CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAM ACTIVITY DESIGN DOCUMENT FORM (CDM-SSC-CPA-DD)
Version 01

CONTENTS

Annexes

NOTE:

(i) This form is for submission of CPAs that apply a small scale approved methodology using the provision of the proposed small scale CDM PoA.

(ii) The coordinating/managing entity shall prepare a CDM Small Scale Programme Activity Design Document (CDM-SSC-CPA-DD)[1,2] that is specified to the proposed PoA by using the provisions stated in the SSC PoA DD. At the time of requesting registration the SSC PoA DD must be accompanied by a CDM-SSC CPA-DD form that has been specified for the proposed SSC PoA, as well as by one completed CDM-SSC CPA-DD (using a real case). After the first CPA, every CPA that is added over time to the SSC PoA must submit a completed CDM-SSC CPA-DD.

[1] The latest version of the template form CDM-CPA-DD is available on the UNFCCC CDM web site in the reference/document section.

[2] At the time of requesting validation/registration, the coordinating managing entity is required to submit a completed CDM-POA-DD, the PoA specific CDM-CPA-DD, as well as one of such CDM-CPA-DD completed (using a real case).

SECTION A. General description of small scale CDM programme activity (CPA)

Note: This template contains text in black and blue ink. The black text cannot be edited by SSC-CPAs, and is common to all SSC-CPAs. Only the blue text shall be edited by implementer(s). Furthermore, only the blue text needs to be checked at the time of a new SSC-CPA inclusion.

A.1. Title of the small-scale CPA:

NuPlanet Small Scale Hydropower PoA – (Insert CPA Number and Name)
Version: (Insert Version)
Date: (Insert Date)

A.2. Description of the small-scale CPA:

CPA (number) is a (insert capacity) MW hydroelectric power installation registered as (insert name). It is situated (insert details). It has a head of (insert number), a design flow of (insert number) cubic metres per second and will use (insert details of technology).

A.3. Entity/individual responsible for the small-scale CPA:

(Insert name of CPA implementer)

A.4. Technical description of the small-scale CPA:

A.4.1. Identification of the small-scale CPA:

A.4.1.1. Host Party:

Republic of South Africa

A.4.1.2. Geographic reference or other means of identification allowing the unique identification of the small-scale CPA (maximum one page):

Located in (insert country name)

(Insert name of property and its location with regard to the nearest town or city)

Latitude (insert co-ordinates)
Longitude (insert co-ordinates)

(Insert map showing location of CPA)

A.4.2. Duration of the small-scale CPA:

A.4.2.1. Starting date of the small-scale CPA:

The start date of this CPA is (insert date).
For CPAs with a start date after inclusion in the PoA, the expected start date is (insert date), when the (insert details of action that would indicate starting date).

A.4.2.2. Expected operational lifetime of the small-scale CPA:

(insert number) years (insert number) months

A.4.3. Choice of the crediting period and related information:

(Indicate whether it will be a fixed or renewable crediting period)

A.4.3.1. Starting date of the crediting period:

(Indicate starting date of the crediting period in DD\MM\YYYY format)

A.4.3.2. Length of the crediting period, first crediting period if the choice is renewable CP:

(insert number) years (insert number) months

A.4.4. Estimated amount of emission reductions over the chosen crediting period:

(insert number) tCO_2e over (insert number) years.

A.4.5. Public funding of the CPA:

(Indicate clearly if public funding was or was not used in the development of the CPA).

A.4.6. Information to confirm that the proposed small-scale CPA is not a de-bundled component

(Insert text clearly showing the argument and information confirming that the CPA is not a de-bundled component using EB54 Annex 13)

A.4.7. Confirmation that small-scale CPA is neither registered as an individual CDM project activity or is part of another Registered PoA:

The CME confirms that the small-scale CPA is neither registered as an individual CDM project activity nor is it a part of another registered PoA.

SECTION B. Eligibility of small-scale CPA and Estimation of emissions reductions

B.1. Title and reference of the Registered PoA to which small-scale CPA is added:

NuPlanet Small Hydropower PoA
Version: 02
Date: 15/12/2012

B.2. Justification of the why the small-scale CPA is eligible to be included in the Registered PoA:

The table below justifies the inclusion of the small-scale CPA in the registered PoA.

Eligibility Criteria from Registered PoA	Discussion How Small-Scale CPA Satisfies the Individual Criteria
1. Any CPA must be located within the internationally recognised boundaries of the Republic of South Africa.	CPA is located within (insert country).
2. Each CPA must be linked to specific geographical co-ordinates supported by a description of its location (the description should include a reference to a national land registry system, if such a system exists)	Done for CPA. See A.4.1 above.
3. Each CPA will use hydroelectricity renewable energy generation technology only. The technology will satisfy all relevant national testing and certification requirements. This will be shown through a review of the feasibility study related reports that describe the technology to be used.	The CPA is a hydroelectricity project.
4. Each CPA should show that the earliest date of its first real action or implementation or construction was after the date on which the CDM-PoA-DD was published for Global Stakeholder Consultation.	The start date of this CPA is (insert date). For CPAs with a start date after inclusion in the PoA, the expected start date is (insert date), when the (insert details of action that would indicate starting date).
5. The CPA must have a capacity of less than 15MW.	The CPA has a capacity of (insert number less than 15) MW.
6. The CPA must involve either the (a) installation of either a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield Plant) or (b) involve a capacity addition or (c) involve a retrofit of an existing plant or (d) a replacement.	(Insert text justifying eligibility in terms of the four options given)
7. CPAs with reservoirs must satisfy at least one of the following conditions:	(Insert text justifying eligibility in terms of conditions given)

