**CLEAN DEVELOPMENT MECHANISM**
**SMALL-SCALE PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM**
**(CDM-SSC-PoA-DD) Version 01**

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NOTE:

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

(ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).

## SECTION A. General description of small-scale programme of activities (PoA)

### A.1 Title of the small-scale programme of activities (PoA):

Small Scale Grid-connected Solar Power Programme
Version Number: 2.0
Date for completing the document: 29/11/2012

| Version Number | Date | Description and reason for revision |
|---|---|---|
| 01 | 28/11/2011 | Initial PDD |
| 02 | 23/03/2012 | Amendments made to account for availability of new information. |
| | | |

### A.2. Description of the small-scale programme of activities (PoA):

This PoA aims to encourage the development of small scale grid-connected (less than or equal to 15MW) solar photovoltaic and solar thermal electricity technologies (hereinafter referred to as "solar power").

Small scale grid-connected solar power projects offer the ability to exploit smaller pockets of solar energy resources that have less of a potentially negative impact on the local environment (such as smaller areas of land taken up by solar arrays). Small scale projects attract capital flows from smaller developers looking for opportunities to enter the market, which helps to create and sustain local businesses and employment.

Both solar photovoltaic and solar thermal electricity technologies are included in this PoA, within the eligibility criteria of approved small scale methodology AMS-1.D – *Grid connected renewable electricity generation (version 17, EB 61)*. Although the technologies may differ, the objective and outcome is the same for all small scale grid-connected solar power projects: The development of economically viable low carbon electrical generation capacity, which delivers power to the national/region grid that would have otherwise have been generated by the operation of existing grid-connected power plants and by the addition of new generation sources to the grid.

A key component of global climate change mitigation efforts is decarbonisation of national/regional grid power systems. In 2010, total global power generation capacity reached an estimated 4,950 GW with non-hydroelectric renewable electricity generation technologies accounting for an estimated 312 GW[1]. Attempts are being made in many countries to scale up and accelerate the development of grid-connected renewable energy technologies, with impressive growth rates being achieved particularly in wind and solar power.

[1] REN21 Renewables 2011 Global Status Report

Global power generation is still, however, dominated by fossil fuels as renewable electricity generation technologies face a number of financial and non-financial barriers. This programme aims to assist the development of small scale grid-connected solar photovoltaic and solar thermal electricity technologies that broadly speaking faces the following barriers:

- Financial

  The project economics of solar power offer insufficient returns to attract investment when compared to conventional thermal electricity generation technologies that presently dominate global electricity generation capacity. High capital costs and possibly uncertain revenues (due to uncertain resource availability) drive up the cost of capital for projects making it harder for them to attain financing.

- Technical/expertise

  Technical barriers exist for all solar power projects, either in problems with intermittency of supply, uncertainty of performance, or potential failure rate of unproven technologies and applications. The necessary level of expertise is linked to these technical barriers, as they become more prominent if the expertise of developing and operating solar power projects is lacking the country, region or sector in question.

Contribution to sustainable development:
Renewable energy is widely considered as an important contribution to sustainable development in Africa. Benefits to sustainable development include that:

- "*the energy is intrinsically sustainable [i.e. allows natural processes to continue] and without fossil-carbon emissions*"[2].
- Additional electricity supply from renewable energy projects to national grids in African countries allows for expansion of grids to new regions where grid connections are not in place, thus increasing access to power to otherwise non- accessed populations.
- renewable power projects allow for increased power production without the pollution and other environmental impacts (such as transport of fossil fuels) that are typical for a conventional power plant.
- the development of renewable power projects also provides job creation during the construction and operation of the facilities.

This is a measure PoA, and as such does not form part of a defined policy on the development of solar power. The goal of this PoA is to encourage development of small scale grid-connected solar photovoltaic and solar thermal electricity technologies, achieving emission reductions across a number of developing countries.

Small scale projects do not offer the same economies of scale that larger scale projects benefit from, nor do they necessarily benefit from any enhanced resource availability compared to large scale projects employing the same technologies. The economics of small scale grid-connected solar power remains

[2] Energy for sustainable development: Policy options for Africa, UN-ENERGY/Africa( A UN collaboration mechanism and UN sub-cluster on energy in support of NEPA), Section 4.1 Policies. Available at: http://www.uneca.org/eca_resources/publications/unea-publication-tocsd15.pdf

challenging and this PoA aims to provide, through the CDM, an additional financial flow to assist in mitigating the real and perceived risks of investing in small scale grid-connected solar power, and help to attract new and increased investment flows into small scale grid-connected solar power technologies.

This PoA is a voluntary action undertaken by Camco Carbon Africa Limited.

## A.3. Coordinating/managing entity and participants of SSC-POA:

**1. Coordinating or managing entity of the PoA as the entity which communicates with the Board.**

.
Camco Carbon Africa Limited

**2. Project participants being registered in relation to the PoA.**

Camco Carbon Africa Limited

| Name of Party involved (*) ((host) indicates a host Party) | Private and/or public entity(ies) project participants (*) (as applicable) | Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No) |
|---|---|---|
| Republic of South Africa (host) | Camco Carbon Africa Limited[3] | No |
| United Kingdom of Great Britain and Northern Ireland | Camco Carbon Africa Limited | No |
| (*) In accordance with the CDM modalities and procedures, at the time of making the CDM-PDD public at the stage of validation, a Party involved may or may not have provided its approval. At the time of requesting registration, the approval by the Party(ies) involved is required. | | |

## A.4. Technical description of the small-scale programme of activities:

### A.4.1. Location of the programme of activities:

The PoA shall cover the following countries[4]:

- Republic of South Africa

[3] In accordance with Glossary of CDM Terms (Version 07.0), Camco Carbon Africa Limited (coordinating and management entity (CME)) is authorized by all participating host country DNAs involved in this PoA and is nominated in the MoC statement as the entity that communicates with the Board and the secretariat.

[4] The list of countries covered by the PoA may be amended post registration to include additional countries subject to the conditions set out in Paragraph 6, Annex 26, EB 60.

