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)

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

Small-scale solar electrical programme, South Africa – CPA-001
Version number: 7.0
Date: 14/11/2012

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

The proposed CPA applies to the following CPA type:

1. The group of the independent activities under the predetermined province of the RSA, each of which is no larger than 0.15 MW installed capacity. Activities will be added *ex post* during the crediting period of the corresponding CPA (actual independent activities may not be known before the registration of the CPA under the PoA)

The proposed CPA comprises the group of the independent activities in the KwaZulu-Natal Province of the RSA, each of which is no larger than 0.15 MW installed capacity. Each independent activity under the proposed CPA uses solar electrical technologies which enable to convert solar radiation into electrical energy.

Electricity which will be produced by activities under the proposed CPA is supplied to:

> Scenario (i) An identified consumer (end user) or the group of consumers, which would have been supplied with electricity from the national grid of the RSA in the absence of the activity, furthermore excess electricity may be supplied to the grid.

Each independent activity under the proposed CPA envisages:

> Option (a) Installation of a solar electrical system at the site where there was no solar electrical system operating prior to the implementation of the activity; or

The proposed CPA size is limited by 15 MW installed capacity.

GHG emissions from the electricity generation for the solar electrical systems amount to zero. The reduction of GHG emissions as a result of the implementation of this CPA will be achieved due to reduction of CO_2 emissions from combustion of fossil fuel at the existing grid-connected power plants and plants which would likely be built in the absence of this CPA.

Since actual independent activities may not be known before the registration of the CPA under the PoA, the activities will be added *ex post* during the crediting period of the corresponding CPA, therefore the start date of this CPA will be later than the date of publishing of the PoA for global stakeholder consultation, namely 23th December 2011; with the expected date of the inclusion of the proposed CPA under the PoA being used as the start of the crediting period, namely 1st January 2013.

The first activity to be added to this system has the following characteristics:

Table A.2-1: Characteristics of first activity in this CPA

Number	Renewable energy type	Project owner name	Address	Geographic Reference		Capacity (kW)
1	Photovoltaic System	Anneke van Lier	KwaZulu-Natal Province, Durban 37 Danville Avenue, Durban North, 4051	Latitude: -29.7690	Longitude: 31.0555	2.405

It is envisaged that 3MW of activities will be added each year until a maximum of 15MW, as shown in the table below.

Table A.2-2: Expected yearly installed power capacity during crediting period

Year	Installed Power Capacity at beginning of year from all activities (MWh)	Newly Installed Power Capacity in specified year (MWh)	Cumulative Installed Power Capacity at end of specified year from all activities (MWh)
2013 (from 01/01 to 31/12)	0.0024	2.9976	3
2014	3	3	6
2015	6	3	9
2016	9	3	12
2017	12	3	15
2018	15	0	15
2019	15	0	15

Contribution to sustainable development

The activities in this CPA satisfy all sustainable development criteria identified by the DNA of the RSA. The activities will promote:

- Development of renewable energy projects in the RSA, thus contributing materially to achieving the established RSA's energy target of having at least 10 000 GWh of electricity generated annually from renewable energy starting from 2013[3] as well as the established GHG mitigation target of getting a deviation below the current emissions baseline of around 34% by 2020[4];
- Enhancement of the motivation of the households and private companies in the RSA to use solar electrical systems for power generation purposes in order to reduce demand for Eskom's electricity;

[3] http://www.energy.gov.za/files/renewables_frame.html

[4] http://www.unep.org/climatepledges/Default.aspx?pid=68

- Creation of new jobs for the people and increase of tax revenues for the RSA budget; and
- Mitigation of the negative environmental impact. Combustion of fossil fuels (mostly coal) at Eskom's power plants and hereby emissions of the harmful substances into the atmosphere, such as flue ash, oxides of sulphur and nitrogen will be reduced due to the implementation of each independent activity under this PoA.

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

The entity responsible for the proposed CPA is Blue World Carbon Capital PCC (BWCC). BWCC is also the managing and coordinating entity of the PoA, as indicated in the PoA-DD.

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

This CPA falls under sectorial scope 1: *Energy industries (renewable-/ non renewable sources) Type*: *Renewable energy projects;* and Category: *I.F. Renewable electricity generation for captive use and mini-grid*[5].

This CPA comprises the group of the independent that uses solar electrical technologies which enable to convert solar radiation into electrical energy, taking advantage of the photovoltaic (PV) effect. Such technologies may include, but are not limited to: wafers (cells) made from single crystal silicon, polycrystalline silicon and ribbon silicon as well as advanced thin film technologies.

