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:	16–19 August 2010, SSC WG 27
Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):	Revision of AMS-III.H for the determination of sludge quantity and methane mass flowrate in case of capacity addition
Indicative methodology to which your submission relates (refer the items of Appendix B of the Simplified Modalities and Procedures), if applicable.	AMS-III.H "Methane recovery in wastewater treatment"
Name of the authors of the query:	Jiwan Acharya Institution: Asian Development Bank jacharya@adb.org

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 Stakeholder:

Request No 1 for Revision of Methodology

The request for methodology revision refers to Para 9 and Para 22 of the approved SSC methodology AMS III H, Version 13[1].

Methodology Requirement

9. New facilities (Greenfield projects) and project activities involving a change of equipment resulting in a capacity addition of the wastewater or sludge treatment system compared to the designed capacity of the baseline treatment system are only eligible to apply this methodology if they comply with the requirements in the General Guidance for SSC methodologies concerning these topics. In addition the requirements for demonstration of the remaining lifetime of the equipment replaced as described in the general guidance shall be followed.

The concerned paragraphs for the project activity in the General Guidance for SSC methodologies, version 13, Annex 14, EB 54 are:

16. Capacity increase: Type II and III project activities involving capacity increase may use a Type II and Type III SSC methodology provided that they can demonstrate that the most plausible baseline scenario for the additional (incremental) capacity is the baseline provided in the respective Type II and III small-scale methodology. The demonstration should include the assessment of the alternatives of the project activity using the steps described in the paragraph 14 above.

The Para 22 of the approved SSC methodology AMS III H, Version 13 indicates that:

22. Methane emissions from the baseline sludge treatment systems affected by the project activity are

[1] The SSC-WG at its 26th meeting has suggested revision to AMS-III.H Ver14. The proposed project has applied the version 13 which was applicable at the time of preparation f the PDD. The revisions suggested herein are not addressed by subsequent revisions, including those suggested in the version 15.

determined using the methane generation potential of the sludge treatment systems:

$$BE_{s,treatment,y} = \sum_j S_{j,BL,y} * MCF_{s,treatment,BL,j} * DOC_s * UF_{BL} * DOC_F * F * 16/12 * GWP_{CH4}$$

Where:

$S_{j,BL,y}$	*Amount of dry matter in the sludge that would have been treated by the sludge treatment system j in the baseline scenario (tonne)*
j	*Index for baseline sludge treatment system*
DOC_s	*Degradable organic content of the untreated sludge generated in the year y (fraction, dry basis). Default values of 0.5 for domestic sludge and 0.257 for industrial sludge shall be used.*
$MCF_{s,treatment,BL,j}$	*Methane correction factor for the baseline sludge treatment system j (MCF values as per table III.H.1)*
UF_{BL}	*Model correction factor to account for model uncertainties (0.94)*
DOC_F	*Fraction of DOC dissimilated to biogas (IPCC default value of 0.5)*
F	*Fraction of CH_4 in biogas (IPCC default of 0.5)*

Proposed revision

The project activity[2] is not a Greenfield project. However, the capacity of the existing water treatment system is augmented by installation of a new intake work, a new primary clarifier and a new anaerobic digester to handle the increase in the volume of sludge received from the city over next decade.

The project activity involves capturing the digester gas (biogas) from the anaerobic digesters (existing and proposed) and flaring the same in an enclosed biogas flaring unit. The project activity only involves the sludge treatment system.

Our submission is that, the project proponent is able to establish that venting of GHG in atmosphere is baseline case even under capacity addition scenario (please refer to the Annexure for the baseline identification and additionality demonstration for the project activity using the "Combined tool to identify the baseline scenario and demonstrate additionality", Version 02.2). Thus, the increase in annual increase in sludge volume due to capacity addition will also result in GHG emission in baseline scenario. In such a case, it will be fair to grant advantage of additional emission reduction to the project proponent. Current provisions of methodology consider baseline at existing sludge volume generation rates, which limits the methane emission at ex ante level. In order to impart accuracy in estimation of emission reduction, we are proposing the following changes in methodology for case of capacity addition.

Option 1: In equation (3), para 22 of the methodology, to arrive at $S_{j,\ BL,y}$ (Amount of dry matter in the sludge that would have been treated by the sludge treatment system j in the baseline scenario), the ex post monitored value of sludge volume generation should be considered instead of considering the existing volume of sludge generated.

Option 2: In equation (3), para 22 of the methodology, to arrive at $S_{j,\ BL,y}$ (Amount of dry matter in the sludge that would have been treated by the sludge treatment system j in the baseline scenario), the annual increase in sludge volume over the project crediting period based on the forecasted data on sludge volume generation should be considered.

Request No 2 for Revision of Methodology

The request refers to Para 26 (VII) of the approved SSC methodology AMS III H, Version 13.

- Methane emissions due to incomplete flaring ($PE_{flaring,y}$) which in turn refers to "Tool to determine

[2] Kinoya Sewerage Treatment Plant GHG Emission Reduction Project in Fiji

project emissions from flaring gases containing methane", EB 28, Annex 13. The request is relevant to Step 5: 'Determination of methane mass flow rate in the residual gas on a dry basis' under the tool.

