

Agenda item 4.1.

Paragraph 19 of the annotated agenda

Concept Note:

Methodological approaches for calculating emission reductions from project activities, resulting in the reduced use of non-renewable biomass in households

CDM EB 103

Bonn, Germany, 12 to 14 June 2019



Procedural background

- CMP 14 encouraged the Board to **review methodological approaches for calculating emission reductions** from project activities, resulting in the **reduced use of non-renewable biomass in households**.



Cookstove methodologies AMS-I.E. and AMS-II.G.

- EB37 (in 2008) approved two cookstove methodologies:
 - “**AMS-I.E.** Switch from non-renewable biomass for thermal applications by the user” and
 - “**AMS-II.G.** Energy efficiency measures in thermal applications of non-renewable biomass”
- Key parameters included:
 - ✓ *EF_{projected_fossilfuel}*: Emission factor for the fossil fuels projected to be used for substitution of non-renewable woody biomass by similar consumers (default 63.7 t CO₂/TJ)
 - ✓ Fraction of woody biomass that can be established as non-renewable biomass (fNRB)
- With 71 PoAs registered, clean cookstoves are by far the most popular PoA type. 322 CPAs have been included in these PoAs and, in addition, 42 project activities are registered.
 - More than 5 million CERs have been issued for clean cookstoves



EB 102 considered a concept note and requested MP to analyse:

a) **The use of fossil fuel emission factor as surrogates for biomass combustion (Issue 5):**

- To explore options for **revising the globally applicable default factor**, taking into account data on actual usage of various fossil fuels for cooking in different regions/countries of the world.
- To explore a method for providing **an option for PPs to determine the factor for their project or PoA**, based on geographic coverage of the project or PoA and fossil fuel usage in the region for cooking.

b) **Non-CO₂ GHG emissions such as CH₄ and N₂O emissions (Issue 6):**

- To explore including these gases in the project boundary, considering **the same mix of fossil fuels** that are identified under issue 5.

c) **Harmonized standards for stove tests (Issue 8):**

- To explore options for applying international (e.g. ISO) standards and national standards where they are available to determine the performance of the stoves.



Purpose

- To present the analysis by MP as requested by the Board



Issue: Default global fossil fuel emission factor

Mandate: Explore options for revising the globally applicable default factor, taking into account data on actual usage of various fossil fuels for cooking in different regions/countries of the world.

- Fossil fuel emission factor ($EF_{projected_fossilfuel}$) in AMS-II.G. and AMS-I.E. include a default value of 63.7 t CO₂/TJ
 - 9 % weight assigned for kerosene and 91 % for LPG.
- The data of actual usage of various fossil fuels for cooking in different regions/countries (average % value in developing countries)

Share of households using fossil fuels for cooking (simple average)	Households cooking with LPG ^(a)	Households cooking with kerosene	Households cooking with coal	Households cooking with other fuels (non-fossil fuel based)	Total
Percentage share ^(b) of all cooking fuels	30%	3%	1%	66%	100%
Percentage share of fossil fuels	87%	9%	4%	--	100%



Issue: Default global fossil fuel emission factor

- Proposed revised value for the fossil fuel emission factor

($EF_{projected_fossilfuel}$): 65.1 t CO₂/TJ

		Households cooking with LPG	Households cooking with kerosene	Households cooking with coal	Total	Fossil fuel emission factor (t CO ₂ /TJ)	Fossil fuel emission factor (t CO ₂ e/TJ) including CH ₄ and N ₂ O emissions
AMS-II.G. (version 3 to 8) and AMS-I.E. (version 4 to 7)		25%	25%	50%		81.6	
AMS-II.G. (version 9 and 10) and AMS-I.E. (version 8 and 9)		91%	9%			63.7	
Proposed revision: based on the percentage of the total number of households using fossil fuels for cooking (simple average)	% share of total fuel use	30%	3%	1%	34%		
	% share of fossil fuel use	87%	9%	4%	100%	65.1	a) 65.6 (based on fossil fuel mix) b) 73.8 (based on wood)
Information for comparison:	Emission factor of wood is 112.0 (t CO ₂ /TJ) and 120.7 t CO ₂ e/TJ including CH ₄ and N ₂ O emissions						



Mandate: Explore including CH₄ and N₂O in the project boundary considering the same mix of fossil fuels that are identified under issue above.

