Indicative simplified baseline and monitoring methodologies
for selected small-scale CDM project activity categories

TYPE I - RENEWABLE ENERGY PROJECTS

Note: Categories I.A, I.B and I.C involve renewable energy technologies that supply electricity, mechanical energy, orand thermal energy, respectively, to the user directly. Renewable energy technologies that supply electricity to a grid fall into category I.D.

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.

I.A. Electricity generation by the user

Technology/measure

1. This category comprises renewable energy generation units that supply individual households or users or groups of households or users with electricity. The applicability is limited to households and users that do not have a grid connection except when;

(a) A group of households or users are supplied electricity through an isolated[1] mini-grid where the capacity of the generating units does shall not exceed 15 MW; or

(b) The emissions reduction per renewable energy based lighting system is less than 5 tonnes of CO_2e a year and where it can be shown that fossil fuel would have been used in the absence of the project activity by;

(i) A representative sample survey (90% confidence interval, ±10% error margin) of target households; or

(ii) Official statistics from the host country government agencies.

These units (e.g., solar home systems, and wind battery chargers) include technologies such as solar power, hydropower, wind power, and other technologies that produce electricity all of which is used on-site by the user, e.g., such as solar home systems, and wind battery chargers. The renewable generating units may be new or replace existing fossil-fuel-fired generation. The capacity of these renewable energy generators shall not exceed 15 MW.

2. Combined heat and power (cogeneration) systems are not eligible under this category.

3. If the unit added has both renewable and non-renewable components (e.g. a wind/diesel unit), the eligibility limit of 15MW for a small-scale CDM project activity applies only to the renewable component. If the unit added co-fires ([non-)] renewable biomass and fossil fuel, the capacity of the entire unit shall not exceed the limit of 15MW.

4. Project activities that seek to retrofit or modify an existing facility for renewable energy generation are included in this category. To qualify as a small-scale project, the total output of the modified or retrofitted unit shall not exceed the limit of 15 MW.

[1] Not connected to the regional or national grids and not exporting and/or importing power from the national/regional grids.

5. In the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than 15 MW and should be physically distinct[2] from the existing units.

Boundary

6. The physical, geographical site of the renewable energy generating unit and the equipment that uses the electricity produced delineates the project boundary.

Baseline

7. The energy baseline is the fuel consumption of the technology in use or that would have been used in the absence of the project activity to generate the equivalent quantity of energy[3], estimated using one of the following three options: ~~The project participants may use one of the following energy baseline formulae:~~

(a) Option 1:

~~$E_B = \Sigma_i(n_i . c_i)/(1 - l)$~~

$$E_{BL,y} = \sum_i \left(n_i * EC_{i,y}\right)/\left(1-l\right) \quad (1)$$

Where:

$E_{BL,y}$	Annual energy baseline; kWh
$\sum_i$	The sum over the group of *i* renewable energy technologies (e.g., renewable energy technologies for ~~residential~~ households, rural health centres, rural schools, grain millings~~s~~, water pumping, ~~for~~ irrigation, etc.) implemented as part of the project activity
n_i	Number of consumers supplied by installations of the renewable energy technology belonging to the group of *i* renewable energy technologies during the year
$EC_{i,y}$ ~~c_i~~	Estimate of average annual individual energy consumption observed in closest grid electricity systems among rural grid connected consumers belonging to the same group of *i* renewable energy technologies. If energy consumption is metered, $EC_{i,y}$ ~~c_i~~ is the average energy consumed[4] by consumers belonging to the group of *i* renewable energy technologies; kWh

[2] Physically distinct units are those that are capable of generating electricity without the operation of existing units, and that do not directly affect the mechanical, thermal, or electrical characteristics of the existing facility. For example, the replacement of the nacelle assembly or blades of a wind battery charger would not be considered "physically distinct".

[3] Renewable energy lighting applications shall consider the equivalent level of lighting service instead of energy (See annex 1 of EB 08)

[4] Potential oversizing of the power capacity installed or energy generated by the CDM project activity shall not be reflected in the baseline and emissions reduction calculation. For this reason, the energy value taken into account shall be the energy consumed. It cannot be the electricity output, except if the project

l Average technical distribution losses that would have been observed in diesel powered mini-grids installed by public programmes or distribution companies in isolated areas, expressed as a fraction[5]

~~E_B annual energy baseline; in kWh/y per year.~~

~~Σ_i the sum over the group of "*i*" renewable energy technologies (e.g., residential, rural health centre, rural school, mills, water pump for irrigation, etc.) implemented as part of the project.~~

