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Application of the Oeko-Institut/WWF-US/ EDF methodology for assessing the quality of carbon credits

This document presents results from the application of version 3.0 of a methodology, developed by Oeko-Institut, World Wildlife Fund (WWF-US) and Environmental Defense Fund (EDF), for assessing the quality of carbon credits. The methodology is applied by Oeko-Institut with support by Carbon Limits, Greenhouse Gas Management Institute (GHGMI), INFRAS, Stockholm Environment Institute, and individual carbon market experts. This document evaluates one specific criterion or sub-criterion with respect to a specific carbon crediting program, project type, quantification methodology and/or host country, as specified in the below table. Please note that the CCQI website Site terms and Privacy Policy apply with respect to any use of the information provided in this document. Further information on the project and the methodology can be found here: www.carboncreditquality.org

Sub-criterion:	1.3.2 Robustness of the quantification methodologies applied to determine emission reductions or removals
Project type:	Industrial biodigesters fed with livestock manure
Quantification methodology:	AMS-III.D – Version 21
Assessment based on carbon crediting program documents valid as of:	15 May 2022
Date of final assessment:	31 January 2023
Score:	2

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Assessment

Relevant scoring methodology provisions

The methodology assesses the robustness of the quantification methodologies applied by the carbon crediting program to determine emission reductions or removals. The assessment of the quantification methodologies considers the degree of conservativeness in the light of the uncertainty of the emission reductions or removals. The assessment is based on the likelihood that the emission reductions or removals are under-estimated, estimated accurately, or over-estimated, as follows (see further details in the methodology):

Assessment outcome	Score
It is very likely (i.e., a probability of more than 90%) that the emission reductions or removals are underestimated, taking into account the uncertainty in quantifying the emission reductions or removals	5
It is likely (i.e., a probability of more than 66%) that the emission reductions or removals are underestimated, taking into account the uncertainty in quantifying the emission reductions or removals OR The emission reductions or removals are likely to be estimated accurately (i.e., there is about the same probability that they are underestimated or overestimated) and uncertainty in the estimates of the emission reductions or removals is low (i.e., up to ±10%)	4
The emission reductions or removals are likely to be estimated accurately (i.e., there is about the same probability that they are underestimated or overestimated) but there is medium to high uncertainty (i.e., ±10-50%) in the estimates of the emission reductions or removals OR It is likely (i.e., a probability of more than 66%) or very likely (i.e., a probability of more than 90%) that the emission reductions or removals are overestimated, taking into account the uncertainty in quantifying the emission reductions or removals, but the degree of overestimation is likely to be low (i.e., up to ±10%)	3
The emission reductions or removals are likely to be estimated accurately (i.e., there is about the same probability that they are underestimated or overestimated) but there is very high uncertainty (i.e., larger than ±50%) in the estimates of the emission reductions or removals OR It is likely (i.e., a probability of more than 66%) or very likely (i.e., a probability of more than 90%) that the emission reductions or removals are overestimated, taking into account the uncertainty in quantifying the emission reductions or removals, and the degree of overestimation is likely to be medium (±10-30%)	2
It is likely (i.e., a probability of more than 66%) or very likely (i.e., a probability of more than 90%) that the emission reductions or removals are overestimated, taking into account the uncertainty in quantifying the emission reductions or removals, and the degree of overestimation is likely to be large (i.e., larger than ±30%)	1

Information sources considered

1 Assessment of CDM ACM0010 – Version 8.0 and references therein

Assessment outcome

The quantification methodology is assigned a score of 2.

Justification of assessment

The small-scale methodology AMS-III.D is based on ACM0010. This assessment should therefore be read in conjunction with the assessment of ACM0010.

AMS-III.D features some simplifications regarding the considered emission sources. Those are listed in the following Table 1. For a more detailed comparison see Table 2 in the Appendix.

Table 1 Comparison of ACM0010 to AMS-III.D (only elements that differ)

Emission sources not considered in AMS-III.D, but considered in ACM0010	Impact on overall emission reductions
N_2O emissions from the manure management treatment system in the baseline and project	Unknown
Leakage emissions due to disposal of treated manure in the baseline and project	Higher (or equal) claim of emission reductions under AMS-III.D

ACM0010 requires estimating N_2O emissions from the manure management treatment system in the baseline and project, whereas AMS-III.D does not consider this emission source. As these emissions occur in both the project and the baseline, the impact of neglecting this emission source is not clear. However, these emissions are relatively small compared to methane leakage emissions. Therefore, this omission is unlikely to have a large impact.

ACM0010 also requires estimating leakage emissions due to disposal of treated manure in the baseline and project where net leakage emissions are positive (i.e., if they reduce the calculated emission reductions) but must not be accounted for where they are negative (i.e., where they increase the calculated emission reductions). By contrast, AMS-III.D ignores this emission source. Other things equal, neglecting leakage emissions under AMS-III.D thus leads to more (or equal) claimed emission reduction compared to ACM0010. Importantly, these leakage emissions have the potential to be large (see assessment of ACM0010, element U4). Compared to ACM0010, AMS-III.D thus has a further element with a high risk of overestimation of emission reductions, while the uncertainty is equally high. For this reason, we assign a score of 2 to this methodology (as compared to 3 for ACM0010).

Appendix

Table 2 Comparison of emissions sources considered in manure management methodologies

Emissions from	CDM ACM0010 (v8)	CAR Livestock (USA v4.0 and Mexico v2.0)	CDM AMS-III.D (v21)
Baseline Emissions			
Baseline waste treatment processes	CH_4: Yes N_2O: Yes	CH_4: Yes **N_2O: No**	CH_4: Yes **N_2O: No**
Electricity or thermal energy generation or use of natural gas in the baseline scenario	CO_2: Yes	**No**	CO_2: Yes[1]
Upstream emissions of fossil fuels used in the baseline scenario	No	No	No
Project Emissions			
Project waste treatment processes / Effluent treatment system	CH_4: Yes N_2O: Yes[2]	CH_4: Yes **N_2O: No**	CH_4: Yes[3] **N_2O: No**
Physical leakage or venting of gas from the biodigester	CH_4: Yes (phys. leakage)	CH_4: Yes **(venting** and phys. leakage)	CH_4: Yes (phys. leakage)
Incomplete destruction of methane from combustion or flaring of the biogas	CH_4: Yes	CH_4: Yes	CH_4: Yes
Electricity and thermal energy use	CO_2: Yes	CO_2: Yes	CO_2: Yes
Project construction and decommissioning	No	No	No
Leakage Emissions			
Disposal of treated manure on land	CH_4: Yes N_2O: Yes[4]	**CH_4: No** **N_2O: No**	**CH_4: No** **N_2O: No**
Storage of liquid or solid[5] effluent (outside project boundary)	CH_4: Yes	CH_4: Unclear	CH_4: Yes
Composting of the digestate	CH_4: Yes N_2O: Yes	CH_4: Yes **N_2O: No**	CH_4: Yes N_2O: Yes
Leakage only considered if in total positive	Applied	Not applied	Not applied
Overall emission reductions			
Minimum value of modelled and measured emission reduction	Applied	Applied	Applied

1 AMS-III.D refers to AMS-III.H, where utilization of the recovered biogas is eligible.
2 Direct and indirect N_2O emissions
3 The effluent from the biodigester shall be handled aerobically, otherwise the related emissions shall be taken into account as per relevant procedures of “AMS-III.AO Methane recovery through controlled anaerobic digestion". In the case of soil application, proper conditions and procedures (not resulting in methane emissions) must be ensured.
4 Incl. application, leaching and run-off
5 Solid effluent usually in a solid waste disposal site.