The cell absorbs solar radiation which energizes the electrons inside the cell and produces electricity. Individual solar cells are linked and placed behind a protective glass sheet to form a PV panel (see Figure A.4-1).

A thin film solar cell (TFSC), also called a thin film photovoltaic cell (TFPV), is a solar cell that is made by depositing one or more thin layers (thin film) of photovoltaic material on a substrate (see Figure A.4-2). The thickness range of such a layer is wide and varies from a few nanometers to tens of micrometers. Many different photovoltaic materials are deposited with various deposition methods on a variety of substrates.

The solar electrical system may be connected either directly to the LV grid of the end user or the national grid of the RSA or via batteries for storage of the electrical energy.

Figure A.4-1: Solar cell and solar panel

[5] CDM Methodology Booklet (page 15), May 2012, http://cdm.unfccc.int/methodologies/documentation/meth_booklet.pdf

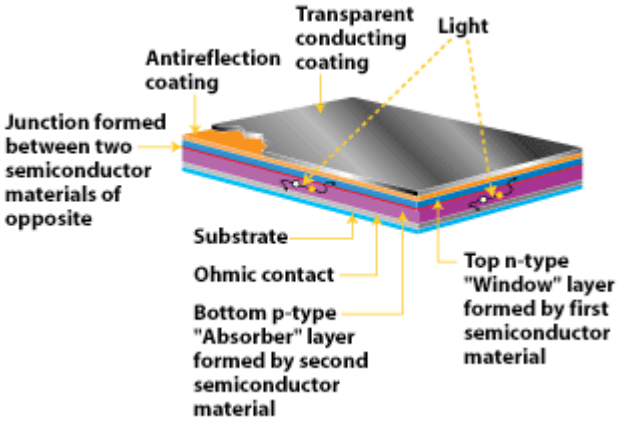

Figure A.4-3: Cross-section of thin film polycrystalline solar cell

Since the procedures set for the CDM do not define 'technology transfer'[6], it is generally interpreted as meaning the use of equipment and/or knowledge by the CDM project, not previously available in the host country; and therefore there is no technology transfer for this project.

Solar electricity is clean. Unlike fossil generated electricity, clean energy does not produce CO_2 emissions. The solar electrical system will be connected to the grid of the RSA or to the independent consumer who is connected to the grid of the RSA. Therefore the construction of solar electrical system displaces greenhouse gas emission intensive electricity production from fossil fired electricity plants.

Solar power is regarded as an environmentally safe technology[7] (see Section C.3 of the PoA-DD for a detailed explanation), which will also be confirmed as part of the CPA inclusion (see Section B.2, Eligibility criteria number 7). Solar electrical systems under this CPA must comply with NEMA[8] regulations regarding environmental impact assessment and proposals of mitigation measures[9]. The main negative environmental effects of a typical solar electrical system include: aesthetic disturbance to nearby communities, and possibly disturbance of some ecosystems. Please refer to Section C for the environmental assessments requirement in the RSA.

For the first activity the solar photovoltaic modules to be installed will be YL 185 P-23b. Each of these modules has 48 high efficiency, polycrystalline solar cells with high transmission and textured glass delivering an efficiency of up to 14.3%[10]. The modules are independently tested to ensure conformance with certification and regulatory standards, and the manufacturing facility is certified to ISO 9001 Quality Management System standards, and it has the following specifications[11]:

[6] "The Contribution of the Clean Development Mechanism under the Kyoto Protocol to Technology Transfer" - http://cdm.unfccc.int/Reference/Reports/TTreport/TTrep10.pdf

[7] Department of Energy of the RSA (http://www.energy.gov.za/files/esources/renewables/r_solar.html)

[8] The Nation Environmental Management Act (NEMA) of the RSA. Also refer to section C.3 for details.

[9] Related to the capacity, size or other characteristics of the system

[10] This is the module efficiency and should not be confused with the load factor

[11] Technical specifications from Solar Panel Type "Yingli Solar - YL 185 P-23b / 1310x990 SERIES"

Electrical parameters at STC (1,000 W/m^2, 25°C, AM 1.5 according to EN 60904-3)

Module type		YL 185 P-23b
Power output	[W]	185.0
Power output tolerances	[%]	+/- 3
Module Efficiency	[%]	14. 3
Voltage at Pmax, V_{mpp}	[V]	23.5
Current at Pmax, I_{mpp}	[A]	7.87
Open circuit voltage V_{oc}	[V]	29.5
Short circuit current I_{sc}	[A]	8.45
Max. system Voltage	[V]	1,000 VDC

The modules will be connected to an inverter, which is an electrical power converter that changes direct current (DC) to alternating current (AC). This will then be connected to an electricity meter before being supplied to the owner. The generated electricity will be continuously measured and recorded. Data on electricity supply will be digitally archived at least on a monthly basis.

