



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:	22–25 August 2011, SSC WG 33
Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):	Clarification on the use of technology supplier provided value for physical leakage estimation
Indicative methodology to which your submission relates (refer the items of Appendix B of the Simplified Modalities and Procedures), if applicable.	AMS-III.AO “Methane recovery through controlled anaerobic digestion”
Name of the authors of the query:	Umamaheswaran Krishnan/Shyamasis Das Institution: Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (Carbon Procurement Unit) Uma.krishnan@giz.de , Shyamasis.das@giz.de

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 Stakeholders

Project Activity:

The subject project activity entails utilization of agro residues with animal manure under co-digestion to generate electricity in an Otto cycle based power plant. The digester with gas recovery system and gas gen-set are the primary components of the power plant. For this specific project, current version of AMS-III.AO (version 01) has been applied for CDM registration of the project.

As per para 17 of the methodology, methane emissions due to physical leakage from the digester and recovery system (PEphy leakage,y) shall be estimated using a default value of 0.05 m³ biogas leaked/m³ biogas produced. With this specific default value the project faces significant reduction in the envisaged emission reductions. We hereby request a clarification from SSC WG on the possibility of using ‘leakage factor based on technology supplier’s specifications for estimating PEphy leakage,y’.

For the subject project activity, the technology supplier is Envitec Biogas AG, through its Indian Subsidiary Envitec Biogas India. Envitec AG is operating various biogas power plants in Europe and the total installed capacity is 202 MW. With the background information of various plants under operation we bring to the notice of SSC WG the following:

1. According to the biogas plants operating conditions, the source of biogas leakage is the biogas cover holder. Normal biogas flow is observed in the appropriately designed piping systems.
2. The technology supplier has carried out various tests to determine the gas permeability of the cover material, with the help of a renowned research organisation (Frauenhofer Institute for Process Engineering & Packaging, Germany) and respective references are furnished with this document.
3. Same type of cover material will be used in our project activity as well.

Based on the test results from the facilities, the leakage in the biogas plants would be less than 1% and the inference can be referred below:

A.	Biogas power plant installation capacity (kW)	Technical Data	900	2 x 2000
B.	Annual biogas generation (m ³)	Technical Data	3,533,901	15,127,322
C.	Gas cover permeability (cm ³ /m ² /d/bar)	Test Report of Fraunhofer Institute for Process Engineering & Packaging, Germany	507.491	507.491
D.	Roof (m ² per unit of a digester)	Technical Data	930	930
E.	Gas permeation per year at 1 bar (cm ³)	Calculated (C * D * 365)	172,267,819	689,071,279
F.	Gas permeated per year at 1mbar (m ³)	E / 100000	172.27	689.07
G.	Leakage (%)	(F / B) *100	0.0049	0.0046

Thus the results show that the actual gas leakage is below 0.01% which is much less than the default value (5%) as recommended in the aforesaid approved SSC methodologies. Hence using a default value of 0.05 m³ biogas leakage /m³ biogas produced, will lead to over-estimation of the actual methane leakage in the project which in turn, has a considerable bearing on the estimation of emission reduction from the concerned project.

Above table represent the data related to similar capacities which of the subject project activity.

Clarification requested:

Based on the above case and findings of the technology supplier, we, hereby, request SSC WG to clarify, whether specific value recommended by technology supplier can be applied for estimating methane emissions due to physical leakage (PEphy leakage,y) from the digester and recovery system.

PP's further clarification

1. It stated "According to the biogas plants operating conditions, the source of biogas leakage is the biogas cover holder. Normal biogas flow is observed in the appropriately designed piping systems." Is it correct that you are proposing to ignore the possible leakage from the piping system, because it is negligible in your opinion? Please confirm.

PP: Yes. The reason is after Biogas generation in the biodigesters the same will be utilized in the engine. The engine is placed close to the digester, hence the biogas leakage thru piping will be infinitesimal. All Biogas transfer piping is fabricated using ERW/Seamless Stainless Steel pipes of grades SS316L, SS304. All pipe to pipe and pipe to fitting joints shall be welded and the total piping system shall be hydro tested before commissioning. All Pipe to equipment joints will have suitable gaskets & seals which will provide leak proof gas transmission. For Digestate & Slurry applications the piping will be of HDPE & PVC materials. All pipes & Fittings will be cold welded. Pipe to equipment joints will have suitable gaskets & seals which will provide leak proof slurry/Digestate transfer. Almost the entire piping is done underground. For areas wherever piping is aboveground, a methane detector is provided to detect gas leakage. The entire plant will be automatically shut down when methane leakage is detected by the detector.

2. It is our understanding that the test provided in your submission is the permeability test of the gas cover material. It may not cover the possible leakage from other parts of the anaerobic digester vessel (e.g. valves, seals, fittings). Please clarify.

PP: As mentioned in our submission, envisaged biogas leakage will be in the digester roof section only. As other parts of digester vessel, seals and fittings are made of concrete material and are placed in the

up of M40 grade concrete there will be no gas leakage through the walls. Also, the digester is hydrotested for any leakage before commissioning. Hence the leakage is not feasible in this location.

PP: In addition to the leakage point mentioned in SSC 552, we would like to have one more clarification sought specific to the same methodology. As per “AMS III AO, Ver 1, point 1 (c)”, PP can claim “emission reductions for one or more sources of substrates if, it cannot be demonstrated organic matter would otherwise been left to decay anaerobically.

In our project condition the feed substrates are:

- Agro-Industrial Residues - Cassava Industrial Screenings, Maize Stalk
- Poultry manure is left to decay below a slatted floor in an enclosed animal confinement facility leading to anaerobic decay and methane emissions
- Wastewater from nearby cassava industries would have been left without methane recovery

For to the project activity, with co digestion process, can we claim the methane component only for the animal manure as per AMS-III.D?

Recommendation by the SSC WG:

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

Please refer to paragraph 28 of the meeting report of the SSC WG 33
<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.

The SSC WG noted that the test data provided by the technology supplier is only for the permeability of the gas cover material and may not cover possible leakage from other parts of the anaerobic digester vessel (e.g. valves, seals, fittings). The SSC WG is therefore of the opinion that it may not lead to a conservative emission reductions by using the supplier’s data provided in this submission.

However, if the technology supplier could provide data reflecting the overall physical leakage level of the whole system, determined according to a national or an international standard, they could be used. Please also note that the Meth Panel (MP) is considering this issue based on a thorough analysis from an external expert.

As to the second question on whether the emission reductions only for the animal manure component can be claimed, the SSC WG agreed to clarify that it is allowed under AMS-III.AO (please refer to paragraph 1 and 19 of the methodology). However, baseline emissions shall be calculated only for the claimed component(s), while project emissions shall be calculated according to the procedures prescribed in the methodology for all co-digested substrates.

Signed by the Chair, Ms. Fatou Gaye

Date: 25/08/2011

Signed by the Vice-Chair, Mr. Peer Stiansen

Date: 25/08/2011

Information to be completed by the secretariat

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