A/R methodological tool

"Calculation of GHG emissions due to leakage from increased use of non-renewable woody biomass attributable to an A/R CDM project activity"

(Version 01)

I. SCOPE, APPLICABILITY AND PARAMETERS

Scope

1. This tool allows for estimation of the increase in GHG emissions due to leakage, resulting from an increased use of non-renewable woody biomass from sources outside the project boundary, attributable to an A/R CDM project activity.

Applicability

2. This tool is applicable for estimating the increase in GHG emissions caused by increased use of non-renewable woody biomass sourced from outside the project boundary as part of an A/R CDM project activity.

3. This tool shall be applied whenever implementation of an A/R CDM project activity is expected to cause an increase, over its use in the baseline, of non-renewable woody biomass sourced from outside the project boundary.

4. This tool applies the most recent definition of renewable biomass as approved by the EB (available at <http://cdm.unfccc.int/Reference/Guidclarif>).

Parameters

5. This tool provides procedures to determine the following parameter:

Parameter	SI Unit	Description
$LK_{NRB,y}$	t CO_2	Leakage from the increase in woody biomass that comes from non-renewable sources, due to project implementation in year *y*

II. PROCEDURE

Estimation of the increase in amount of woody biomass consumed as a result of implementation of the CDM A/R project activity that is sourced from outside the project boundary

6. The increase, above the baseline scenario, in the woody biomass (above- and below-ground) that is sourced from outside the project boundary and is utilized for project implementation (ΔWB_{used}), must be used to estimate emissions.[1] This shall be done in either of two general ways:

1. Mass measurement or estimation

7. The project participants may estimate ΔWB_{used} by direct measurement (weighing), or by sampling. Sampling may be done, for example, by measuring mass of samples of the amount of biomass that is sourced from outside the project boundary and using an appropriate scaling factor to estimate the total biomass. Project participants could, for example, weigh and determine the mass of the amount of wood used for posts for a given length of fence. The amount of wood used from outside the project boundary would then be the fence length made of wood sourced from outside the project boundary divided by the given length of fence and, multiplied by the measured amount of wood used in the given length. Project participants may choose to determine dry mass or as conservative simplification use non-dry mass in equation 2.

2. Volume measurement or estimation

8. The project participants may estimate the increase in volume of woody biomass, over its use in the baseline scenario, from sources outside of the project boundary due to project implementation (ΔWV_{used}), by direct measurement of volume. This may be done by measurement of the volume of the total biomass used, or by measuring the volume of samples of biomass and using an appropriate scaling factor to estimate the total volume. For example, project participants could measure the volume of wood used for posts for a given number of posts, and calculate the average wood volume per post. The volume of wood used, that is sourced from outside the project boundary, would then be the total number of posts, that are made from wood sourced from outside the project boundary, multiplied by the measured volume of wood per post.

9. If the estimation is based on volume then:

$$\Delta WB_{used,y} = \Delta WV_{used,y} * D \quad \textbf{(1)}$$

where:

$\Delta WB_{used,y}$	Increase in woody biomass, over its use in the baseline scenario, from sources outside of the project boundary due to project implementation in year *y*, t d.m
$\Delta WV_{used,y}$	Increase in volume of woody biomass, over its use in the baseline scenario, from sources outside of the project boundary due to project implementation in year *y*, m^{-3}
D	Basic wood density of the extracted wood; t d.m. m^{-3}
	(If local or national values are not available, use appropriate values from IPCC GPG-

[1] If the amount of biomass used in the baseline scenario is not known it shall be assumed to be equal to zero.

LULUCF, 2003: Table 3A.1.9 or 2006 IPCC Guidelines for National Greenhouse Gas Inventory: Table 4.13)

Estimation of leakage from increased use of non-renewable woody biomass in the CDM A/R project

10. Leakage emissions are caused by an increase, over its use in the baseline scenario, in the amount of non-renewable woody biomass utilized from outside the project boundary as a result of project implementation. The emissions are calculated as follows:

$$\Delta WB_{NRB,y} = \Delta WB_{used,y} - \Delta WB_{\text{Re}newable,y} \quad \textbf{(2)}$$

$$LK_{NRB,y} = \Delta WB_{NRB,y} * BEF_2 * CF * (1+R) * \frac{44}{12} \quad \textbf{(3)}$$

where:

