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TYPE II - ENERGY EFFICIENCY IMPROVEMENT PROJECTS

Project participants shall take into account the general guidance to the methodologies, information on additionality, abbreviations and general guidance on leakage provided at: http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html.

II.G. Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass

Technology/measure

1. This category comprises ~~small~~ appliances involving the efficiency improvements in the thermal applications of non-renewable biomass. Examples of these technologies and measures include the introduction of high efficiency biomass fired cook stoves or ovens or dryers and/or improvement of energy efficiency of existing biomass fired cook stoves or ovens or dryers.

2. If any similar registered ~~small-scale~~ CDM project activities exist in the same region as the proposed project activity then it must be ensured that the proposed project activity is not saving the non-renewable biomass accounted for by the already ~~other~~ registered project activities.

3. Project participants are able to show that non-renewable biomass has been used since 31 December 1989, using survey methods.

4. Project participants are encouraged[1] to document how the indoor air pollution impact has been considered when choosing/designing and using the improved cook stoves.

Boundary

5. The project boundary is the physical, geographical site ~~area~~ of the efficient systems using ~~use of non-renewable~~ biomass.

Baseline

6. 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.

7. Emission reductions would be calculated as:

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

Where:

ER_y	Emission reductions during the year y in tCO_2e
$B_{y,savings}$	Quantity of woody biomass that is saved in tonnes

[1] Although mandatory indoor air pollution tests during the baseline and project situations as a monitoring requirement is not implied here, it is strongly recommended that scientific monitoring of indoor air quality is done as not all improved stove designs ensure reduction in health damaging pollutants as compared to the baseline.

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II.G. Energy Efficiency Measures in Thermal Applications of Non-Renewable Woody biomass (cont)

$f_{NRB,y}$ Fraction of woody biomass saved by 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 woody biomass that is substituted (IPCC default for wood fuel, 0.015 TJ/tonne)

$EF_{projected\_fossilfuel}$ Emission factor for the substitution of non-renewable woody biomass by similar consumers. The substitution 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 fuel

$$B_{y,savings} = B_y \cdot (1 - \frac{\eta_{old}}{\eta_{new}}) \quad \textbf{(2)}$$

Where:

B_y Quantity of woody biomass used in the absence of the project activity in tonnes

η_{old} Efficiency of the baseline system/s being replaced, measured using representative sampling methods or based on referenced literature values (fraction), use weighted average values if more than one type of systems are encountered;

0.10 default value may be optionally used if the replaced system is the three stone fire or a conventional system lacking improved combustion air supply mechanism and flue gas ventilation system i.e., without a grate as well as a chimney; for rest of the systems 0.2 default value may be optionally used.

η_{new} Efficiency of the system being deployed as part of the project activity (fraction)

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 woody biomass per appliance (tonnes/year). This can be derived from historical data or a survey of local usage, OR

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

$$B_y = \frac{HG_{p,y}}{NCV_{biomass} \cdot \eta_{old}} \quad \textbf{(3)}$$

Where:

$HG_{p,y}$ Amount of thermal energy generated by the new technology in the project in year *y* (TJ)

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II.G. Energy Efficiency Measures in Thermal Applications of Non-Renewable Woody biomass (cont)

Differentiation between Non-renewable and Renewable woody biomass

8. Project participants shall ~~must~~ determine the share of renewable and non-renewable woody biomass in ~~the total biomass consumption~~ B_y (the quantity of woody biomass used in the absence of the project activity) using nationally approved methods (e.g., surveys or government data if available) and determine $f_{NRB,y}$. The following principles shall be taken into account:

Demonstrably Renewable woody biomass[2] (DRB):

Woody[3] biomass is "renewable" if any one of the following two ~~five~~ conditions is satisfied:

I. The woody biomass is originating from land areas that are forests[4] where:

(a) The land area remains a forest; and

(b) Sustainable management practices are undertaken on these land areas to ensure, in particular, that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and

(c) Any national or regional forestry and nature conservation regulations are complied with.

II. The biomass is woody biomass and originates from ~~cropland and/or grasslands~~ non-forest areas (e.g., croplands, grasslands) where:

(a) The land area remains ~~cropland and/or grasslands~~ as non-forest or is reverted to forest; and

(b) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and

(c) Any national or regional forestry, agriculture and nature conservation regulations are complied with.

~~III. The biomass is non-woody biomass and originates from croplands and/or grasslands where:~~

~~(a) The land area remains cropland and/or grasslands or is reverted to forest; and~~

~~(b) Sustainable management practices are undertaken on these land areas to ensure in particular that the level of carbon stocks on these land areas does not~~

[2] This definition uses elements of ~~is based on~~ Annex 18, EB 23.

[3] In cases of charcoal produced from woody biomass, the demonstration of renewability shall be done for the areas where the woody biomass is sourced.

[4] The forest definitions as established by the country in accordance with the decisions 11/CP.7 and 19/CP.9 should apply.