### A.4.1.1. Host Party(ies):

The Host Parties to the PoA shall be the following countries[5]:

Republic of South Africa

### A.4.1.2. Physical/ Geographical boundary:

The geographical location covered by the PoA is the sovereign borders of the following countries[6]:

- Republic of South Africa

Maps of the countries covered by the PoA are given below[7]:

**Figure 1a: Map of the Republic of South Africa**

[5] The list of countries covered by the PoA may be amended post registration to include additional countries subject to the conditions set out in Paragraph 6, Annex 26, EB 60.

[6] The list of countries covered by the PoA may be amended post registration to include additional countries subject to the conditions set out in Paragraph 6, Annex 26, EB 60.

[7] The maps of countries covered by the PoA may be amended post registration to include additional countries subject to the conditions set out in Paragraph 6, Annex 26, EB 60.

**A.4.2. Description of a typical small-scale CDM programme activity (CPA):**

This PoA aims to support and accelerate the development of small scale grid-connected solar power technologies.

A typical CPA included in this PoA will be:

- Newly built solar power generation unit(s) (photovoltaic, solar thermal electricity generation)
- Supplying electricity to a national/regional grid; or supplying electricity to an identified consumer via national/regional grid through a contractual arrangement
- Within the capacity constraints for applying an approved small scale methodology, i.e. <15MW installed capacity

*In accordance with approved small scale methodology 1.D./version 17, EB 61.*

**A.4.2.1. Technology or measures to be employed by the SSC-CPA:**

CPAs may employ any solar photovoltaic or solar thermal electricity generation technologies (less than or equal to 15MW) that are eligible under approved small scale methodology AMS-1.D – *Grid connected renewable electricity generation (version 17, EB 61)*.

Although the solar power technology employed by each CPA may differ, all CPAs will result in emission reductions through displacing more carbon intensive electricity on the national/regional electricity system that it is connected to.

As per AMS-1.D *(version 17, EB 61)*, 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.

**A.4.2.2. Eligibility criteria for inclusion of a SSC-CPA in the PoA:**

These eligibility criteria have been developed in accordance with Methodological Standard – *Standard for the Development of Eligibility Criteria for the Inclusion of a Project Activity as a CPA under the PoA, version 01.0, Annex 3, EB 63.*

A CPA under this PoA shall use the following checklist in the CPA DD to ensure eligibility with the PoA[8]:

| Eligibility requirement | CPA specific Justification |
|---|---|

[8] Eligibility criteria will be updated as necessary in accordance with section III B "Requirements for updating eligibility criteria" (para 14-18) of the *Standard for the Development of Eligibility Criteria for the Inclusion of a Project Activity as a CPA under the PoA, version 01.0, Annex 3, EB 63.*,

| Eligibility requirement | CPA specific Justification |
|---|---|
| Either: (a) Install a new solar power plant at a site where there was no solar power plant operating prior to the implementation of the project activity (Greenfield plant); (b) Involve a capacity addition (increase in the installed power generation capacity of an existing solar power plant); (c) Involve a retrofit (repair or modification of an existing solar power plant with the purpose of improving efficiency or performance without adding additional solar power plants or units); or (d) Replacement or retrofit of an existing solar plant with a new solar power plant or unit with generation capacity greater than or equal to the redundant unit(s) | |
| Be located within the geographical boundary as stated in section A.4.1.2 of the PoA DD | |
| Comply with all testing and certification requirements for solar power technologies in the relevant host country | |
| Either: (a) Supply electricity to a national/regional grid; or (b) Supply electricity to an identified consumer via national/regional grid through a contractual arrangement | |
| For greenfield projects, have a total installed capacity of less than or equal to 15MW | |
| If the CPA has both solar power and non-solar power components, the eligibility limit of 15MW shall apply only to the solar power component | |
| If the CPA involves a capacity addition then the added capacity shall not exceed 15MW and should be physically distinct from the existing solar power units; in the case of replacement or retrofit, the total output of the replaced or retrofitted solar power units shall not exceed 15MW | |
| If multiple sites are included under a single CPA, all 15MW capacity constraints above refer to the aggregate capacity of all of the installations included | |
| Pass the double counting checks as detailed in section A.4.4.1 of the PoA DD | |
| Pass the de-bundling checks as detailed in section A.4.4.1 of the PoA DD | |
| A CPA will not be eligible for inclusion in the PoA if any of the energy generating equipment employed by the CPA has been transferred from another activity | |
| Be in full compliance with all relevant host country laws, regulations and industry standards including undertaking local stakeholder consultation, environmental impact analysis and project licencing | |
| Have its start date (as defined in the CDM Glossary of Terms, version 07) falling after the start of validation of the PoA, verified by documentary evidence | |
| Demonstrate additionality as detailed in section E.5 of the PoA-DD and section B.3. of the specific CPA DD | |
| In the case where public funding is used, not result in a diversion of any official development assistance, as detailed in section A.4.5 of the PoA DD | |
| Have a crediting period that does not exceed the end date of the PoA (on 06/12/2039) | |
| Fulfil the double accounting check to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA | |

**A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):**

(i) The proposed PoA is a voluntary coordinated action;

This PoA is a voluntary coordinated action by the CME to support the development of small scale grid-connected solar electricity generation technologies, in all of the countries listed in A.4.1.1.

(ii) If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA;

The framework for assessment of additionality is defined at the PoA level and demonstrated at the CPA level. In accordance with Guidelines on the demonstration of additionality of small-scale project activities, Version 9, EB68, Annex 27, grid-connected solar power technologies of installed capacity up to 15MW are included in a positive list of technologies that are *"automatically defined as additional for project sizes up to and including the small-scale CDM thresholds"*.

The eligibility criteria set out in section A.4.2.2 are aligned with the requirements of the positive list, so any eligible CPA will therefore be automatically defined as additional and as such would not have been implemented in the absence of the PoA.

Additionality will be demonstrated at the CPA level through providing all necessary evidence(s) to show that the CPA meets all of the eligibility criteria set out in section A.4.2.2.

