CLEAN DEVELOPMENT MECHANISM

AMS-I.D

Small-scale Methodology

Grid connected renewable electricity generation

Version 18.0

Sectoral scope(s): 01

United Nations
Framework Convention on
Climate Change

TABLE OF CONTENTS **Page**

1. Introduction

1. The following table describes the key elements of the methodology:

Table 1. Methodology key elements

Typical project(s)	Construction and operation of a new power plant/unit or retrofit, rehabilitation (or refurbishment), replacement or capacity addition of an existing power plant that uses renewable energy sources and supplies electricity to the grid
Type of GHG emissions mitigation action	Renewable energy. Displacement of electricity that would be provided to the grid by more-GHG-intensive means

2. Scope, applicability, and entry into force

2.1. Scope

2. This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass:

   (a) Supplying electricity to a national or a regional grid; or

   (b) Supplying electricity to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.

3. Illustration of respective situations under which each of the methodology (i.e. “AMS-I.D.: Grid connected renewable electricity generation”, “AMS-I.F.: Renewable electricity generation for captive use and mini-grid” and “AMS-I.A.: Electricity generation by the user) applies is included in the appendix.

2.2. Applicability

4. This methodology is applicable to project activities that:

   (a) Install a Greenfield plant;

   (b) Involve a capacity addition in (an) existing plant(s);

   (c) Involve a retrofit of (an) existing plant(s);

   (d) Involve a rehabilitation of (an) existing plant(s)/unit(s); or

   (e) Involve a replacement of (an) existing plant(s).

5. Hydro power plants with reservoirs that satisfy at least one of the following conditions are eligible to apply this methodology:

   (a) The project activity is implemented in an existing reservoir with no change in the volume of reservoir;

(b) The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m^2;

(c) The project activity results in new reservoirs and the power density of the power plant, as per definitions given in the project emissions section, is greater than 4 W/m^2.

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

7. Combined heat and power (co-generation) systems are not eligible under this category.

8. In the case of project activities that involve the capacity 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[1] from the existing units.

9. In the case of retrofit, rehabilitation or replacement, to qualify as a small-scale project, the total output of the retrofitted, rehabilitated or replacement power plant/unit shall not exceed the limit of 15 MW.

10. In the case of landfill gas, waste gas, wastewater treatment and agro-industries projects, recovered methane emissions are eligible under a relevant Type III category. If the recovered methane is used for electricity generation for supply to a grid then the baseline for the electricity component shall be in accordance with procedure prescribed under this methodology. If the recovered methane is used for heat generation or cogeneration other applicable Type-I methodologies such as “AMS-I.C.: Thermal energy production with or without electricity” shall be explored.

11. In case biomass is sourced from dedicated plantations, the applicability criteria in the tool “Project emissions from cultivation of biomass” shall apply.

2.3. Entry into force

12. The date of entry into force is the date of the publication of the EB 81 meeting report on 28 November 2014.

3. Normative references

13. Project participants shall apply the “General guidelines for SSC CDM methodologies, information on additionality (attachment A to Appendix B) and “General guidance on leakage in biomass project activities” (attachment C to Appendix B) provided at <http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html> mutatis mutandis.

[1] 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 addition of a steam turbine to an existing combustion turbine to create a combined cycle unit would not be considered “physically distinct”.

14. This methodology also refers to the latest approved versions of the following approved methodologies and tools:

    (a) "Project emissions from cultivation of biomass";

    (b) "ACM0002: Grid-connected electricity generation from renewable source";

    (c) "AMS-I.A.: Electricity generation by the user";

    (d) "AMS-I.C.: Thermal energy production with or without electricity";

    (e) "AMS-I.F.: Renewable electricity generation for captive use and mini-grid";

    (f) "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion";

    (g) "Tool to calculate the emission factor for an electricity system";

    (h) "Tool to determine the remaining lifetime of equipment";

    (i) "Assessment of the validity of the original/current baseline and update of the baseline at the renewal of the crediting period".

