

**CDM-MP88-A03**

## Draft Methodological tool

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# TOOL33: Default values for common parameters

Version 02.0

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**United Nations**  
Framework Convention on  
Climate Change

## COVER NOTE

### 1. Procedural background

1. The Executive Board of the clean development mechanism (CDM) (hereinafter referred to as the Board), at its 113<sup>th</sup> meeting (EB 113) approved the “TOOL33: Default values for common parameters” (hereinafter referred to as tool). Further, the Board requested the Meth Panel (MP) to elaborate the principles of conservativeness of values that will be applied depending on the level of uncertainty of underlying data.

### 2. Purpose

2. The proposed revision provides further information regarding the principles of conservativeness of values as per mandate from the Board. It also includes default values for use with cookstove methodologies.

### 3. Key issues and proposed solutions

#### 3.1. Principle of conservativeness

3. When defining default factors in the CDM context, the principle of conservativeness seeks to ensure environmental integrity and avoid the overestimation of emission reductions, while considering the most up-to-date information available that are of unbiased sources and seeking to reflect conditions that are grounded in reality.
4. In developing and proposing default values, a literature review of preferred information sources such as the IPCC literature, databases and reports of UN Agencies, the World Bank, International Energy Agency, International Renewable Energy Agency and other comparable sources, of relevant information is undertaken.
5. However in some cases there is a need to take a pragmatic approach without compromising the environmental integrity of the values developed. In some sectors, the data availability is largely from informal or non-verifiable sources of information (one example of this is household fuelwood and charcoal consumption), that affects the reliability and detail of the data sources vary enormously, from statistically sound surveys, to modelling, to compilation of secondary data sources.
6. Generally, the values from the most suitable dataset that are relevant, reliable, current and objective are to be considered and proposed for a pragmatic recommendation following the guiding principles of conservativeness mentioned in paragraph 3 above.

#### 3.2. Rationale for inclusion of default values related to cookstove methodologies

7. In addition, the proposed revision also includes default values for the following parameters:
  - a) Wood-to-charcoal conversion factor;
  - b) Average annual consumption of the woody biomass per person;

- c) Fraction of non-renewable biomass;
  - d) Efficiency of pre-project device;
8. The rationale for these values is provided under the section 3.0 of the concept note "Review of default baseline assumptions applied in AMS-I.E, AMS-II.G and TOOL30", as contained in annex 19 to the 88<sup>th</sup> meeting report of the MP.

#### **4. Impacts**

9. The proposed revision will clarify the choice of default values of common parameters presented in this tool as they are derived following quality objectives including principles of conservativeness for the data and data sources.
10. Further, inclusion of new default values for parameters relevant for energy efficient cookstove projects will enhance the reliability of emission reductions estimates as these values are based on recent studies and literature and are conservative when compared to the current values.

#### **5. Subsequent work and timelines**

11. The MP, at its 88<sup>th</sup> meeting, agreed to seek public inputs on the draft revised tool, and any input will be discussed with the MP and forwarded to the Board for its consideration.

#### **6. Recommendations to the Board**

12. The MP recommends that the Board adopt the revised draft tool, to be made effective at the time of the Board's approval.

<b>TABLE OF CONTENTS</b>	<b>Page</b>
<b>1. INTRODUCTION .....</b>	<b>5</b>
<b>2. SCOPE, APPLICABILITY, AND ENTRY INTO FORCE .....</b>	<b>5</b>
2.1. Scope .....	5
2.2. Applicability .....	5
2.3. Entry into force .....	5
<b>3. NORMATIVE REFERENCES .....</b>	<b>5</b>
<b>4. DEFINITIONS .....</b>	<b>5</b>
<b>5. PARAMETERS .....</b>	<b>6</b>
5.1. Carbon dioxide emission factor for diesel generating system used for off-grid power generation purposes .....	6
5.2. Carbon dioxide emission factor for kerosene usage for lighting applications by households and communities .....	7
5.3. Wood-to-charcoal conversion factor .....	7
5.4. Average annual consumption of woody biomass per person .....	7
5.5. Fraction of non-renewable biomass .....	7
5.6. Efficiency of pre-project device .....	7
<b>6. PARAMETERS .....</b>	<b>7</b>
<b>APPENDIX 1. PROCESS, CRITERIA AND TIMELINE FOR THE UPDATE OF THE DEFAULT VALUES .....</b>	<b>10</b>
<b>APPENDIX 2. PRINCIPLES OF CONSERVATIVENESS .....</b>	<b>11</b>

## 1. Introduction

1. This tool serves as a repository of default values<sup>1</sup> of common parameters which are applied in methodologies that refer to this tool.

