# 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:* | 27–30 October 2009, SSC WG 23 |
| *Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):* | Revision of AMS-I.C to be consistent with AMS-I.E |
| *Indicative methodology to which your submission relates (refer the items of Appendix B of the Simplified Modalities and Procedures), if applicable.* | AMS-I.C |
| *Name of the authors of the query:* | Naoki Matsuo<br>Institution: PEAR Carbon Offset Initiative, Ltd.<br>n_matsuo@pear-carbon-offset.org, n_matsuo@climate-experts.info |

**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 PP:

AMS-I.E "Switch from Non-Renewable Biomass for Thermal Applications by the User" specifies the baseline scenario and baseline emissions as follows.

**Baseline**

5. It is assumed that in the absence of the project activity, the baseline scenario would be the use of fossil fuels for meeting similar thermal energy needs.

6. Emission reductions would be calculated as:

$$ER_y = B_y \cdot f_{NRB,y}.NCV_{biomass} \cdot EF_{projected\_fossilfuel} \quad \textbf{(1)}$$

Where:

| | |
|---|---|
| $ER_y$ | Emission reductions during the year y in $tCO_2e$ |
| $B_y$ | Quantity of biomass that is substituted or displaced in tonnes |
| $f_{NRB,y}$ | Fraction of biomass used in the absence of the project activity in year y that can be established as non renewable biomass using survey methods |
| $NCV_{biomass}$ | Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne) |

| | |
|---|---|
| $EF_{projected\_fossilfuel}$ | Emission factor for the projected fossil fuel consumption in the baseline. The fossil fuel likely to be used by similar consumers is taken: 71.5 $tCO_2/TJ$ for Kerosene, 63.0 $tCO_2/TJ$ for Liquefied Petroleum Gas (LPG) or the IPCC default value of other relevant fossil fuel. |

$B_y$ is determined by using one of the two following options.

(a) Calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of biomass per appliance (tonnes/year). This can be derived from historical data or estimated using survey methods, OR

(b) Calculated from the thermal energy generated in the project activity as:

$$B_y = HG_{p,y} / (NCV_{biomass} \cdot \eta_{old}) \quad \textbf{(2)}$$

Where:

| | |
|---|---|
| $HG_{p,y}$ | Quantity of thermal energy generated by the new renewable energy technology in the project in year y (TJ) |
| $\eta_{old}$ | Efficiency of the system being replaced, measured using representative sampling methods or based on referenced literature values |

It may be implicitly assumed that the methodology is applied for low-income rural area and each unit of activity is micro-level such as biogas micro-digester for each household.

In the area where fossil fuel (such as low-quality coal briquette) is available, such fossil fuel is used instead of labor-intensive biomass at home in many cases. For this case, AMS-I.C is applied instead of AMS-I.E even though the same technology is used.

An example can be seen for the case of biogas micro-digester technology in low-income rural areas in China. In the area with coal, coal briquette is replaced. While in the area without coal, (non-renewable) biomass is replaced by biogas (by using the biogas micro-digester).

The basic idea of AMS-I.E in the treatment of (a) is *how much non-renewable biomass was used historically or statistically*. This idea may be more accurate than (b): *how much thermal energy was generated by the project activity* because the supplied amount of energy by the project activity would not the same as the energy supplied by non-renewable energy (in the baseline scenario).

On the other hand, the consistent treatment (for (a) above) is not explicitly stated in AMS-I.C. Para. 11 of the AMS-I.C states that

**Baseline Emissions**

11. For renewable energy technologies that displace technologies using fossil fuels, the simplified baseline is the fuel consumption of the technologies that would have been used in the absence of the project activity times an emission factor for the fossil fuel displaced. For calculating the emission factor, reliable local or national data shall be used. IPCC default values shall be used only when country or project specific data are not available or demonstrably difficult to obtain.

The first sentence of this paragraph implicitly allows using historical or statistical method (if it is more accurate method). However, for other part of the methodology, the baseline energy consumption is assumed to be that of the project activity. This is true for most cases of industrial thermal energy use which AMS-I.C covers. On the other hand, AMS-I.C also covers the case of tiny thermal energy use in low-income rural areas (as in the case of AMS-I.E). Therefore, consistent treatment is needed (or it is possible to prepare a new methodology specific to such cases).

First, I propose to transfer the paragraph 19 in AMS-I.C:

19. For household or commercial applications/systems, whose maximum output capacity is less than 45 kW thermal and where it can be demonstrated that the metering of thermal energy output is not plausible, as in the case of cooking stoves, gasifiers, driers, water heaters etc., efficiency of the baseline units shall be determined by adopting one of the following criteria:

(a) Highest measured operational efficiency over the full range of operating conditions of a representative sample of units with similar specifications, using baseline fuel. The efficiency tests shall be conducted following the guidance provided in relevant national / international standards;

(b) Highest of the efficiency values provided by two or more manufacturers for units with similar specifications using the baseline fuel;

(c) Highest efficiency from referenced literature values or default efficiency of 100%.

to the end of the sub-section of the **"baseline emissions"** because other paragraphs deal with co-generation, while paragraph 19 deals only with thermal energy specific to tiny system.

In addition, I propose to add the following sentences to the paragraph 19 above in order to keep consistency with AMS-I.E:

Or emission reductions would be calculated as:

$ERy = \sum i\ Bi,y * NCVi * EFi$ (eq. no)

Where:

*ERy* Emission reductions during the year *y* (tCO2/yr).