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

CPA-001 under the South African Small-Scale Solar Electrical Programme implemented by BWCC.

No	Name	Type	Total CPA capacity, MW	Province	Commercial Operation Date
1	CPA-001 under the South African Small-Scale Solar Electrical Programme	1	Up to 15 MW	KwaZulu-Natal Province	01/01/2013

A.4.1.1. Host Party:

The Republic of South Africa (RSA)

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

All activities under the proposed CPA are located within the boundaries of the KwaZulu-Natal Province of the RSA.

The location of the proposed CPA within the RSA is shown in Figure A.4-1.

Figure A.4-1: The location of the proposed CPA within the RSA

Table A.4-1: Geographic reference of known activities in this CPA

No.	Project Owner Name	Address	Geographic Reference	
1	Anneke van Lier	KwaZulu-Natal Province, Durban 37 Danville Avenue, Durban North, 4051	Latitude: -29.7690	Longitude: 31.0555

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

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

01/08/2012 (the date after publishing of the PoA for global stakeholder consultation, the date of signing the purchasing contract for the first activity)

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

25 years[12] 0 months (the expected operation lifetime of the solar electrical systems)

[12] Technical specifications from Solar Panel Type "Yingli Solar - YL 185 P-23b / 1310x990 SERIES"

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

Renewable crediting period

A.4.3.1. Starting date of the crediting period:

01/01/2013 (the expected date of the inclusion of the proposed CPA under the PoA) or the date of registration whichever is later.

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

7 years 0 months

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

Years	Annual estimation of emission reductions in tonnes of CO_2 e
2013	2 338
2014	7 009
2015	11 684
2016	16 357
2017	21 030
2018	23 368
2019	23 368
Total estimated reductions (tonnes of CO_2 e)	**105 154**
Total number of crediting years	**7**
Annual average over the crediting period of estimated reductions (tonnes of CO_2 e)	**15 022**

A.4.5. Public funding of the CPA:

No official Development Aid is involved or diverted as a result of the project activity/activities under the CPA[13].

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

In order to avoid registering a proposed CPA that is in fact a de-bundled component of another CPA or CDM project activity, Blue World Carbon Asset Management (Pty) Ltd (BWC) follows the guidelines provided in the "Guidelines on assessment of de-bundling for SSC project activities" (Version 03), reported as Annex 13 to the EB 54.

For SSC-CPA Type 1

Paragraph 10 of the guidelines reads as follows:

[13] See section B.2 – eligibility criterion 8.

"10. " If each of the independent subsystems/measures (e.g., biogas digester, solar home system) included in the CPA of a PoA is no larger than 1% of the small-scale thresholds defined by the methodology applied, then that CPA of PoA is exempted from performing de-bundling check i.e., considering as not being a de-bundled component of a large scale activity."

Each independent activity under the proposed CPA will not be larger than 1% of the small-scale thresholds therefore proposed CPA is exempted from performing de-bundling check. (See Section A.4.4.1. PoA-DD).

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 proposed CPA is not registered as an individual CDM project activity or as 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:

PoA title: "Small-scale solar electrical programme, South Africa", Version 08, 12/11/2012

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

The proposed CPA meets all the eligibility criteria for inclusion in the PoA as listed in Section A.4.2.2 of the PoA-DD. Note that all CPA Type 2 criteria are not applicable since this CPA is CPA Type 1.

Table B.2-1: Compliance with Eligibility criteria (also refer to Table A.4-2 in CDM-PoA-DD)

PoA Eligibility criteria (Table A.4-2 in CDM-PoA-DD)	Compliance with eligibility criteria/ Mean of proof	Supporting document
1. The CPA (type 1 and type 2) shall be located within the geographical boundaries of the RSA.	The CPA is designed for inclusion of activities located within the Kwazulu-Natal province.	The signed form from the owner of activity providing the following information: Name, address, GPS coordinates (Management system, Table 6)
2. For CPA Type 1: the seller of solar electrical system for each activity shall provide the signed Table 6 of the Management System of the PoA and agreement with the owner of activity where he shall contractually agree and sign the following before inclusion into the CPA: a) The activity has neither been and will not be registered as a CDM project activity nor as a CPA under another PoA; and b) The owner is aware that the activity will be subscribed to the present PoA. For CPA Type 2: the owner of each activity shall provide the signed Table 6 of the Management System of the PoA and agreement with CME where he shall contractually agree and sign the following before inclusion into the CPA: a) The activity has neither been and will not be registered as a CDM project	Before inclusion of an activity into this CPA, Table 6 of the Management System of the PoA will be signed by the owner of the activity, as well as an agreement with the owner of activity where he shall contractually agree and sign the following before inclusion into the CPA: a) The activity has neither been and will not be registered as a CDM project activity nor as a CPA under another PoA; and b) The owner is aware that the activity will be subscribed to the present PoA.	Signed copy of Table 6 of the Management system by the owner of the activity and an agreement with the seller.