4. Definitions

15. The definitions contained in the Glossary of CDM terms shall apply.

16. In addition, for the purpose of this methodology, the following definitions apply:

    (a) **Backup generator** - a generator that is used in the event of an emergency, such as power supply outage due to either main generator failure or grid failure or tripping of generator units, to meet electricity demand of the equipment at power plants/units site during emergency;

    (b) **Capacity addition** - a capacity addition is an investment to increase the installed power generation capacity of existing power plants through: (i) the installation of new power plants/units besides the existing power plants/units; or (ii) the installation of new power plants/units, additional to the existing power plants/units. The existing power plants/units in the case of capacity addition continue to operate after the implementation of the project activity;

    (c) **Co-fired system** - uses both fossil fuels and renewable energy source in a single boiler for simultaneous combustion and fossil fuel may be used during a period of time when the biomass is not available;

    (d) **Existing reservoir** - a reservoir is to be considered as an "existing reservoir" if it has been in operation for at least three years before the implementation of the project activity;

    (e) **Greenfield power plant** - a new renewable energy power plant that is constructed and operated at a site where no renewable energy power plant was operated prior to the implementation of the project activity;

    (f) **Installed power generation capacity (or installed capacity or nameplate capacity)** - the installed power generation capacity of a power unit is the capacity, expressed in Watts or one of its multiples, for which the power unit has been designed to operate at nominal conditions. The installed power generation capacity of a power plant is the sum of the installed power generation capacities of its power units;

(g) **Rehabilitation (or refurbishment)** - is an investment to restore existing power plants/units that was severely damaged or destroyed due to foundation failure, excessive seepage, earthquake, liquefaction, or flood. The primary objective of rehabilitation or refurbishment is to restore the performances of the facilities. Rehabilitation may also lead to increase in efficiency, performance or power generation capacity of the power plants/units with/without adding new power plants/units;

(h) **Replacement** - is an investment in new power plants/units that replaces one or several existing units at the existing power plant. The new power plants/units has the same or a higher power generation capacity than the plants/units that was replaced;

(i) **Reservoir** - a reservoir is a water body created in valleys to store water generally made by the construction of a dam;

(j) **Retrofit** - or modification is an investment to repair or modify existing operating power plants/units, with the purpose to increase the efficiency, performance or power generation capacity of the plants/units, without adding new power plants/units. A retrofit restores the installed power generation capacity to or above its original level. Retrofits shall only include measures that involve capital investments and not regular maintenance or housekeeping measures.

17. In addition, the definitions in the latest approved version of the “Tool to calculate the emission factor for an electricity system” apply.

5. Baseline methodology

5.1. Project boundary

18. The spatial extent of the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to.

5.2. Baseline scenario for Greenfield power plant

19. The baseline scenario is that the electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid.

5.3. Baseline scenario for retrofit, rehabilitation or replacement

20. For project activities that involve retrofit, rehabilitation or replacement of an existing facility, the baseline scenario is the continuing operation of the existing plant. The methodology uses historical electricity generation data to determine the electricity generation of the existing plant in the baseline scenario, assuming that the historical situation observed prior to the implementation of the project activity would continue. In the absence of the CDM project activity, the existing facility would continue to provide

electricity to the grid at historical average levels until the time at which the electrical generation facility would be likely to be retrofitted, rehabilitated or replaced in the absence of the CDM project activity. From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and baseline electricity supply is assumed to equal the project's net electricity supply and no emission reductions are assumed to occur.

5.4. Baseline scenario for capacity addition

21. If the project activity is a capacity addition to existing grid-connected renewable energy power plant/unit, the baseline scenario is the existing facility that would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted ($DATE_{BaselineRetrofit}$), and electricity delivered to the grid by the added capacity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources. From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and no emission reductions are assumed to occur.

5.5. Baseline emissions

22. Baseline emissions include only CO_2 emissions from electricity generation in power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,y} \quad \text{Equation (1)}$$

Where:

BE_y	=	Baseline emissions in year *y* (t CO_2)
$EG_{PJ,y}$	=	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh)
$EF_{grid,y}$	=	Combined margin CO_2 emission factor for grid connected power generation in year *y* calculated using the latest version of the "Tool to calculate the emission factor for an electricity system" (t CO_2/MWh)

23. The emission factor shall be calculated in a transparent and conservative manner as follows:

(a) A combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) according to the procedures prescribed in the "Tool to calculate the emission factor for an electricity system"; or

(b) The weighted average emissions (in t CO_2/MWh) of the current generation mix. The data of the year in which project generation occurs must be used.