~~n_i number of consumers supplied by installations of the renewable energy technology belonging to the group of "*i*" renewable energy technologies during the year.~~

~~e_i estimate of average annual individual consumption (in kWh/y per year) observed in closest grid electricity systems among rural grid connected consumers belonging to the same group of "*i*" renewable energy technologies. If energy consumption is metered, e_i is the average energy consumed[6] by consumers belonging to the group of "*i*" renewable energy technologies.~~

~~l average technical distribution losses that would have been observed in diesel powered mini-grids installed by public programmes or distribution companies in isolated areas, expressed as a fraction.[7]~~

~~OR~~

(b) Option 2:

~~$E_B = \Sigma_i O_i / (1 - l)$~~

$$E_{BL,y} = \sum_i EG_{i,y} / (1 - l) \quad \textbf{(2)}$$

Where:

$E_{BL,y}$ Annual energy baseline; kWh/y

$\sum_i$ The sum over the group of *i* renewable energy technologies (e.g., renewable energy technologies for solar home systems, solar pumps) implemented as part of the project activity

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participant justifies that it represent a reasonable estimate of the energy that would have been generated by a diesel generator larger than 35 kW and operating with a load factor of at least 50% to provide similar electricity services.

[5] A reasonable default value for distribution losses on low voltage rural distribution grid could be 20%.

[6] ~~Potential oversizing of the power capacity installed or energy generated by the CDM project activity shall not be reflected in the baseline and emissions reduction calculation. For this reason, the energy value taken into account shall be the energy consumed. It cannot be the electricity output, except if the project participant justifies that it represent a reasonable estimate of the energy that would have been generated by a diesel generator larger than 35 kW and operating with a load factor of at least 50% to provide similar electricity services.~~

[7] A reasonable default value for distribution losses on low voltage rural distribution grid could be 20%.

$EG_{i,y}$ The estimated annual output of the renewable energy technologies of the group of *i* renewable energy technologies installed; kWh/y

l Average technical distribution losses that would have been observed in diesel powered mini-grids installed by public programmes or distribution companies in isolated areas, expressed as a fraction

~~E_B annual energy baseline; in kWh/y per year~~

~~Σ_i the sum over the group of "*i*" renewable energy technologies (e.g., solar home systems, solar pumps) implemented as part of the project.~~

~~O_i the estimated annual output of the renewable energy technologies of the group of "*i*" renewable energy technologies installed; (in kWh/y per year)~~

~~*l* average technical distribution losses that would have been observed in diesel powered mini-grids installed by public programmes or distribution companies in isolated areas, expressed as a fraction.~~

~~OR~~

(c) Option 3: The baseline can be a ~~A~~ trend adjusted projection of historic fuel consumption ~~is acceptable~~ in situations where an existing technology is replaced. For the specific case of lighting devices a daily usage of 3.5 hours shall be assumed, unless it is demonstrated that the actual usage hours adjusted for seasonal variation of lighting is different based on representatives sample survey (90% confidence interval +/-10% error) done for minimum of 90 days.

~~8. If the project participants wish to use a different formula to determine E_{BL}, the proposal needs to be accepted in accordance with the modalities for new methodologies for small-scale project activities (see paragraph 2 of the general guidance).~~

8. For Option 1 and Option 2 above the emissions baseline is the energy baseline calculated in accordance with paragraphs 7a and 7b above times a default emission factor ~~calculated as below~~:

$$BE_{CO_2,y} = E_{BL,y} * EF_{CO_2} \quad \textbf{(3)}$$

Where:

$BE_{CO_2,y}$ Emissions in the baseline in year y; t CO_2

$E_{BL,y}$ Annual energy baseline in year y; kWh

EF_{CO2} CO_2 emission factor ~~per unit of energy~~; t CO_2/kWh

For EF_{CO2} a default value of 0.8 kg CO_2-e/kWh, which is derived from diesel generation units, may be used. A small-scale project proponent may, with adequate justification use a higher emissions factor from Table I.D.1 under category AMS I.D.

