

Call for public input – Template for input	ACM0002: Grid-connected electricity generation from renewable sources TOOL07: Tool to calculate the emission factor for an electricity system
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Name of submitter: MDB Working Group on Article 6 of the Paris Agreement (MDB WG)

Affiliated organization of the submitter (if any): MDB WG

Contact email of submitter:

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ACM0002 or TOOL07	Section no.	Para. no.	Comment	Proposed change (Include proposed text)
ACM0002			<p><b>Identification of baseline scenario:</b> Likely scenario to prevail in absence of project activity impacting emissions, linked to baseline approach.</p> <p>Emissions from grid connected plants, emission intensity factor computed based on TOOL07 for grid emission factor</p>	<p>Changes to the tool needed to define a PA appropriate emission factor aligned with the PA baseline approach and NDC accounting among other aspects to be incorporated. [Considering the complexity in determining such PA appropriate emission factor by project developers at project level, a separate tool may be developed and may be applied by the host country authority to determine such PA appropriate emission factor at national level.]</p>
ACM0002			<p><b>calculation method for emission factor of electricity system, in A6.4 mechanism context:</b> Changes to the tool needed to define a PA appropriate emission factor aligned with the PA baseline approach and NDC accounting among other aspects to be incorporated</p>	<p>The calculation of the grid emission factor based on the tool might need revision to align with eligible baseline scenarios.</p> <p>The changes to the TOOL07 are cited in the following rows and also the track change version of the TOOL07 is also being submitted.</p>
ACM0002	2.1	3	<p><b>Applicable energy storage technology/measure:</b></p> <p><b>The energy storage system to be applicable under this Meth may not be exclusively limited to battery based, considering various innovative energy storage technology are able to increase the usage of RE resources and battery based solution may not be appropriate in some certain situation(s).</b></p>	<p>“Further, the methodology applies to grid-connected renewable energy generation project activities which integrate Energy Storage System (ESS) to a Greenfield power plant or to an existing solar photovoltaic or wind power plant.”</p>

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ACM0002	2.2	5, 6(d)	<p><b>Applicability:</b> The methodology is currently limited to BESS, for application where BESS is charged with electricity generated from the associated renewable energy power plant(s)</p>	<p>Taking into account the potential role of BESS in achieving power sector decarbonization pathways and need for financial support for parties due to its high capex and marginal abatement cost, this methodology should be expanded or developing a top down new methodology to cover its applications where BESS is located in transmission and/or at distribution system and used for integration of VRE through the provision of ancillary services involving application for frequency control, ramping, and operating reserves, this may require modelling approach building on principles/guideline already developed elsewhere within the CDM methodology (ies) and/or such being developed, if any, under A6.4 methodology(ies).</p>
ACM0002	2.2	7	<p><b>Reservoir emissions</b> The Climate Bonds Standard criteria for hydropower stipulates use of two sustainability assessment tools supported by the International Hydropower Association (IHA) and a multistakeholder coalition of organisations. These tools are the ESG Gap Analysis Tool for identifying and addressing gaps against recognised good practice across 12 environmental, social and governance assessment topics; and the <a href="#">G-res Tool</a> for reporting the <b>estimated net greenhouse gas emissions of a reservoir</b>. Accordingly, it requires to demonstrate it has a low carbon footprint: recording either a power density of more than 5 W/m<sup>2</sup> or an emissions intensity of less than 100 gCO<sub>2</sub>e/kWh. For newer projects (in operation from or after the year 2020), the power density should be greater than 10 W/m<sup>2</sup> or the emission intensity should be less than 50 gCO<sub>2</sub>e/kWh. <a href="#">G-res Tool</a> is recommended to estimate emissions intensity.</p>	<p>We suggest MEP to evaluate/consider the application of G-res tool in the context of determining applicability under Art 6.4-ACM0002, especially in cases where the size of an associated reservoir is greater than 1 km<sup>2</sup> in flooded area.</p>

