



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:	26–29 April 2010, SSC WG 25
Title/Subject (give a small title or specify the subject of your submission, maximum 200 characters):	Clarification on the determination of biomass savings in AMS-II.G
Indicative methodology to which your submission relates (refer the items of Appendix B of the Simplified Modalities and Procedures), if applicable.	AMS-II.G, ver. 02 “Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass”
Name of the authors of the query:	Georg Zenk Institution: Uganda Carbon Bureau georgzenk@ugandacarbon.org , imarkov@slb.com , billfarmer@ugandacarbon.org

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:

Clarification is requested on the determination of $B_{y,savings}$ in the current version of AMS-II.G.

In its current version, AMS II.G. uses the following formula to compute the quantity of woody biomass that is saved:

$$B_{y,savings} = B_y \cdot 1 - \frac{\eta_{old}}{\eta_{new}}$$

After researching the literature and confirming with experts at Aprovecho Research Center, out of the different tests that can be applied to biomass stoves, only the Water Boiling Test (WBT) is able to provide absolute efficiency (η) as a direct output, as it uses the thermal energy needed to bring a predefined quantity of water to a boil and compares it with the energy contained in the fuel which is used. However, depending on the type of food which is prepared with an improved stove, real biomass savings might differ from the estimated biomass savings based on the WBT. Literature and experts therefore confirm, that the Controlled Cooking Test (CCT), which like the WBT is performed in a laboratory, reliably replicates real kitchen conditions, and therefore is an appropriate alternative to determine the biomass savings achieved by using an improved stove. In the CCT, a pre-defined recipe (typical for the locality, which the experiment intends to represent) is cooked with an improved cook stove as well as with the baseline cooking system in order to compare the fuel consumption of the different appliances. The main performance output of the CCT is the *Specific Fuel Consumption* (SC) which indicates the ratio of fuel to food cooked and is specific to the cooking task being performed (i.e. it needs to be done with the specimen appliance as well as the traditional cooking method under the same circumstances to yield a valid comparison). SC is defined as follows:

$$SC = \frac{f_d}{W_f} \cdot 1000$$

Where,

SC is the Specific Fuel Consumption, reported in grams of fuel per kilogram of food cooked

f_d is the weight of fuel used to complete the CCT cooking task

W_f is the weight of food cooked during the CCT cooking task

Now, if we use the following formula for energy efficiency:

$$\eta = \frac{E_{cf}}{f_d \times NCV}$$

Where,

E_{cf} is the energy absorbed by the cooked food

NCV is the net calorific value of the fuel used to cook the food

...and substitute this formula in the energy ratio used in the methodology, we obtain:

$$\frac{\eta_{old}}{\eta_{new}} = \frac{\frac{E_{cf}}{f_{d,old} \times NCV}}{\frac{E_{cf}}{f_{d,new} \times NCV}} = \frac{f_{d,new}}{f_{d,old}} = \frac{\frac{f_{d,new}}{W_f} \cdot 1000}{\frac{f_{d,old}}{W_f} \cdot 1000} = \frac{SC_{new}}{SC_{old}}$$

(because the CCT is done with the same cooking task and uses the same type of fuel)

Hence, if we substitute the ratio above into the original equation, we obtain:

$$B_{y,savings} = B_y \cdot \left(1 - \frac{SC_{new}}{SC_{old}}\right)$$

To summarize, the clarification sought is as to whether B_y , savings can be computed using the specific fuel consumption obtained from a relevant CCT experiment.

REFERENCES:

The latest version of the Water Boiling Test and Controlled Cooking Test can be found at:

<http://www.aprovecho.org/lab/work/protocols>

OR

<http://ehs.sph.berkeley.edu/hem/page.asp?id=42>

Recommendation by the SSC WG:

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

Please refer to paragraph 23 of the meeting report of the SSC WG 25
(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 SSC WG agreed to clarify that the quantity of woody biomass saved ($B_{y,savings}$) by the project activity can indeed be calculated using the specific fuel consumption (SFC) obtained from a relevant testing procedure including Controlled Cooking Test, since SFC and efficiency are inversely proportional to each

other. The SSC WG further agreed to clarify that the equation 2 of the methodology may be expressed in terms of SFC as proposed by the submission.

Signed by the Chair, Mr. Peer Stiansen

Date: 29/04/2010

Signed by the Vice-Chair, Mr. Hugh Sealy

Date: 29/04/2010

Information to be completed by the secretariat

SSC-Submission number	SSC_395
Date when the form was received at UNFCCC secretariat	29 April 2010
Date of transmission to the EB	29 April 2010
Date of posting in the UNFCCC CDM web site	29 April 2010