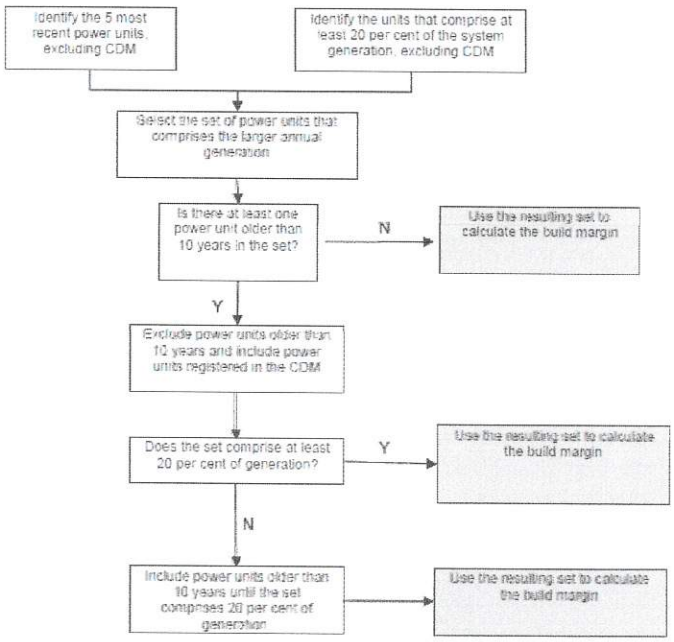

Figure 3: Procedure to determine the sample group of power units used to calculate the build margin

Determining the electricity generated (MWh) by the 5 most recently built power units, $AEG_{SET\text{-}5\text{-}units}$

Using the list of electricity generated (MWh) and year of commissioning of power units provided by the CEB (please see the worksheet labelled 'list of power plants' that is found in the Excel calculator named 'Grid Emission Factor of Mauritius 2014 – Combined Margin – 20 March 2015.xlsx'), the details of the 5 most recently built power units $SET_{5\ units}$ (excluding the registered CDM landfill gas project at Mare Chicose that started power generation in August 2011) are summarized in Table 6. In this case, $AEG_{SET\text{-}5\text{-}units}$ = 252,473 MWh.

Table 6: Set of 5 most recently built power units, $AEG_{SET\text{-}5\text{-}units}$

Power unit	Power plant	Date Commissioned	Fuel type	Installed capacity (MW)	Net electricity to grid (MWh) [fossil + renewables]	Fuel consumption (excluding renewables) (t)
N/A	Sarako PV plant	February 2014	solar	15	20,406	N/A
N/A	Midlands Dam	14 March 2013	hydro	0.35	1,310	N/A
G6	Fort Victoria	May 2012	HFO	15	154,633	31,653
G5		Apr 2012		15		
G4		Apr 2012		15		
G3		Apr 2012		15		
G2	Fort Victoria	Sept 2010	HFO	15	75,327	15,435
G1		Sept 2010		15		
N/A	La Nicolière	2010	hydro	0.35	797	N/A
TOTAL					**252,473**	**47,088**

A power plant/unit is a facility that generates electric power. Several power units at one site comprise one power plant, whereas a power unit is characterized by the fact that it can operate independently from other power units at the same site. Where several identical power units (i.e. with the same capacity, age and efficiency) are installed at one site, they may be considered as one single power unit.

Determining the set of power units that generate 20% of total grid electricity, and that have been most recently built, $SET_{>20\ per\ cent}$

The total grid electricity generated in 2014 was 2,633.2 GWh (Table 1). Twenty per cent of this value is 526,650 MWh. Hence, additional power plant than the 5 most recent plants shown in Table 6 have to be identified. Since a fraction of a power plant/power unit cannot be used for additional generation, the 20% of total grid electricity is met through the set of power plants shown in Table 7.