• The CPA is implemented in an existing reservoir with no change in the volume of reservoir. • The CPA 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. • 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.	
8. CPAs will demonstrate additionality using the Guidelines on the Demonstration of Additionality of Small-Scale Projects (formerly known as Attachment A of Appendix B of the "Simplified modalities and procedures for small-scale CDM project activities") as detailed in Section E.5.1 of the PoA-DD.	This CPA will demonstrate additionality using (insert text indicating how additionality is to be demonstrated).
9. CPAs will have undertaken stakeholder consultations, which will have been formally recorded.	(Insert text indicating how stakeholder consultations were done).
10. CPAs will have undertaken an analysis of their environmental impacts, which will have been formally recorded.	(Insert text indicating how environmental analysis was done).
11. CPAs that have received development assistance will submit written confirmation from the assistance provider that this has not resulted in a diversion of official development assistance.	(Insert text indicating that if the project has received official development assistance then this did not result in a diversion of official development assistance).
12. CPAs will show clearly that the target group is grid-connected. This will be shown clearly through a review of the feasibility related documentation, clearly indicating that hydroelectricity will be delivered into the grid's electricity transmission system. As CPAs will be feeding into the grid via the transmission system, an eligibility criterion related to distribution mechanisms is not required.	(insert text clearly indicating how it has been shown that CPA is grid-connected and is feeding renewable electricity into the grid's transmission system)
13. The CPA implementer will provide a declaration that the CPA in aggregate meets the small-scale or microscale threshold criteria and will remain within these thresholds throughout the crediting period of the CPA.	(insert text confirming that the CPA implementer has provided a declaration)

14. CPAs shall show that they are not debundled projects through the application of the latest approved version of the "Guidelines on assessment of debundling for SCC project activities".	(Insert text indicating how the CPA is not a debundled project using the latest version of the debundling guidelines).

In terms of the CPA meeting the applicability of version 17 of AMS I.D, please see the table below:

Paragraph	AMS I.D Applicability Criteria	Justification of Applicability
1.	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.	(Insert justification of applicability of version 17 of AMS-I.D.)
3.	This methodology is applicable to project activities that: (a) Install a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity (Greenfield plant); (b) Involve a capacity addition;[3] (c) Involve a retrofit[4] of (an) existing plant(s); or (d) Involve a replacement[5] of (an) existing plant(s).	(Insert justification of applicability of version 17 of AMS-I.D.)
4.	Hydro power plants with reservoirs[6] that satisfy at least one of the following conditions are eligible to apply this methodology: • The project activity is implemented in an existing reservoir with no change in the volume of reservoir;	(Insert justification of applicability of version 17 of AMS-I.D.)

[3] A capacity addition is an increase in the installed power generation capacity of an existing power plant through: (i) The installation of a new power plant besides the existing power plant/units; or (ii) The installation of new power units, additional to the existing power plant/units. The existing power plant/units continue to operate after the implementation of the project activity.

[4] Retrofit (or rehabilitation or refurbishment). It involves an investment to repair or modify an existing power plant/unit, with the purpose to increase the efficiency, performance or power generation capacity of the plant, without adding new power plants or units, or to resume the operation of closed (mothballed) power plants. 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.

[5] Replacement. It involves investment in a new power plant or unit that replaces one or several existing unit(s) at the existing power plant. The installed capacity of the new plant or unit is equal to or higher than the plant or unit that was replaced.

[6] A reservoir is a water body created in valleys to store water generally made by the construction of a dam.

	• The project activity is implemented in an existing reservoir,[7] 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/m2; • 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/m2.	
5.	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,[8] the capacity of the entire unit shall not exceed the limit of 15 MW.	(Insert justification of applicability of version 17 of AMS-I.D.)
6.	Combined heat and power (co-generation) systems are not eligible under this category.	(Insert justification of applicability of version 17 of AMS-I.D.)
7.	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[9] from the existing units.	(Insert justification of applicability of version 17 of AMS-I.D.)
8.	In the case of retrofit or replacement, to qualify as a small-scale project, the total output of the retrofitted or replacement unit shall not exceed the limit of 15MW.	(Insert justification of applicability of version 17 of AMS-I.D.)
25.	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 plantations complying with	(Insert justification of applicability of version 17 of AMS-I.D.)

[7] 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.

[8] A co-fired system uses both fossil and renewable fuels, for example the simultaneous combustion of both biomass residues and fossil fuels in a single boiler. Fossil fuel may be used during a period of time when the biomass is not available and due justifications are provided.

[9] 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".

	the applicability conditions of AM0042.	
26.	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 of simplified modalities and procedures for small-scale clean development mechanism project activities; decision 4/CMP.1) or following the procedures included in the leakage section of AM0042.	(Insert justification of applicability of version 17 of AMS-I.D.)
27.	In case the project activity involves the replacement of equipment, and the leakage from 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.	(Insert justification of applicability of version 17 of AMS-I.D.)

The table above clearly shows that the CPA meets all the relevant criteria as laid down in the applied methodology.

B.3. Assessment and demonstration of additionality of the small-scale CPA, as per eligibility criteria listed in the Registered PoA:

In this section the text will present the case for additionality for the CPA using the following guidance.

