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:	21–24 June 2011, SSC WG 32
Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):	Revision of AMS-I.E to allow simplified options to determine the quantity of biomass/biogas
Indicative methodology to which your submission relates (refer the items of Appendix B of the Simplified Modalities and Procedures), if applicable.	AMS-I.E "Switch from non-renewable biomass for thermal applications by the user"
Name of the authors of the query:	Naoki Matsuo Institution: Climate Experts, Ltd. 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

The paragraph 6 of the methodology (below in roman) required the following options for estimation of quantity of woody biomass that is displaced by the project.

(a) Calculated as the product of the number of appliances multiplied by the estimate of average annual consumption of woody 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: ....;

Regarding determination of biomass displaced, the option (a) required average annual consumption of woody biomass per appliance. The "appliance" here can be interpreted as cook stoves and boilers.

The matter here is that the requirement of the option (a) is applicable for boilers well and truly. However, in the case of households based cook stoves, grasping biomass consumption per stove is not realistic and very challenges in most developing countries where households most probably use more than one stove for cooking (same type or different type) for different conditions. For example, use outdoor stove in summer or fine days and indoor stove in winter or rainy days. On the other hand, we see several survey report for biomass consumption "per household".

Therefore, the following revision is recommended for the option (a).

(a) Calculated as the product of the number of appliances or number of households multiplied by the estimate of average annual consumption of woody biomass per appliance or per household (tonnes/year); This can be derived from historical data or using survey methods undertaken by project participants or by a reliable third party with documentation.

As for the option (b) (Calculated from the thermal energy generated in the project activity), it is required to grasp/have the quantity of thermal energy generated by the new renewable energy technology (biogas stoves, solar cookers, passive solar homes) in the project.

The term of "thermal energy" generated by the new renewable technology" may have DOE go far to

require PP to monitor the physical quantity of the heat generated by, e.g., cook stove (this request actually happened!). We see no scientific lab in rural villages...

Obviously the term of thermal energy generated by the renewable energy technology in the project indicates the heat value of fuel that combusted through the new renewable technology (biogas stoves, boilers, solar cookers) and obtained by the end users. Thus a rational approach to estimate thermal energy is using the measured quantity of renewable energy (biogas, solar energy) and heat content or caloric value of the renewable energy through taking an efficiency of renewable technology into account.

Therefore, it is recommended to insert "(heat content of the fuel)" after "thermal energy".

$HG_{p,y}$ Quantity of thermal energy (heat content of the fuel) generated by the new renewable energy technology in the project in year y (TJ). $HG_{p,y}$ can be monitored either demand-side or supply-side. If supply-side monitoring is applied, appropriate procedure is needed to ensure that the physical leakage between these sides is negligible.

Taking account of requirement of standardized baselines by the CMP, the following can be added for revision:

In case the host government provides standardized specification of the heat generation by size (and/or by other spec) of the technology to generate fuel (e.g., standard biogas generation rate by the size of biogas digester) under the governmental programme, such standardized value in the host country or region can be applied.

Additional information from PP

Biogas Digester Generation Capacity Standards

1. Introduction

Biogas digester, as a feasible and accessible renewable energy technology, has been widely promoted in the rural area of developing countries.

There are various types of biogas digesters such as hydraulic pressurized (fixed dome) biogas digester, floating drum biogas digester, partially submerged plastic biogas digester, fiberglass reinforced plastic above ground biogas digester. Up to now, most dominant types applied in developing world are hydraulic pressurized and floating drum biogas digesters.

In order to accelerate biogas digester dissemination, governments have launched biogas development programs in national scale and developed corresponding regulation and standards for construction, installation and operation. Here, some information of biogas digester standards of China and Bangladesh will be given.

2. Biogas Digester in China

It was from the year of 2000 when the Ministry of Agriculture, P.R.China (MOA) allocated the specific fund, so as to strengthen the standard making of biogas technology. Until now, more than two-third of the standard have been completed.

On January1, 2003, GB[1]/T 4750-2002 (Collection of standard design drawing for households anaerobic digesters) were valid, which included the standard of design drawings, construction, quality evaluation, pipe and facility installation as well as operation / management.

One of the main parameters of biogas digester specified in the GB/T4750-2002 is daily biogas generation rate for per efficient volume of biogas digester. In the condition of normal management and operation and satisfying the fermentation ways required by the standard, the biogas generation

[1] Initial of the term of National Standard in Chinese

rate of a biogas digester ranges 0.2–0.4 m^3/m^3/day.

Moreover, GB/T 3066-2001(domestic biogas stoves) requires standard for heat capacity of biogas stoves applied in the national program is not less than 2.79 kW (2400 kcal/h).

3. Biogas Digester in Bangladesh

National Domestic Biogas and Manure Program (NDBMP) has been launched by Bangladesh government with a support of Netherlands Development Organization (SNV) since 2006. And the executive body of the program is Infrastructure Development Company Ltd (IDCOL)—semi-governmental financial institution to undertake several governmental programmes—that organizes several partner organizations (such as biogas constructors, NGOs and biogas digester equipment suppliers) to implement the program.

The program has provided related quality control system (for fixed dome biogas digester) with the compliance of set quality standards during construction as well as operation and maintenance phases.

