Information note

"Top-down development of standardized approaches for rural energy supply (biogas)"

I. Background

1. The Executive Board (hereinafter referred to as the Board) of the clean development mechanism (CDM) agreed to launch a call for public input on developing standardized approaches in small-scale methodologies as indicated in the work programme of the Board 2012 (EB 67, annex 1).

2. Stakeholders were invited to provide their input on the "Information note on the top-down development of standardized approaches for rural energy supply (biogas)". The call for input from public stakeholders was open from 14 May (12:00 GMT) to 28 May 2012 (12:00 GMT).

3. In total two public submissions were received from stakeholders. The SSC WG at its thirty-seventh meeting thanked the authors of the submission. In addition the following responses were prepared by the secretariat and the SSC WG on some of the issues raised in particular those related to paragraph 6 of the information note.

II. Summary of public comments and responses by the SSC WG

4. **Question (a):** are the proposed specific default values for biogas generation reasonable and conservative?

[Comment from Climate Focus]: according to the elaboration given in the technical report in appendix I, we conclude that the suggested default value of 0.13 m^3/m^3, is too conservative due to the following reasons.

(a) The value is based on the most conservative average biogas production as reported in table 6 of cattle;

(b) The value is adjusted to a 50% discount factor to adjust to the misalignment to the standard which cannot be the case in all the covered countries;

(c) The digester technology used for the calculations is actually one of the least efficient designs.

As a result, the proposed standardized baseline is applicable in many different situations resulting in the most conservative outcome. We, however, suggest for some adjustments to make the standardized value more accurately applicable per region/country as the following:

(a) Incorporating the exact combination of animal types in a sampling group within the country/region;

(b) Applying further temperature range based on average temperature data per country;

(c) Applying the most common digester design within the host country;

[Response from the SSC WG and the secretariat]: in response to (a), this would result in a detailed analysis per country, taking into account genetic stock of the animal, combinations of animals and animal weights. This may not be possible due to lack of data. Furthermore, the number of animals and the combinations will vary amongst regions and years. In response to (b), average country temperature data lack sufficient details for example in Nepal there are three climate zones. A detailed assessment per country is possible, taking into account seasonal variations, but would be quite complex. In response to

(c), that approach would overestimate or underestimate the biogas production of other technologies applied. Furthermore, in the underrepresented regions often no common digester design can be identified. In addition, as new biogas technologies are being developed and introduced, this means that the default values need to be reconsidered each 1-2 years.

[Comment from Climate Experts]: the default values proposed here based on the study are deemed to be conservative. On the other hand, the default value provides rather conservative emission reductions than what we know base on our knowledge at least for the case of China. As shown in the attached spreadsheet, the baseline emissions would be 1.14 ton CO_2/yr using the default value rather than 1.76 ton CO_2/yr per household based on the Standards of Chinese Government, i.e. 35% lower. Based on another calculation using the fossil fuel consumption, it is estimated to be 3.35 tCO_2/yr, i.e. around 1/3 of that of the default value. Therefore, we consider that the default value would be too conservative. I hope you to apply the default value to other registered CDM projects/PoAs. The default values can be extended to biogas digesters fed with poultry litters. Because the values are also believed to be conservative values for feeding of poultry litters as poultry litters has the higher B_0 (0.24 m^3 CH_4/kg VS: Table 10A-9, IPCC 2006 Volume 4 chapter 10) than that of cattle and buffalo. The values also can be extended to regions/countries where climate zone is temperate/cold (temperature 15-20) with some conditions like existence of heating measures for biogas digester such as a biogas digester in a greenhouse. This kind of measure has been widely practiced in China. Moreover, the unit for the default value should be m^3/m^3.day rather than m^3/m^3.