24. Calculations shall be based on data from an official source (where available)[2] and made publicly available.

5.5.1. Calculation of $EG_{PJ,y}$

25. The calculation of $EG_{PJ,y}$ is different for greenfield plants, capacity additions, retrofits, and replacements. These cases are described as follows:

5.5.1.1. Greenfield power plants

26. If the project activity is the installation of a greenfield power plant, then:

$$EG_{PJ,y} = EG_{PJ,facility,y} \qquad \text{Equation (2)}$$

Where:

$EG_{PJ,facility,y}$	=	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)

5.5.1.2. Capacity addition in wind, solar, wave or tidal power plants

27. In the case of wind, solar, wave or tidal power plants/units, it is assumed that the addition of new capacity does not significantly affect the electricity generated by existing plants/units.[3] In this case, the electricity fed into the grid by the added power plants/units shall be directly metered and used to determine $EG_{PJ,y}$.

$$EG_{PJ,y} = EG_{PJ\_Add,y} \qquad \text{Equation (3)}$$

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[2] Plant emission factors used for the calculation of emission factors should be obtained in the following priority:

1. *Acquired directly* from the dispatch center or power producers, if available; or
2. *Calculated*, if data on fuel type, fuel Emission Factor, fuel input and power output can be obtained for each plant. If confidential data available from the relevant host Party authority are used, the calculation carried out by the project participants shall be verified by the DOE and the CDM-PDD may only show the resultant carbon emission factor and the corresponding list of plants;
3. *Calculated*, as above, but using estimates such as: default IPCC values from the 2006 IPCC Guidelines for *National* GHG Inventories for net calorific values and carbon emission factors for fuels instead of plant-specific values technology provider's name plate power plant efficiency or the anticipated energy efficiency documented in official sources (instead of calculating it from fuel consumption and power output). This is likely to be a conservative estimate, because under actual operating conditions plants usually have lower efficiencies and higher emissions than name plate performance would imply; conservative estimates of power plant efficiencies, based on expert judgments on the basis of the plant's technology, size and commissioning date; or
4. *Calculated*, for the simple OM and the average OM, using aggregated generation and fuel consumption data, in cases where more disaggregated data is not available.

[3] In this case of wind power capacity additions, some shadow effects can occur, but are not accounted under this methodology.

Where:

$EG_{PJ\_Add,y}$ = Quantity of net electricity generation supplied to the grid in year *y* by the project plant/unit that has been added under the project activity (MWh)

5.5.1.3. Capacity addition in hydro or geothermal power plants

28. In the case of hydro or geothermal power plants/units, the addition of new power plants/units may significantly affect the electricity generated by the existing plants/units. For example, a new hydro turbine installed at an existing dam may affect the power generation by the existing turbines. Therefore, the approach as in section 5.5.1.5 below for retrofit, rehabilitation or replacement projects shall be used for capacity addition in hydro power plants and geothermal power plants. $EG_{facility,y}$ corresponds to the net electricity generation supplied to a grid by the existing plants/units and the added plants/units together constituting "project plants/units". A separate metering of electricity supplied to a grid by the added plants/units is not necessary under this option.

5.5.1.4. Capacity addition to biomass power plants

29. For project activities that involve the addition of renewable energy generation units at an existing biomass based power generation facility, where the existing and new units share the use of common and limited renewable resources (e.g. 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. The baseline energy generation $(EG_{PJ,y})$ corresponding to the net increase in electricity production associated with the project should be calculated as follows:

$$EG_{PJ,y} = \begin{cases} (EG_{PJ,facility,y} - EG_{BL,existing,y}), & \text{until DATE}_{\text{BaselineRetrofit}} \\ 0, & \text{after DATE}_{\text{BaselineRetrofit}} \end{cases}$$ Equation (4)