(iii) If the PoA is implementing a mandatory policy/regulation, this would/is not enforced;

Not applicable

(iv) If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.

Not applicable

**A.4.4. Operational, management and monitoring plan for the programme of activities (PoA):**

**A.4.4.1. Operational and management plan:**

(i) Clear definition of roles and responsibilities in the process of inclusion of CPAs

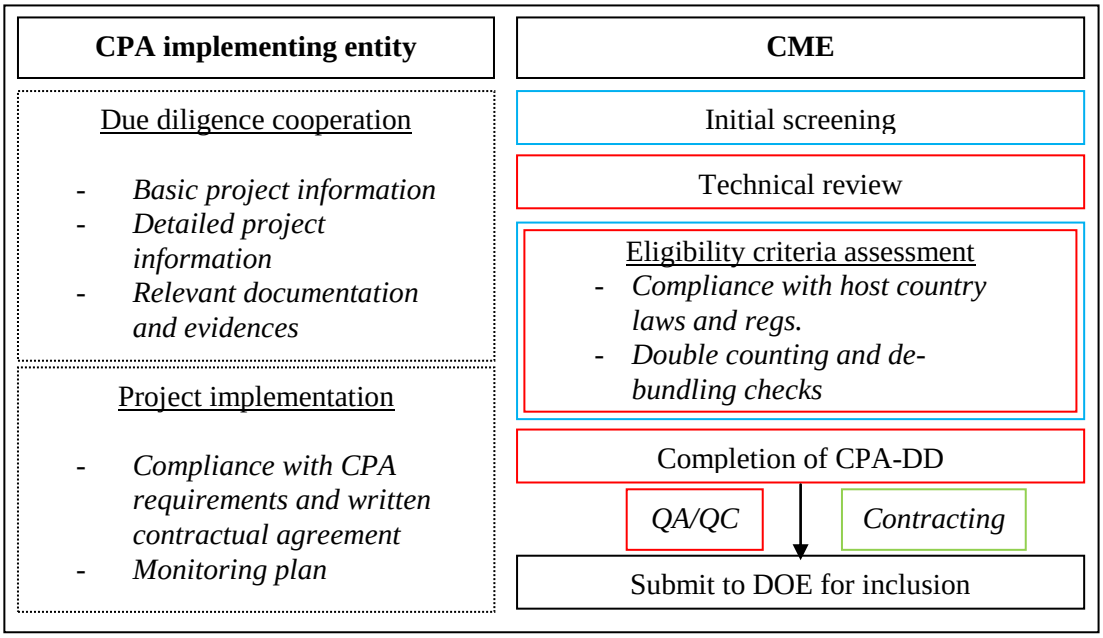


**Figure 2: CPA inclusion process**

The role of the *CME* is to assess and review potential CPAs, and work with the implementing entity – through a contractual agreement – to perform the eligibility assessment, complete the CPA-DD, and submit the CPA to the DOE for inclusion. The CME responsibilities are split across three teams within the organisation: PoA team; CDM qualification, and legal, and have been colour coded in Figure 2 as follows.

| | | |
|---|---|---|
| *CDM qualification team* | *Legal team* | *PoA team* |

All three teams report to the CME Managing Director who has overall responsibility for the inclusion process.

The role of the *implementing entity* is to provide all of the necessary project information and documentation to the CME to facilitate a comprehensive assessment of potential CPA's eligibility under the PoA, and enable the CME to complete the CPA-DD.

A contractual agreement will be prepared by the CME and signed by each CPA implementing entity prior to submission of the CPA-DD to a DOE for inclusion, which clearly defines the roles of the CME and CPA implementing entity in the process of inclusion as described above.

(ii) Records and arrangements for training and capacity development for personnel

A record of CME staff members and respective roles will be complied and made available to the DOE at validation. This record will be kept up-to-date and allow for any gaps that may emerge in the CME team structures or capabilities of personnel to be easily identified and addressed.

Training will be provided where applicable and a record of training provided to personnel will be kept and made available to the DOE on request.

(iii) Measures for continual improvements of the PoA management

The PoA management process will be assessed annually with comments invited from all team members and participating CPA implementing entities to help identify any possible areas for improvement.

The annual assessment will take the form of a questionnaire that will be sent out electronically to all CME staff and on paper to participating CPA implementing entities.

(iv) Procedures for technical review of potential CPAs

The CME will perform a detailed technical review of all potential CPAs to ensure that only eligible CPAs under the eligibility criteria of the PoA are pursued. The technical review process with be done in cooperation with the CPA implementing entity. The following technical documentation will be requested by the CME:

- Feasibility study
- Project information memorandum
- Environmental impact assessment
- Engineering design plans
- Financial marketing materials
- Financial due diligence report

The majority of potential CPA implementing entities will not be able to provide all of the documentation listed above, but the CME will work with the CPA implementing entity to take an informed view of the validity and accuracy of the CPA technical information available.

Once there is sufficient confidence in the project information that the CPA is eligible under the PoA, the CME will proceed with the inclusion process.

(v) Records and documentation control process for each CPA

The CME will manage and maintain a safe electronic database for the PoA containing the following information for each CPA under the PoA:

- Unique CPA identification code[9]
- CPA title/project name

[9] The format of this identification code will be a three letter country code followed by a 4 digit project number. i.e. for the 3rd CPA in South Africa the CPA identification code will be *RSA0003*.

- Implementing entity – name, address, contact details
- Solar power technology employed
- Installed generation capacity
- Name of the electricity system to which the CPA is connected to
- Location
- CPA start date

(vi) A system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA

Every CPA to be included in the PoA will be contracted on the basis that is exclusive to Camco Carbon Africa Limited. To fulfil this legal exclusivity requirement, each CPA will undergo a double accounting check to ensure that it has not already been registered as a CDM project activity or as a CPA in another PoA. Every CPA will be cross referenced with i) the existing CPAs in the electronic database described above, ii) the UNFCCC CDM website project cycle and validation search pages:

http://cdm.unfccc.int/Projects/projsearch.html
http://cdm.unfccc.int/Projects/Validation/index.html

and, iii) The CDM PoA project database information provided by the UNEP Risø Centre and the Institute for Global Environmental Strategies:

http://cdmpipeline.org/
http://www.iges.or.jp/en/cdm/report_cdm.html

To further safe guard against double accounting, the CME will request that all CPA implementing entities confirm in writing, or through a contractual arrangement, that their project is not part of a separate CDM project activity or is also a CPA under different PoA.