## 2. Scope, applicability, and entry into force

### 2.1. Scope

2. This tool includes default values of the parameters listed under section 5 below. ~~(a) carbon dioxide (CO<sub>2</sub>) emission factors for diesel generator systems used for off-grid power generation purposes, and (b) CO<sub>2</sub> emission factor for kerosene usage by households and communities for lighting purposes;~~
3. The appendix 1 of this tool specifies the validity, process for update and timelines for the update of the default values.

### 2.2. Applicability

4. This tool shall be applied in conjunction with the methodologies which refer to this tool to source the default values to estimate the baseline emissions (e.g. from the use of diesel generating systems in off-grid power generation purpose or the baseline kerosene usage, ~~or from the use high efficiency biomass-based fired devices~~).
5. The default values as contained in section 5 of this tool are valid up to 10 March 2025. Notwithstanding the provisions on the validity of new, revised and previous versions of methodologies and methodological tools in the "Procedure: Development, revision and clarification of baseline and monitoring methodologies and methodological tools", there will be no grace period for the application of this tool and the validity of the default values after this date, including in cases where further default values are added to this tool through revisions of this tool before this date.

### 2.3. Entry into force

6. The date of entry into force is the date of the publication of the ~~EB ###~~ meeting report on ~~## Month 2022~~.

## 3. Normative references

7. The tool refers to the latest approved version of "TOOL07: Tool to calculate the emission factor for an electricity system".

## 4. Definitions

8. The definitions contained in the Glossary of CDM terms shall apply.

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<sup>1</sup> The background information on the rationale for the default values is included under Annex 3 of MP87 meeting report.

9. For the purpose of this tool, the following definition shall apply:
- a) **Mini-grid system** – An integrated energy system consisting of interconnected loads and one or more energy resources with a total capacity not exceeding 15 MW (i.e. the sum of installed capacities of all electricity generating units connected to the mini-grid is equal to or less than 15 MW), which is not connected to a national or a regional grid.

## 5. Parameters

10. This tool provides default values to following parameters:
- a) CO<sub>2</sub> emission factor for diesel generating system used for off-grid power generation purposes; **and**
- b) CO<sub>2</sub> emission factor for kerosene used for lighting applications **by households and communities;**
- c) **Wood-to-charcoal conversion factor;**
- d) **Average annual consumption of woody biomass per person;**
- e) **Fraction of non-renewable biomass; and**
- f) **Efficiency of pre-project device.**

### 5.1. Carbon dioxide emission factor for diesel generating system **used for off-grid power generation purposes**

11. For a baseline electricity generating system including the mini-grid system where all generators use exclusively fuel oil and/or diesel fuel, the CO<sub>2</sub> emission factor for a diesel generating system of the relevant capacity operating at optimal load as given in Table 1 shall be considered.

**Table 1. Emission factors for diesel generator systems (in kg CO<sub>2</sub>/kWh<sup>(a)</sup>)**

Cases	Mini-grid with 24 hour service	(a) Mini-grid with temporary service (4 – 6 hr/day); (b) Productive applications; (c) Water pumps	Mini-grid with storage
		Load factors [%]	
Size	25%	50%	100%
<15 kilowatts (kW)	1.0	0.9	0.8
>=15 <35 kW	1.0	0.8	0.8
>=35 <135 kW	1.0	0.8	0.8
>=135 <200 kW	0.9	0.8	0.8
> 200 kW	0.8	0.8	0.8