[Response from the SSC WG and the secretariat]: a standard indicates what the performance of a biodigester is under standard conditions, i.e. with recommended feeding rates. Literature shows, however, that recommended feeding practices are not always observed, this may simply be related to the fact that people do not always have enough animals to sustain that feeding rate. A good example is pig farming, where fattening pigs are raised until slaughter, and then replaced by piglets, at that moment the amount of manure is much lower than just before slaughter. Consequently volatile solids (VS) feeding rates are not constant over time and therefore the biogas output would not always reach the values suggested by the standard. Data from both Vietnam and Cambodia supports this argument. In other words, a given standard value is a good indication of the average performance or average operation conditions that you may expect at certain scenario. The default value is not intended to reflect the average expectation. As the animal population always varies, as farmers may not feed all the manure into the biogas plant, as a proper hydraulic retention time (HRT) (as per standard) is not always observed, as the temperature fluctuates throughout the year, a biogas output value as per standard would not be conservative. A lower value was recommended, which may seem very conservative, but in fact is a compromise considering all uncertainties surrounding the variables that influence biogas production.

We agree that we need to distinguish between ambient temperature and temperature of digestion. If the project proponents can evidence (e.g. by direct monitoring) that the temperature of digestion is above 20 degrees even though the average ambient temperature is lower, the adoption of a default value in the range 20–25 degrees would be appropriate.

The default values should be given as "m^3/m^3.day"

5. **Question (b):** what kind of additional conditions or monitoring requirements should be included in the methodology to use the default values if any?

[Comment from Climate Focus]: the default value used as the standardized baseline presented in Table 13 is very conservative, the reason why the monitoring parameters are limited to those mentioned under paragraph 40. With the current value we do not see any necessity for any additional monitoring data while with a less conservative value, sampling of the biogas consumption among households/farms could have been added to the monitoring data in order to avoid overestimation of the emission reductions.

[Response from the SSC WG and the secretariat]: The proposed default value is not overly conservative when compared with varying practices observed in Cambodia and Vietnam.

[Comment from Climate Experts]: the study shows that the biogas generation rate depends mainly on the operation practice. Therefore, as mentioned in the study, the practical monitoring requirements should be to ensure that the biogas digesters are still operating.

[Response from the SSC WG and the secretariat]: yes, that would be the only requirement in this case. That is also the reason why the biogas production value is rather conservative, because between use and not use of a biogas plant there will be many cases where people only use the plant for achieving a lower generation capacity than the designed value.

6. **Question (c):** are there other appropriate approaches for standardization? If any, please recommend providing justification on the proposed approach(es).

[Comment from Climate Focus]: yes, instead of introducing several monitoring parameters, another solution would be to introduce another standardized baseline value based on the amount of biogas consumption per household per different regions/countries. There are some advantageous with this approach:

(a) It is the most secure way to ensure the destruction of the generated biogas (as long as the baseline manure waste management has been identified appropriately and as long as the operation of the bio-digesters are monitored);

(b) It is conservative enough as it does not take into account the amount of biogas that is not used through the stoves;

(c) It is the best solution to avoid false emission reductions as the amount of biogas that has been flared will be considered in the emission reductions only;

By introducing this approach it will be possible to have an standardized value for emission reductions per cubic meter of the bio-digester capacity.

[Response from the SSC WG and the secretariat]: We don't think this is secure since the household may have biogas as complementary energy source (and not exclusive) the methane destruction is not ensured, release could happen. Furthermore, this approach is only feasible if biogas is used for some identified purposes, as it would be complicated to calculate the avoided emissions when biogas is used for many purposes, for example for cooking, for animal feed preparation, for room heating, lighting etc. If biogas consumption is only measured for stoves, then that approach is conservative, provided that measures are implemented to avoid the release of biogas (incl monitoring). However, it is acknowledged that the final use of the biogas and the level of service of the energy conversion devices shall match the digester biogas generation capacity under operation conditions. We expect that in the future the increased experience and maturity of the technologies for monitoring biogas production and final use will enable more precise determination of performance at both sides (production and usage), its range of variation and thus allowing increased confidence on the default values adopted under certain applicability conditions.

[Comment from Climate Experts]: the efficiency of the conventional cookstove is better to be provided. In the above calculation, it is set as 0.2 as a conservative value. The result is sensitive to this value. It is also useful to provide per household coal consumption in the coal use areas as you try to provide that of the woody biomass.

[Response from SSC WG and secretariat]: noted.