In the event that a CPA is found to be already registered either as a CDM project activity or as a CPA of another PoA, the CME will not include the CPA under this PoA.

(vii) The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity.

The same process described in point (ii) above will be used to perform a de-bundling check in accordance with Annex 13, EB 54 *Guidelines on Assessment of De-Bundling for SSC Project Activities*.

A CPA will be deemed a de-bundled component of a large scale project activity if an existing project activity exists that is both:

a) Implemented by the same entity or managed by the same CME as the proposed CPA; and
b) Located within 1km of the proposed CPA, as measured from the closest point

To further safe guard against double accounting, the CME will educate all CPA implementing entities of the de-bundling rules and ask them to confirm in writing, or through a contractual arrangement, that their project is not a de-bundled component of a large scale project activity.

If a proposed CPA fails this check and is found to be a de-bundled component of a large scale project activity, the CME will not include the CPA under this PoA.

(viii) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA;

To ensure all CPA implementing entities are aware that their project is being subscribed to the PoA and to clarify their consent in this matter, a contractual arrangement will be executed between the CME and each CPA implementing entity that includes the following provisions:

- The project activity is to be included as a CPA under the *Small Scale Grid-connected Solar Power Programme* PoA, coordinated and managed by the CME
- The implementing entity shall not register the CPA as a CDM project activity or include the CPA in another PoA
- The implementing entity shall not undertake a CDM project that employs the same technology, or another CPA within 1 km of the proposed CPA
- A clear agreement on the ownership and transfer of rights to the CERs generated by the CPA

**A.4.4.2. Monitoring plan:**

Emission reductions will be verified for each CPA independently. No sampling methods will be used.

The parameters listed in section E.7.1 will be monitored for each CPA by the implementing entity in accordance with the monitoring plan detailed in the section E.7.2 and in each CPA design document. Monitoring data will be submitted to the CME periodically and stored in a safe electronic database. All raw monitoring data will be recorded and stored by the respective implementing entities.

The electronic database will enable the CME to track the status of verification for each CPA and ensure no double counting occurs.

**A.4.5. Public funding of the programme of activities (PoA):**

The details of any public funding that is part of a CPA under this PoA will be provided in section A.4.5. of the CPA-DD.

## SECTION B. Duration of the programme of activities (PoA)

**B.1. Starting date of the programme of activities (PoA):**

06/12/2011[10]

**B.2. Length of the programme of activities (PoA):**

28 years

**SECTION C. Environmental Analysis**

>>

**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:**

1. Environmental Analysis is done at PoA level ☐
2. Environmental Analysis is done at SSC-CPA level ☑

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

The environmental analysis will be done at the CPA level

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

The PoA will cover all countries listing in section A.4.1.1.

Different countries may have different requirements and regulations for environmental impact assessments (EIA) for solar power projects. The respective laws and requirements for EIAs in the host country of each CPA will be described at the CPA level in the CPA design document.

If an EIA for a CPA is required under law in that host country, the CME will ensure that a fully compliant EIA has been conducted and presented to the DOE as part of the inclusion process, otherwise the CPA will not be included in the PoA.

**SECTION D. Stakeholders' comments**

[10] In accordance with CDM glossary of terms v7 (see http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM.pdf)), start date is defined as "In the context of a CDM PoA, the date on which the coordinating/managing entity officially notifies the secretariat and the DNA of their intention to seek the CDM status or the date of publication of the PoA-DD for global stakeholder consultation in accordance with the relevant CDM rules and requirements.". The validation of the PoA began on (06/12/2011) which is the date when the PoA DD was published for Global Stakeholder Consultation.

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

1. Local stakeholder consultation is done at PoA level ☐
2. Local stakeholder consultation is done at SSC-CPA level ☑

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

The local stakeholder consultation will be done at the CPA level

**D.3. Summary of the comments received:**

The local stakeholder consultation will be done at the CPA level

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

The local stakeholder consultation will be done at the CPA level

## SECTION E. Application of a baseline and monitoring methodology

**E.1. Title and reference of the approved SSC baseline and monitoring methodology applied to a SSC-CPA included in the PoA:**

Approved small scale methodology AMS-1.D – Grid connected renewable electricity generation (version 17, EB 61)

**E.2. Justification of the choice of the methodology and why it is applicable to a SSC-CPA:**

All CPAs under this PoA will be applicable to AMS-1.D version 17, following the applicability criteria listed below:

**Table 1: Applicability criteria of Approved small scale methodology AMS-1.D**

| |
|---|
| *1. Technology/measure* |
| Each CPA must comprise of solar power generation units that supply electricity to the national or regional grid; or to an identified consumer facility via the nation/regional grid through a contractual arrangement |
| *2. Project type* |
| Each CPA must be either:<br>- The installation of 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)<br>- Involve a capacity addition (increase in the installed power generation capacity of an existing power plant)<br>- Involve a retrofit (repair or modification of an existing power plant with the purpose of improving efficiency or performance without adding additional power plants or units)<br>- Replacement or retrofit of an existing plant with a new plant or unit with generation capacity greater than or equal to the redundant unit(s) |
| *3. Capacity constraints* |

| |
|---|
| Depending on the type of project, the following capacity constraints apply for each CPA:<br>- For greenfield plants, a total installed capacity of less than or equal to 15MW<br>- If the CPA has both renewable and non-renewable components, the eligibility limit of 15MW shall apply only to the renewable component<br>- If the CPA employs technology that co-fires renewable and non-renewable fuels the capacity of the entire system shall not exceed 15MW<br>- If the CPA involves the addition of renewable generation then the added capacity shall not exceed 15MW and should be physically distinct from the existing units; in the case of replacement or retrofit, the total output of the replaced or retrofitted units shall not exceed 15MW |