activity nor as a CPA under another PoA; and b) The owner is aware that the activity will be subscribed to the present PoA. Moreover for CPA Type 2, BWC shall check the UNFCCC CDM project database to verify that each activity to be included in the proposed CPA, has not been previously submitted to the UNFCCC, before inclusion into the CPA, as well as provide a declaration for the same.		
3. Technology: Each activity to be included into the CPA (type 1 and type 2) shall only use solar PV systemsFor CPA type 1: the installed capacity of each activity shall be equal or less than 0.15 MW. For CPA type 2: the installed capacity of the CPA shall be equal or less than 15 MW. Services: Electricity generation. Measure for AMS-I.D. and AMS-I.F.: GHG emission reduction due to displacement of grid electricity. Each activity under the CPA (type 1 and type 2) shall be connected to either: i) An identified consumer (end user) or group of consumers, which would have been supplied with electricity from the national grid[14] of the RSA in the absence of the activity (where excess electricity may be supplied to the grid) or; ii) to the national grid of the RSA Furthermore the owner of each activity under the CPA connected to (i) and using methodology AMS-I.F. shall be connected to	Technology/measure: Before inclusion of an activity into this CPA the owner of the solar electrical system will supply documentation that the activity to be included into the CPA uses solar electrical technologies with an installed capacity equal or less than 0.15 MW. Services: Before inclusion of an activity into this CPA the owner of the solar electrical system will supply documentation that the activity under the CPA shall be connected to an identified consumer (end user) or group of consumers, which would have been supplied with electricity from the national grid of the RSA in the absence of the activity (where excess electricity may be supplied to the grid). Furthermore the owner of each activity under the CPA shall provide documentation that he was connected to the grid before the project activity	Technology/measure: Technical specification from the seller of the electrical system/ technology supplier. Signed Table 6 of the Management system of the PoA from the owner of the activity. For identified consumer: Electricity bill or proof of pre-paid electricity from the owner.

[14] The national grid of the RSA includes the national transmission, distribution or reticulation lines ('Eskom grid' at the time of drafting of the PoA-DD) and a municipal electricity network that is connected to the national transmission, distribution or reticulation lines.

the grid before the activity implementation.		
4. The start date of the activity under CPA (type 1 and type 2) shall be after the date of start of global stakeholder process for the PoA (23/12/2011).	The start date of the CPA is defined in section A.4.2.1 as being 01/08/2012. Before inclusion of an activity into this CPA, the owner of the activity has to supply documentation for the start date of each activity.	Signed equipment purchase contract with the seller of the solar electrical system/technology provider.
5. Both CPA type 1 and type 2 shall meet the applicability conditions and other requirements of either AMS-I.D. (version 17) or AMS-I-F. (version 02) or combination of both methodologies.	Before inclusion of an activity into this CPA, the CME has to provide documentation that the CPA activity: • Uses solar electrical technologies to produce electricity; and • Envisages either a new installation or a capacity addition And at the same time check that the total installed capacity of the combination of activities within a CPA, each of which is no larger than 0.15 MW, shall be smaller or equal to 15 MW installed capacity;	Technical specification from the seller of the electrical system/technology supplier and signed Table 6 of the Management system of the PoA from the owner of the activity.
6. Both CPA types shall demonstrate additionality as per Annex 27 of EB 68 (Version 09.0) Each and every CPA to be included into this PoA has to employ the solar technologies as per eligibility criteria 3. This criterion also states that "Each activity under the CPA (type 1 and type 2) shall be connected to either: i. An identified consumer (end user) or group of consumers, which would have been supplied with electricity from the national grid of the RSA in the absence of the activity (where excess	Each and every CPA that will be included into this PoA has to employ the solar technologies. And at the same time the total installed capacity of the combination of activities within a CPA, each of which is no larger than 0.15 MW, shall be smaller or equal to 15 MW installed capacity Thus, any CPA to be included into this PoA is additional.	6. Technology/measure: Technical specification from the seller of the electrical system/ technology supplier. Signed Table 6 of the Management system of the PoA from the owner of the activity. Electricity bill or proof of pre-paid electricity from the owner