Where:

$$EG_{BL,existing,y} = MAX(EG_{actual,y}, EG_{estimated,y})$$ Equation (5)

Where:

$EG_{BL,existing,y}$ = The net electrical energy that would have been supplied by the plant/unit to the grid in the absence of the project activity determined as maximum of $EG_{actual,y}$ and $EG_{estimated,y}$ in year y (MWh)

$EG_{actual,y}$ = The net electrical energy produced and supplied to the grid by existing power plant/unit (installed before the project activity) in year *y* in the absence of the project activity (MWh)

$EG_{estimated,y}$ = Estimated net electrical energy that would have been produced by the existing units under the observed availability of the renewable resource in year *y* (MWh)

$DATE_{BaselineRetrofit}$	=	Point in time when the existing equipment would need to be replaced in the absence of the project activity (date)

30. 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 $EG_{BL,existing,y}$ still holds, and the value for $EG_{estimated,y}$ should continue to be estimated assuming the capacity and operating parameters are the same as that at the time of the start of the project activity.

5.5.1.5. Retrofit, rehabilitation or replacement in hydro, solar, wind, geothermal, wave and tidal plants

31. In the case of retrofit, rehabilitation or replacement in hydro, solar, wind, geothermal, wave and tidal plants where power generation can vary significantly from year to year, due to natural variations in the availability of the renewable source (e.g. varying rainfall, wind speed or solar radiation), the use of few historical years to establish the baseline electricity generation can involve a significant uncertainty. The methodology addresses this uncertainty by adjusting the historical electricity generation by its standard deviation. This ensures that the baseline electricity generation is established in a conservative manner and that the calculated emission reductions are attributable to the project activity. Without this adjustment, the calculated emission reductions could mainly depend on the natural variability observed during the historical period rather than the effects of the project activity. The baseline energy generation ($EG_{PJ,y}$) corresponding to the net increase in electricity production associated with the project is thus calculated as follows:

$$EG_{PJ,y} = \begin{cases} \max(\mathrm{EG_{PJ,facility,y}} - (\mathrm{EG_{historical}} + \sigma_{historical}), 0), & \text{until } \mathrm{DATE_{BaselineRetrofit}} \\ 0, & \text{after } \mathrm{DATE_{BaselineRetrofit}} \end{cases}$$

Equation (6)

Where:

$EG_{historical}$	=	Annual average historical net electricity generation by the existing renewable energy plant that was operated at the project site prior to the implementation of the project activity and determined per the procedure prescribed under section 5.5.2. below (MWh)
$\sigma_{historical}$	=	Standard deviation of the annual average historical net electricity supplied to the grid by the existing renewable energy plant that was operated at the project site prior to the implementation of the project activity (MWh)
$DATE_{BaselineRetrofit}$	=	Point in time when the existing equipment would need to be replaced in the absence of the project activity (date). This parameter does not apply to rehabilitation projects

5.5.1.6. Retrofit, rehabilitation or replacement in biomass plants

32. The baseline energy generation ($EG_{PJ,y}$) corresponds to the net increase in electricity production associated with the project is calculated as follows:

$$EG_{PJ,y} = \begin{cases} (EG_{PJ,facility,y} - EG_{BL,retrofit,y}), until\ DATE_{BaselineRetrofit} \\ 0, after\ DATE_{BaselineRetrofit} \end{cases}$$ Equation (7)

$$EG_{BL,retrofit,y} = MAX(EG_{historical}, EG_{estimated,y})$$ Equation (8)

$EG_{BL,retrofit,y}$	=	The net electrical energy that would have been supplied by the plant/unit to the grid in the absence of the project activity determined as maximum of $EG_{historical,y}$ and $EG_{estimated,y}$ in year *y* (MWh)

5.5.2. Determination of $EG_{historical}$

33. Average of historical net electrical energy 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 per cent or more), shall be used.

34. To determine $EG_{historical}$, project participants may choose between two historical periods. This allows some flexibility: the use of the longer time period may result in a lower standard deviation and the use of the shorter period may allow a better reflection of the (technical) circumstances observed during the more recent years.