All CPAs under this PoA will be applicable to the "Tool to calculate the emission factor for an electricity system" ((Version 02.2.1), following the applicability criteria listed below:

**Table 2: Applicability criteria of "Tool to calculate the emission factor for an electricity system" ((Version 02.2.1),**

| |
|---|
| The following conditions will be adhered to when applying this tool for each CPA:<br>• This tool may be applied to estimate the OM, BM and/or CM when calculating baseline emissions for a project activity that substitutes grid electricity, i.e. where a project activity supplies electricity to a grid or a project activity that results in savings of electricity that would have been provided by the grid (e.g. demand-side energy efficiency projects).<br>• In case of CDM projects the tool is not applicable if the project electricity system is located partially or totally in an Annex I country |

**Table 3: Applicability criteria of "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02)**

| |
|---|
| The following conditions will be adhered to when applying this tool for each CPA:<br>• This tool provides procedures to calculate project and/or leakage $CO_2$ emissions from the combustion of fossil fuels. It can be used in cases where $CO_2$ emissions from fossil fuel combustion are calculated based on the quantity of fuel combusted and its properties. Methodologies using this tool should specify to which combustion process j this tool is being applied. |

## E.3. Description of the sources and gases included in the SSC-CPA boundary

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

The main source of emissions within the project boundary is fossil fuels fired in power plants connected to the national/region electricity system that the CPA is connected to.

Some eligible solar technologies may utilise supplementary fossil fuels for electricity generation, in which case the $CO_2$ emissions resulting from the combustion of that supplementary fossil fuel is included in the project boundary also.

**Table 2: Breakdown of emission sources**

| | 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 |
| **Project activity** | $CO_2$ emissions from combustion of fossil fuels required to operate the power plant | $CO_2$ | Yes *(if applicable for supplementary fossil fuel use)* | Main emission source for solar thermal, Zero for PV |
| | | $CH_4$ | No | Minor emission source for solar thermal, Zero for PV |
| | | $N_2O$ | No | Minor emission source for solar thermal, Zero for PV |

**E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:**

Assuming applicability of AMS-1.D as outlined in section E.2, the baseline scenario is that the electricity delivered to the grid as a result of the project activity would have otherwise been generated by the operation of grid-connected power plants and/or by the addition of new generation sources to the grid.

**E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA):** >>

**E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:**

As explained in section A.4.3, additionality is to be demonstrated at the CPA level through illustrating compliance with the eligibility criteria set out in section A.4.2.2.

More specifically, all eligible CPAs will i) employ a solar power technology (photovoltaic or solar thermal electricity generation); ii) be grid-connected, and iii) have a generation capacity no greater than 15MW. Additionality of eligible CPAs is therefore predefined in accordance with Guidelines on the demonstration of additionality of small-scale project activities, Version 9, EB68, Annex 27.

Project types that are explicitly listed in the positive list of grid-connected renewable electricity generation technologies are automatically defined as additional without further documentation of barriers. Solar technologies up to 15MW of installed capacity are included in the positive list and are there for defined as additional.

**E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:**

Each CPA-DD will follow the framework outlined in section E.5.1 above. All relevant documentation will be presented to the DOE prior to inclusion of each CPA under the PoA.

Each CPA-DD will illustrate additionality in the following way:

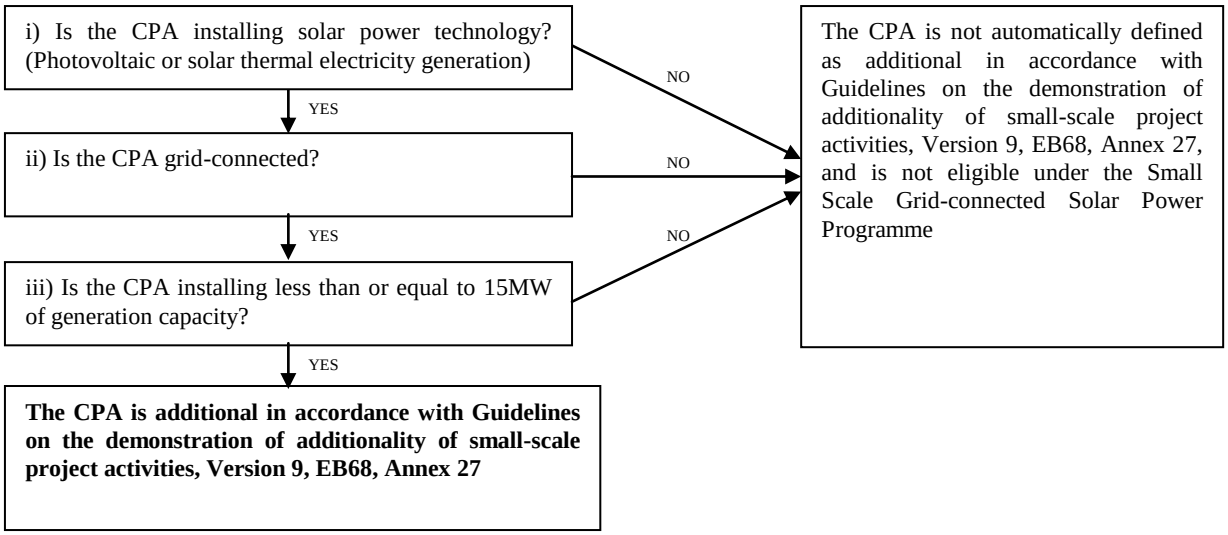


**Figure 3: CPA additionality framework**

## E.6. Estimation of Emission reductions of a CPA:

### E.6.1. Explanation of methodological choices, provided in the approved baseline and monitoring methodology applied, selected for a typical SSC-CPA:

Each CPA will fall under one of the following project types, as applicable under approved small scale methodology AMS-1.D – Grid connected renewable electricity generation (version 17, EB 61):

**Greenfield** Installation of a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity

**Retrofit** Repair or modification of an existing power plant with the purpose of improving efficiency or performance without adding additional power plants or units

**Capacity addition** Increase in the installed power generation capacity of an existing power plant

### E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA:

As described in E.4, the baseline scenario is that the power generated by the project would have otherwise been generated by the operation of grid-connected power plants, or the addition of new generating sources, in the absence emissions of the project activity.