9. In the case of Option 3, tThe emissions baseline is the historic fuel consumption calculated in accordance with paragraph 7c above times the CO_2 emission ~~coefficient~~ factor for the fuel displaced. IPCC default values for emission ~~coefficients~~ factors may be used.

$$BE_{CO_2,y} = \sum_j FC_{j,y} * NCV_j * EF_{CO_2,j} \quad (4)$$

Where:

$BE_{CO_2,y}$	Emissions in the baseline in year y; t CO_2
$FC_{j,y}$	Amount of fuel consumption of fuel type ~~i~~ *j*; mass or volume unit in year y
NCV_j	Net calorific value of fuel type ~~i~~ *j*; gigajoule per mass or volume unit
$EF_{CO_2,j}$	CO_2 emission factor of fuel type ~~i~~ *j*; t CO_2/GJ
~~i~~ *j*	Fuel type used for combustion

~~For option (1) and option (2) above the emissions baseline is the energy baseline calculated in accordance with paragraphs and above times a default emission factor calculated as below$E_{BL,CO2}$ = E_{BL}*$EF_{CO2, kwh}$~~

~~For $EF_{CO2, kwh}$ The emission factorA a default value of 0.8 kKg CO_2-e/kWh, which is derived from diesel generation units, may be used for options 7(a) and 7(b). A small-scale project proponent may, with adequate justification use a higher emissions factor from Table I.D.1 under category AMS I.D.~~

10. In the case of project activities adding renewable energy capacity, if the availability of renewable resources is limited, the impact of a decrease in electricity production from the units installed before the project implementation must be considered.

For the specific case of hydropower plants, this effect could be considered calculating the production of electricity that must be used for the emission reduction calculation with the following procedure:

(1) E~~To estimate e~~very year during the crediting period, the energy that would have been produced under ~~in~~ the same hydrological conditions by the units installed before the project is estimated;

(2) The electricity generation ~~production~~ i.e. $EG_{PJ,hydro,add,y}$ ~~EG_y (MWh/ year) that must~~ to be considered to calculate emission reductions is calculated with the following formula:

~~$EG_y = TE_y - WTE_y$~~

$$EG_{PJ,hydro,add,y} = EG_{hydro,y} - EG_{hydro,old,y} \quad (5)$$

Where:

$EG_{PJ,hydro,add,y}$	Net increase in electricity generation by hydropower plants in year *y* that should be considered as the energy baseline (E_{BL}) in year y; kWh
$EG_{hydro,y}$ b	~~The~~ total actual electricity produced in year *y* in the plant (all units); kWh
$EG_{hydro,old,y}$	~~The~~ estimated electricity that would have been produced by the units installed before the project under the hydrological conditions of year *y*; kWh

~~EG_y electricity production in year y that should be considered for calculating energy baseline (E_{BL})....; MWh/y~~

~~TE_y the actual electricity produced in year *y* in the plant (all units); MWh/y~~

11. In the case of project activities that involves the addition of renewable energy generation units at an existing renewable power generation facility, where the existing and new units share the use of common and limited renewable resources (e.g. streamflow, reservoir capacity, biomass residues), the potential for the project activity to reduce the amount of renewable resource available to, and thus electricity generation by, existing units must be considered in the determination of baseline emissions, project emissions, and/or leakage, as relevant.

For project activities that involve the addition of new generation units (e.g., turbines) at an existing facility, electricity generation ~~the increase in electricity production associated with the project~~ (~~EG_y in~~ MWh/ y~~ear~~) should be calculated as follows:

~~$EG_y = TE_y - WTE_y$~~

$$EG_{electrical,add,y} = EG_{electrical,PJ,y} - EG_{electrical,old,y} \quad (6)$$

Where:

$EG_{electrical,add,y}$	Net increase in electricity generation by renewable energy plant in year *y* that should be considered as energy baseline (E_{BL}); kWh
$EG_{electrical,PJ,y}$	Total actual electricity produced in year *y* by all units, existing and new project units; kWh
$EG_{electrical,old,y}$	Estimated electricity that would have been produced by existing units (installed before the project activity) in year *y* in the absence of the project activity; kWh

~~EG_y Electricity generation by renewable energy plant in year y that should be considered for calculating energy baseline (E_{BL}); MWh/y electricity productiongeneration in year y ; MWh/y~~

~~TE_y = the total electricity produced in year *y* by all units, existing and new project units; MWh/y~~

~~, where~~ The value $EG_{electrical,old,y}$ ~~WTE_y~~ is given by

~~$WTE_y = MAX(WTE_{actual,y}, WTE_{estimated,y})$~~

$$EG_{electrical,old,y} = MAX\left(EG_{electrcial,actual,y}, EG_{electrical,estimated,y}\right) \quad (7)$$

Where:

$EG_{electrical,actual,y}$	Actual, measured electrical energy production of the existing units in year *y*; kWh
$EG_{electrical,estimated,y}$	Estimated electrical energy that would have been produced by the existing units under the observed availability of the renewable resource (e.g., hydrological conditions) for year *y*; kWh