The CPA will clearly choose which of the two options it is using to argue that an investment barrier exists as per the "Guidelines on the Demonstration of Additionality of Small-Scale Projects".

In the case of Option 1: Investment Analysis, the parameters used in the development of the financial model should be detailed in a table with the following format i.e.

Parameter (Unit)	Value	Information Source

It should be clearly stated which default value is being used for the after-tax equity return from version 05 of the "Guidelines on the Assessment of Investment Analysis".

The results of this analysis should be presented in a table format as follows:

Parameter	Value
After-Tax Equity IRR as a Result of Financial Analysis (excluding CDM income)	X%
Default Value for the Expected Return on Equity for Group 1 Projects in South Africa	X%

If the after-tax equity IRR is less than the default value then it can be stated that the project is additional.

For Option 1 a sensitivity analysis should also be done. The variables to be analysed constitute more than 20% of the either total project costs or total project revenues, as well as those that may be less than 20% but constitute key components of the project. The analysis covers a range of +10% and -10%.

The results of the sensitivity analysis would be detailed in a table format as follows:

Parameter	Impact on Equity IRR of Parameter Variation (%)			
	-10%	-5%	+5%	+10%

If any parameter breaches the default value threshold, the likelihood of this occurring would have to be explained, with use of the table below.

Parameter	Percentage variation to meet default benchmark	Likelihood?

In the case of Option 2: Investment Barrier, the CPA must show that it is unable to secure debt finance and/or an equity investment without the CDM for it to be able to move into implementation. This is an access to finance barrier, in accordance with version 01 of the 'Guidelines for objective demonstration and assessment of barriers'.

This will be done as per the format of the table below:

Barrier Type	Description of the Barrier	Evidence Sources Confirming the Existence of the Barrier	How does the CDM alleviate the barrier?
Investment Barrier	The CPA is unable to secure either debt finance and\or an equity investment without the CDM.	*[Insert CPA specific supporting documentation: Documentary evidence clearly showing the investments in or financing for the project are dependent on the project securing CDM project registration and benefitting from the CDM. This documentary evidence could include, but is not limited to, loan agreements.]*	By enabling the project to secure financing for it to be able to move into implementation.

If the investment barrier is shown to exist then the CPA would be considered additional.

B.4. Description of the sources and gases included in the project boundary and proof that the small-scale CPA is located within the geographical boundary of the registered PoA.

Table E.3: Emissions sources included in or excluded from the CPA boundary

	Source	Gas	Included?	Justification / Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
CPA	For hydro power activities with no reservoirs or existing reservoirs (with no increase in size).	CO_2	No	According to AMS I.D. and version 13 of ACM 0002.
		CH_4	No	
		N_2O	No	
	For hydro power activities that result in new single or multiple reservoirs and hydro power activities that result in the increase of single or multiple existing reservoirs.	CO_2	No	According to AMS I.D.
		CH_4	Yes/No	According to AMS-I.D. which referred to in the most recent version of ACM0002, for hydro power project activities that result in new reservoirs and hydro power project activities that result in the increase of existing reservoirs, project proponents shall account for CH_4 and CO_2 emissions from the reservoir, estimated as follows: Included if the power density of the project activity (PD) is greater than 4 W/m^2 and less than or equal to 10 W/m^2. Excluded if the power density of the project activity (PD) is greater than 10 W/m^2.
		N_2O	No	According to AMS I.D..

Re table E.3 above, insert appropriate content for CPA source and related content depending on nature of project.

The geographical co-ordinates of the project clearly indicate it is within the boundaries of (insert name of country).

B.5. Emission reductions:

B.5.1. Data and parameters that are available at validation:

(Delete tables where appropriate)

Data / Parameter:	$EF_{grid, CM, y}$
Data unit:	tCO_2/MWh
Description:	The Combined margin CO_2 emission factor for grid connected power generation in year *y*
Source of data used:	Calculation by using the latest version of the "Tool to calculate the emission factor for an electricity system" for South Africa (see Annex 3)
Value applied:	(insert value)
Justification of the choice of data or description of measurement methods and procedures actually applied :	
Any comment:	

Data / Parameter:	Cap_{BL}
Data unit:	W
Description:	Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero
Source of data used:	Project site
Value applied:	(insert value)
Justification of the choice of data or description of measurement methods and procedures actually applied :	Determine the installed capacity based on recognised standards
Any comment:	For CPAs that are either run of river projects or use existing reservoirs, this parameter can be neglected as $PE_{HP,y} = 0$.

Data / Parameter:	A_{BL}
Data unit:	m^2
Description:	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full. For new reservoirs, this value is zero.
Source of data used:	Project site
Value applied:	(insert value)
Justification of the choice of data or description of measurement methods	Measured from topographical surveys, maps, satellite pictures, etc.

and procedures actually applied :	
Any comment:	For CPAs that are either run of river projects or use existing reservoirs, this parameter can be neglected as $PE_{HP,y} = 0$.