The emission factor of the grid / electricity system used in the baseline calculations ($EF_{CO2, Grid,y}$) will be derived in accordance with Methodological Tool – *Tool to calculate the emission factor for an electricity system, version 02.2.1, Annex 19, EB 63*.

The emission factor shall be calculated using transparent and verifiable data that will be presented in each CPA design document.

**For Greenfield sites**

The baseline emissions ($BE_y$) for a greenfield site are calculated as the product of the expected power generation of project ($EG_{BL,y}$) and the grid emissions factor ($EF_{CO2, Grid,y}$):

$$BE_y = EG_{BL,y} * EF_{CO2, Grid,y}$$

Where:

| | |
|---|---|
| $BE_y$ | Baseline Emissions in year y ($tCO_2e$) |
| $EG_{BL,y}$ | 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 ($tCO_2/MWh$). The steps to calculate a grid emission factor are included in Annex to this document. |

**For retrofit or capacity addition projects**

The baseline scenario for retrofit or replacement projects involves the continuing operation of the existing power plant.

The baseline emissions ($BE_{retrofit,CO2,y}$) are calculated as follows:

$$BE_{retrofit,CO2,y} = EG_{BL,retrofit,y} * EF_{CO2, grid, y}$$

Where:

$$EG_{BL,retrofit,y} = EG_{PJ,faciltiy,y} - (EG_{historical} + \sigma_{historical})$$

*$EG_{BL,retrofit,y}$ = 0 on or after the point in time when the existing equipment would need to be replaced in any case in the absence of the project activity.*

Where:

| | |
|---|---|
| $BE_{retrofit,CO2,y}$ | The baseline emissions in year y ($tCO_2$) |
| $EG_{BL,retrofit,y}$ | Quantity of net electricity supplied to the grid as a result of the implementation of the CDM project activity in year y (MWh) |
| $EG_{PJ,faciltiy,y}$ | Quantity of net electricity generation supplied by the total power plant (of which the project activity forms a part of) to the grid in year y (MWh) |

| | |
|---|---|
| $EG_{historical}$ | 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 (MWh)<br><br>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% or more), shall be used.<br><br>A minimum of 3 years of historical generation data is required for retrofit/replacement project activities. For any relevant CPA, if historical generation data of the require duration is not available, then that CPA will not be included under this PoA |
| $\sigma_{historical}$ | Standard deviation of the 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 (MWh) |

It is assumed that the addition of new capacity or retrofitting of existing unit to increase capacity does not significantly affect the electricity generated by existing plant(s) or unit(s). In this case, the electricity produced by the added power plant(s) or unit(s) could be directly metered and used to determine $EG_{BL,y}$, provided that the electricity produced by the added power plant(s) or unit(s) addition is separately metered.

Project activities that involve a capacity addition shall use the equations above replacing subscript "retrofit" with "capacity addition".

The requirements concerning demonstration of the remaining lifetime of the replaced equipment shall be met as described in the General Guidelines to SSC CDM methodologies (version 19, EB 69). If the remaining lifetime of the affected systems increases due to the project activity, the crediting period shall be limited to the estimated remaining lifetime, i.e. the time when the affected systems would have been replaced in the absence of the project activity.

**Project emissions**

For CPAs which also use supplementary fossil fuels (i.e. some solar thermal electricity technologies), $CO_2$ emissions from the combustions of fossil fuels shall be accounted for as project emissions $PE_{FF,y}$.

$PE_{FF,y}$ shall be calculated as per the latest version of the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02)

Therefore, project emissions will be calculated as follows:

$$PE_y = PE_{FF,y}$$

Where:

| | |
|---|---|
| $PE_y$ | Project emissions in year y ($tCO_2e/y$) |

$PE_{FF,y}$ Project emissions from fossil fuel consumption in year y ($tCO_2/y$)

**Leakage**

Leakage is only considered if the project activity employs electricity generation technology that has been transferred from another activity. As set out in the eligibility criteria in section A.4.2.2, any CPA that employs electricity generation technology that has been transferred from another activity is ineligible under this PoA.

Therefore, leakage is considered to be zero.

**Emission reductions**

Emission reductions are calculated as follows:

$ER_y = BE_y - PE_y$

Where:

| | |
|---|---|
| $ER_y$ | Emission reductions in year y ($tCO_2e/y$) |
| $BE_y$ | Baseline emissions in year y ($tCO_2e/y$) |
| $PE_y$ | Project emissions in year y ($tCO_2e/y$) |

**E.6.3. Data and parameters that are to be reported in CDM-SSC-CPA-DD form:**

| **Data / Parameter:** | **$EF_{CO2,grid,y}$** |
|---|---|
| Data unit: | $tCO_2/MWh$ |
| Description: | 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" |
| Source of data used: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Value applied: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | As per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Any comment: | Calculated using the *ex ante* option |

| **Data / Parameter:** | **$NCV_{i,y}$** |
|---|---|
| Data unit: | GJ/tonne |
| Description: | The net calorific value (energy content) for fossil fuel type i in year y |
| Source of data used: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate |

| | |
|---|---|
| | the emission factor for an electricity system" *version 02.2.1* |
| Value applied: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | As per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Any comment: | - |

| **Data / Parameter:** | **$EF_{CO2,i,y}$** |
|---|---|
| Data unit: | tCO2/GJ |
| Description: | CO2 emission factor for fuel i in year y |
| Source of data used: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Value applied: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | As per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Any comment: | - |

| **Data / Parameter:** | **FCi,m,y** |
|---|---|
| Data unit: | tonnes |
| Description: | Amount of fossil fuel type i consumed by power plant unit m in year y |
| Source of data used: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Value applied: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | As per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Any comment: | - |

| **Data / Parameter:** | **EGm,y** |
|---|---|
| Data unit: | MWh |
| Description: | Net quantity of electricity delivered to the grid by power plant unit m in year y |
| Source of data used: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate |

| | |
|---|---|
| | the emission factor for an electricity system" *version 02.2.1* |
| Value applied: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | As per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Any comment: | - |

| **Data / Parameter:** | $EF_{grid,BM,y}$ |
|---|---|
| Data unit: | tCO2/MWh |
| Description: | Build margin CO2 emission factor for the project electricity system in year y |
| Source of data used: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Value applied: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | As per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Any comment: | - |

| **Data / Parameter:** | $EF_{grid,OM,y}$ |
|---|---|
| Data unit: | tCO2/MWh |
| Description: | Operating margin CO2 emission factor for the project electricity system in year y |
| Source of data used: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Value applied: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | As per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Any comment: | - |

