CDM: Recommendation Form for Small Scale Methodologies (version 01)

(To be used for presenting questions/proposals/amendments to the simplified methodologies for small-scale CDM project activity categories)

Date of SSC WG meeting:	29 April–02 May 2009, SSC WG 20
Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):	Revision regarding calculation of project methane emissions during composting in AMS-III.F
Indicative methodology to which your submission relates (refer the items of Appendix B of the Simplified Modalities and Procedures), if applicable.	AMS-III.F version 06
Name of the authors of the query:	Mr. Sumit Barat Institution: IL&FS Ecosmart Limited sumit.barat@ilfsecosmart.com

Summary of the query:

Please use the space below to summarize the query related to SSC methodologies/categories SSC Modalities and Procedures provide recommendation/analysis of the SSC WG.

Original text from PP:

As per Clarification Request submitted by IL&FS Ecosmart Limited on 21st October 2008, Consideration of methane emissions factor for composting of organic waste under AMS-III.F version 06 (reference number SSC_245), the use of default values as proposed in Equation 6 of AMS IIIF version 06 amounts to project emissions greater than baseline emissions and in a sense project generates negative CERs. In response to the above request, SSC WG (para 31 of the meeting report of the SSC WG 19) agreed that the project proponent may propose a method to demonstrate the absence of anaerobic conditions in which case the project methane emissions can be neglected which includes technically sound methods to evaluate and monitor the conditions during the composting process based on which aerobic conditions in the compost is guaranteed to an extent that the methane emissions during composting may be considered as negligible (for example, less than 5% of the total reductions expected for the whole crediting period) — for consideration by the SSC WG.

With reference to the recommendation given by SSC WG on the clarification request, the Project Proponent is proposing a revision in the AMS IIIF version 06 by introducing a monitoring parameter to monitor the oxygen content in the waste piles (windrows) during composting and thereby estimating the project emissions from release of methane during composting process.

The methane emissions can occur during composting process only in the event anaerobic conditions are reached in the windrows. This can be completely prevented by proper management of waste piles during composting process through regular and proper turning of waste. The same waste under different management conditions may emit negligible or high amount of methane. Using a uniform emission factor would unnecessary penalise those project proponents who are following proper waste management practices and thereby causing negligible methane emissions during composting. Hence the project proponent recommends introduction of monitoring parameter that would monitor the oxygen content in the waste piles (windrows) and determine the methane emissions during composting. The detailed description and justification of the parameter is mentioned below.

Proposed Amendment in para 24 of AMS III F *version 06*

Project Activity Emissions

24. Methane emissions during composting ($PE_{y, comp}$) shall be calculated as follows:

During the composting process in the event aerobic conditions are not completely reached in all areas, at all times, pockets of anaerobic conditions – isolated areas in the composting heap where oxygen concentrations are so low that the biodegradation process turns anaerobic – may occur. This is a potential emission source for methane similar to anaerobic conditions which occur in unmanaged landfills. The duration of the composting process is less than the duration of the crediting period. This is because of the fact that the compost may be subject to anaerobic conditions during its end use, which is not foreseen that it could be monitored. Assuming a residence time for the compost in anaerobic conditions equal to the crediting period is conservative. Through pre-determined sampling procedures the percentage of waste that degrades under anaerobic conditions can be determined. Using this percentage, project methane emissions from composting are calculated as follows:

$$PE_{y, comp} = BE_{CH4,SWDS,y} * GWP_{CH4} * S_{a,y} \quad \textbf{(6)}$$

Where:

$PE_{c, CH4, y}$	Is the project methane emissions due to anaerobic conditions in the composting process in year y (tCO2e)
$BE_{CH4,SWDS,y}$	Yearly methane generation potential of the solid waste composted or anaerobically digested by the project activity during the years "x" from the beginning of the project activity (x=1) up to the year *y* estimated as per the 'Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site' (tCO_2e). The tool may be used with the factor "f=0.0" assuming that no biogas is captured and flared. With the definition of year x as 'the year since the landfill started receiving wastes, x runs from the first year of landfill operation (x=1) to the year for which emissions are calculated (x=y)'
GWP_{CH4}	Is the Global Warming Potential of methane (tCO2e/tCH4)
$S_{a,y}$	is the share of the waste that degrades under anaerobic conditions in the composting plant during year y (%)

Calculation of $S_{a,y}$

$S_{a,y}$ is determined by a combination of measurements and calculations. Bokhorst et al[4] and Richard et al[5] show that if oxygen content is below 5% - 7.5%, aerobic composting processes are replaced by anaerobic processes. To determine the oxygen content during the process, project participants shall measure the oxygen content according to a predetermined sampling scheme and frequency.

These measurements should be undertaken for each year of the crediting period and recorded each year. The percentage of the measurements that show oxygen content below 7.5% is presumed to be equal to the share of waste that degrades under anaerobic conditions (i.e. that degrades as if it were landfilled), hence the emissions caused by this share are calculated as project emissions ex-post on an annual basis:

$$S_{a,y} = S_{OD,y} / S_{total,y} \quad \textbf{(7)}$$

Where:

$S_{OD,y}$	is the number of samples per year with an oxygen deficiency (i.e. oxygen content below 7.5%)
$S_{total,y}$	is the total number of samples taken per year, where $S_{total,y}$ should be chosen in a manner that ensures the estimation of $S_{a,y}$ with 20% margin of error at a 95% confidence level.

The above calculations will result into monitoring the actual project methane emissions from the

composting process thus checking unjust crediting of negative Emission reductions resulting with the use of proposed IPCC default values.

[4] Jan Bokhorst. Coen ter Berg – Mest & Compost Behandelen beoordelen & Toepassen (Eng: Manure & Compost –Treatment, judgement and use), Louis Bolk Instituut, Handbook under number LD8, Oktober 2001

[5] Tom Richard, Peter B. Woodbury, Cornell composting, operating fact sheet 4 of 10, Boyce Thompson Institute for Plant Research at Cornell University Cornell University

Recommendation by the SSC WG:

Please use the space below to provide amendments/change (in your expert view, if necessary).

Please refer to paragraph 17 of the meeting report of the SSC WG 20 (http://cdm.unfccc.int/Panels/ssc_wg).

Answer to authors of query by the SSC WG:

Please use the space below to provide answer to the authors of the above query

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

Taking into account the method proposed in the submission together with other related submissions, the SSC WG agreed to recommend a revision of AMS-III.F to provide more guidance regarding the calculation of project emissions from the compost taking into account specific characteristics of the composting technology/measure employed.

Signature of SSC WG Chair ……..

(Hugh Sealy)

Date: 02/05/2009

Signature of SSC WG Vice-Chair ……..

(Peer Stiansen)

Date: 02/05/2009

Information to be completed by the secretariat	
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