<sup>(a)</sup> A conversion factor of 3.2 kgCO<sub>2</sub> per kg of diesel has been used (following 2006 IPCC Guidelines for National Greenhouse Gas Inventories)

## 5.2. Carbon dioxide emission factor for kerosene usage for lighting applications by households and communities

12. In methodologies where, in the baseline, kerosene usage for lighting purposes and usage of diesel generating system for meeting electricity demand is envisaged, the default emission factor is provided as follows:
- For the first 55 kWh of electricity supplied to the user by the project electricity generating system in a given year, an emission factor of 2.72 kg CO<sub>2</sub>/kWh (i.e. 2.72 t CO<sub>2</sub>/MWh) may be used;
  - For the electricity supplied to the user by the project electricity generating system in a given year that is above 55 kWh, an emission factor as specified in Table 1 above based on the diesel generator capacity and the load may be used.

## 5.3. Wood-to-charcoal conversion factor

13. A default value of 4.0 kg of fuelwood (wet basis) per kg of charcoal (dry basis) as a wood-to-charcoal conversion factor should be used. The project participant may also use other options as provided in Data / Parameter table 3, to determine the value.

## 5.4. Average annual consumption of woody biomass per person

14. A default value of 0.4 tonnes/person/year should be used. The project participants may use other options to determine the value, following the requirements of applied small-scale CDM methodologies.

## 5.5. Fraction of non-renewable biomass

15. A default value of 0.3 for the fraction of non-renewable biomass ( $f_{NRB}$ ) should be used. The project participant may use other options to determine the  $f_{NRB}$  value following the requirements in TOOL30.

## 5.6. Efficiency of pre-project device

16. Default values of efficiency of pre-project device used for cooking and/or water boiling applications are as follows:
- For a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation (i.e. without a grate or a chimney) a default value of 0.15 may be used;
  - For other type of devices a default value of 0.25 may be used.

# 6. Parameters

Data / Parameter table 1.

Data / Parameter:	$EF_{CO_2,y}$
Data unit:	tCO <sub>2</sub> /MWh
Description:	CO <sub>2</sub> emission factor for the diesel generating system used for off-grid power generation purpose in year y

Source of data:	An emission factor as specified in Table 1 above based on the diesel generator capacity and the load
Measurement procedures (if any):	-
Any comment:	.

**Data / Parameter table 2.**

<b>Data / Parameter:</b>	<b><math>EF_{CO_2,k}</math></b>
Data unit:	tCO <sub>2</sub> /MWh
Description:	CO <sub>2</sub> emission factor for <b>baseline kerosene used for lighting applications by households and communities</b> in year y
Source of data:	<b>2.72 tCO<sub>2</sub>/MWh a</b> As per paragraph 12 above
Measurement procedures (if any):	-
Any comment:	Eligible only for the first 55 kWh of electricity supplied to the user by the project electricity generating system in a given year unless otherwise specified in the methodology

**Data / Parameter table 3.**

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<b>Data / Parameter:</b>	<b>CF</b>
Data unit:	-
Description:	Wood-to-charcoal conversion factor
Source of data:	One of the following three options may be used to determine this factor: i) A default value of 4 kg of fuelwood (wet basis) per kg of charcoal (dry basis); ii) Project participants should justify the proposed value of wood-to-charcoal conversion factor when the default value of 4 is not applied but a higher value is proposed. Such justifications should include: a. Evidence that the proposed values are applicable to project specific contexts, for its validation by DOEs, such as the below: i. A sample based testing of the kilns for efficiency in charcoal production, providing a clear description of the testing method used including the standard followed; b. Compare the proposed values against the values reported in relevant scientific literature, and credibly justify any differences; iii) Project participants may use country or region specific values approved through the "procedure for development, revision, clarification and update of standardized baselines," which are available on the CDM website <a href="http://cdm.unfccc.int/methodologies/standard_base/index.html">http://cdm.unfccc.int/methodologies/standard_base/index.html</a>
Measurement procedures (if any):	-
Any comment:	The term 'wet basis' assumes that the wood is 'air-dried' as is specified in the IPCC 2006 guidelines