***[For retrofit/capacity addition projects only]***

| **Data / Parameter:** | $EG_{historical}$ |
|---|---|
| Data unit: | MWh/y |
| Description: | Annual average historical net electricity generation delivered to the grid by the existing renewable energy plant that was operated at the site prior to the |

| | |
|---|---|
| | implementation of the project activity |
| Source of data used: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Value applied: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | Measured by electricity meters |
| Any comment: | Minimum 3 years of operating data. Detailed data provided in supplementary spread sheet |

***[For retrofit/capacity addition projects only]***

| **Data / Parameter:** | $\sigma_{historical}$ |
|---|---|
| Data unit: | MWh/y |
| 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 the data used to establish $EG_{historical}$<br>SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Value applied: | SSC-CPA to apply the value for the relevant grid as per the "Tool to calculate the emission factor for an electricity system" *version 02.2.1* |
| Justification of the choice of data or description of measurement methods and procedures actually applied : | Parameter to be calculated as the standard deviation of the annual generation data used to calculated $EG_{historical}$ for retrofit or replacement project activities |
| Any comment: | Minimum 3 years of operating data. Detailed data provided in supplementary spread sheet |

## E.7. Application of the monitoring methodology and description of the monitoring plan:

### E.7.1. Data and parameters to be monitored by each SSC-CPA:

| **Data / Parameter:** | $EG_{BL,y}$ / $EG_{PL,facility,y}$ |
|---|---|
| Data unit: | MWh/y |
| Description: | Quantity of net electricity generation supplied to the grid in year y |
| Source of data to be used: | Project activity site |

| | |
|---|---|
| Value of data applied for the purpose of calculating expected emission reductions in section B.5 | - |
| Description of measurement methods and procedures to be applied: | Measured using electricity meters<br><br>Monitoring frequency to be continuous and at least monthly recording |
| QA/QC procedures to be applied: | Cross check measurement results with records for sold electricity |
| Any comment: | This value includes all units, existing and new in the case of capacity addition / retrofit projects |

| **Data / Parameter:** | $\mathbf{FC_{i,j,y}}$ |
|---|---|
| Data unit: | Mass or volume unit per year (e.g. ton/yr or $m^3$/yr) |
| Description: | Quantity of fuel type i combusted in process j during the year y |
| Source of data to be used: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Value of data applied for the purpose of calculating expected emission reductions in section B.5 | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Description of measurement methods and procedures to be applied: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| QA/QC procedures to be applied: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Any comment: | Applicable to CPAs which use supplementary fossil fuels for electricity generation |

| **Data / Parameter:** | $\mathbf{W_{C,i,y}}$ |
|---|---|
| Data unit: | tC/mass unit of the fuel |
| Description: | Weighted average mass fraction of carbon in fuel type i in year y |
| Source of data to be used: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Value of data applied for the purpose of calculating expected emission reductions in section B.5 | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Description of measurement methods and procedures to be applied: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |

| | |
|---|---|
| QA/QC procedures to be applied: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Any comment: | Applicable to CPAs which use supplementary fossil fuels for electricity generation |

| **Data / Parameter:** | $\rho_{i,y}$ |
|---|---|
| Data unit: | Mass unit/volume unit |
| Description: | Weighted average density of fuel type i in year y |
| Source of data to be used: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Value of data applied for the purpose of calculating expected emission reductions in section B.5 | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Description of measurement methods and procedures to be applied: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| QA/QC procedures to be applied: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Any comment: | Applicable to CPAs which use supplementary fossil fuels for electricity generation |

| **Data / Parameter:** | $NCV_{i,y}$ |
|---|---|
| Data unit: | GJ per mass or volume unit (e.g. GJ/m³, GJ/ton) |
| Description: | Weighted average net calorific value of fuel type i in year y |
| Source of data to be used: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Value of data applied for the purpose of calculating expected emission reductions in section B.5 | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Description of measurement methods and procedures to be applied: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| QA/QC procedures to be applied: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Any comment: | Applicable to CPAs which use supplementary fossil fuels for electricity generation |

| **Data / Parameter:** | $EF_{FF,y}$ |
|---|---|
| Data unit: | $tCO_2$/tonne |
| Description: | Emission factor of fossil fuel consumed in year y |
| Source of data to be | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel |

| | |
|---|---|
| used: | combustion" (Version 02) |
| Value of data applied for the purpose of calculating expected emission reductions in section B.5 | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Description of measurement methods and procedures to be applied: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| QA/QC procedures to be applied: | As per the "Tool to calculate project or leakage $CO_2$ emissions from fossil fuel combustion" (Version 02) |
| Any comment: | Applicable to CPAs which use supplementary fossil fuels for electricity generation |

**E.7.2. Description of the monitoring plan for a SSC-CPA:**

The CME will work with the CPA implementing entity to design and implement the following monitoring plan.

**1. Monitoring plan objective and organisation**

The CPA implementing entity is responsible for the implementation and management of the monitoring plan. The CME will qualify and assist with the monitoring plan. The CPA implementing entity will submit all relevant data to the CME that is required for the periodic verification of emission reductions. To ensure all data is reliable and transparent, each CPA will establish quality assurance and quality control (QA &QC) procedures to control and manage data reading, recording, auditing and archiving and to ensure the quality of all relevant project documents.