~~$WTE_{actual,y}$ = the actual, measured electricity production of the existing units in year *y*; MWh/y~~

~~$WTE_{estimated,y}$ = the estimated electricity that would have been produced by the existing units under the observed availability of the renewable resource (e.g., hydrological conditions) for year *y*;. MWh/y~~

If the existing units shut down, are derated, or otherwise become limited in production, the project activity should not get credit for generating electricity from the same renewable resources that would have otherwise been used by the existing units (or their replacements). Therefore, the equation for $EG_{electrical,old,y}$ ~~WTE_y~~ still holds, and the value for $EG_{electrical,estimated,y}$ ~~$WTE_{estimated,y}$~~ should continue to be estimated assuming the capacity and operating parameters are the same as those~~at~~ at the time of the start of the project activity.

If the existing units are subject to modifications or retrofits that increase production, then $EG_{electrical,old,y}$ ~~WTE_y~~ can be estimated using the procedures described for $EG_{BL,electrical,retrofit}$~~$EG_{baseline}$~~below.

12. For project activities that seek to retrofit or modify an existing facility for renewable energy generation the baseline scenario is the following:

In the absence of the CDM project activity, the existing facility would continue to provide electricity ($EG_{BL,electrical,retrofit,y}$) ~~in MWh/year~~) at historical average levels ($EG_{historical,electrcial,y}$) ~~in MWh/year~~), until the time at which the generation facility would be likely to be replaced or retrofitted in the absence of the CDM project activity ($DATE_{BaselineRetrofit}$). From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and baseline electricity production ~~($EG_{BL,Retrofit}$ $EG_{baseline}$)~~ is assumed to equal project electricity production ~~($EG_{PJ,y}$, in MWh/year),~~ and no emission reductions are assumed to occur.

~~$EG_{BL,Retrofit,y} EG_{retro,PJ,y} = MAX(EG_{historical,y}, EG_{estimated,y})$ until $DATE_{BaselineRetrofit}$~~

$$EG_{BL,electrical,retrofit,y} = MAX\left(EG_{historical,electrical}, EG_{estimated,electrical,y}\right) \quad until \quad DATE_{BaselineRretrofit} \quad (8)$$

~~$EG_{baseline} EG_{BL,Retrofit} = EG_{PJ,y}$ on/after $DATE_{BLaselineRetrofit}$~~

Where:

$EG_{BL,electrical,retrofit,y}$	Electrical energy production by an existing facility in the absence of the project activity; ~~MWh/y~~ kWh

$EG_{historical,electrical}$	Average of historical annual electricity levels delivered by the existing facility, spanning all data from the most recent available year (or month, week or other time period) to the time at which the facility was constructed, retrofit, or modified in a manner that significantly affected output (i.e., by 5% or more); kWh
$EG_{estimated\ electrical,\ ,y}$	Estimated electrical energy that would have been produced by the existing units under the observed availability of renewable resource (e.g., hydrological conditions) in year *y;* kWh
$DATE_{BaselineRL\_retrofit}$	Date at which the existing generation facility is likely to be replaced or retrofitted in the absence of the CDM project activity

The eEnergy bBaseline ~~emissions (E_{BL}~~ ~~BE_y in t CO_2)~~ is ~~are~~ then, ~~the product of the baseline emissions factor (EF_y in t CO_2/MWh) , times~~ the electricity supplied by the project activity ($EG_{PJ,\ electrical,\ retrofit,\ y}$ ~~in MWh/y~~) minus the baseline electricity supplied in the case of modified or retrofit facilities ($EG_{baselineBL,\ electrical,retrofit,y}$ ~~in MWh/y~~), as follows:

~~$BE_y = (EG_{PJ,y} - EG_{baseline}) \cdot EF_y$~~

~~where:~~

$$E_{BL,y} = \left(EG_{PJ,retrofit,y} - EG_{BL,retrofit,y}\right) \quad \textbf{(9)}$$

Where:

$E_{BL,y}$	Annual energy baseline in year y; kWh
$EG_{PJ,electrical,retrofit,y}$	Electricity supplied by the project activity in year y (after retrofit); kWh
$EG_{BL,\ retrofit,y}$	Electricity supplied by an existing facility in the absence of the project activity in year y (before retrofit); kWh

$EG_{historical,\ electrical}$ is the average of historical electricity levels delivered by the existing facility, spanning all data from the most recent available year (or month, week or other time period) to the time at which the facility was constructed, retrofit, or modified in a manner that significantly affected output (i.e., by 5% or more), expressed in kilowatt-hour per year. A minimum of 5 years (60 months) (excluding abnormal years) of historical generation data is required in the case of hydro facilities. For other facilities, a minimum of 3 years of data is required. In the case that 5 years of historical data (or three years in the case of non-hydro project activities) are not available e.g., due to recent retrofits or exceptional circumstances as described in footnote[8] – a new methodology or methodology revision must be proposed.