**Data / Parameter table 4.**

<b>Data / Parameter:</b>	<b>Average annual consumption of woody biomass</b>
Data unit:	tonnes/person/year
Description:	Average annual consumption of woody biomass per person
Source of data:	0.4
Measurement procedures (if any):	-
Any comment:	-

**Data / Parameter table 5.**

<b>Data / Parameter:</b>	<b><math>f_{NRB}</math></b>
Data unit:	Fraction or %
Description:	Fraction of non-renewable biomass
Source of data:	0.3
Measurement procedures (if any):	-
Any comment:	-

**Data / Parameter table 6.**

<b>Data / Parameter:</b>	<b>Efficiency of pre-project device</b>
Data unit:	Fraction
Description:	Efficiency of pre-project device used for cooking and/or water boiling applications
Source of data:	(i) 0.15 for a three-stone fire using firewood (not charcoal), or a conventional device with no improved combustion air supply or flue gas ventilation (i.e. without a grate or a chimney); (ii) 0.25 for other types of devices
Measurement procedures (if any):	-
Any comment:	-

## **Appendix 1. Process, criteria and timeline for the update of the default values**

1. The validity of the default values included in this tool shall be re-assessed by the Methodologies Panel (MP) every three years.
2. The MP shall initiate the analysis of the default values at least 365 days prior to the expiry date of the default values as referred to in paragraph 5 of this tool.
3. The MP shall review relevant information pertaining to the default values and prepare a recommendation on the continuation or update to the default values for consideration by the Board.
4. The Board shall decide on the continuation or update to the default values.
5. The Board may include additional default values in this tool at any point in time. In such cases, the validity of the default values added is limited to the remaining valid period of the default values as indicated in paragraph 5 of this tool and those default values are subject to review as indicated in paragraphs 1–3 **above of this appendix**.
6. Stakeholders may propose addition of default values in this tool following the process in section 6 'Revision of approved methodology or methodological tool' of the "Procedure: Development, revision and clarification of baseline and monitoring methodologies and methodological tools".

## Appendix 2. Principles of conservativeness

### 1. Background

1. This appendix provides guiding principles of conservativeness that were applied to determine the default values included in this tool considering the level of uncertainty of underlying data.

### 2. Principles of conservativeness

2. When defining default factors in the CDM context, the principle of conservativeness seeks to ensure environmental integrity and avoid the overestimation of emission reductions, while considering the most up-to-date information available that are of unbiased sources and seeking to reflect conditions that are grounded in reality.
3. In developing and proposing default values, a literature review of relevant information is undertaken. The preferred information sources are trusted sources such as the IPCC literature, databases and reports of UN Agencies, the World Bank, International Energy Agency, International Renewable Energy Agency and other comparable sources including publications from scientific journals with high impact factor.
4. Where feasible, data that fulfils the requirements and quality assurance and quality control (QA/QC) for primary data specified under the standardised baseline framework is used (refer to, QA/QC guidelines at <https://cdm.unfccc.int/Reference/Guidclarif/index.html>).
5. In some cases there is a need to take a pragmatic approach without compromising the environmental integrity of the values developed. Noting the wide heterogeneity of data and information the original values require some process of transformation, i.e. conversion to a common format, using conversion factors and assumptions, etc.
6. After converting into the common format, the values from the most suitable dataset(s) that are relevant, complete, consistent, reliable, current, accurate and objective is considered. Where relevant, standard deviation of the data set is considered and adjustments to use the lower or higher bound values for conservative estimate of default values is undertaken.

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### Document information

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<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	13 July 2022	MP 88, Annex 3 To be considered by the Board at EB 115. A call for public input will be issued for this draft document. Any input will be discussed with the MP and forwarded to the Board for consideration. Revision to: <ul style="list-style-type: none"><li>• Include the principles of conservativeness of values that will be applied depending on the level of uncertainty of underlying data;</li><li>• Include default values for use with cookstove methodologies.</li></ul>
01.0	11 March 2022	EB 113, Annex 9 Initial adoption

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