$\Delta WB_{NRB,y}$	Increase in woody biomass, over its use in the baseline scenario, that comes from non-renewable sources in year *y*, t d.m.
$\Delta WB_{used,y}$	Increase in woody biomass, over its use in the baseline scenario, from sources outside of the project boundary due to project implementation in year *y*, t d.m.
$\Delta WB_{\text{Re}newable,y}$	Increase in woody biomass, over its use in the baseline scenario, that comes from renewable sources from outside the project boundary in year *y*, t d.m.
$LK_{NRB,y}$	Leakage from the increase in woody biomass, over its use in the baseline scenario, that comes from non-renewable sources due to project implementation in year *y*, t CO_2
BEF_2	Biomass expansion factor for converting biomass of extracted round wood to total above-ground biomass (including bark); t d.m t^{-1} d.m. (If local or national values are not available, use the values from IPCC GPG-LULUCF, 2003 Table 3A.1.10)
CF	Carbon fraction of dry matter; t C t^{-1} d.m. (default = 0.5)
R	Average root-to-shoot ratio for the species of trees from which the woody biomass originates; t C t^{-1} C The use of a conservative default value of 0.3 is recommended. For sources of alternative data see the approved methodological tool: "*Estimation of emissions from clearing, burning and decay of existing vegetation due to implementation of a CDM A/R project activity*". <http://cdm.unfccc.int/methodologies/ARmethodologies/approved_ar.html>

11. If project participants claim to use renewable biomass $\Delta WB_{renewable,y}$ they shall apply the definition of renewable biomass as approved by the Board (available at <http://cdm.unfccc.int/Reference/Guidclarif>.

III. LIST OF PARAMETERS AND VARIABLES:

Defaults

Variable:	Unit:	Description:	Source of data:	Any comment:
BEF_2	t d.m. t^{-1} d.m	Biomass expansion factor for converting biomass of extracted round wood to total above-ground biomass (including bark)	If local or national values are not available, use the values from IPCC GPG-LULUCF, 2003 Table 3A.1.10	
CF	t C t^{-1} d.m.	Carbon fraction of dry matter	Default = 0.5	
D	t d.m. m^{-3}	Basic wood density of the extracted wood	If local or national values are not available, use appropriate values from IPCC GPG-LULUCF, 2003: Table 3A.1.9 or 2006 IPCC Guidelines for National Greenhouse Gas Inventory: Table 4.13	
R	t C t^{-1} C	Average root-to-shoot ratio for the species of trees from which the woody biomass originates	Use of a conservative default value of 0.3 is recommended	For sources of alternative data see the approved methodological tool: "*Estimation of emissions from clearing, burning and decay of existing vegetation due to implementation of a CDM A/R project activity*" (http://cdm.unfccc.int/methodologies/ARmethodologies/approved_ar.html)

Data and parameters estimated for the *ex ante* and monitored for *ex post* calculations

Data/parameter:	Data unit:	Description:	Source of data:	Measurement procedure (if any):	Monitoring frequency:	Any comment:
$\Delta WB_{Renewable,y}$	t d.m.	Increase in woody biomass, over its use in the baseline scenario, that comes from renewable sources from outside the project boundary in year *y*	Must be supported by using definition of renewable biomass as provided by the Board (available at http://cdm.unfccc.int/Reference/Guidclarif)			
$\Delta WB_{used,y}$	t d.m.	Increase in woody biomass, over its use in the baseline scenario, from sources outside of the project boundary due to project implementation in year *y*	Direct measurement or calculated using $\Delta WV_{used,y}$	Weighing and determination of mass, or by sampling		
$\Delta WV_{used,y}$	m^{-3}	Increase in volume of woody biomass, over its use in the baseline scenario, from sources outside of the project boundary due to project implementation in year *y*	Measurement	Direct measurement of the volume of the total biomass used, or by measuring samples of the volume of biomass and using an appropriate scaling factor to estimate the total volume		

Other variables:

Variable:	Unit:	Description:
$\Delta WB_{NRB,y}$	t d.m.	Increase in woody biomass, over its use in the baseline scenario, that comes from non-renewable sources in year *y*
$LK_{NRB,y}$	t CO_2	Leakage from the increase in woody biomass that comes from non-renewable sources, due to project implementation in year *y*

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History of the document

Version	Date	Nature of revision
01	EB 39, Annex 11, 16 May 2008	Initial adoption