[8] Data for periods affected by unusual circumstances such as natural disasters, conflicts, and transmission constraints shall be excluded

~~$EG_{estimated,y}$ is the estimated electricity that would have been produced by the existing units under the observed availability of renewable resource (e.g. hydrological conditions) for year y.~~

All project electricity generation above baseline levels (~~$EG_{baseline}$~~ $EG_{BL,\ electrical,\ retrofit,y}$) would have otherwise been generated by the operation of power plants and by the addition of new generation sources.

In order to estimate the point in time when the existing equipment would need to be replaced in the absence of the project activity ($DATE_{BaselineR}$~~$_{Laseline,\ rR}$~~$_{etrofit}$), project participants may take the following approaches into account:

(a) The typical average technical lifetime of the equipment type may be determined and documented, taking into account common practices in the sector and country, e.g., ~~based~~ on the basis of industry surveys, statistics, technical literature, etc.

(b) The common practices of the responsible company regarding replacement schedules may be evaluated and documented, e.g., ~~based~~ on the basis of historical replacement records for similar equipment.

The point in time when the existing equipment would need to be replaced in the absence of the project activity should be chosen in a conservative manner: that is ~~i.e.,~~ if a range is identified, the earliest date should be chosen.

Leakage

13. If the energy generating equipment is transferred from another activity or if the existing equipment is transferred to another activity, leakage is to be considered.

Monitoring

14. Monitoring shall consist of:

(a) An annual check of all systems or a sample thereof to ensure that they are still operating (other evidence of continuing operation, such as on-going rental/lease payments could be a substitute).

OR

(b) Metering the electricity generated by all systems in ~~of~~ a sample thereof.

15. For projects where only biomass or biomass and fossil fuel are used the amount of biomass and fossil fuel input shall be monitored.

16. For projects consuming biomass, a specific fuel consumption[9] of each type of fuel (biomass or fossil) to be used should be specified *ex ante*. The consumption of each type of fuel shall be monitored.

[9] Specific fuel consumption is the fuel consumption per unit of electricity generated (e.g., tonnes of bagasse per megawatt-hour~~MWh~~).

17. If fossil fuel is used, the electricity generation metered should be adjusted ~~to deduct~~ by deducting the electricity generation from fossil fuels using the specific fuel consumption and the quantity of fossil fuel consumed.

18. If more than one type of biomass fuel is consumed, each shall be monitored separately.

19. The amount of electricity generated using biomass fuels calculated as per paragraph 17 shall be compared with the amount of electricity generated calculated using specific fuel consumption and amount of each type of biomass fuel used. The lower of the two values should be used to calculate emission reductions.

Project activity under a programm~~me~~ of activities

The following conditions apply for use of this methodology in a project activity under a programm~~me~~ of activities:

21. In the specific case of biomass project activities the applicability of the methodology is limited to either project activities that use biomass residues only or biomass from dedicated~~designated~~ plantations complying with the applicability conditions of AM0042 as in A~~a~~nnex 1 of this document.

22. In the specific case of biomass project activities the determination of leakage shall be done following the general guidance for leakage in small-scale biomass project activities (attachment C of appendix B[10] of simplified modalities and procedures for small-scale clean development mechanism project activities) or following the ~~prescriptions~~ procedures included in the leakage section of AM0042. ~~as in Aannex 1 of this document.~~In case the project activity involves the replacement of equipment and the leakage ~~effect~~ from ~~of~~ the use of the replaced equipment in another activity is neglected, because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented. The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.

[10] Available on http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html.

Annex 1 (applicability conditions and guidance on leakage below concerns pProject activity under a programme of activities)

