

CDM-SSCWG53-A03

Information note

Analysis of AMS-III.F and AMS-III.Y followed by revision of the methodologies

Version 01.0



United Nations
Framework Convention on
Climate Change

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1. Procedural background

1. The Executive Board of the clean development mechanism (CDM) (hereinafter referred to as the Board), at its ninety-third meeting (EB93), adopted the workplans of the Methodologies Panel (MP) and Small-Scale Working Group (SSC WG) for 2017, which contained an analysis of “AMS-III.F: Avoidance of methane emissions through composting” and “AMS-III.Y: Methane avoidance through separation of solids from wastewater or manure treatment systems” followed by revision of the methodologies.
2. The Board, at its ninety-second meeting (EB92), approved the revisions of “AMS-III.F: Avoidance of methane emissions through composting” and “AMS-III.Y: Methane avoidance through separation of solids from wastewater or manure treatment systems” to expand the applicability of the methodology and include an alternative simplified but conservative approach for the calculation of emission reductions when organic bedding material is included. At the same time, the Board requested the SSC WG to **further explore whether additional alternative methods could be included** in the above methodologies, **e.g. monitoring based on livestock feed**, and to propose revisions to the above methodologies if necessary at a future meeting.

2. Purpose

3. The purpose of this information note is to analyse possibility of alternative monitoring method as mandated by the Board.

3. Key issues and proposed solutions

4. Both AMS-III.F and AMS-III.Y refer to the requirements in AMS-III.D for calculation of emissions associated with animal manure. In AMS-III.F, baseline emissions from the manure composted are calculated based on the method of paragraph 16 of “AMS-III.D: Methane recovery in animal manure management systems” (version 20). Similarly, paragraph 43 of AMS-III.Y requires that annual volatile solids excretion shall be determined following relevant procedure in AMS-III.D.
5. The latest version of AMS-III.D (version 20) includes several options to estimate volatile solids (VS).

Paragraph 17 (b) *“Volatile solids (VS) are the organic material in livestock manure and consist of both biodegradable and non-biodegradable fractions. For the calculations the total VS excreted by each animal species is required. The preferred method to obtain VS is to use data from nationally published sources. These values shall be compared with IPCC default values and any significant differences shall be explained. **If data from nationally published sources are not available, country-specific VS excretion rates can be estimated from feed intake levels, via the enhanced characterisation method (tier 2) described in section 10.2 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10.** If country specific VS values are not available IPCC default values from 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10 table 10 A-4 to 10 A-9 can be used provided that the project participants assess the suitability of those data to the specific situation of the treatment site particularly with reference to feed intake levels.”*

6. Although the above guidance in AMS-III.D is in line with the requirements of “ACM0010: GHG emission reductions from manure management systems” where VS is determined using one of the four options, the latter provides a more detailed guidance. The second option (presented in the order of preference) is the method based on dietary intake of livestock. ACM0010 provides a specific equation to be used to estimate VS and monitoring requirements for parameters used in the equation. The equation has been developed based on Equation 10.24 of 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10, and it requires collection of following data to estimate gross energy intake and feed digestibility: weight (kg); average weight gain per day (kg); feeding situation: confined, grazing, pasture conditions; milk production per day (kg/day) and fat content (%); average amount of work performed per day (hours day⁻¹); percentage of females that give birth in a year; wool growth; number of offspring; and feed digestibility (%).
7. To provide further clarity on various methods available to estimate VS, it is proposed that the equation in ACM0010 referred in paragraph 6 above be included in AMS-III.D. **See the proposed revision in Appendix 1.**

4. Impacts

8. The proposed revision will provide more clarity and ensure consistency on the requirements in the methodologies. The inclusion of alternative methods as options to estimate VS will provide flexibility on the choice to project developers.

5. Subsequent work and timelines

9. The SSC WG, at its 53th meeting, agreed on the draft revised methodology. After receiving public inputs on the document, the SSC WG will continue working on the draft revised methodology, at its 54th meeting, for recommendation to the Board at a future meeting of the Board.

6. Recommendations to the Board

10. Not applicable (call for public input).

Appendix 1. Proposed revisions to AMS-III.D

1. **Paragraph 16 (b):** Volatile solids (VS) are the organic material in livestock manure and consist of both biodegradable and non-biodegradable fractions. For the calculations the total VS excreted by each animal species is required.

- (i) The preferred method to obtain VS is to use data from nationally published sources. These values shall be compared with IPCC default values and any significant differences shall be explained.
- (ii) If data from nationally published sources are not available, country-specific VS excretion rates can be estimated from feed intake levels, via the enhanced characterisation method (tier 2) described in section 10.2 in 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10.

$$VS_{LT,y} = \left[GE_{LT} \times \left(1 - \frac{DE_{LT}}{100} \right) + (UE \times GE_{LT}) \right] \times \left[\left(\frac{1 - ASH}{ED_{LT}} \right) \right] \times nd_y \quad \text{Equation (1)}$$

Where:

$VS_{LT,y}$	=	Annual volatile solid excretions for livestock LT entering all AWMS on a dry matter weight basis (kg -dm/animal/yr)
GE_{LT}	=	Daily average gross energy intake (MJ/animal/day)
DE_{LT}	=	Digestible energy of the feed (per cent)
UE	=	Urinary energy (fraction of GE_{LT})
ASH	=	Ash content of manure (fraction of the dry matter feed intake)
ED_{LT}	=	Energy density of the feed fed to livestock type LT (MJ/kg -dm)
nd_y	=	Number of days treatment plant was operational in year y

- (iii) If country specific VS values are not available IPCC default values from 2006 IPCC Guidelines for National Greenhouse Gas Inventories Volume 4 chapter 10 table 10 A-4 to 10 A-9 can be used provided that the project participants assess the suitability of those data to the specific situation of the treatment site particularly with reference to feed intake levels;

2. **Paragraph 16 (c):** Project participants may adjust default IPCC values for VS for a site-specific average animal weight. If so, it shall be well explained and documented. The following equation shall be used:

$$VS_{LT,y} = \left(\frac{W_{site}}{W_{default}} \right) \times VS_{default} \times nd_y \quad \text{Equation (1)}$$

Where:

$VS_{LT,y}$	=	Annual volatile solid excretions for livestock <i>LT</i> entering all AWMS on a dry matter weight basis (kg -dm/animal/yr)
W_{site}	=	Average animal weight of a defined livestock population at the project site (kg)
$W_{default}$	=	Default average animal weight of a defined population, this data is sourced from IPCC 2006 (kg)
$VS_{default}$	=	Default value for the volatile solid excretion rate per day on a dry-matter basis for a defined livestock population (kg dm/animal/day)
nd_y	=	Number of days treatment plant was operational in year <i>y</i> Number of days in year <i>y</i> where the animal manure management system is operational

3. **Paragraph 16 (d):** B_o or VS values applicable to developed countries can be used provided the following four conditions are satisfied:

- (i) The genetic source of the livestock originates from an Annex I Party;
- (ii) The farm uses formulated feed rations (*FFR*) which are optimized for the various animal(s), stage of growth, category, weight gain/productivity and/or genetics;
- (iii) The use of *FFR* can be validated (through on-farm record keeping, feed supplier, etc.);
- (iv) The project specific animal weights are more similar to developed country IPCC default values.

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Document information

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