electricity may be supplied to the grid) or; ii. to the national grid of the RSA"		
7. For CPA (type 1 and type 2) environmental impact assessment shall be carried out in line with NEMA[15] regulation[16]	Since the activities in this CPA are CPA Type 1, both EIA and Basic Assessment are not required.	Not required
8. No official Development Aid shall be involved or diverted as a result of activities under the CPA (type 1 and type 2).	Before inclusion of an activity into this CPA the owner of each activity has to provide documentation that no official Development Aid will be involved or diverted as a result of activities under the CPA. If Annex 1 countries are involved, then a declaration from the concerned agency in Annex 1 country should also be submitted before inclusion into the CPA.	The declaration from the seller of the solar electrical system.
9. For both CPA types where applicable, target group (e.g. domestic/commercial/ industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation) shall be identified in accordance with applied methodology or methodologies i.e.either AMS-I.D. (version 17) or AMS-I.F. (version 02) or combination of both methodologies.	Technology/measure: Before inclusion of an activity into this CPA the owner of the solar electrical system will supply documentation that the activity to be included into the CPA uses solar electrical technologies with an installed capacity equal or less than 0.15 MW. Services: Before inclusion of an activity into this CPA the owner of the solar electrical system will supply documentation that the activity under the CPA shall be connected to either: i) An identified consumer (end user) or group of consumers, which would have been supplied with electricity from the national grid[17] of the RSA in the absence of the activity (where excess electricity may be supplied to the grid) or;	Since this requirement has particularly been reflected in eligibility criterion (3), no supplementary evidence required

[15] NEMA: National Environmental Management Act. Also see section C.3.

[16] Related to the capacity, size or other characteristics of the plant

[17] The national grid of the RSA includes the national transmission, distribution or reticulation lines ('Eskom grid' at the time of drafting of the PoA-DD) and a municipal electricity network that is connected to the national transmission, distribution or reticulation lines.

	ii) to the national grid of the RSA	
10. For CPA (type 1 and type 2) sampling requirements shall be assessed and carried out in line with relevant UNFCCC/CDM EB requirements.	10. For CPA (type 1 and type 2) sampling requirements shall be assessed and carried out in line with requirements of Annex 4 & 5 of EB 69.	10. This PoA and CPA do not use the sampling method for monitoring, therefore no supplementary evidence is required.
11. For both CPA types Where applicable, the conditions that ensure that CPA in aggregate meets the small-scale or micro-scale threshold criteria and remains within those thresholds throughout the crediting period of the CPA shall be assessed in accordance with either Annex 26 of EB 68 (version 04.0) for micro-scale threshold or CMP.2, § 28 for small-scale thresholds.	Technology/measure: Before inclusion of an activity into this CPA the owner of the solar electrical system will supply documentation that the activity to be included into the CPA uses solar electrical technologies with an installed capacity equal or less than 0.15 MW. Services: Before inclusion of an activity into this CPA the owner of the solar electrical system will supply documentation that the activity under the CPA shall be connected to: i) An identified consumer (end user) or group of consumers, which would have been supplied with electricity from the national grid[18] of the RSA in the absence of the activity (where excess electricity may be supplied to the grid)	Since this requirement has particularly been reflected in eligibility criterion (3), no supplementary evidence required.
12. For CPA (type 1 and type 2) debundling checks shall be performed in line with EB 54 Annex 13.	Not applicable since this is CPA Type 1.	Confirmation in CPA-DD that the SSC-CPA is not a debundled component of a large scale CPA or CDM project activity as seen in section A.4.6.
13. For both CPA types leakage shall be assessed and carried out in accordance with applied methodology or metholdogies i.e. either AMS-I.D. (version 17) or AMS-I.F. (version 02) or combination of both methodologies, as shown in Table E.2-1 and E.2-2 in the PoA-DD	The energy generating equipment shall not be transferred from another activity; therefore there won't be any leakage.	Technology/measure: Technical specification from the seller of the electrical system/ technology supplier. Signed Table 6 of the Management system of the PoA from the owner of the activity. For identified consumer: Electricity bill or proof of pre-paid electricity from the owner.

[18] The national grid of the RSA includes the national transmission, distribution or reticulation lines ('Eskom grid' at the time of drafting of the PoA-DD) and a municipal electricity network that is connected to the national transmission, distribution or reticulation lines.