The QA&QC procedures include an outline of the responsibilities of each CPA employee with respect to the project activity and associated monitoring activities. Document templates and step by step process steps for compiling and storing data as well archiving in a clear, accurate and transparent manner are also included. The communication plan between the CPA implementing entity and the CME are clearly outlined.

**2. Monitoring data**

The CPA implementing entity will monitor all parameters outlined in section E.7.1. .
Net electricity generation supplied to the grid shall be recorded at least monthly, with all other data recorded as often as is practically possible.

Metering data will be cross referenced with invoice data for electricity generation.

All data will be compiled and archived by the CPA implementing entity, and will be submitted to the CME both periodically and upon request in adherence to the QA&QC procedures.

Monitoring data will subsequently be submitted by the CME to the DOE for periodic verifications of emission reductions.

The CME will electronically store all monitoring data until 2 years after the end of the crediting period.

**3. Quality assurance and quality control**

The CME has a dedicated operations team to ensure the full implementation of the monitoring plan to ensure quality assurance throughout the crediting period and beyond. This operations team will provide constant support to the CPA implementing entity to ensure that all activities adhere to CPA QA&QC procedures and that the monitoring plan is fully implemented.

As part of the QA&QC procedures for each CPA, the CPA implementing entity is responsible for the maintenance and calibration of all metering devices to the set industry standard in Republic of South Africa. The CME will request from the implementing entity official certification that all metering devices are compliant with the set industry standard, and this shall be presented to the DOE.

All metering devices will be recalibrated and inspected periodically by qualified personnel, in accordance with the set industry standard. This will happen at least once per 3 years.

Each CPA monitoring plan will outline the procedures for monitoring and recording of all relevant parameters listed in section E.7.1.

Quality Assurance and Quality Control measures will be outlined at the CPA level to illustrate how implementing entities will coordinate with the CME to provide reliable and transparent monitoring data, which can be safely stored and verified.

Full details of the monitoring plan for each individual CPA will be described at the CPA level.

**E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)**

Contact person: Eoin Martin
Email: eoin.martin@camcoglobal.com
Date of completion: 25/11/2011

**Annex 1**

**CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY and PARTICIPANTS IN THE PROGRAMME of ACTIVITIES**

| | |
|---|---|
| Organization: | Camco Carbon Africa Limited |
| Street/P.O.Box: | Green Street |
| Building: | Channel House |
| City: | St Helier |
| State/Region: | Jersey |
| Postfix/ZIP: | JE2 4UH |
| Country: | Channel Islands |
| Telephone: | +44 207 121 6100 |
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| E-Mail: | |
| URL: | www.camcoglobal.com |
| Represented by: | |
| Title: | Managing Director |
| Salutation: | Mr |
| Last Name: | Houston |
| Middle Name: | - |
| First Name: | Arthur |
| Department: | Carbon Projects |
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| Direct FAX: | +44 207 121 6101 |
| Direct tel: | +44 207 121 6100 |
| Personal E-Mail: | Project.Participant.ru@camcoglobal.com |
| Secondary Representative: | |
| Title: | Associate - Carbon |
| Salutation: | Ms |
| Last Name: | Pertynska |
| Middle Name: | |
| First Name: | Julia |
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| Personal E-Mail: | Project.Participant.ru@camcoglobal.com |

## Annex 2

## INFORMATION REGARDING PUBLIC FUNDING

This will be included at the CPA level.

## Annex 3

## BASELINE INFORMATION

- - - - -

In accordance with Methodological Tool – *Tool to calculate the emission factor for an electricity system, version 02.2.1, Annex 19, EB 63*, the grid emission factor will be calculated as follows:

STEP 1. Identify the relevant electricity systems;
STEP 2. Choose whether to include off-grid power plants in the project electricity system (optional);
STEP 3. Select a method to determine the operating margin (OM);
STEP 4. Calculate the operating margin emission factor according to the selected method;
STEP 5. Calculate the build margin (BM) emission factor;
STEP 6. Calculate the combined margin (CM) emissions factor.

*Step 1: Identify the relevant electricity systems*
The relevant electricity system plants and plant types are listed.

*Step 2: Choose whether to include off-grid power plants in the project electricity system (optional)*
Only grid power plants will be included in the calculation.

*Step 3: Select a method to determine the operating margin (OM)*
In accordance with Methodological Tool – *Tool to calculate the emission factor for an electricity system, version 02.2.1, Annex 19, EB 63*, the operating margin ($EF_{grid,OM,y}$) is calculated using one of the following methods:

(a) Simple OM
(b) Simple adjusted OM
(c) Dispatch data analysis OM
(d) Average OM

*Step 4: Calculate the operating margin emission factor according to the selected method*
The Simple OM is calculated *ex ante*, using a 3-year generation-weighted average based on the most recent data available at the time of submission of the SSC-CPA DD to the DOE for validation.

*Step 5: Calculate the build margin (BM) emission factor*
The BM ($EF_{grid,BM,y}$) is determined using the method set out in Methodological Tool – *Tool to calculate the emission factor for an electricity system, version 02.2.1, Annex 19, EB 63*.

*5a: Identify the 5 most recent power units, excluding CDM ($SET_{5\text{-}units}$)*
*5b: Identify the units that comprise at least 20% of the system generation, excluding CDM ($SET_{\geq 20\%}$)*
*5c: Select the set of power units that comprises the larger annual generation*
*5d: Is there at least one power unit older than 10 years in the set?*
*5e: Exclude power units older than 10 years and include power units registered in the CDM*
*5f: Does the set comprise at least 20% of generation?*
*5g: Include power units older than 10 years until the set comprises 20% of generation*

*Step 6: Calculate the combined margin emissions factor*
The combined margin (CM) emissions factor ($EF_{grid,CM,y}$) is calculated using the Weighted average CM method, Option A and equation (14) of the tool.

## Annex 4

## MONITORING INFORMATION

No further information

- - - - -