35. Project participants may choose among the following two time spans of historical data to determine $EG_{historical}$:

(a) The three last calendar years (in case of hydro power plants five years)[4] prior to the implementation of the project activity; or

(b) The time period from the calendar year following $DATE_{hist}$, up to the last calendar year prior to the implementation of the project, as long as this time span includes at least three calendar years (in case of hydro power plants five years), where $DATE_{hist}$ is latest point in time between:

(i) The commissioning of the plant/unit;

(ii) If applicable: the last capacity addition to the plant/unit; or

(iii) If applicable: the last retrofit or rehabilitation of the plant/unit.

36. In case of rehabilitation where the power plant/unit did not operate for last three (in case of hydro power plants five years) calendar years before the rehabilitation starts, $EG_{historical}$ is equal to zero.

[4] In the case that three years of historical data are not available due to recent retrofits or unusual circumstances such as natural disasters, conflicts, and transmission constraints, a new methodology or methodology revision shall be proposed.

5.5.3. Calculation of $DATE_{BaselineRetrofit}$

37. In order to estimate the point in time when the existing equipment would need to be replaced/retrofitted in the absence of the project activity ($DATE_{BaselineRetrofit}$), project participants may take into account the typical average technical lifetime of the type equipment, which shall be determined and documented as per the "Tool to determine the remaining lifetime of equipment".

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

5.6. Project emissions

39. For most renewable energy project activities, PE_y = 0. However, for the following categories of project activities, project emissions have to be considered following the procedure described in the most recent version of "ACM0002: Grid-connected electricity generation from renewable sources":

    (a) Emissions related to the operation of geothermal power plants (e.g. non-condensable gases, electricity/fossil fuel consumption);

    (b) Emissions from water reservoirs of hydro power plants.

40. CO_2 emissions from on-site consumption of fossil fuels due to the project activity shall be calculated using the latest version of the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion".

41. In case biomass is sourced from dedicated plantations, the procedures in the tool "Project emissions from cultivation of biomass" shall be used.

5.7. Leakage

42. General guidance on leakage in biomass project activities shall be followed to quantify leakages pertaining to the use of biomass residues.

5.8. Emission reductions

43. Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y - LE_y \qquad \text{Equation (9)}$$

Where:

ER_y	=	Emission reductions in year *y* (t CO_2)
BE_y	=	Baseline Emissions in year *y* (t CO_2)
PE_y	=	Project emissions in year *y* (t CO_2)
LE_y	=	Leakage emissions in year *y* (t CO_2)

6. Monitoring methodology

44. The quantities and types of biomass and the biomass to fossil fuel ratio (in case of co-fired system) to be used during the crediting period should be explained and documented transparently in the CDM-PDD. For the selection of the baseline scenario, an ex ante estimation of these quantities should be provided.

45. The applicable requirements specified in the "General guidelines for SSC CDM methodologies" (e.g. calibration requirements, sampling requirements) are also an integral part of the monitoring guidelines.

6.1. Parameters for monitoring during the crediting period

Data / Parameter table 1.

Data / Parameter:	$EF_{grid,,y}$
Data unit:	t CO_2e/kWh
Description:	CO_2 emission factor of the grid electricity in year *y*
Source of data	-
Measurement procedures (if any):	As per the requirements in "Tool to calculate the emission factor for an electricity system"
Monitoring frequency:	-
Any comment:	-

Data / Parameter table 2.

Data / Parameter:	$EG_{PJ,facility,y}$
Data unit:	MWh
Description:	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*
Source of data	Electricity meter(s)
Measurement procedures (if any):	This parameter should be either monitored using bi-directional energy meter or calculated as difference between (a) the quantity of electricity supplied by the project plant/unit to the grid; and (b) the quantity of electricity the project plant/unit from the grid. In case it is calculated then the following parameters shall be measured: (a) The quantity of electricity supplied by the project plant/unit to the grid; and (b) The quantity of electricity delivered to the project plant/unit from the grid
Monitoring frequency:	Continuous monitoring, hourly measurement and at least monthly recording
Any comment:	-

Data / Parameter table 6.