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ACM0002	5.7.1, 5.4.2	63 , 39, 40	<p>Estimation of emissions reductions prior to validation</p> <p>The methodology currently limits the use of models or other tools to estimate the emission reductions prior to validation, only in the case where grid emission factor is determined ex post during monitoring.</p>	<p>The use of models or other tools should also be allowed prior to validation especially in cases where the data from the power sector models are utilized for estimating the emission factor for future years and with a requirement to validate them with a specified frequency.</p> <p>The current limitation can also be expanded to use models/tools for other parameters, as applicable as well, that are determined through ex post monitoring such as project emissions from the operation of dry steam, flash steam and binary geothermal power plants due to non-condensable gases and/or working fluid. Please refer to the Predictive emission model discussed in the WORLD Bank paper: <a href="https://openknowledge.worldbank.org/server/api/core/bitstreams/ff94bf29-532a-5f1a-b597-593af74a64bc/content">https://openknowledge.worldbank.org/server/api/core/bitstreams/ff94bf29-532a-5f1a-b597-593af74a64bc/content</a></p>
TOOL07	1	1	<p><b>Introduction:</b> This methodological tool determines the CO2 emission factor for the displacement of electricity generated by power plants in an electricity system, by calculating the “combined margin” emission factor (CM) of the electricity system.</p>	<p>The tool could be expanded to cover other GHGs too, such as CH4 and N2O. However, CH4 and N2O emissions factors for electricity generation are less than 0.3% and 0.4% when compared to CO2 emissions, therefore it could still be excluded.</p> <p>This methodological tool determines the CO2 emission factor, or no change.</p> <p>Although, the reference to the combined margin may be removed. There could be alternate approaches too.</p>

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TOOL07	2.1	2	<p><b>Scope:</b> The CM is the result of a weighted average of two emission factors pertaining to the electricity system: the “operating margin” (OM) and the “build margin” (BM). The operating margin is the emission factor that refers to the group of existing power plants whose current electricity generation would be affected by the proposed CDM project activity. The build margin is the emission factor that refers to the group of prospective power plants whose construction and future operation would be affected by the proposed CDM project activity.</p>	<p>Literature research has indicated that the average grid emission factor should not be used for calculating abatement by intervention rather a marginal emission factor is more appropriate in these circumstances, because it is designed to take into account the change in electricity generation at the margins.</p> <p>The average grid emission factors published by IEA have been generally found to be much lower when compared with marginal grid emission factors quoted in registered CDM project(s) from the respective countries. As a result, the emissions reduction estimates from electricity saving or renewable energy power generation projects are bound to be underestimated with the average grid EFs.</p> <p>Further, the reference emission factors in case of Joint Crediting Mechanism (JCM) are derived corresponding to the respective grid mix in a conservative and simple manner to secure net emission reductions. Such a calculation takes into consideration the most advanced technologies being used in the currently operational power plants in the country.</p> <p>Therefore, apart from reference to the combined margin approach, the average and reference emission factors may also be included or embedded in the CM approach.</p> <p>For example, use of the published Emission factor derived by International Energy Agency (IEA) is cited in the Global Carbon Council (GCC) methodology GCCM001;</p> <p>Use of reference emission factors in case of Joint Crediting Mechanism (JCM) methodologies for grid connected RE projects.</p>

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TOOL07	2.2	3	<b>Applicability:</b> This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity that is where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).	As per above, may also include average and reference emission factors too, or embed in the definition of CM.
TOOL07	2.2	5	In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country.	For post 2020 regime, this para is not relevant. This clause may be removed.
TOOL07	3	8	<b>Normative references:</b> This tool refers to the latest approved versions of the TOOL09: Determining the baseline efficiency of thermal or electric energy generation systems". This tool is also referred to in the TOOL05 "Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation"...	The default values prescribed in TOOL09 may need to be revisited, following the example of the JCM approach with the reference emission factor.  Changes to Appendix with default efficiency factors in TOOL09 would be needed.
TOOL07	5	11	<b>Parameters:</b> Table 1. Parameters	The table 1 of parameters may be expanded with the average ( $EF_{grid,Avg,y}$ ) and reference emission factor ( $EF_{grid,Ref,y}$ ).
TOOL07	5	12	Table 2. Data requirements to determine OM and BM	The table 2 need to be amended for simplification and inclusion of other approaches too.
TOOL07	6	14	<b>Baseline methodology procedure:</b> Project participants shall apply the following six steps:	Either the options be included prior to the steps or certain steps may become optional and additional steps be added.
TOOL07	6.1	16	<b>Step 1: Identify the relevant electricity systems:</b> the project participants shall identify any connected electricity systems. If a connected electricity system is located partially or totally in Annex I countries, then the emission factor of that connected electricity system should be considered zero	The following part may be removed 'If a connected electricity system is located partially or totally in Annex I countries, then the emission factor of that connected electricity system should be considered zero'
TOOL07	6.1	26	For imports from connected electricity systems located in Annex I country(ies), the emission factor is 0 tons CO2 per MWh.	This paragraph may be removed following changes to para 16.
TOOL07	6.3	42	<b>Step 3: Select a method to determine the operating margin (OM):</b> Ex ante option: if the ex-ante option is chosen, the emission factor is determined once at the validation stage, thus no monitoring and recalculation of the emissions factor during the crediting period is required.	The ex-ante and ex-post options would need to be edited. Instead of stating as an option for determination of the factor once, monitoring and recalculation would be required.  Further, for ex-ante estimation, top-down defined emission factors for the grid based on modelling may be included.