Eligibility #5: Applicability

The basic structure of CPA-001 is installation of solar electrical systems and the generated electricity by the activity is supplied to:

> Scenario (i) An identified consumer (end user) or the group of consumers, which would have been supplied with electricity from the national grid of the RSA in the absence of the activity, furthermore excess electricity may be supplied to the grid; or

So BWCC determines that it can only apply the methodology AMS-I.F. for CPA-001. Methodology AMS-I.D. is not applicable for this CPA since only excess electricity will be supplied to the grid.

Additionally, analysis of the specific CPA scenario is performed to ensure the applicability of methodologies. The results of the analysis for the first activity under this CPA are as tabled below.

Methodology AMS-I.F. is applicable to CPA Type 1, where produced electricity is supplied to an identified consumer (end user) or the group of consumers, which would have been supplied with electricity from the national grid of the RSA in the absence of the activity, furthermore excess electricity may be supplied to the grid. The applicability criteria of the methodology are defined and addressed as follows:

Table B.2-2: Applicability conditions for AMS-I.F.

Applicability criterion	Applicability	Comment
This methodology comprises renewable energy generation units, such as photovoltaic, hydro, tidal/wave, wind, geothermal and renewable biomass that supply electricity to user(s). The project activity will displace electricity from an electricity distribution system that is or would have been supplied by at least one fossil fuel fired generating unit i.e. in the absence of the project activity, the users would have been supplied electricity from one or more sources listed below: a) A national or a regional grid (grid hereafter); b) Fossil fuel fired captive power plant; c) A carbon intensive mini-grid.	Applicable	This CPA comprises renewable electricity generation, by means of a solar electrical system (photovoltaic). Furthermore electricity is supplied to an individual user who would have been supplied electricity from the national grid of the RSA.
For the purpose of this methodology, a mini-grid is defined as small-scale power system with a total capacity not exceeding 15 MW (i.e. the sum of installed capacities of all generators connected to the mini-grid is equal to or less than 15 MW) which is not connected to a national or a regional grid.	Not applicable	Electricity is not supplied to users which would have been supplied electricity from a carbon intensive mini-grid. Thus, it does not need to satisfy this applicability condition.

Illustration of respective situations under which each of the methodology (AMS-I.D, AMS-I.F and AMS-I.A) applies is included in Table 2[19].	Applicable	The activity displaces grid electricity consumption, furthermore excess electricity may be supplied to the grid and therefore falls under methodology AMS-I.F. since it displaces grid electricity consumption at the end user.
Hydro power plants with reservoirs 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; • The project activity is implemented in an existing reservoir, where the volume of reservoir is increased and the power density of the project activity, as per definitions given in the project emissions section, is greater than 4 W/m^2; • 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.	Not applicable	The activity is not the installation of a hydro power plant, so it does not need to satisfy this applicability condition.
For biomass power plants, no other biomass other than renewable biomass is to be used in the project plant.	Not applicable	The activity is not the installation of a biomass power plant, so it does not need to satisfy this applicability condition.
This methodology is applicable for 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, (c) Involve a retrofit of (an) existing plant(s); or (d) Involve a replacement of (an) existing plant(s).	Applicable	The activity envisages (a) Installing a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the project activity.
In the case of project activities that involve the capacity addition of renewable energy generation units at an existing renewable power generation facility, the added capacity of the units added by the project should be lower than	Not applicable	The activity does not involve capacity addition, so it does not need to satisfy this applicability condition.

[19] AMS-I.F. (version 02), page 11

15 MW and should be physically distinct from the existing units.		
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 15 MW.	Not applicable	The activity under the PoA does not involve retrofit or replacement of an existing facility, so it does not need to satisfy this applicability condition.
If the unit added 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 unit added co-fires fossil fuel, the capacity of the entire unit shall not exceed the limit of 15 MW.	Not applicable	This activity does not have non-renewable components, so it does not need to satisfy this applicability condition.
Combined heat and power (co-generation) systems are not eligible under this category.	Not applicable	This activity does not involve co-generation. According to the AMS-I.F., the CPA must not satisfy this applicability condition.
If electricity and/or steam/heat produced by the project activity is delivered to a third party i.e. another facility or facilities within the project boundary, a contract between the supplier and consumer(s) of the energy will have to be entered that ensures that there is no double counting of emission reductions.	Not applicable	For this activity electricity produced is not delivered to a third party, so it does not need to satisfy this applicability condition.
The following conditions apply for use of this methodology in a project activity under a programme of activities:		
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 the applicability conditions of AM0042.	Not applicable	This activity is not the installation of a biomass power plant, so it does not need to satisfy this applicability condition.
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.	Not applicable	This activity is not the installation of a biomass power plant, so it does not need to satisfy this applicability condition.
In case the project activity involves the replacement of equipment, and the leakage from	Not applicable	This activity does not involve replacement of equipment, so it

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.		does not need to satisfy this applicability condition.