Table 7: Set of 5 most recently built power units that generate at least 20% of total grid electricity, $SET_{>20\ per\ cent}$

Power unit	Power plant	Date Commissioned	Fuel type	Installed capacity (MW)	Net electricity to grid (MWh)	Fuel consumption (excluding

					[fossil + renewables]	renewables) (t)
N/A	Sarako PV plant	February 2014	solar	15	20,406	N/A
N/A	Midlands Dam	14 March 2013	hydro	0.35	1,310	N/A
G6	Fort Victoria	May 2012	HFO	15	154,633	31,653
G5		Apr 2012		15		
G4		Apr 2012		15		
G3		Apr 2012		15		
G2	Fort Victoria	Sept 2010	HFO	15	75,327	15,435
G1		Sept 2010		15		
N/A	La Nicolière	2010	hydro	0.35	797	N/A
G1	CTSav	October 2007	coal/bagasse	45	359,561	208,429
G2		April 2007		45	133,998	N/A
TOTAL					**746,032**	

A comparison between the results shown in Tables 6 and 7 reveals that $SET_{sample} = SET_{\geq 20 \text{ per cent}}$. It is pointed out that none of the power plants/units shown in Table 7 to reach at least 20% of total grid electricity is older than 10 years.

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units m during the most recent year *y* for which electricity generation data is available (2014 in present case), calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad (2)$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year *y* (tCO_2/MWh);
$EG_{m,y}$ = Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh);
$EF_{EL,m,y}$ = CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh);
m = Power units included in the build margin; and
y = Most recent historical year for which electricity generation data is available.

Using data given in Table 3 and Table 7, the BM has been calculated as: **0.8135 tCO_2/MWh**. The detail of the calculations is as follows:

EF_{BM} = [(31,653 X 3.034)+(15,435 X 3.034)+(208,429 X 2.226)] (tCO_2) / 746,032 (MWh) = 0.8135 tCO_2/MWh.

Step 6 - Calculate the combined margin (CM) emissions factor.
The combined margin emission factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM} \quad (3)$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (tCO_2/MWh);
$EF_{grid,OM,y}$ = Operating margin CO_2 emission factor in year y (tCO_2/MWh);
w_{OM} = Weighting of operating margin emissions factor (%); and
w_{BM} = Weighting of build margin emissions factor (%).

The following default values should be used for w_{OM} and w_{BM}:

(a) **Wind** and **solar power generation** project activities: w_{OM} = 0.75 and w_{BM} = 0.25 (owing to their intermittent and non-dispatchable nature) for the first crediting period and for subsequent crediting periods;

(b) **All other projects**: w_{OM} = 0.5 and w_{BM} = 0.5 for the first crediting period, and w_{OM} = 0.25 and w_{BM} = 0.75 for the second and third crediting period, unless otherwise specified in the approved methodology which refers to this tool.

The combined margin grid emission factors for the island of Mauritius (i.e. Mauritius) have been calculated using Eq. (3) and are summarized in Table 8.

Table 8: Combined Margin grid emission factor for the national electricity system of the island of Mauritius for the first crediting period.

Type of Project	OM (tCO_2/MWh)	BM (tCO_2/MWh)	CM (tCO_2/MWh)
PV and wind	1.0170	0.8135	**0.9661** [(1.0170 X 0.75) + (0.8135 X 0.25)]
All other projects	1.0170	0.8135	**0.9152** [(1.0170 X 0.5) + (0.8135 X 0.5)]

The Excel calculator ('Grid Emission Factor of Mauritius 2014 – Combined Margin – 20 March 2015.xlsx') also calculates the combined margin grid emission factor for the second and third crediting periods.

Use of the standardized baseline with an approved methodology

Please explain how the standardized baseline will be used with the relevant approved methodology(ies) or approved tool, i.e. which (parts of) the approved methodology(ies) or the approved tool are replaced by the standardized baseline.

The standardized baseline may be used by any approved CDM methodologies that make reference and apply CDM Methodological Tool 07 – i.e. "Tool to calculate the emission factor for an electricity system (Version 04.0.0)". That is, the standardized baseline will replace parts of approved CDM methodologies that use baseline emission related to the grid emission factor.

Validity of the standardized baseline

Please state the vintage of the parameters used to derive the standardized baseline, in accordance with the requirements contained in the approved methodology or tool.

The standardized baseline will be valid for a period of 3 years as from the time of approval.

REFERENCES AND ANY OTHER INFORMATION

The following documents have been submitted with this submission:

- Report entitled "Digest of Energy and Water Statistics - 2013";
- Excel sheet that has been developed to calculate the grid mission factor of Mauritius ('Grid Emission Factor of Mauritius 2014 – Combined Margin – 20 March 2015.xlsx');
- Letter of Comfort CEB dated 17 February 2014

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History of the document

Version	Date	Nature of revision(s)
01.0	23 March 2012	Initial publication.
Decision Class: Regulatory **Document Type**: Form **Business Function**: Methodology		