meApplicability

1. The methodology is applicable under the following conditions:

- The project activity involves the installation of a new grid-connected power plant that is mainly fired with renewable biomass from a dedicated plantation (fossil fuels or other types of biomass may be co-fired).;
- Prior to the implementation of the project activity, no power was generated at the project site (i.e., the project plant does not substitute or amend any existing power generation at the project site).;
- The geographic and system boundaries for the relevant electricity grid can be clearly identified and information on the characteristics of the grid is available.;
- Biomass used by the project facility is not stored for more than one year.;
- The dedicated plantation must be newly established as part of the project activity for the purpose of supplying biomass exclusively to the project.
- The biomass from the plantation is not chemically processed (e.g., esterification to produce biodiesel, production of alcohols from biomass, etc.) prior to combustion in the project plant; but however, it may be processed mechanically or be dried.;
- The site preparation does not cause longer-term net emissions from soil carbon. Carbon stocks in soil organic matter, litter and deadwood can be expected to decrease more due to soil erosion and human intervention or increase less in the absence of the project activity;
- The land area of the dedicated plantation will be planted by direct planting and/or seeding;
- After harvest, regeneration will occur either by direct planting or natural sprouting;
- Grazing will not occur within the plantation;
- No irrigation is undertaken for the biomass plantations;
- The land area where the dedicated plantation will be established is, prior to project implementation, severely degraded and in absence of the project activity would have not been used for any other agricultural or forestry activity. The land degradation can be demonstrated using one or more of the following indicators:
  (a) Vegetation degradation, e.g.,
    - crown cover of pre-existing trees has decreased in the recent past for reasons other than sustainable harvesting activities;

  (b) Soil degradation, e.g.,
    - soil erosion has increased in the recent past;
    - soil organic matter content has decreased in the recent past.

  (c) Anthropogenic influences, e.g.,
    - there is a recent history of loss of soil and vegetation due to anthropogenic actions; and
    - demonstration that there exist anthropogenic actions/activities that prevent the possible occurrence of natural regeneration.

Leakage

2. An important potential source of leakage for this project activity is an increase in emissions from fossil fuel combustion or other sources due to diversion of biomass residues from other uses to the project plant as a result of the project activity.

If biomass residues are co-fired in the project plant, project participants shall demonstrate that the use of the biomass residues does not result in an increase in d use of fossil fuel consumption s or other GHG emissions elsewhere. For this purpose, project participants shall assess as part of the monitoring the supply situation for each type of biomass residue *k* used in the project plant. Table 6 below outlines the options that may be used to demonstrate that the biomass residues used in the plant did not increase fossil fuel consumption or other GHG emissions elsewhere.

B1	The biomass residues are dumped or left to decay under mainly aerobic conditions. This applies, for example, to dumping and decay of biomass residues on fields.
B2	The biomass residues are dumped or left to decay under clearly anaerobic conditions. This applies, for example, to deep landfills with more than 5-meter depth. This does not apply to biomass residues that are stock-piled[5] or left to decay on fields.
B3	The biomass residues are burnt in an uncontrolled manner without utilizing them for energy purposes.
B4	The biomass residues are sold to other consumers in the market and the predominant use of the biomass residues in the region/country is for energy purposes (heat and/or power generation).
B5	The biomass residues are used as feedstock in a process (e.g. in the pulp and paper industry).
B6	The biomass residues are used as fertilizer
B7	The proposed project activity not undertaken as a CDM project activity (use of the biomass residues in the project plant)
B8	Any other use of the biomass residues.

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B2 The biomass residues are dumped or left to decay under clearly anaerobic conditions. This applies, for example, to deep landfills with more than 5 meters. This does not apply to biomass residues that are stock-piled[5] or left to decay on fields.

B3 The biomass residues are burnt in an uncontrolled manner without utilizing them for energy purposes.

B4 The biomass residues are sold to other consumers in the market and the predominant use of the biomass residues in the region/country is for energy purposes (heat and/or power generation)

B5 The biomass residues are used as feedstock in a process (e.g. in the pulp and paper industry)
B6 The biomass residues are used as fertilizer

B7 The proposed project activity not undertaken as a CDM project activity (use of the biomass residues in the project plant)

B8 Any other use of the biomass residues

Which approach should be used depends on the most plausible baseline scenario for the use of the biomass residues. Where scenarios B1, B2 or B3 apply, use approaches L_1, L_2 and/or L_3. Where scenario B4 applies, use approaches L_2 or L_3. Where scenario B5 applies, use approach L_4.