~~systematically decrease over time (carbon stocks may temporarily decrease due to harvesting); and~~

~~(c) Any national or regional forestry, agriculture and nature conservation regulations are complied with.~~

~~IV. The biomass is a biomass residue and the use of that biomass residue in the project activity does not involve a decrease of carbon pools, in particular dead wood, litter or soil organic carbon, on the land areas where the biomass residues are originating from.~~

~~IV. The biomass is the non-fossil fraction of an industrial or municipal waste.~~

Non-renewable biomass:

~~To complement the survey results, The following indicators may be useful for conducting surveys in the local areas:~~

Non-renewable woody biomass (NRB) is the quantity of woody biomass used in the absence of the project activity (B_y) minus the DRB component, so long as at least two of the following supporting indicators are shown to exist:

- Trend showing increase in time spent or distance travelled by users (or fuel-wood suppliers) for gathering fuel wood or alternatively trend showing increase in transportation distances for the fuel wood transported into the project area;
- Survey results, national or local statistics, studies, maps or other sources of information such as remote sensing data that show that carbon stocks are depleting in the project area ~~Inference derived from historical data may also be used if available for this purpose~~
- Increasing trends in fuel wood price indicating scarcity;
- Trends in the type of cooking fuel collected by users, suggesting scarcity of woody biomass.

~~A single indicator may not provide sufficient evidence that biomass in the region is non-renewable and therefore more than one indicator may be used~~

Thus the fraction of woody biomass saved by the project activity in year *y* that can be established as non renewable is

$$f_{NRB,y} = \frac{NRB}{NRB + DRB} \quad \textbf{(4)}$$

Project participants shall also provide evidence that the trends seen are not on account of enforcement of local/national regulations.

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II.G. Energy Efficiency Measures in Thermal Applications of Non-Renewable Woody biomass (cont)

Leakage

9. Leakage relating to the non-renewable woody biomass shall be assessed from *ex post* surveys of users and areas from where woody biomass is sourced (using 90/30 precision for selection of samples). The following potential sources of leakage were identified shall be considered:

(a) Use/diversion of non-renewable woody biomass saved under the project activity by non-project households/users who previously used renewable energy sources. If this leakage assessment quantifies an increase in the use of non-renewable woody biomass used by the non-project households/users attributable to the project activity then B_y is adjusted to account for the quantified leakage.

(b) Use of non-renewable biomass saved under the project activity to justify the baseline of other CDM project activities can also be potential source of leakage. If this leakage assessment quantifies a portion of non-renewable biomass saved under the project activity that is used as the baseline of other CDM project activity then By is adjusted to account for the quantified leakage.

(c) Increase in the use of non-renewable biomass outside the project boundary to create non-renewable biomass baselines can also be potential source of leakage. If this leakage assessment quantifies an increase in use of non-renewable biomass outside the project boundary then By is adjusted to account for the quantified leakage.

10. If equipment currently being utilised is transferred from outside the boundary to the project activity another activity or if the existing equipment is transferred to another activity leakage is to be considered.

Monitoring

11. Monitoring shall consist of an annual check of efficiency of all appliances or a representative sample thereof to ensure that they are still operating at the specified efficiency (η_{new}) or replaced by an equivalent in service appliance. Where replacements are made, monitoring shall also ensure that the efficiency of the new appliances is similar to the appliances being replaced.

12. In order to assess the leakages specified above monitoring shall include data on the amount of woody biomass saved under the project activity that is used by non-project households/users (who previously used renewable energy sources). Other data on non-renewable woody biomass use required for leakage assessment shall also be collected.

13. Monitoring shall ensure that the replaced low efficiency appliances are disposed off and not used within the boundary or within the region. Monitoring shall ensure that:

1. either the replaced low efficiency appliances are disposed off and not used within the boundary or within the region; or

2. If the baseline stoves usage continues, monitoring shall ensure that the wood fuel consumption of those stoves is excluded from B_y in equation 2.

14. In case option (b) in paragraph 7 ~~6~~ is chosen for baseline calculations, monitoring shall include the amount of thermal energy generated by the new renewable energy technology in the project in year y, where applicable.

Representative sampling methods

15. Sample size shall be chosen for a 90/10 precision (90% confidence interval and 10% margin of error) for parameter values used to determine emission reductions and project proponents shall make all reasonable efforts to achieve this specified level of confidence/precision; in cases where survey results indicate that 90/10 precision is not achieved the lower bound of a 90% confidence interval of the parameter value may be chosen as an alternative to repeating the survey efforts to achieve 90/10 precision.

Project activity under a programme of activities

16. The use of this methodology in a project activity under a programme of activities is legitimate if the following leakages are estimated, if required on a sample basis using 90/30 precision for selection of samples, and accounted for:

(a) Use of non-renewable woody biomass saved under the project activity to justify the baseline of other CDM project activities can also be potential source of leakage. If this leakage assessment quantifies a portion of non-renewable woody biomass saved under the project activity that is used as the baseline of other CDM project activity then B_y is adjusted to account for the quantified leakage.

(b) Increase in the use of non-renewable woody biomass outside the project boundary to create non-renewable woody biomass baselines can also be potential source of leakage. If this leakage assessment quantifies an increase in use of non-renewable woody biomass outside the project boundary then B_y is adjusted to account for the quantified leakage.

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II.G. Energy Efficiency Measures in Thermal Applications of Non-Renewable Woody biomass (cont)

History of the document

Version	Date	Nature of revision
02	EB 51, Annex # 04 December 2009	To include: (a) a best-practices recommendation for project participants to consider relative indoor pollution characteristics of project versus baseline cook stoves, (b) default efficiency factors for baseline cook stoves, (c) procedures for sampling, (d) revised procedures for determination of quantity of woody biomass that can be considered as non renewable, and (e) clarifications as to which leakage requirements are appropriate for projects versus PoAs.
01	EB 37, Annex 7 01 February 2008	Initial adoption.
Decision Class: Regulatory **Document Type**: Standard **Business Function**: Methodology		