Tool requirements

Step 5: 'Determination of methane mass flow rate in the residual gas on a dry basis'

The quantity of methane in the residual gas flowing into the flare is the product of the volumetric flow rate of the residual gas ($FV_{RG,h}$), the volumetric fraction of methane in the residual gas ($fv_{CH4,RG,h}$) and the density of methane ($\rho_{CH4,n}$) in the same reference conditions (normal conditions and dry or wet basis).

$$TM_{RG,h} = FV_{RG,h} \; X \; fv_{CH4,RG,h} \; X \; \rho_{CH4,n} \quad (13)$$

Proposed Revision

The proposed small-scale project activity[3] envisages capturing the digester gas (biogas) from the anaerobic digesters (existing and proposed) and flaring the same in an enclosed biogas flaring unit. The approved SSC methodology AMS III H, Version 13 is being applied to the project activity.

Currently, the biogas generated is being vented out through the large openings on top of the existing digester without capture / destruction. In this scenario, without appropriate and safe infrastructure in place, the on-site measurement and monitoring of volumetric flow rate of the residual gas ($FV_{RG,h}$) for ex-ante estimation for the purpose of PDD is deemed risky (due to explosive nature of methane) and not feasible. The necessary infrastructure for safe operation is to be installed as part of the proposed project activity.

We think that such a scenario will be common to most of the expansion projects and hence, the following approach to determine the volumetric flow of residual gas may be permitted.

Option 1

$TM_{RG,h}$ [Mass flow rate of methane in the residual gas in the hour h (kg/h)] is required to calculate the **$PE_{flare,y}$** [Project emissions from flaring of the residual gas stream in year y (tCO2e)] in the '*Step 7: Calculation of annual project emissions from flaring' under "Tool to determine project emissions from flaring gases containing methane"* . This can be calculated using the Baseline emission calculation, Methodology III H, Version 13, Para 22, equation (3) and **ignoring the GWP for CH4**. The ex-post calculations shall be done based on the monitored data for **$TM_{RG,h}$** post project implementation.

$$BE_{s,treatment,y} = \sum S_{j,BL,y} * MCF_{s,treatment,BL,j} * DOC_{s} * UF_{BL} * DOC_{F} * F * 16/12$$

For the purpose of ex-ante estimation the value of **$TM_{RG,h}$** [Mass flow rate of methane in the residual gas in the hour h (kg/h)] can be calculated as follows: The value of **$S_{j,BL,y}$** [Amount of dry matter in the sludge that would have been treated by the sludge treatment system j in the baseline scenario (tonne)] is obtained from the 10 day data monitoring campaign or historical data. The rest of the parameters in the above equation are factors with defined values. With the above calculation, volume of methane generated (tonnes or kg/year or hr) can be directly arrived at .

The obtained **$TM_{RG,h}$** value can be used in the 'Step 7: Calculation of annual project emissions from flaring' under "Tool to determine project emissions from flaring gases containing methane", EB 28, Annex 13 to arrive at **$PE_{flare,y}$**.

$$PE_{flare,y} = \sum TM_{RG,h} \; X \; (1- \eta_{flare,h}) \; X \; GWP_{CH4} / 1000 \quad (15)$$

Option 2

Alternatively, volumetric flow rate of the residual gas ($FV_{RG,h}$) can be calculated based on equipment manufacturer's inputs as below:

$FV_{RG,h}$ = Volume of Dry Sludge generated (tonnes/hour)(Data from 10 day data monitoring campaign) * Biogas/Residual Gas generation rate/potential (m3/tonne of sludge digested) (Data from designers input)

In case of both of the above options are not accepted, clarification is requested on how to proceed with calculating the $\mathbf{TM}_{RG,h}$ and $FV_{RG,h}$ value for the project activity.

Recommendation by the SSC WG:

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

Please refer to paragraph 11 of the meeting report of the SSC WG 27 (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.

In response to the request for revision related to the increasing sludge generation volume for the *ex ante* estimation purpose in the context of a capacity addition project, the SSC WG agreed to clarify that forecasted sludge generation volume or the designed value for the capacity expansion project can be used for the *ex ante* estimation (para 30, equation 14, AMS-III.H version 15). The *ex post* emission reduction shall be calculated based on the real monitored data (e.g. monitored volume of treated sludge, please see para 31, AMS-III.H version 15).

In response to the request for revision related to *ex ante* and *ex post* project emission determination from flaring, the SSC WG agreed to clarify that this emission source can be determined *ex ante* by using the baseline emission calculation for sludge treatment (para 23, equation (3), AMS-III H version 15) but without the consideration of GWP for CH4 (corresponds to submission author's first proposal on this topic). However, the "Tool to determine project emissions from flaring gases containing methane" which is based on real monitored data shall be followed for *ex post* purpose.

The SSC WG agreed to include the changes described above at the time of recommending a revision of AMS-III.H.

Signed by the Chair, Mr. Peer Stiansen

Date: 19/08/2010

Signed by the Vice-Chair, Mr. Hugh Sealy

Date: 19/08/2010

Information to be completed by the secretariat

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