CPA-001 is eligible to the PoA because it complies with the eligibility criteria as defined in section A.4.2.2 of the CDM-PoA-DD.

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

The additionality of the proposed CPA was demonstrated on the PoA level. The criteria for assessing additionality of a CPA are reflected in eligibility criteria (3) and (6), namely:

Technology/measure: Before inclusion of an activity into this CPA the owner of the solar electrical system will supply documentation that the activity to be included into the CPA uses solar electrical technologies with an installed capacity equal or less than 0.15 MW.

Services: Before inclusion of an activity into this CPA the owner of the solar electrical system will supply documentation that the activity under the CPA shall be connected to an identified consumer (end user) or group of consumers, which would have been supplied with electricity from the national grid of the RSA in the absence of the activity (where excess electricity may be supplied to the grid).

Furthermore the owner of each activity under the CPA shall provide documentation that he was connected to the grid before the project activity.

And,

Each and every CPA that will be included into this PoA has to employ the solar technologies, and at the same time the total installed capacity of the combination of activities within a CPA, each of which is no larger than 0.15 MW, shall be smaller or equal to 15 MW installed capacity.

The proposed CPA is additional since it satisfies these criteria.

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.

The spatial extent of the proposed CPA boundary includes each independent activity, each end user of electricity as well as all power plants connected physically to RSA's grid.

The greenhouse gases and emission sources included in or excluded from the proposed CPA boundary are shown in Table B.4-1.

Table B.4-1: Emissions sources included in or excluded from the proposed CPA boundary

Source		Gas	Included?	Justification / Explanation
Baseline	CO_2 emissions from electricity generation in fossil fuel fired power plants connected to the grid of the RSA	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
CPA	GHG emissions from the combustion of fossil fuel for electricity generation in the independent installations	CO_2	No	GHG emissions for the proposed CPA are equal to zero and no fossil fuels combustion will occur as part of the proposed CPA.
		CH_4	No	
		N_2O	No	

All independent activities under the proposed CPA are located in the KwaZulu-Natal Province of the RSA (see Fig. A.4-1 above).

B.5. Emission reductions:

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

Data / Parameter:	$EG_{m,y}$
Data unit:	MWh
Description:	Net quantity of electricity generated and delivered to the grid by power unit *m* in year *y*
Source of data used:	Eskom's statistic data
Value applied:	See Annex 3-3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official statistics, publicly available and reliable data source
Any comment:	The data for the three most recent reporting years is provided. This value will be a constant for each crediting period

Data / Parameter:	$FC_{i,m,y}$
Data unit:	mass or volume unit
Description:	Amount of fossil fuel type *i* consumed by power unit *m* in year *y*
Source of data used:	Eskom's statistic data
Value applied:	See Annex 3-3
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official statistics, publicly available and reliable data source
Any comment:	The data for the three most recent reporting years is provided. This value will be a constant for each crediting period

Data / Parameter:	$NCV_{coal,y}$
Data unit:	GJ/t
Description:	Net calorific value of Other Bituminous Coal
Source of data used:	2006 IPCC Guidelines for National GHG Inventories, Volume 2: Energy, Chapter 1, Table 1.2
Value applied:	19.9
Justification of the choice of data or description of measurement methods and procedures actually applied :	For the sake of a conservative approach the IPCC default value at the lower limit of the uncertainty at a 95% confidence interval is used. The default NCV that is available on the Eskom website is 0.02509 TJ/t fuel.[20] The 2006 IPCC Guidelines references the NCV of the different types of coal. The Eskom default value corresponds to the NCV of 'other bituminous coal'. Therefore the IPCC value for 'other bituminous coal' was applied to calculate the grid emission factor.
Any comment:	This value will be a constant for each crediting period

Data / Parameter:	$EF_{CO_2,coal,y}$
Data unit:	tCO_2/GJ
Description:	CO_2 emission factor of Other Bituminous Coal
Source of data used:	2006 IPCC Guidelines for National GHG Inventories, Volume 2: Energy, Chapter 1, Table 1.4
Value applied:	0.0895
Justification of the choice of data or description of measurement methods and procedures actually applied :	For the sake of a conservative approach the IPCC default value at the lower limit of the uncertainty at a 95% confidence interval is used. The default emission factor that is available on the Eskom website is 25.8 tC/TJ.[21] The 2006 IPCC Guidelines references the carbon content of the different types of coal. The Eskom default value corresponds to the carbon

