Approved baseline and monitoring methodology/ methodological tool clarification response form (Version 02.0)

INFORMATION TO BE COMPLETED BY THE SECRETARIAT OR PANEL/ WG	
Date and number of Panel/ WG meeting:	14–17 October 2013, SSC WG 42
Title/Subject of the request for clarification:	In AMS-III.AO version 01, the provision of the calculation of achieved emission reductions and Equation 4 is not consistent
Reference number of the request for clarification:	SSC_692
Exact reference (number, title and version) of the methodology or methodological tool to which the request for clarification applies:	AMS-III.AO Methane recovery through controlled anaerobic digestion --- Version 1.0
Fast track or Regular track:	☐ Fast track ☒ Regular track

Summary of the request for clarification

Original text from Stakeholder:

Dear Madam or Sir,

I am writing you to request a clarification regarding the monitoring of AMS-III.AO. Methane recovery through controlled anaerobic digestion, version 01. In AMS-III.AO, the provision of the calculation of achieved emission reductions and Equation 4 is not consistent.

AMS.III.AO provides that “emission reductions achieved by the project activity is limited to the ex post calculated baseline emissions minus project and leakage emissions using the actual monitoring data for the project activity” (hereafter referred to as Provision). However, Equation 4 of AMS-III.AO gives a different interpretation of above principle of the achieved emission reductions. According to Equation 4, the achieved emission reduction is the lower one between the ex post calculated baseline emissions minus project and leakage emissions using the actual monitoring data for the project activity, and the achieved biogas destruction minus the project and leakage emission. Please advise whether the verbal description or the formula have priority, especially during the first years after the project implementation.

$$ER_{y,ex\ post} = min\left[\begin{matrix}(BE_{y,ex\ post} - PE_{y,ex\ post} - LE_{y,ex\ post}), (MD_y - PE_{y,power,ex\ post} - \\ PE_{y,transp,ex\ post} - PE_{y,res\ waste,ex\ post} - PE_{y,phy\ leakage,ex\ post} - LE_{y,ex\ post})\end{matrix}\right]$$

The inconsistency leads to an overly conservative emission reduction estimate due to the ex post calculation of $BE_{SWDS,y}$, as an component of $BE_{y,ex\ post}$. $BE_{SWDS,y}$ is calculated by the Methodological Tool "Emissions from solid waste disposal site” based on the First-order Decay Model and the monitored values for the parameter $W_{j,x}$. As a result, $BE_{SWDS,y}$ increases over time while MD stays approximately constant over time. In particular, $BE_{SWDS,1}$ will be very small in comparison to MD_1 (resulting in a very small or even negative $ER_{1,ex\ post}$), while in later years the situation will typically be reversed. The cumulative emission reductions over time are therefore lower than the cumulative results of either the first term (BE-PE-LE) or the second term (MD-PE-LE). Hence, the formula is overly conservative and does not give an accurate picture of the emission reductions resulting from the project.

Furthermore, I would like to suggest a solution to resolve the inconsistency. It would be ok to keep both the verbal description of the calculation of achieved emission reduction and Equation 4, if below text and equation were used in paragraph 19 of AMS-III.AO:

Ex post $BE_{SWDS,y}$ shall be calculated as follows, which are based on the Methodological Tool "Emissions from solid waste disposal site”:

$$BE_{SWDS,y,ex\ post} = \frac{1}{n}\sum_{y=1}^{n} BE_{SWDS,y}$$

$$BE_{SWDS,y} = \varphi_y \cdot (1 - f_y) \cdot GWP_{CH4} \cdot (1 - OX) \cdot \frac{16}{12} \cdot F \cdot DOC_{f,y} \cdot MCF_y \cdot \sum_{x=1}^{n} \sum_{j} W_{j,x,\exp ost} \cdot DOC_j \cdot e^{-k_j \cdot (y-x)} \cdot (1 - e^{-k_j})$$

Where, n is the length of the crediting period which is 7 or 10;

$W_{j,x,ex\ post}$ shall be obtained via following methods:

- From year 1 to year y, $W_{j,x,ex\ post}$ shall be monitored with respect to the Methodological Tool "Emissions from solid waste disposal site";

- From year y+1 to year n, $W_{j,x,ex\ post}$ uses the average amount of solid waste type *j* disposed in the anaerobic digester during year 1 to year y;

Clarification by the secretariat or Panel/ WG

The small-scale working group (SSC WG) of the CDM Executive Board would like to thank the author for the submission.

Equation 4 of the methodology is consistent. It is the intent of the methodology to be conservative by capping the emission reduction based on the methane generation that would have happened in the absence of the project activity.

This methodology comprises measures to avoid methane emissions from biomass or other organic matters that would have otherwise been left to decay anaerobically in a solid waste disposal site (unmanaged treatment). In the project activity, controlled biological treatment of biomass or other organic matters is introduced through anaerobic digestion in closed reactors (managed) equipped with biogas recovery and combustion/flaring system.

In principle due to the unmanaged treatment in the baseline, methane would have released as indicated by the first order decay model used in the “Tool on emissions from solid waste disposal sites” and represented by the first part of equation 4. This is the maximum methane emission that would occur in the absence of the project activity, as the methane emissions from an unmanaged treatment would always be less than the methane emissions from a managed treatment from a given amount of waste. Thus, the maximum methane generation for a given amount of waste is capped to its fate in the baseline.

The implementation of the project activity is managed treatment and the emission reduction from the actual utilisation is presented by the second part of equation 4 in the methodology.

The minimum between what would be the maximum methane emissions in the absence of the project activity for a given amount of waste and the actual achieved methane capture and destruction or its gainful use is then the conservative emission reductions that can be claimed.

The approach in equation 4 is consistent with the other similar small scale methodologies for example “AMS.III.D: Methane recovery in animal manure management systems”.

With regard to negative emission reductions using equation 4, based on the above explanation, in case ex-post project emissions (e.g. $PE_{flaring}$) are not managed well, the project can potentially generate more project emissions than the calculated baseline emissions (using first order decay model). Thus achieving negative emission reductions, although rare, is not ruled out when a large portion of captured emissions are emitted to the atmosphere without an efficient destruction provision.

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Document information

Version	*Date*	*Description*
02.0	18 July 2013	Revised to remove the row "Date and signature of the chair and vice chair of Panel/WG (in case of clarification by Panel/WG)"
01.0	4 July 2013	Initial publication. This document supersedes and replaces the following documents: • Recommendation Form for Small Scale Methodologies (F-CDM-SSCwg) (Version 01.1) • Recommendation Form for Small Scale A/R Methodologies and Procedures (F-CDM-SSC-AR) (Version 01.1)
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