Energy Efficiency Measures in Thermal Applications of Non-Renewable Biomass

Technology/ Measure

1. This category comprises small appliances involving efficiency improvements in the thermal application of non-renewable biomass (such as fuelwood or charcoal). These technologies and measures include high efficiency cook stoves and ovens using non-renewable biomass. Project activities, which also involve the switch to renewable biomass, shall apply using the category "Switch from Non-Renewable Biomass to Renewable Energy for Thermal Applications by the User".

Boundary

2. The project boundary is the physical, geographical area of the use of non-renewable biomass.

Baseline

3. It is assumed that in the absence of the project activity, the baseline scenario would be the mix of non-renewable biomass and fossil fuel use expected to be used in the baseline, within the project duration, by the local consumers, for meeting similar thermal energy needs. Project proponents must demonstrate that the biomass use claimed to be non-renewable is indeed non-renewable, following the EB 23 Annex 18 definition of "renewable biomass" (by inversion).

In order to avoid incentives to enhance deforestation and forest degradation in order to meet the conditions of "non-renewable biomass", project proponents must, in addition, demonstrate that the biomass used by the project participants was non-renewable at the time of, or before, the adoption of this methodology (September 2006).

4. Emission reductions would be calculated as:

$$ER_y = B_{y,savings} \cdot NCV_{biomass} \cdot EF_{non-renewable\ biomass,CO2} \cdot 10^{-3}$$

Note: 10^{-3} added

where:

ERy	Emission reductions during the year y in t CO_2e
By,savings	Quantity of non-renewable biomass that is saved in tonnes In the case of charcoal the quantity of non-renewable biomass going into the charcoal making process should be used (IPCC default: 6 kg wood per kg charcoal, reference manual of 1996 Guidelines page 1.45)
NCVbiomass	Net calorific value of the non-renewable biomass that is substituted (IPCC default for wood fuel, 15 MJ/Kg).
EFnon-renewable biomass, CO_2	Emission factor for the substitution of non-renewable biomass by similar consumers locally in t CO_2 / TJ biomass.

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

where:

By	Quantity of non-renewable biomass used in the absence of the project activity
η_{old}	Efficiency of the system being replaced, use 20% as default value or local data if available
η_{new}	Efficiency of the system being deployed as part of the project activity.

$$EF_{\text{non-renewable biomas, CO2}} = \frac{1}{2} \cdot (EF_{CO2,\text{start}} + EF_{CO2,\text{end}})$$

$$EF_{CO2,\text{start}} = EF_{CO2,\text{biomass}}$$

$$EF_{CO2,\text{end}} = X * (\frac{\varepsilon_{\text{stoves, biomass}}}{\varepsilon_{\text{stoves, fossil}}} \cdot EF_{CO2,\text{fossil}}) + (1 - X) * EF_{CO2,\text{biomass}}$$

where:

$EFCO_2$, start	CO_2 emission factor of the baseline at the start of the project
$EFCO_2$, end	CO_2 emission factor of the baseline at the end of the project
$EFCO_2$, fossil	CO_2 emission factor for the fossil fuel; 71.5 tCO_2/TJ for Kerosene, 63.0 tCO_2/TJ for LPG or the IPCC default value of the fossil fuel commonly observed with local consumers
$EFCO_2$, biomass	CO_2 emission factor for the biomass fuel; 109.6 tCO_2/TJ (default for biomass from IPCC 1996 GL).
X	Share of fossil fuel used, in the baseline, by the "in-project" consumers at the time when the project ends, according to historical and/or current trends. X is to be determined as part of the PDD. By definition, at the beginning of the project all "in-project" consumers use non-renewable biomass.
εstoves,biomass	Average efficiency of stoves fired with biomass, use 20% as default value or local data if available
εstoves,fossil	Average efficiency of stoves fired with fossil fuels, use 50% as default value or local data if available

Leakage

5. If there is a possibility that the savings of non-renewable biomass due to the project activity lead to greater use of non-renewable biomass outside the project boundary, then a leakage deduction of 15% shall be applied.

Monitoring

6. Monitoring shall consist of an annual check of all appliances or a representative sample thereof to ensure that they are still operating or replaced by an equivalent in service appliance. Monitoring shall include the efficiency of the appliances.

7. Monitoring shall ensure that the replaced low efficiency appliances are not used within the boundary.

8. If the leakage deduction of 15% is not applied, monitoring shall demonstrate that greater use of non-renewable biomass outside the project boundary does not occur.