Data / Parameter:	EF_{RES}
Data unit:	$kgCO_2e/MWh$
Description:	Default emission factor for emissions from reservoirs.
Source of data used:	Decision by EB23
Value applied:	90
Justification of the choice of data or description of measurement methods and procedures actually applied :	-
Any comment:	-

Data / Parameter:	$EG_{historical}$
Data unit:	MWh/yr
Description:	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 used:	Project activity site.
Measurement procedures (if any):	-
Any comment:	-

Data / Parameter:	$\sigma_{historical}$
Data unit:	MWh/yr
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 used:	Calculated from data used to establish $EG_{historical}$.
Measurement procedures (if any):	Parameter to be calculated as the standard deviation of the annual generation data used to calculate $EG_{historical}$ for retrofit or replacement project activities.
Any comment:	-

Data / Parameter:	$Date_{BaselineRetrofit}$
Data unit:	Date.
Description:	Point in time when the existing equipment would need to be replaced in the absence of the project activity.
Source of data used:	Project activity site.
Measurement procedures (if any):	As per the methodology ACM0002 version 13.

Any comment:	-

B.5.2. Ex-ante calculation of emission reductions:

Baseline emissions

The baseline emissions are the product of electrical energy baseline $EG_{BL,y}$ expressed in MWh of electricity produced by the renewable generating unit multiplied by the grid emission factor.

$$BE_y = EG_{BL,y} * EF_{CO_2,grid,y}$$

Where:

BE_y	Baseline Emissions in year *y* (t CO_2e)
$EG_{BL,y}$	Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year *y* (MWh)
$EF_{CO2,grid,y}$	CO_2 emission factor of the grid in year *y* (t CO_2/MWh)

Therefore, BE_y = (insert figure) tCO_2e

Project Emissions

Emissions from water reservoirs of hydro power plants:

For CPAs that are either run of river projects or use existing reservoirs:

$PE_{HP,y} = 0$

However, for hydro power CPAs that result in new single or multiple reservoirs and hydro power project activities that result in the increase of single or multiple existing reservoirs, CPA implementers shall account for CH_4 and CO_2 emissions from the reservoirs, estimated as follows:

(a) <u>If the power density of the single or multiple reservoirs (PD) is greater than 4 W/m^2 and less than or equal to 10 W/m^2</u>

$$PE_{HP,y} = \frac{EF_{Res} \times TEG_y}{1000}$$

Where:

$PE_{HP,y}$	Project emissions from water reservoirs (tCO_2e/yr)
EF_{Res}	Default emission factor for emissions from reservoirs of hydro power plants in year y (kgCO_2e/MWh)
TEG_y	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (MWh)

Therefore, $PE_{HP,y}$ = (insert figure) tCO_2e

(b) <u>If the power density of the project activity (PD) is greater than 10 W/m^2</u>

$$PE_{HP,y} = 0$$

The power density of the CPA (PD) is calculated as follows:

$$PD = \frac{Cap_{PJ} - Cap_{BL}}{A_{PJ} - A_{BL}}$$

Where:

PD	Power density of the project activity (W/m^2)
Cap_{PJ}	Installed capacity of the hydro power plant after the implementation of the project activity (W)
Cap_{BL}	Installed capacity of the hydro power plant before the implementation of the project activity (W). For new hydro power plants, this value is zero.
A_{PJ}	Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (m^2)
A_{BL}	Area of the single or multiple reservoirs measured in the surface of the water, before the implementation of the project activity, when the reservoir is full (m^2). For new reservoirs, this value is zero.

Emissions from on-site consumption of fossil fuels:

CO_2 emissions from on-site consumption of fossil fuels due to the CPA shall be calculated using the version 02 of the 'Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion'. The consumption of fossil fuels is likely to be for onsite emergency/backup generators.

The project emissions from the consumption of fossil fuels are calculated with equation 1 from the Tool; where the emissions are based on the quantity of fuel combusted and the CO_2 emission coefficient of the fuel; as follows:

$$PE_{FC,y} = FC_y \times COEF_{i,y}$$

Where:

$PE_{FC,y}$	Project emissions from the consumption of fossil fuels in year *y* (tCO_2e/yr)
$FC_{j,y}$	Quantity of fuel consumed by the project activity in year *y* (l/yr)
$COEF_{i,y}$	CO_2 emission coefficient of fossil fuel in year *y* (tCO_2e/l)

Therefore, $PE_{FC,y}$ = (insert figure) tCO_2e

The applied tool states that the CO_2 emission coefficient ($COEF_{i,y}$) can be calculated using one of two options, depending on the availability of data of the fossil fuel. Although Option A is the preferred approach, it is unlikely that the CPA implementer will measure the weighted average mass fraction of carbon in the fossil fuels ($w_{c,j,y}$), nor is this type of information conventionally supplied on South African fuel supply invoices. Therefore, Option A will not be applied.

The CO_2 emission coefficient of fossil fuels will, therefore, be calculated using Option B from the Tool, where the coefficient, $COEF_{i,y}$, is based on net calorific value and the CO_2 emission factor of the fossil fuel; as follows:

$$COEF_{i,y} = NCV_{i,y} \times EF_{CO_2,i,y}$$

Where:

$COEF_{i,y}$	CO_2 emission coefficient of fossil fuel in year *y* (tCO_2e/l)
$NCV_{i,y}$	Net calorific value of fossil fuel in year *y* (MJ/l)
$EF_{CO_2,i,y}$	Emission factor of fossil fuel in year *y* (tCO_2e/MJ)

Emission reductions

The emissions reductions are then calculated as follows:

$$ER_y = BE_y - PE_y - LE_y$$

Where:

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

Therefore, ER_y = (insert figure) tCO2e

B.5.3. Summary of the ex-ante estimation of emission reductions:

Year	Estimation of project activity emissions (tonnes of CO_2 e)	Estimation of baseline emissions (tonnes of CO_2 e)	Estimation of leakage (tonnes of CO_2 e)	Estimation of overall emission reductions (tonnes of CO_2 e)
(Insert year)	(Insert value)	(Insert value)	(Insert value)	(Insert value)
(Insert year)	(Insert value)	(Insert value)	(Insert value)	(Insert value)
(Insert year)	(Insert value)	(Insert value)	(Insert value)	(Insert value)
(Insert year)	(Insert value)	(Insert value)	(Insert value)	(Insert value)
(Insert year)	(Insert value)	(Insert value)	(Insert value)	(Insert value)
(Insert year)	(Insert value)	(Insert value)	(Insert value)	(Insert value)
(Insert year)	(Insert value)	(Insert value)	(Insert value)	(Insert value)
(Insert year)	(Insert value)	(Insert value)	(Insert value)	(Insert value)
(Insert year)	(Insert value)	(Insert value)	(Insert value)	(Insert value)
(Insert year)	(Insert value)	(Insert value)	(Insert value)	(Insert value)
Total (tonnes of CO_2 e)	(Insert value)	(Insert value)	(Insert value)	(Insert value)

B.6. Application of the monitoring methodology and description of the monitoring plan:

B.6.1. Description of the monitoring plan:

1. Monitoring Period

The monitoring period will start from the date of commissioning of the CPA. An annual monitoring report will be produced for full calendar years (or part thereof for the first year depending on the commissioning date).

2. Data Monitored and Sources

The quantity of net electricity generation that is produced and fed into the grid by the CPA in year *y* shall be determined on the basis of the measurements taken by the electricity meters. As an accuracy check the meters will be cross-checked with records for sold electricity. If there is a material difference (defined as being more than 1%), this would be investigated, explained and discussed in the monitoring report.

Each CPA will have two bi-directional meters recording net electricity production. The first is the Main Meter which is the primary source for all data readings. The second is a check meter, which is a back-up meter which records data concurrently with the main meter. It is used if the Main meter is considered faulty or inaccurate. Data gathering is done remotely or if the remote system is down the data is downloaded manually at the facility.

The fossil-fuel use associated with the backup/emergency generators is only for back-up or emergency purposes, but will still be monitored in the project activity.

3. Monitoring Plan Management

The CPA facility manager is responsible for the effective implementation of the monitoring management plan. All elements of the monitoring plan will be supported by formal procedures and regular training of delegated personnel, as appropriate.

The CME is responsible for managing and monitoring the data set that generates the grid emission factor.

4. Storage of Data

All data collected will be archived electronically in multiple locations (at least two) to ensure no data is lost. All data will be kept for at least two years after the end of the crediting period.

5. Meter Calibration

Meters will be calibrated in accordance with the manufacturer's requirements. The results of each calibration will be recorded in a formal report and the report archived.

The monitoring of the quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CPA in year *y* and the grid emission factor will be undertaken by the CPA with assistance from the CME as follows:

- The CPA developer will monitor and record the monitoring parameters ;
- The CME will provide guidance to the CPA developer on how the monitoring should be conducted and how data should be collected with regards to the emission reduction calculations;
- The CPA developer will provide data on monitored parameters, required calculations (if any) and any documentary evidence required to the CME;
- The CME will document and store all data related to the parameters, provided by CPA developer in a central electronic database (PoA monitoring database), while primary data will be stored by the CPA developer. The data for the CPA will be kept for at least two years after the end of the last crediting period for the CPA; and,
- The CME will review relevant CPA monitoring records, prepare the monitoring report and provide the monitoring report to the DOE.

The data and parameters to be monitored by the CPA are as follows:

(Delete tables where appropriate)

Data / Parameter:	$EG_{PJ,y}$
Data unit:	MWh/yr
Description:	Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CPA in year *y*
Source of data to be used:	Meters at project activity site.
Value of data applied for the purpose of calculating expected emission reductions in section B.5	(Insert value)
Description of measurement methods and procedures to be applied:	Electricity meters separately measure each CPA, at the boundary between the CPA and the electricity grid. The parameter will be monitored continuously and the data aggregated monthly for monitoring purposes. These meters will be bidirectional to measure the amount of electricity imported from the grid and the amount of electricity exported to the grid. The quantity of net electricity generated will be calculated by subtracting the imported electricity from the exported electricity. The meter accuracy will be determined when installed through an assessment of the appropriate national standards for the meter type to be used.
QA/QC procedures to be applied:	Cross check measurement results with records for sold electricity. Any differences to be discussed in monitoring report. Calibration schedule for electricity meters to be developed and implemented. This will be done in accordance with the manufacturer's specifications and if required by an accredited organisation.
Any comment:	-

Data / Parameter:	$FC_{j,y}$
Data unit:	l/yr

Description:	Quantity of fossil fuel consumed by the project activity in year *y*
Source of data to be used:	Measured at project site.
Value of data	(Insert value)
Description of measurement methods and procedures to be applied:	The quantity of fossil fuel consumed by the backup/diesel generators will be measured with meters.
QA/QC procedures to be applied:	Purchase invoices will be checked monthly against meter readings.
Any comment:	The reason for the measurement of this parameter is to ensure that diesel is used for emergency and back-up purposes only and is therefore not a material emission source in the project.