Data / Parameter:	$EG_{PJ,add,y}$
Data unit:	MWh

Description:	Quantity of net electricity generation supplied to the grid in year *y* by the project plant/unit that has been added under the project activity
Source of data	Electricity meter(s)
Measurement procedures (if any):	If applicable, measurement results shall be cross checked with records for sold/purchased electricity (e.g. invoices/receipts). This parameter should be either monitored using bi-directional energy meter or calculated as difference between (a) the quantity of electricity supplied by the project plant/unit to the grid; and (b) the quantity of electricity the project plant/unit from the grid. In case it is calculated then the following parameters shall be measured: (a) The quantity of electricity supplied by the project plant/unit to the grid; and (b) The quantity of electricity delivered to the project plant/unit from the grid
Monitoring frequency:	Continuous monitoring, hourly measurement and at least monthly recording
Any comment:	Applicable to wind, solar, wave, tidal or biomass power plants/units.

Data / Parameter table 7.

Data / Parameter:	**-**
Data unit:	Tonne
Description:	Quantity of biomass consumed in year *y*
Source of data	Project activity site
Measurement procedures (if any):	Use mass or volume based measurements. Adjust for the moisture content in order to determine the quantity of dry biomass. The quantity of biomass shall be measured continuously or in batches. If more than one type of biomass fuel is consumed, each shall be monitored separately. Cross-check: Cross-check the measurements with an annual energy balance that is based on purchased quantities (e.g. with sales/receipts) and stock changes. Check the consistency of measurements ex post with annual data on energy generation, fossil fuels and biomass used and the efficiency of energy generation as determined ex ante
Monitoring frequency:	Continuously and estimate using annual energy/mass balance
Any comment:	-

Data / Parameter table 8.

Data / Parameter:	**-**
Data unit:	%
Description:	Moisture content of the biomass (wet basis)
Source of data	Project activity site

Measurement procedures (if any):	On-site measurements. Ex ante estimates should be provided in the PDD and used during the crediting period. In case of dry biomass, monitoring of this parameter is not necessary
Monitoring frequency:	The moisture content of biomass of homogeneous quality shall be determined ex ante. The weighted average should be calculated and used in the calculations
Any comment:	-

Data / Parameter table 9.

Data / Parameter:	**-**
Data unit:	GJ/mass or volume unit
Description:	Net calorific value of biomass type *k*
Source of data	Project activity site
Measurement procedures (if any):	Measurement in laboratories according to relevant national/international standards. Measure quarterly, taking at least three samples for each measurement. The average value can be used for the rest of the crediting period. Measure the NCV based on dry biomass. Check the consistency of the measurements by comparing the measurement results with relevant data sources (e.g. values in the literature, values used in the national GHG inventory) and default values by the IPCC. If the measurement results differ significantly from previous measurements or other relevant data sources, conduct additional measurements
Monitoring frequency:	Determine once in the first year of the crediting period
Any comment:	-

Data / Parameter table 10.

Data / Parameter:	$\sigma_{historical}$
Data unit:	MWh
Description:	Standard deviation of the annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the project site prior to the implementation of the project activity
Source of data	Calculated from data used to establish $EG_{historical}$
Measurement procedures (if any):	Calculated from data used to establish $EG_{historical}$ Parameter to be calculated as the standard deviation of the annual generation data used to calculate $EG_{historical}$ for retrofit or replacement project activities
Monitoring frequency:	-
Any comment:	-

46. Parameters relevant to reservoir based hydro and geothermal plants not included in this table shall be monitored following the procedure provided in the most recent version of ACM0002.

7. Project activity under a Programme of Activities

47. The methodology is applicable to a programme of activities, no additional leakage estimations are necessary other than that indicated under leakage section above.