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TOOL07	6.4.1	46	<b>Step 4: Calculate the operating margin emission factor according to the selected method:</b> The simple OM emission factor is calculated as the generation-weighted average CO <sub>2</sub> emissions per unit net electricity generation (t CO <sub>2</sub> /MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units	The simple OM may be replaced with reference emission factor.
TOOL07	6.4.1	47	The simple OM may be calculated by one of the following two options:  <b>Option A:</b> Based on the net electricity generation and a CO <sub>2</sub> emission factor of each power unit; or  <b>Option B:</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.	The options would not be needed with the reference OM being calculated with respective share of type of fossil fuel power plants.  Instead of 'unit' it would be 'type' of power plant.  Also, as part of simplification, the other options A1 and option B too could be removed, as then the plant specific generation may not be needed.
TOOL07	6.4.1.1	48	Option A: Calculation based on average efficiency and electricity generation of each plant	Instead of average efficiency, take into consideration the most advanced technologies being used in currently operational power plants in the country/region.
TOOL07	6.4.1.1.1	49	The emission factor of each power unit <i>m</i> should be determined as follows:	The emission factor of each power plant type <i>m</i> should be determined as...  Further, the option A1 could be removed.
TOOL07	6.4.1.1.1	50	Where several fuel types are used in the power unit, use the fuel type with the lowest CO <sub>2</sub> emission factor for $EF_{CO_2,m,i,y}$ . <b>Option A3</b> - If for a power unit <i>m</i> only data on electricity generation is available, an emission factor of 0 t CO <sub>2</sub> /MWh can be assumed as a simple and conservative approach.	The option A3 could be removed for simplification and not to rely on historic efficiency data.
TOOL07	6.4.1.2	54	6.4.1.2. Option B: Calculation based on total fuel consumption and electricity generation of the system	This option could be removed for simplification and not to rely on historic fuel consumption data.

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TOOL07	6.4.1.2	55	For this approach (simple OM) to calculate the operating margin, the subscript m refers to the power plants/units delivering electricity to the grid, not including low-cost/must-run power plants/units.	This para too could be removed, as already covered earlier.
TOOL07	6.4.3	67	The CO <sub>2</sub> emission factor of the grid power units $n (EF_{EL,n,y})$ should be determined as per the guidance for the simple OM, using the Options A1, A2 or A3	Reference to options to be removed following changes earlier.
TOOL07	6.4.4	71	When following the guidance of calculation of the simple OM, Option B should only be used if the necessary data for Option A is not available.	Following earlier point, as option B is getting removed, this para too gets removed.
TOOL07	6.5	72	<b>Step 5: Calculate the build margin (BM) emission factor:</b> In terms of vintage of data, project participants can choose between one of the following two options:	The option 1 fixing the BM ex-ante to be removed.
TOOL07	6.5	75	...excluding power units registered as CDM project activities...	This clause to be removed
TOOL07	6.5	76	The following diagram summarizes the procedure above:	The flow diagram to be edited as per above point.
TOOL07	6.5	78	The CO <sub>2</sub> emission factor ....., using the Options A1, A2 or A3	Reference to options to be removed following changes earlier.
TOOL07	6.5	79	If the power units included in the build margin... only Option A2 from guidance in Step 4....	This para can be removed as option A2 is the only option following above changes and the efficiency too correspond to the most advanced technologies being used in currently operational power plants in the country/region

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TOOL07	6.6	86	<p>The following default values should be used for <math>w_{OM}</math> and <math>w_{BM}</math>: for projects other than Solar and Wind</p> <p>“(b) All other projects: <math>w_{OM} = 0.5</math> and <math>w_{BM} = 0.5</math> for the first crediting period, and <math>w_{OM} = 0.25</math> and <math>w_{BM} = 0.75</math> for the second and third crediting period,<sup>1</sup> unless otherwise specified in the approved methodology which refers to this tool.”</p>	<p>We propose to introduce new options for project developers to consider (along with the guidance), especially to incentivise the adoption of values that align with forward looking approaches, taking into account the decarbonization plans/net zero pledges by parties.</p>
TOOL07	7	103	<p><b>Monitoring methodology:</b> Some parameters listed below under “data and parameters” either need to be monitored continuously during the crediting period or need to be calculated only once for the crediting period, depending on the data vintage chosen...</p>	<p>Some parameters listed below under “data and parameters” need to be monitored continuously during the crediting period</p>

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<sup>1</sup> Project participants can submit alternative proposal, for revision of tool or the methodology or deviation from its use, if the weightage does not reflect their situation with an explanation for the alternative weights.