



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)

<i>Date of SSC WG meeting:</i>	24–27 February 2009, SSC WG 19
<i>Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):</i>	Consideration of methane emissions factor for composting of organic waste under AMS-III.F version 06
<i>Indicative methodology to which your submission relates (refer the items of Appendix B of the Simplified Modalities and Procedures), if applicable.</i>	AMS-III.F version 06
<i>Name of the authors of the query:</i>	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:

The project activity on composting of Municipal Solid Waste (MSW) uses methodology AMS III F – version 06. CDM benefit is available to the project activity for avoidance of methane production from decay of biomass (MSW) through composting. During the composting process, biomass decays under aerobic condition thereby avoiding production of methane.

The methodology directs to calculate **Project Emissions due to composting** as per the equation:

$$PE_y = Q_y * EF_{\text{composting}} * GWP_{CH_4} \quad (\text{Eq. 6 of AMS III F Ver 06})$$

Where:

Q_y = Quantity of raw waste treated (tonnes)

EF = Emission factor for composting of organic waste (t CH_4 /ton waste treated). Emission factors can be based on facility/site-specific measurements, country specific values or IPCC default values (table 4.1, chapter 4, Volume 5, 2006 IPCC Guidelines for National Greenhouse Gas Inventories). IPCC default values are **10 g CH_4 /kg** waste treated on a dry weight basis and **4 g CH_4 /kg** waste treated on a wet weight basis

GWP_{CH_4} = Global Warming Potential of Methane (21)

Since it is difficult for project proponents to obtain site specific measurements and country specific values do not exist, majority of Project Proponents would have to depend on IPCC default values as provided in the methodology to calculate project emissions due to composting.

Also the **Baseline Emissions (as per AMS IIIF, version06)**

$$BE_y = BE_{CH_4,SWDS,y} - (MD_{y,reg} * GWP_{CH_4}) + (MEP_{y,ww} * GWP_{CH_4}) \dots \dots \dots (\text{Eq. 1 of AMS IIIF Ver06})$$

Where:

BE_y : Amount of methane emitted from the decay of the degradable organic carbon in the biomass

solid waste composted in the project activity)

$BE_{CH_4,SWDS,y}$: Yearly methane generation potential of the solid waste composted estimated using “Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site- Version 04”

GWP_{CH_4} : Global Warming Potential for CH_4 (value of 21 is used)

$MD_{y,reg}$: Amount of methane that would have to be captured and combusted in the year y to comply with the prevailing regulations (tonne)

$MEP_{y,ww}$: Methane emission potential in the year y of the wastewater co-composted. The value of this term is zero if co-composting of wastewater is not included in the project activity (tonne)

Considering a situation of project activity involving composting without treating wastewater with Waste Composition as follows:

Waste type	Share of each waste type in percentage
% Wood and wood products, A	5.0%
% Pulp, paper and cardboard, B	5.0%
% Food, food waste, beverages and tobacco, C	60.0%
% Textiles, D	5.0%
% Garden, yard and park waste, E	5.0%
Inerts	20.0%

- Value of Methane Correction factor (MCF) applied: 1 (default value for managed landfill)
- Considering Mean Annual Temperature (MAT) > 20° and Mean Annual Precipitation (MAP) < 1000 mm

And using the First Order Decay (FOD) model described in “Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site- Version 04” :

The Baseline emissions from waste in first year comes out to be **6.71 g CH_4 per kg** of waste treated on dry weight basis and **2.97 g CH_4 per kg** of waste treated on wet weight basis

while

The Project emissions due to composting in first year is given as **10 g CH_4 per kg** of waste treated on dry weight basis and **4 g CH_4 per kg** of waste treated on wet weight basis as per the methodology

Thus in both the cases, project emissions are more than baseline emissions resulting in negative emission reductions potential from treatment of waste. Emission reductions amount to be -3.29 g CH_4 per kg of waste treated on dry weight basis and -1.03 g per kg of waste treated on wet weight basis as per existing methodology.

Since use of default values as proposed in Equation 6 of AMS IIF ver06 amounts to project emissions greater than baseline emissions and in a sense project generates negative CERs, project proponent feels that due to recent revision and the default value proposed in methodology would result in **unnecessary seclusion** of composting activity from enjoying CDM. Also, the other project emissions to be accounted under methodology for use of onsite fuel and electricity have not been considered in above mentioned situation and would lead to further decrease in emission reductions.

It is to be noted that composting process involves degradation of waste in aerobic conditions resulting in negligible emission of methane during the composting process which last for 6-8 weeks during which the methane generation potential of waste is neutralized completely while the baseline calculation predicts amount of methane generated by waste in a landfill for the entire year. Thus the project emission during composting process can not be theoretically greater than baseline emission. Moreover, the existing method of calculating baseline emissions is already conservative on account of using conservative values

of following parameters in Tool:

Parameter	Default Value	Resulting in reduction of baseline emissions (in %)
Fraction of Degradable Organic Carbon that can decompose (DOC_f)	0.5	50%
Model Correction factor to account for model uncertainties (ϕ)	0.9	10%
Fraction of methane in SWDS gas, volume fraction (F)	0.5	50%

Considering the situation, Project Proponent seeks the clarification on whether and how otherwise negligible project emission from release of methane during composting process should be accounted for in the already conservative baseline calculation which would result in generation of positive credits from composting activity. The current methodology discourages any composting activity from applying for CDM benefit by awarding it negative CERs.

The project proponent also requests the panel to reconsider the inclusion of methane emission factor during composting activity as project emission since the emissions are negligible. Further it is very difficult to estimate the actual value of methane emission by a small scale project proponent and the available default values proposed in methodology results in negative CER from small scale composting projects]

Recommendation by the SSC WG:

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

Please refer to paragraph 31 of the meeting report of the SSC WG 19 (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.

It is stated in the ‘waste’ section of 2006 IPCC Guidelines for National Greenhouse Gas Inventories that “CH₄ is formed in anaerobic sections of the compost, but it is oxidised to a large extent in the aerobic sections of the compost. The estimated CH₄ released into the atmosphere ranges from less than 1 percent to a few per cent of the initial carbon content in the material (Beck-Friis, 2001; Detzel et al., 2003; Arnold, 2005).” Further, the indicated range of emission factor for composting in table 4.1 is quite wide, i.e. 0.08 to 20. The default value adopted in AMS-III-F is based on this guidance.

The situation of negative credits in the first year of the project is not unexpected, since the composting emissions occur in the composting process (which is fast and occurs within the year), while the same waste, if disposed in the landfill (baseline scenario), would decay in a much slower way, releasing methane according to its composition (as modelled in the FOD model).

The author of the submission may consider proposing a request for the revision of AMS-III.F — including 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.



Signature of SSC WG Chair

(Hugh Sealy)

Date: 27/02/2009



Signature of SSC WG Vice-Chair

(Peer Stiansen)

Date: 27/02/2009

Information to be completed by the secretariat

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