*Bi,y* Quantity of baseline fossil fuel *i* that is substituted or displaced by the project activity in (ton/yr).

*NCVi* Net calorific value of the baseline fossil fuel *i* that is substituted or displaced (TJ/ton).

*EFi* Emission factor for the baseline fossil fuel I (tCO2/TJ). 71.5 tCO2/TJ for kerosene, 63.0 tCO2/TJ for LPG or the IPCC default value of other relevant fossil fuels.

*Bi,y* is determined by using one of the two following options.

(a) Calculated as the product number of appliances or household multiplied by the estimate of average annual consumption of the fossil fuel per appliances or household (tonnes/year). This can be derived from historical data or estimated using survey method, OR

(b) Calculated from the thermal energy generated in the project activity as:

$Biy = HGi,y / (NCVi * \eta i,old)$ (eq. no)

where

*HGi,y* Portion of the baseline fossil fuel *i* in the quantity of thermal energy generated by the project renewable energy technology in year *y* (TJ/yr). If plural fossil fuels are displaced by the project activity, the project participant shall demonstrate the reasonable method to identify the portion.

$\eta i,old$ Efficiency of the system, which uses the fossil fuel *i*, being replaced, measured using representative sampling methods or based on referenced literature values.

In addition, I would like to propose to amend "5 tonnes of CO2e a year" in para 30. (c):

(c) If the emissions reduction per system is less than 5 tonnes of $CO_2e$ a year:

(i) Recording annually the number of systems operating (evidence of continuing operation, such as on-going rental/lease payments could be a substitute), if necessary using survey methods;

(ii) Estimating the annual hours of operation of an average system, if necessary using survey methods. Annual hours of operation can be estimated from total output (e.g., tonnes of grain dried) and output per hour if an accurate value of output per hour is available.

to "10 tonnes of CO2 a year".

I believe that this provision (c) is for tiny activities such as household-level biogas micro-digester. However, as shown in a study "PoA CDM Manual—Mini Biogas Plants for Households" (http://www.cd4cdm.org/Publications/PoAManualBiogasHouseholds.pdf) as a CD4CDM Working Paper by UNEP RISØ, estimated emission reductions per household is 1.76–7.0 tCO2/yr (p.35 of the paper). Therefore, I think it is better to extend the applicable size of the unit to 10 tCO2/yr.

**Recommendation by the SSC WG:**

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

Please refer to paragraph 4 of the meeting report of the SSC WG 23 (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 author requested changes to how baseline emissions are calculated in AMS-I.C for thermal applications (e.g., household biogas digesters) in order to be consistent with AMS-I.E and to change the limits (from 5 to 10 tonnes/year of reduction per unit) at which simplified monitoring is allowed.

With respect to the proposed baseline emission calculations changes in AMS-I.C, the author suggested that when switching from fossil fuels to renewable fuels, baseline emissions can be calculated based on heat output in the project case (divided by efficiency of old units) as is currently indicated in AMS-I.C, or by estimating how much fossil fuel per unit was used in the baseline case, as is an option in AMS-I.E.

The SSC WG agreed not to recommend the modifications suggested to AMS-I.C because while the use of estimates of baseline fuel use is plausible for projects that replace non-renewable biomass (AMS-I.E) it is not plausible for projects that replace fossil fuel for the following reasons:

- It shall be noted that earlier versions of AMS-I.C (version 06 and below dated November 2005 or earlier) included projects substituting non renewable biomass (AMS-I.E projects). Under the prevailing guidance from the Board these projects have been subsequently excluded from AMS I C and upon request from CMP to the Board, new methodologies namely AMS-I.E and AMS-II.G have been developed under special circumstances. It shall also be noted that the baseline emission calculations of AMS-I.E and AMS-II.G use a reference approach, i.e., consideration of kerosene/LPG substitution. Due to the reference approach as well as due to other adjustment factors for example the

fraction of non renewable biomass (fNRB) the calculation of the emission reductions will be conservative in AMS-I.E and AMS-II.G. Thus any uncertainties related to measurement of baseline fuel use changes are more than compensated by net to gross adjustments in AMS-I.E which is not the case in AMS-I.C. Given this background it would be inappropriate to choose certain elements of AMS-I.E to include in AMS-I.C while ignoring other correlated items. Hence SSC WG agreed not to recommend the changes proposed.

In terms of the suggested modifications to monitoring requirements, paragraph 30 (c), the SSC WG found that there was not adequate justification to raise the limit to 10 tonnes of $CO_2e$ per year. The SSC WG found the report referenced by the author to be informative and however based on only four biogas programmes showing saving values at 1.76, 3.56, 6.2 and 7.0 tonnes of $CO_2e$ per year per bio-digester. The SSC WG therefore considered these values to be indicative. While obviously none of these are at the 10 tonnes of $CO_2e$ per year value suggested, there was also no documentation as to the source of these values. Therefore, at this point in time, the SSC WG is not recommending a change to paragraph 30 (c).

Signature of SSC WG Chair ……..

*(Hugh Sealy)*

Date: 30/10/2009

Signature of SSC WG Vice-Chair ……..

*(Peer Stiansen)*

Date: 30/10/2009

| **Information to be completed by the secretariat** | |
|---|---|
| SSC-Submission number | SSC_356 |
| Date when the form was received at UNFCCC secretariat | 30 October 2009 |
| Date of transmission to the EB | 30 October 2009 |
| Date of posting in the UNFCCC CDM web site | 30 October 2009 |