Data / Parameter:	$NCV_{i,y}$
Data unit:	MJ/l
Description:	Net calorific value of fossil in year *y*
Source of data to be used:	IPCC default value at the upper limit of uncertainty at a 95% confidence interval.
Value of data	(Insert value)
Description of measurement methods and procedures to be applied:	The IPCC default value at the upper limit of uncertainty at a 95% confidence interval for the emission factor of the fossil fuel, according to the 2006 guidelines.
QA/QC procedures to be applied:	Any future revisions of the IPCC guidelines will be taken into account.
Any comment:	-

Data / Parameter:	$EF_{CO2,i,y}$
Data unit:	tCO_2e/MJ
Description:	Emission factor of fossil fuel in year *y*
Source of data to be used:	IPCC default value at the upper limit of uncertainty at a 95% confidence interval.
Value of data	(Insert value)
Description of measurement methods and procedures to be applied:	The IPCC default value at the upper limit of uncertainty at a 95% confidence interval for the emission factor of the fossil fuel, according to the 2006 guidelines.
QA/QC procedures to be applied:	Any future revisions of the IPCC guidelines will be taken into account.
Any comment:	-

Data / Parameter:	Cap_{PJ}
Data unit:	W
Description:	Installed capacity of the hydro power plant before the implementation of the project activity. For new hydro power plants, this value is zero
Source of data to be	Project site

used:	
Value of data applied for the purpose of calculating expected emission reductions in section B.5	(insert value)
Description of measurement methods and procedures to be applied:	Checking nameplate capacity
QA/QC procedures to be applied:	-
Any comment:	For CPAs that are either run of river projects or use existing reservoirs, this parameter can be neglected as $PE_{HP,y} = 0$.

Data / Parameter:	A_{PJ}
Data unit:	m^2
Description:	Area of the reservoir measured in the surface of the water, after the implementation of the CPA project activity, when the reservoir is full.
Source of data to be used:	Project site
Value of data applied for the purpose of calculating expected emission reductions in section B.5	(insert value)
Description of measurement methods and procedures to be applied:	Measured from topographical surveys, maps, satellite pictures
QA/QC procedures to be applied:	
Any comment:	For CPAs that are either run of river projects or use existing reservoirs, this parameter can be neglected as $PE_{HP,y} = 0$.

Data / Parameter:	TEG_y
Data unit:	MWh/yr
Description:	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year one.
Source of data to be used:	Project activity site.
Measurement procedures (if any):	Electricity meters.
Monitoring frequency:	Continuous measurement and at least monthly recording.
QA/QC procedures to be applied:	-
Any comment:	Applicable to hydro power project activities with a power density of the project

	activity (PD) greater than 4W/m^2 and less than or equal to 10 W/m^2.

C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

(Insert text indicating and justifying the level at which environmental analysis has been undertaken)

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

(Insert text documenting the source of the environmental analysis and the results)

C.3. Please state whether an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA), in accordance with the host Party laws/regulations:

(State clearly if an environmental impact assessment was required in accordance with the host Party's laws/regulations)

SECTION D. Stakeholders' comments

D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

(Insert text indicating and justifying the level at which stakeholders comments were invited)

D.2. Brief description how comments by local stakeholders have been invited and compiled:

(Insert text describing how comments by local stakeholders were invited and complied)

D.3. Summary of the comments received:

(Insert text providing a summary of the comments received)

D.4. Report on how due account was taken of any comments received:

(Insert text indicating how due account was taken of any comments received)

Annex 1

CONTACT INFORMATION ON ENTITY/INDIVIDUAL RESPONSIBLE FOR THE SMALL-SCALE CPA

Organization:	To be completed as appropriate
Street/P.O.Box:	To be completed as appropriate
Building:	To be completed as appropriate
City:	To be completed as appropriate
State/Region:	To be completed as appropriate
Postfix/ZIP:	To be completed as appropriate
Country:	To be completed as appropriate
Telephone:	To be completed as appropriate
FAX:	To be completed as appropriate
E-Mail:	To be completed as appropriate
URL:	To be completed as appropriate
Represented by:	To be completed as appropriate
Title:	To be completed as appropriate
Salutation:	To be completed as appropriate
Last Name:	To be completed as appropriate
Middle Name:	To be completed as appropriate
First Name:	To be completed as appropriate
Department:	To be completed as appropriate
Mobile:	To be completed as appropriate
Direct FAX:	To be completed as appropriate
Direct tel:	To be completed as appropriate
Personal E-Mail:	To be completed as appropriate

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

Annex 3

BASELINE INFORMATION

Calculation of Grid emission factor:

The **project electricity system** is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity, and that can be dispatched without significant transmission constraints.

Latest publicly available data at the time of CPA inclusion should be used to calculate the grid emission factor.

STEP 1: IDENTIFY THE RELEVANT ELECTRICITY SYSTEMS

The **project electricity system** is defined by the spatial extent of the power plants that are physically connected through transmission and distribution lines to the project activity and that can be displaced without significant transmission constraints.

Similarly, a **connected electricity system**, e.g. national or international, is defined as an electricity system that is connected by transmission lines to the project electricity system. Power plants within the connected electricity system can be dispatched without significant transmission constraints, but transmission to the project electricity system has significant transmission constraints.

The project electricity system and any connected electricity systems must be clearly defined for each CPA.