Table 6. Approaches to rule out leakage

L_1	Demonstrate that at the sites where the project activity is supplied from with biomass residues, the biomass residues have not been collected or utilized (e.g., as fuel, fertilizer or feedstock) but have been dumped and left to decay, land-filled or burnt without energy generation (e.g., field burning) prior to the implementation of the project activity. Demonstrate that this practice would continue in the absence of the CDM project activity, e.g., by showing that in the monitored period no market has emerged for the biomass residues considered or by showing that it would still not be feasible to utilize the biomass residues for any purposes (e.g., owing to due to the remote location where the biomass residue is generated).
L_2	Demonstrate that there is an abundant surplus of the biomass residue, which is not utilized, in the region of the project activity which is not utilized. For this purpose, demonstrate that the quantity of available biomass residues of type *k* in the region is at least 25% larger than the quantity of biomass residues of type *k* that are utilized (e.g., for energy generation or as feedstock), including the project plant.
L_3	Demonstrate that suppliers of the type of biomass residue in the region of the project activity are not able to sell all of their biomass residues. For this purpose, project participants shall demonstrate that the ultimate supplier of the biomass residue (who supplies the project) and a representative sample of suppliers of the same type of biomass residue in the region had a surplus of biomass residues (e.g., at the end of the period during which biomass residues are sold), which they could not sell and which are not utilized.
L_4	Identify the consumer that would use the biomass residue in the absence of the project activity (e.g., the former consumer). Demonstrate that this consumer has substituted the biomass residue diverted to the project with other types of biomass residues (and not with fossil fuels or other types of biomass than biomass residues[11]) by showing that the former user only fires biomass residues for which leakage can be ruled out using approaches L_2 or L_3. Provide credible evidence and document the types and amounts of biomass residues used by the former user as replacement for the biomass residue fired in the project activity and apply approaches L_2 or L_3 to these types of biomass residues. Demonstrate that the substitution of the biomass residues used in the project activity with other types of biomass residues does not require a significant additional energy input except for the transportation of the biomass residues.

Where If project participants wish to use approaches L_2, L_3 or L_4 to assess leakage effects, they shall clearly define the geographical boundary of the region and document it in the draft

[11] The generation of other types of biomass than biomass residues may be involved with significant GHG emissions, for example, from cultivation or harvesting.

CDM-PDD. In defining the geographical boundary of the region, project participants should take the usual distances for biomass transports into account:, that isi.e., if biomass residues are transported up to 50 km, the region may cover a radius of 50 km around the project activity. In any case, the region should cover a radius around the project activity of at least 20 km but not more than 200 km. Once defined, the region should not be changed during the crediting period(s).

Project participants shall apply a leakage penalty to the quantity of biomass residues, for which project participants cannot demonstrate with one of the approaches above that the use of the biomass residue does not result in leakage. The leakage penalty aims at adjusting emission reductions for leakage effects in a conservative manner, assuming that this quantity of biomass residues is substituted by the most carbon intensive fuel in the country.

If for a certain biomass residue type *k* used in the project leakage effects cannot be ruled out with one of the approaches above, leakage effects for the year *y* shall be calculated as follows:

$$LE_y = EF_{CO_2,LE} \cdot \sum_h FC_{biomass,h,y} \cdot NCV_h \qquad (10)$$

Where:

LE_y	=	lLeakage emissions during the year *y*; (t CO_2/yr)
$EF_{CO2,LE}$	=	CO_2 emission factor of the most carbon intensive fuel used in the country; (t CO_2/GJ)
$BF_{LE}FC_{biomass,hn,y}$	=	qQuantity of biomass residue type *hn* used for heat generation as a result of the project activity during the year *y* and for which leakage can not be ruled out using one of the approaches L_1, L_2, L_3 or L_4; (tons of dry matter (d.m.) or liter)
NCV_n	=	nNet calorific value of the biomass residue type *hn*; (GJ/ton d.m. of dry matter or GJ/liter)
*h*N	=	bBiomass residue type *hn* for which leakage can not be ruled out using one of the approaches L_1, L_2, L_3 or L_4

In case of approaches L_1, $FCBF_{biomassLE,hn,y}$ corresponds to the quantity of biomass residue type *hn* that is obtained from the relevant source or sources.

In case of approaches L_2 or L_3, $FCBF_{biomassLE,hn,y}$ corresponds to $FC_{biomass,PJ,k,y}$, the quantity of biomass residue type *k* used in the project plant as a result of the project activity during the year *y* ($FC_{biomass}BF_{LE,hn,y} = FC_{biomass,}BF_{PJ,k,y}$, where *hn* = *k*).

