CDM: Response form for request for clarification on Approved Methodologies (version 01.1)

Date of Meth Panel meeting:	24 - 28 September 2007
Title and number of request for clarification	Clarification on the use of local values for degradable organic carbon (DOCj) and decay rates (kj) for waste types that are not sufficiently characterised by default values / AM_CLA_0055

Summary of the query:

Please use the space below to summarize the request for clarification on the related approved methodologies.

The panel received two requests for clarification regarding the choice of values for parameters "DOC" and "k", used in the first order decay model to estimate the methane generation from disposal of waste in landfill, for empty fruit bunches (EFB). In view of the common issue the panel has provided a combined analysis and response to the two requests. The requests contend the EB33 decision that EFB having characteristics similar to wood, in terms cellulose, hemi-cellulose and lignin content, should be treated as wood waste and, therefore, default IPCC 2006 values for wood should be used for the above mentioned two parameters.

The request AM CLA 0055 (referred to AM 0039) states that none of the IPCC default values for different categories are applicable to EFB for the following reasons:

(i) The "DOC" and "k" values in the IPCC or other literature are based on typical composition of municipal solid waste that does not include EFB, therefore, are not representative.

(ii) The k values, or half life of decay, are mostly based on temperate region studies and there is a lack of studies of degradation under tropical conditions.

(iii) EFB is steam cooked at 130 degree centigrade for 90 minutes, therefore, its degradability is increased due to break down of lignin, the component that is the hardest to degrade.

(iv) EFB though has similar characteristics as of wood but does not have the same "heartwood" structure of wood, therefore, decays much faster.

(v) A number of studies have indicated that the EFB decays in a very short duration, though most of these studies are for composting, which is aerobic degradation process.

(vi) It has been pointed that EFB has ideal C:N ratio of 54, therefore, it degrades faster than wood for which the ratio is 100-500.

The submission urges the Meth Panel to reconsider prescribing EFB as a "wood waste" category by default.

The second submission (referred to the Tool) states that an experiment is underway to simulate anaerobic disposal of EFB, which indicates that the half life is of the order of 0.26. Further results will be provided before the MP29 meeting to further support it. Also, it quotes IPCC "half life of 3 years or less is appropriate for fast degrading waste under tropical and moist conditions".

The request, therefore, proposes that the following should be allowed:

(i) Use of procedure, as described in the submission, to estimate the DOC values. The submission states that DOC can be estimated as "total organic carbon content less the carbon in the lignin content of the EFB".

(ii) In view of the reasons stated above, till scientific evidence is provided, EFB should be considered as having same degradability as the food waste and, therefore, use the "k" value for food waste.

Recommendation by the Meth Panel:

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

1) C to N ratio

The literature reports that the C:N ratio should be less than 30 for fast degradation of organic waste. Therefore, the contention that C:N ratio of 54 for EFB is ideal for fast decay is not appropriate. Also, in paper "Chemical composition of oil palm empty fruit bunch and its decomposition in the field" by W Raubmi, the reported value of C:N ratio is between 71-90, which is close to the lower range for wood.

2) Proposed DOC estimation method:

The mathematical equation for DOC value though suggested to be based on LQM report, is different. The report suggests estimating the DOC as product of (i) sum of cellulose and hemi cellulose, measured in dry basis, in the EFB; and (ii) adjusted for moisture. The suggested procedure estimates total organic carbon as difference of total carbon less total inorganic carbon. The total organic carbon is then adjusted for lignin content. Based on information from a research paper and using the provided procedures it results in DOC value of 60% on dry basis. The value of DOC for wood is 50 on dry basis. The Meth Panel will require an expert input for the assessment of the proposed measurement procedure.

3) Steam treatment

The reference "Ethanol potential for Empty Fruit Bunches pre-treated by Wet-Explosion", provided to support the argument that steam treated waste degrades faster, is inappropriate. The paper is related to exploration of special treatments to test how extraction of oil can be enhanced, which may not be implemented in a normal palm oil process. Further, the process diagram shows that EFB are treated through sterlization process, it is not clear what does this process imply.

4) The k parameter

Though there is some evidence provided for decay of "k ", the experiments presented are for aerobic conditions. The contention is that EFB structure is different from wood, is pre-cooked and also has a better C:N ratio, therefore, decays faster than the wood. The Meth Panel will require expert advice on these issues before a decision can be taken to accept the request.

Further, the following questions could be asked to the PPs:

(i) Please provide estimates of DOC based on the formulae provided in the LQM report and as per that proposed by the PPs.

(ii) Please provide a complete detailed process of FFB processing for production of crude palm oil as well as whether this process is followed at each processing facility, small or large. Further, in reference provide it shows that FFB is only treated to sterlization process, please describe this process.

The request also states that experiments to simulate degradation in landfill are being performed, it should be made clear that only evidence that is based on experiments that authenticated as tests as per proper procedures should be submitted.

In absence of the available information the tool should be revised as per EB request.

Also, AM0039 should be revised to make reference to the tool and remove the reference that allows use of local DOC values without its consideration by Board either through deviation or request for revision.

Answer to authors of the request for clarification by the Meth Panel :

Please use the space below to provide an answer to the authors of the above query

Additional information are required from Project Participants in order to assess the requests for clarification:

(i) Please provide estimates of DOC based on the formulae provided in the LQM report and as per that proposed by the PPs.

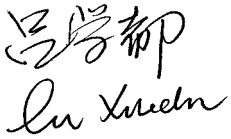
(ii) Please provide a complete detailed process of FFB processing for production of crude palm oil as well as whether this process is followed at each processing facility, small or large. Further, in reference provide it shows that FFB is only treated to sterilization process, please describe this process.

The request also states that experiments to simulate degradation in landfill are being performed, it should be made clear that only evidence that is based on experiments that authenticated as tests as per proper procedures should be submitted.

In absence of the available information the tool should be revised as per EB request.

Signature of Meth Panel Chair ……..

Date: 28/09/2007 *(Akihiro Kuroki)*



Signature of Meth Panel Vice-Chair ……..

Date: 28/09/2007 *(Xuedu Lu)*

Information to be completed by the secretariat	
F-CDM-AM	AM_CLA_0055
Name of the authors of the query:	TUEV-RHEIN
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