Appendix. Scope of AMS-I.D., AMS-I.F. and AMS-I.A. based on project types

Table 1 Scope of AMS-I.D., AMS-I.F. and AMS-I.A. based on project types

	Project type	AMS-I.A.	AMS-I.D.	AMS-I.F.
1	Project supplies electricity to a national/regional grid		√	
2	Project displaces grid electricity consumption (e.g. grid import) and/or captive fossil fuel electricity generation at the user end (excess electricity may be supplied to a grid)			√
3	Project supplies electricity to an identified consumer facility via national/regional grid (through a contractual arrangement such as wheeling)		√	
4	Project supplies electricity to a mini grid[1] system where in the baseline all generators use exclusively fuel oil and/or diesel fuel			√
5	Project supplies electricity to household users (included in the project boundary) located in off grid areas	√		

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[1] The sum of installed capacities of all generators connected to the mini-grid is equal to or less than 15 MW.

* 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.

Document information*

Version	*Date*	*Description*
18.0	28 November 2014	EB 81, Annex 24 Revision to: • Introduce the methodological tool “Project emissions from cultivation of biomass”; • Streamline procedure to estimate project emissions associated with biomass cultivation across large and small scale methodologies; • Remove restrictions for application in a PoA; • Include the changes recommended in SSC_591 and SSC_558; • Streamline procedure for retrofit and capacity addition with ACM0002.
17.0	3 June 2011	EB 61, Annex 17 To simplify the monitoring requirements for quantity, net calorific value and moisture content of biomass. To clarify the applicability conditions.
16.0	28 May 2010	EB 54, Annex 7 To distinguish the project activities solely supplying renewable electricity to a grid from activities displacing electricity from a grid. The parameters to be monitored including the frequency and QA/QC procedures are also included.
15.0	16 October 2009	EB 50, Annex 29 To include the procedures to calculate project emissions for hydropower with reservoirs as specified in Annex 5 of EB 23.
14.0	17 July 2009	EB 48, Annex 23 To include more guidance on: the monitoring of electricity generated; calculation of project emissions for geothermal project activities; and editorial changes.
13.0	14 December 2007	EB 36, Annex 26 To refer directly to the “Tool to calculate the emission factor for an electricity system” for reasons of clarity.
12.0	27 July 2007	EB 33, Annex 23 To allow for their application under a programme of activities (PoA), where the limit of the entire PoA exceeds the limit for small-scale CDM project activities.
11.0	04 May 2007	EB 31, Annex 21 To include guidance on monitoring of biomass project activities. All small-scale biomass project activities applying AMS-I.D. (firing only biomass or firing biomass and fossil fuel) are required to monitor the biomass and any fossil fuel used.
10.0	15 December 2006	EB 28, Annex 22 The proposed revision includes guidance on consideration of capacity limit and on estimation of baseline/project/leakage

Version	*Date*	*Description*
		emissions in the case of project activities that involve the addition of renewable energy generation units at an existing renewable power generation facility.
09.0	21 July 2006	EB 25, Annex 29 An amendment to the procedure for estimating the combined margin emission factor of AMS-I.D, making it thereby consistent with ACM0002.
08.0	24 February 2006	EB 23, Annex 32 To: (i) include provisions for retrofit and renewable energy capacity additions as eligible activities; (ii) Provide clarification for baseline calculations under Category I.D; and (iii) Provide clarification on the applicability of Category I.A as against Category I.D.

Decision Class: Regulatory
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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*	*Description*
07.0	25 November 2005	EB 22, Para. 59 References to “non-renewable biomass” in Appendix B deleted.
06.0	30 September 2005	EB 21, Annex 22 Guidance on consideration of non-renewable biomass in Type I methodologies, thermal equivalence of Type II GWhe limits included.
05.0	EB 18, Annex 6 25 February 2005	EB 18, Annex 6 Guidance on ‘capacity addition’ and ‘cofiring’ in Type I methodologies and monitoring of methane in AMS-III.D included.
04.0	22 October 2004	EB 16, Annex 2 AMS-II.F was adopted, leakage due to equipment transfer was included in all Type I and Type II methodologies.
03.0	14 June 2004	EB 14, Annex 2 New methodology AMS-III.E was adopted.
02.0	28 November 2003	EB 12, Annex 2 Definition of build margin included in AMS-I.D, minor revisions to AMS-I.A, AMS-III.D, AMS-II.E.

01.0	21 January 2003	EB 7, Annex 6 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).

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