STEP 2: CHOSE WHETHER TO INCLUDE OFF-GRID POWER PLANTS IN THE PROJECT ELECTRICITY SYSTEM

This step is optional according to the tool. The grid emission factor is calculated from only grid power plants (**Option I**). Off-grid power plants are not included in the calculations.

STEP 3: SELECT A METHOD TO DETERMINE THE OPERATING MARGIN (OM)

The OM is calculated using the **simple OM method (Option a)**. The simple OM method can be used provided that the low-cost/must-run resources constitute less than 50% of the total grid generation in average of the five most recent years.

The average percentage of low-cost/must-run resources must be calculated for each CPA to show that it is below 50% of the total grid generation for this project electricity system, and subsequently, that Option (a) is applicable.

In terms of data vintages, the *ex ante* option should be chosen to calculate the simple OM. In this option a 3 year generation-weighted average are used for the grid power plants. Using this option also means that

the emission factor is determined only once at the validation stage, thus no monitoring and recalculation is required during the crediting period.

Each CPA should state the vintages of data that was used.

STEP 4: CALCULATE THE OPERATING MARGIN EMISSION FACTOR ACCORDING TO THE SELECTED METHOD

The simple OM emission factor ($EF_{grid,OMsimple,y}$) is calculated as the generation-weighted average CO_2 emissions per unit net electricity generation (tCO_2/MWh) of all generating power plants serving the system, not including low-cost/must-run power plants/units. Hence, the hydro and nuclear power plants are excluded from the calculation of the OM.

Option A is used for calculating the simple OM. The calculations in this option are based on the total net electricity generation and a CO2 emission factor of each power plant.

Option A – Calculation based on average efficiency and electricity generation of each plant

Under this option, the simple OM emission factor is calculated based on the net electricity generation of each power plant and an emission factor of each power plant, as follows:

$$EF_{grid,OMsimple,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}}$$

Where:

$EF_{grid,OMsimple,y}$	= Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$EG_{m,y}$	= Net quantity of electricity generated and delivered to the grid by power unit m in the year y (MWh)
$EF_{EL,m,y}$	= CO_2 emission factor of power unit m in year y (tCO_2/MWh)
m	= All power units serving the grid in year y except low-cost/must-run power units
y	= The relevant year as per data vintage chosen in Step 3

Determination of $EF_{EL,m,y}$

The emission factor for each power plant m was determined as follows (**Option A1**):

$$EF_{grid,OMsimple,y} = \frac{\sum_i \left(FC_{i,y} \times NCV_{i,y} \times EF_{CO2,i,y}\right)}{EG_y} \quad \textbf{(6)}$$

Where:

$EF_{grid,OMsimple,y}$	= Simple operating margin CO_2 emission factor in year y (tCO_2/MWh)
$FC_{i,y}$	= Amount of fossil fuel type i consumed in the project electricity system in year y (mass or volume unit)

$NCV_{i,y}$	=	Net calorific value (energy content) fossil fuel type *i* in year *y* (GJ/mass or volume unit)
$EF_{CO2,i,y}$	=	CO_2 emission factor of fossil fuel type *i* in year *y* (tCO_2/GJ)
EG_y	=	Net electricity generated and delivered to the grid by all power sources serving the system, not including low-cost/must-run power plants/units, in year *y* (MWh)
i	=	All fossil fuel types combusted in power sources in the project electricity system in year *y*
y	=	The relevant year as per data vintage chosen in Step 3.

Electricity imports are treated as one power plant, as per the tool guidance.

