Comment on the draft revision of the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site".

1. Introduction

The Global Alliance for Incinerator Alternatives (GAIA) welcomes the opportunity to respond to the CDM Executive Board's call for public input on the draft revision of the methodological tool. GAIA also commented on this tool earlier this year.

Waste disposal sites tend to replace climate friendlier and more cost-effective options of waste management such as recycling and composting. They are climate friendlier because they prevent waste from going to a disposal site and are more cost-effective because waste pickers from the informal sector manually collect and separate waste in most of the developing world. Therefore disposal sites should not even be supported by the CDM.

Waste disposal sites that are eligible for CDM projects are large enough to replace multiple smaller local waste treatment sites. Yet, smaller waste treatment sites are actually climate friendlier because they produce significantly less methane than a large plant (individually, as well as in sum) and avoid the additional emissions associated with transport of the waste to a large site.

It should also be noted that the trend towards more managed landfill practices in developing nations – facilitated in part by the CDM – ironically leads to enhanced anaerobic conditions and therefore generation of greater quantities of methane in the future (UNEP, 2010).

The issuance of carbon credits for capturing methane gas from waste disposal sites provides a perverse incentive for not enacting legislation requiring methane capture at waste disposal sites. For example, at the same time that the Chilean legislature was discussing a proposed new national landfill standard requiring methane capture, the first two methane capture projects from Chilean waste disposal sites were registered under the CDM. Although the legislation was expected to pass it disappeared from the docket. This begs the question as to whether the legislation was put on hold in order to not call into question the additionality of future methane capture projects from Chile.

We had eagerly hoped that the draft revision to the tool would take a conservative approach to calculating emissions from solid waste disposal sites. Unfortunately the draft revision is weaker than its predecessor. Below we provide our comments on the draft revision of the methodological tool to ensure that parameters are set to reflect the actual conditions of the disposal site in question. Only then can methane emissions from the site be calculated more accurately and stringently.

2. Evaluation

Stockpiles

It is alarming to see that the methodology has become weakened by allowing stockpiles to be considered a solid waste disposal site if certain conditions are met. The previous version of the methodology was stricter and more conservative. GAIA strongly urges the methodological panel to revert to the previous version.

Formula to calculate emissions

While GAIA welcomes that baseline emissions can now also be calculated on a monthly basis, we are disappointed that this is not required. A yearly average for climatic zones with distinct wet and dry seasons is meaningless. We provide further comments on this issue in the next section while discussing parameter setting for $\mathbf{DOC_j}$ and $\mathbf{k_j}$.

Choice of data and parameters

- GAIA welcomes that $\boldsymbol{\varphi}$, the default values for the model correction factor has been set more stringently and can be calculated for specific situations. The fact that different values are used for dry and wet conditions indicates the difficulty in calculating a yearly average for regions with distinct dry and wet seasons.

- Although the choice for the default value of the oxidation factor (**OX)** is justified by citing the IPCC 2006 Guidelines, a more recent literature search indicates that there is a debate in the scientific literature about what the appropriate value should be. More recent scientific work, such as Mueller et al. (2009) brings up important arguments that should be considered. We suggest that more research on this subject should be carried out and that a range, based on certain critical factors, may be more appropriate.

- The parameter $\mathbf{DOC_f}$ describes the share of the degradable organic fraction that degrades under the conditions of the landfill. The IPCC does not give a reference value, because there are a diverse number of poorly constrained factors that can influence this parameter including humidity, temperature, oxygen content and the type of bacteria present. The methodology tool arbitrarily sets this parameter to a value of 0.5. An upper and lower range should be used rather than setting it to only one value.

- **MCF**, the methane correction factor, takes into account that unmanaged or poorly managed landfills produce less methane. In controlled landfills, the process of burying waste and regularly covering deposits with a low-permeability material creates an internal environment that favors methane-producing bacteria. Developing country dumps on the other hand are generally uncompressed, unmanaged, scavenged (by both people and animals) and frequently smoldering or on fire. All these conditions prevent the optimal anaerobic conditions for methane production to develop, resulting in lower methane generation relative to "well-managed" landfills in developed countries. Therefore less methane is produced per tonne of organic waste compared to controlled sites. Thus it is heartening to see that the CDM methodology adjusts the value assigned to **MCF** according to local conditions at the landfill. However, the values assigned to the categories appear to be arbitrary. Further documentation and perhaps research is needed to assign realistic MCF values to real-world, developing country conditions

- The parameter $\mathbf{DOC_j}$ is the fraction of degradable organic waste in the waste type **j**. The methodological tool has a table for five waste types and differing values for wet and dry waste. Additionally $\mathbf{k_j}$, is the decay rate for the waste type **j**. This factor takes into account the type of waste, differentiates between two climatic zones and whether the waste is wet or dry. For the decay rate ($\mathbf{k_j}$) the tool states that "long term averages based on statistical data" should be used to decide the climatic zone.

Both of these parameters heavily influence the methane generation rate, so how these parameters are set is important. There is a large range in both parameters depending on whether a waste type (**j**) is wet or dry. Yet, in monsoonal regions, unlike temperate zones, there are distinct dry and wet seasons, making a long-term average meaningless. In order to make these parameters more relevant, a time vector should be added that calculates $\mathbf{DOC_j}$ and $\mathbf{k_j}$ monthly.

- We are disappointed to see that the Global Warming Potential of methane ($\mathbf{GWP_{CH4}}$) is not being updated to 25 on a 100 year time-scale to reflect the most recent values calculated by the IPCC (2007).

- The factor $\mathbf{f_y}$ describes the efficiency of landfill gas collection. This is a contentious subject: landfill operators often assert capture rates above 80% whereas the efficiency of landfill gas collection systems vary widely, from 10-85%, as acknowledged by the IPCC Guidelines (2006). Given the importance of this factor to the overall baseline, it is unacceptable to rely upon operator self-documentation, as is the current practice. The CDM should insist on actual measurements of methane leakage from the landfill sites in question to empirically determine site-specific values for $\mathbf{f_y}$.

3. Conclusion

Weakening tools to calculate emissions from CDM projects undermines the goals of the CDM by allowing spurious credits to enter the system. Therefore we suggest another iteration of the tool that prohibits the application of this tool to stockpiles, requires monthly calculation of emissions to account for climatic factors and a more rigorous approach to the choice and calculation of parameter values.

4. References

Intergovernmental Panel on Climate Change (2006). **Waste generation, composition and management data**, *Guidelines for National Greenhouse Gas Inventories,* Chapter 2.

Intergovernmental Panel on Climate Change (2007), Fourth Assessment Report, volume 2, p. 212.

Müller, M., W. Rommel, B. Gerstmayr, M. Hertel, and H. Krist (2009), **The Clean Development Mechanism in the waste management sector: An analysis of potentials and barriers within the present methodological framework,** Augsburg, Bifa Environmental Institute, Text Nr. 42.
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