Under the designs will be basically two types; a) design for cattle dung and human excreta, and b) design for poultry droppings. Each design will have 6 sizes of different capacities. These sizes will be 1.2, 1.6, 2.0, 2.4, 3.2 and 4.8m^3 daily gas generation /production capacity[2]. The gas generated from the last two sizes digesters (3.2 and 4.8).

Please find attached "Construction Manual of the IDCOL Model Biogas Plant" for your reference.

In the field of domestic biogas programme, SNV of the Netherland has a vast experience in many developing countries (except for China and India which are most successful countries). See http://www.snvworld.org/en/ourwork/Pages/Building_viable_domestic_biogas_programmes.aspx

4. The net quantity of thermal energy supplied by the project activity

The following options will be used for calculating the net thermal energy provided by the project activity (biogas digesters and gas stoves) in the option (b) of the methodology AMS-I.E:

Option (1): Based on the biogas generated/produced by biogas digesters

$$HG_{i,y} = BS_{biogas,i,y} * \eta_{PJ} * NCV_{biogas} * UF$$

$BS_{biogas,i,y}$: The net quantity of biogas supplied to biogas cook stoves for use (*i.e.*, biogas flow) by biogas digester type *i* during the year *y* (m^3). This is determined as per biogas generation rates of biogas digesters specified in national standards or related literatures and documents.

η_{PJ}: Efficiency of the biogas cook stove measured using representative sampling methods or based on value provided by manufacturers or literature values.

NCV_{biogas}: The net calorific value of the biogas (MJ/m^3-biogas)

UF: Uncertainty factor (0.98)

Option (2): Based on the rated thermal capacity of the biogas cook stoves

$$HG_{i,y} = RC_{biogas,i,y} * 3.6 * \eta_{PJ} * (O_{i,y} * 365) * UF$$

$RC_{biogas,i,y}$: The manufacturers rated thermal capacity of biogas cook stove *i* in year *y* ($kW_{thermal}$). This is determined as per measures using representative sampling methods or based on value provided by manufacturers or literature values.

η_{PJ}: Efficiency of the biogas cook stove measured using representative sampling methods or based on value provided by manufacturers or literature values.

UF: Uncertainty factor (0.98).

[2] In Bangladesh the size of biogas digesters are classified by gas generation/production capacity instead of physical volume/capacity.

5. Whether woody biomass was used only for cook stoves displaced

For most part of developing countries where biogas digester is a feasible option, thermal energy is needed only for cooking, *i.e.*, almost no demand for heating. There is no other usage of woody biomass apparently (no use for lighting, *etc*.)

In case SSC WG considers that this is beyond common knowledge, the methodology can include the following sentence:

> For the use of woody biomass, the project participant shall demonstrate that the woody biomass would be used only for cooking by the conventional baseline cook stoves in the absence of the project activity by using documented evidences such as statistics or report released by a third party.

However, I personally believe that this procedure is not relevant for this methodology which can only be utilized in LDCs/poorest areas in developing countries.

Recommendation by the SSC WG:

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

Please refer to paragraph 11 of the meeting report of the SSC WG 32 <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.

Proposal 1: Determination of average annual consumption of woody biomass "per household" as an alternative to "per appliance".

The SSC WG agreed to clarify that the expression "per appliance" does not preclude the survey to be done "per household". As long as it is known how many appliances there are in the surveyed households, the data per household may be used in the calculation. However, the data per household may need to be corrected if the service provided by the project technology is only part of the service provided by the biomass in the baseline, e.g. a biogas cooking stove is introduced whereas biomass in the baseline has been used for both cooking and room heating.

Proposal 2: An option to calculate the net thermal energy based on the biogas generated by biogas digesters (m3-biogas/m3-digester), which is determined as per biogas generation rates of biogas digesters specified in national standards or related literatures.

While acknowledging that the use of national standards or literature to determine the biogas generation may significantly ease monitoring requirements, the SSC WG feels that some issues may require further investigation before recommending such an approach, e.g. the biogas digesters which are constructed in accordance with national standards may not always generate the biogas as estimated in the literature; the biogas digester may not be operated properly so that the expected biogas production rate in the national standard/relevant literature will not be achieved. The SSC WG is considering the following possible solutions in order to address the underlying issues, where the proponent is invited to provide further inputs

- To verify the appropriateness of the values in the national standards or literature before using them in the calculations, for example, through actual measurement of biogas consumption in a specific year of the crediting period), such a value (or the lower bound of the range in the standard) then may be used for the subsequent years in the crediting period; or

- To provide the verifiable operation/maintenance manual in the PDD to ensure that the biogas digesters will be operated and maintained properly, as required by the national standard or relevant literatures, where applicable.

The SSC WG agreed to continue to work on this topic, keeping in mind the streamlining of project activities as well as the environmental integrity.

Proposal 3: An option to calculate the net thermal energy based on the rated thermal capacity of the biogas cook stoves ($kW_{thermal}$), which is determined through sampling methods or the values provided by manufacturers or literature values.

The SSC WG is of the opinion that the rated capacity is just a "potential" energy generation as cook stoves may not operate at this full capacity all the time, and therefore it cannot be used alone to calculate energy generation attributable to the project activity.

Signed by the Chair, Ms. Fatou Gaye

Date: 24/06/2011

Signed by the Vice-Chair, Mr. Peer Stiansen

Date: 24/06/2011

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