- With the inclusion of CH₄ and N₂O emissions, fossil fuel emission factor will be as follows:
 - When CH₄ and N₂O emission factors of the same mix of fossil fuels are used: **65.6 t CO₂e/TJ**;
 - For comparison: When CH₄ and N₂O emission factors of wood are used: 73.8 t CO₂e/TJ.
 - A plausible alternative that MP considered, however did not recommend as EB guidance was to consider fossil fuel mix.



Issue: Option for PPs to determine $EF_{projected_fossilfuel}$ for their project or PoA

Mandate: Explore a method for providing an option for PPs to determine $EF_{projected_fossilfuel}$ for their project or PoA, based on geographic coverage of the project or PoA and fossil fuel usage in the region for cooking.

**Global default fossil fuel
emission factor: 65.6 t CO₂e/TJ**

$$ER_{y,i,j} = B_{y,savings,i,j} \times N_{y,i,j} \times \mu_y \times f_{NRB,y} \times NCV_{biomass} \times EF_{projected_fossilfuel} \quad \text{Equation (1)}$$

As an alternative to the use of the default value for the fossil fuel emission factor, project participants may estimate the fossil fuel emission factor for their project or PoA by determining x_j (a fraction representing fuel type j used in the region/country or project area for cooking).

$$ER_{y,i,j} = B_{y,savings,i,j} \times N_{y,i,j} \times \mu_y \times NCV_{biomass} \times f_{NRB,y} \quad \text{Equation (2)}$$

$$\times \sum_j \{x_j \times (EF_{FF,j,CO_2} + EF_{FF,j,CH_4} \times GWP_{CH_4} + EF_{FF,j,N_2O} \times GWP_{N_2O})\}$$

**Region/project area - specific fossil
fuel emission factor: ? t CO₂e/TJ**

- MP recommended a method, however is of the opinion that having only a default value may be a preferred option, considering that projection of the fossil fuel is a hypothetical one.

Issue: Harmonized standards for stove tests

Mandate: Explore options for applying international standards (e.g. ISO) and national standards where they are available to determine the performance of the stoves.

- ISO has recently published a series of standards for harmonized lab and field tests of cookstoves:
 - ISO 19867-1:2018: Clean cookstoves and clean cooking solutions – Harmonized laboratory test protocols.
 - The MP is of the view that the use of ISO standards should also be cited in CDM methodologies as options.
 - During the practitioner workshop (06 May 2019), stakeholders requested the continued use and acceptance of the existing protocols (e.g. WBT, CCT, and KPT protocols listed in Clean Cooking Alliance) alongside the recently approved ISO Standards as there is limited experience in its application.
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Issue: Harmonized standards for stove tests

- The MP considered the following aspects need further look:
 - a) Difference in calculating thermal efficiency between WBT and ISO;
 - b) Comparability of the test results for baseline and project;
 - c) Infrastructure for stove test (e.g. accredited laboratories) for ISO 19867-1:2018.
- Therefore, before finalizing the recommendation to the Board, the MP aims to conduct further analysis on the differences in WBT test protocol and ISO standard, and explore what guidance would be required when applying the ISO standards as an option for testing efficiency of stoves (e.g. which sections to be applied, guidance on eligibility of labs).



- The improvement of the methodological approaches for the calculation of emission reductions by reducing use of non-renewable biomass will facilitate the implementation of CDM project activities and PoAs in the household cookstove sector, which have strong relevance for the regions that are underrepresented in the CDM.



Subsequent work and timelines

- The MP will propose revisions to AMS-I.E. and AMS-II.G. at a future meeting, based on the guidance from the Board.



Recommendations to the Board

The MP recommends that the Board consider the concept note and provide further guidance.

- a) Consider the revised value of the fossil fuel emission factor of **65.6 t CO₂e/TJ**, which includes non-CO₂ GHG emissions using the same mix of fossil fuels.
- b) Take note that the MP will continue to conduct further analysis what guidance would be required when applying the ISO standards as an option for testing efficiency of stoves.
 - ✓ The findings of the analysis will be considered while proposing a revision of AMS-I.E. and AMS-II.G to the Board at a future meeting.