In case of approach L_4, $\left(FC_{biomass,h,y} \cdot NCV_h\right)$ corresponds to the lower value of the following quantities:

(a) The quantity of fuel types *m*, expressed in energy quantities, that are used by the former user of the biomass residue type *k* and for which leakage can not be ruled out because the fuels used are either (i) fuels types other than biomass residues (e.g., fossil fuels or biomass types other than biomass residues) or (ii) are biomass residues but leakage can not be ruled out for those types of biomass residues with approaches L_2 or L_3; as follows:

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I.A. Electricity generation by the user (cont)

$$FC_{biomass,h,y} \cdot NCV_h = \sum_m FC_{m\_former\ user,y} \cdot NCV_m \qquad (11)$$

~~Where:~~

~~$FCBF_{biomassLE,hn,y}$~~	=	~~qQuantity of biomass residue type *hn* used for heat generation as a result of the project activity during the year *y* and for which leakage can not be ruled out using approach L_4; (tons of d.m. dry matter or liter)~~
~~NCV_{hn}~~	=	~~nNet calorific value of the biomass residue type *hn* (GJ/t d.m. on of dry matter or GJ/liter)~~
~~*h*N~~	=	~~bBiomass residue type *hn* for which leakage can not be ruled out using approach L_4~~
~~$FC_{fm\_former\ user,m,y}$~~	=	~~qQuantity of fuel type *m* used by the former user of the biomass residue type *hn* during the year *y* (mass or volume unit)~~
~~NVC_m~~		~~nNet calorific value of fuel type *m*; (GJ/t d.m.on of dry matter or GJ/liter)~~
~~*m*M~~	=	~~fFuel type *m*, being either (i) a fuel type other than a biomass residue (e.g. fossil fuel or biomass other than biomass residues) or (ii) a biomass residues for which leakage can not be ruled out with approaches L_2 or L_3~~

~~(b) The quantity of biomass residue type *k*, expressed in energy quantities, used in the project plant during the year *y* ($FCBF_{biomassLE,hn,y} = FC_{biomass,}BF_{PJ,k,y}$, where $hn = k$).~~

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History of the document*

Version	Date	Nature of revision
13	EB 42, Annex 16 26 September 2008	Include project activities for renewable energy based lighting (e.g. solar-lamps) to displace fossil fuel usage in lighting in rural households that are not grid connected or connected to a weak grid prone to blackouts/brownouts.
12	EB 33, Annex 19 22 June 2007	Clarify the applicability of the methodology and maintain consistency with the revision AMS-I.B, which provides guidance for situations where electricity is a co-product of the project activity, providing mechanical energy for the user.
11	EB 32, Annex 25 22 June 2007	Clarify the monitoring of biomass in project activities that apply this methodology which is consistent with monitoring of biomass in the approved methodology AMS I.D.
10	EB 31, Annex 19 04 May 2007	Clarify that all cogeneration project activities should apply AMS I.C.
09	EB 28, Annex 24 15 December 2006	Maintain consistency across categories particularly in relation to AMS I.D; Revised guidance on capacity addition activities and a default emission coefficient of 0.8 kg CO2 /kWh for diesel generation, as opposed to 0.9 kg CO2 /kWh.
08	EB 23, Annex 29 24 February 2006	Include provisions for retrofit and renewable energy capacity additions as eligible activities; Provide clarification for baseline calculations under category I.D; Provide clarification on the applicability of Category I.A as against Category I.D.

* This document, together with the 'General Guidance' and all other approved SSC methodologies, was part of a single document entitled: Appendix B of the Simplified Modalities and Procedures for Small-Scale CDM project activities until version 07.

History of the document: Appendix B of the Simplified Modalities and Procedures for Small-Scale CDM project activities

Appendix B of the Simplified Modalities and Procedures for Small-Scale CDM project activities contained both the General Guidance and Approved Methodologies until version 07. After version 07 the document was divided into separate documents: 'General Guidance' and separate approved small-scale methodologies (AMS).		
Version	**Date**	**Nature of revision**
07	EB 22, Para. 59 25 November 2005	References to "non-renewable biomass" in Appendix B deleted.
06	EB 21, Annex 22 20 September 2005	Guidance on consideration of non-renewable biomass in Type I methodologies, thermal equivalence of Type II GWhe limits included.
05	EB 18, Annex 6 25 February 2005	Guidance on 'capacity addition' and 'cofiring' in Type I methodologies and monitoring of methane in AMS III.D included.
04	EB 16, Annex 2 22 October 2004	AMS II.F was adopted, leakage due to equipment transfer was included in all Type I and Type II methodologies.
03	EB 14, Annex 2 30 June 2004	New methodology AMS III.E was adopted.
02	EB 12, Annex 2 28 November 2003	Definition of build margin included in AMS I.D, minor revisions to AMS I.A, AMS III.D, AMS II.E.
01	EB 7, Annex 6 21 January 2003	Initial adoption. The Board at its seventh meeting noted the adoption by the Conference of the Parties (COP), by its decision 21/CP.8, of simplified modalities and procedures for small-scale CDM project activities (SSC M&P).