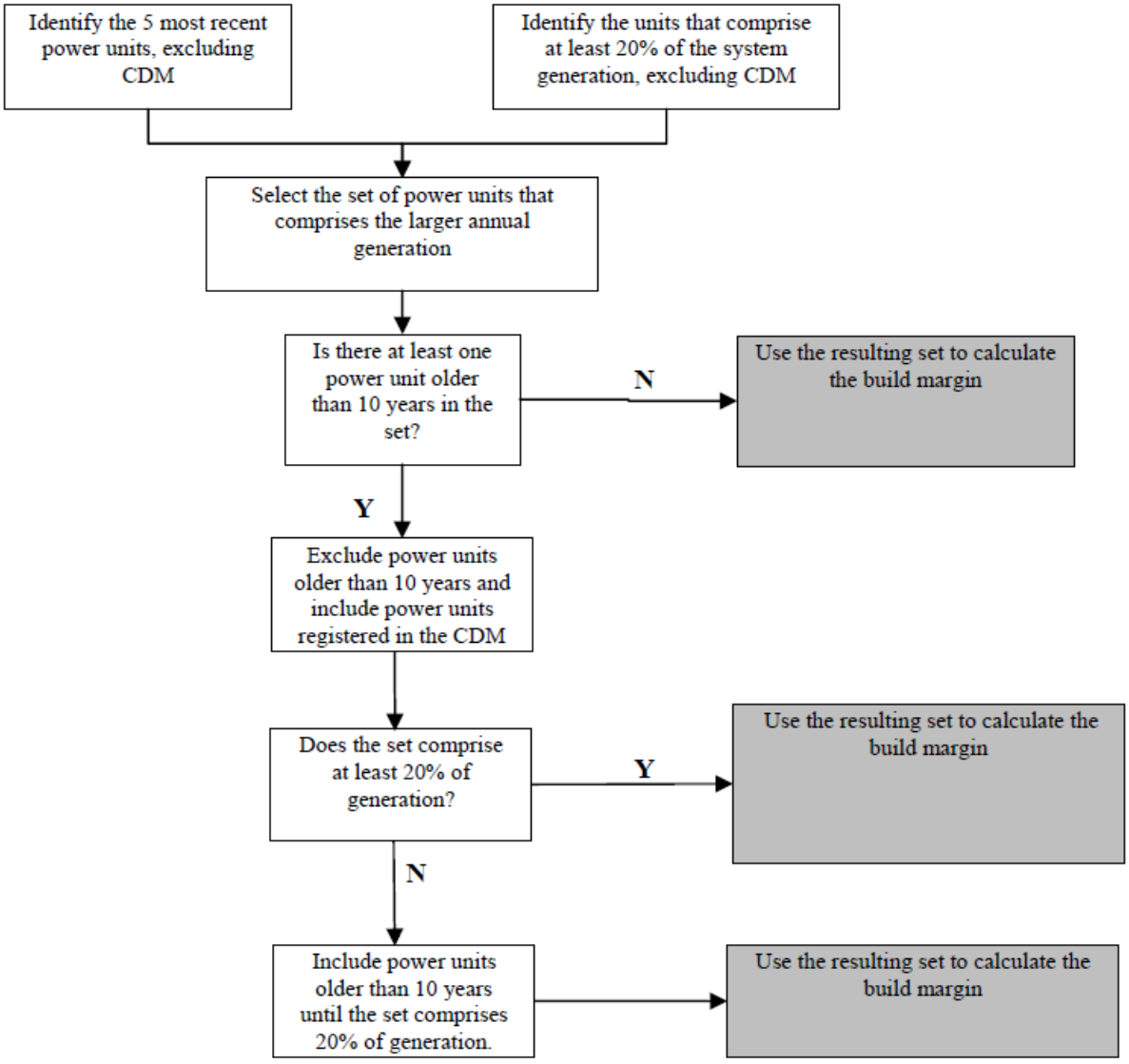
The parameters used in calculations should be clearly shown and referenced.

STEP 5: CALCULATE THE BUILD MARGIN (BM) EMISSION FACTOR

In terms of vintage of data, **Option 1** was selected: For the first crediting period, calculate the build margin emission factor *ex ante* based on the most recent information available on units already built for sample group *m* at the time of CDM-PDD submission to the DOE for validation.

The sample group of power units *m* used to calculate the build margin were determined as per the procedure delineated in the tool, consistent with the data vintages selected.

The following diagram summarizes the procedure of identifying the sample group:



Clearly state which power stations are included in the sample selected for the build margin.

The build margin emissions factor is the generation-weighted average emission factor (tCO_2/MWh) of all power units *m* during the most recent year *y* for which power generation data is available, calculated as follows:

$$EF_{grid,BM,y} = \frac{\sum_m EG_{m,y} \times EF_{EL,m,y}}{\sum_m EG_{m,y}} \quad \textbf{(13)}$$

Where:

$EF_{grid,BM,y}$ = Build margin CO_2 emission factor in year y (tCO_2/MWh)

$EG_{m,y}$	= Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y* (MWh)
$EF_{EL,m,y}$	= CO_2 emission factor of power unit *m* in year *y* (tCO_2/GJ)
m	= Power units included in the build margin
y	= Most recent historical year for which power generation data is available.

In the case that the sample group of power units m used to calculate the build margin is the resulting set **SETsample-CDM->10yrs** according to the tool: *If the power units included in the build margin m correspond to the sample group **SETsample-CDM->10yrs**, then, as a conservative approach, only option A2 from guidance in Step 4 (a) can be used and the default values provided in Annex 1 shall be used to determine the parameter $\eta_{m,y}$.*

The CO_2 emission factor of each power unit m ($EL_{EL,m,y}$) should be determined as per the guidance in Step 4 (a) for the simple OM, using **Option A2**:

$$EF_{EL,m,y} = \frac{EF_{CO2,m,i,y} \times 3.6}{\eta_{m,y}} \quad \textbf{(3)}$$

Where:

$EF_{EL,m,y}$	= CO_2 emission factor of power unit *m* in year *y* (tCO_2/MWh)
$EF_{CO2,m,i,y}$	= Average CO2 emission factor of fuel type *i* used in power unit *m* in year *y* (tCO_2/GJ)
$\eta_{m,y}$	= Average net energy conversion efficiency of power unit *m* in year *y* (ratio)
m	= All power plants/units serving the grid in year y except low-cost/must-run power plants/units
i	= All fossil fuel types combusted in power plant/unit m in year y
y	= The relevant year as per data vintage chosen in Step 3.

The default value for $\eta_{m,y}$ for power stations in the BM can be obtained from Annex 1 of the tool.

STEP 6: CALCULATE THE COMBINED MARGIN (CM) EMISSION FACTOR

The combined margin factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times w_{OM} + EF_{grid,BM,y} \times w_{BM} \quad \textbf{(14)}$$

Where:

$EF_{grid,BM,y}$	= Build Margin CO_2 emission factor in year y (tCO_2/MWh)
$EF_{grid,OM,y}$	= Operating margin CO_2 emission factor in year y (tCO_2/MWh)
w_{OM}	= Weighting of operating margin emissions factor (%)
w_{BM}	= Weighting of build margin emissions factor (%)

Annex 4

MONITORING INFORMATION

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