[20] http://www.eskom.co.za/c/article/236/cdm-calculations/
[21] http://www.eskom.co.za/c/article/236/cdm-calculations/

	content of 'other bituminous coal'. Therefore the IPCC value for 'other bituminous coal' was applied to calculate the grid emission factor.
Any comment:	This value will be a constant for each crediting period

Data / Parameter:	$EF_{CO_2,NG,y}$
Data unit:	tCO_2/GJ
Description:	CO_2 emission factor of Natural Gas
Source of data used:	2006 IPCC Guidelines for National GHG Inventories, Volume 2: Energy, Chapter 1, Table 1.4
Value applied:	0.0543
Justification of the choice of data or description of measurement methods and procedures actually applied :	For the sake of a conservative approach the IPCC default value at the lower limit of the uncertainty at a 95% confidence interval is used.
Any comment:	This value will be a constant for each crediting period

Data / Parameter:	η_{OCGT}
Data unit:	ratio
Description:	Average net energy conversion efficiency of open cycle gas turbine power plant
Source of data used:	Tool to calculate the emission factor for an electricity system, Annex 1
Value applied:	0.395
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value is used
Any comment:	This value will be a constant for each crediting period

Data / Parameter:	$\eta_{m,y}$
Data unit:	ratio
Description:	Average net energy conversion efficiency of coal-fired power plant that has operated for more than 10 years
Source of data used:	Tool to calculate the emission factor for an electricity system, Annex 1
Value applied:	0.37
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value is used
Any comment:	This value was appointed as a constant to Majuba and Kendal power plants for the calculation of build margin CO_2 emission factor (refer to Annex 3-5). This

	value will be a constant for each crediting period

Data / Parameter:	$EG_{n,y}$
Data unit:	MWh
Description:	Net quantity of electricity generated and delivered to the grid by power unit *n* in year *y*
Source of data used:	Eskom's statistic data
Value applied:	See Annex 3-4
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official statistics, publicly available and reliable data source
Any comment:	The data for 2010 reporting year is provided. This value will be a constant for each crediting period

Data / Parameter:	$FC_{i,n,y}$
Data unit:	mass or volume unit
Description:	Amount of fossil fuel type *i* consumed by power unit *n* in year *y*
Source of data used:	Eskom's statistic data
Value applied:	See Annex 3-4
Justification of the choice of data or description of measurement methods and procedures actually applied :	Official statistics, publicly available and reliable data source
Any comment:	The data for 2010 reporting year is provided. This value will be a constant for each crediting period

Data / Parameter:	$EF_{grid,CM}$
Data unit:	tCO_2/MWh
Description:	Combined margin CO_2 emission factor for grid connected power generation calculated ex ante
Source of data used:	Calculated (see Annex 3)
Value applied:	0.988
Justification of the choice of data or description of measurement methods and procedures actually applied :	Calculated ex ante based on the "Tool to calculate the emission factor for an electricity system" (version 02.2.0)
Any comment:	This value will be a constant for each crediting period.

Data / Parameter:	$LF_{Solar\ systems}$
Data unit:	-
Description:	Load factor of the solar systems
Source of data used:	The National Energy Regulator of South Africa, Review of Renewable Energy Feed - In Tariffs, Table A7, page 30[22]
Value applied:	0.18
Justification of the choice of data or description of measurement methods and procedures actually applied :	Default value
Any comment:	This value is used to predict the annual net electricity generation. This value is required in order to perform calculations for expected CER's. Since these are small installations, there is not a set value for this, and each CPA will have a different value, therefore an estimate is required to perform the initial calculation.

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

The total emission reductions of the proposed CPA are calculated on the basis of the equations and parameters presented and explained in Section E.6.2 of the PoA-DD and B.5.1 of this document.

Emission reduction calculation

Since there are two different scenario's in terms of where electricity can be supplied to, namely:

Scenario (a) An identified consumer (end user) or the group of consumers, which would have been supplied with electricity from the national grid of the RSA in the absence of the activity, furthermore excess electricity may be supplied to the grid; or

Scenario (b) The national grid of the RSA,

each scenario is given its own baseline parameter for clarity purposes ($EG^{a}_{Solar\ systems,y}$ and $EG^{b}_{Solar\ systems,y}$ respectively), instead of just the one ($EG_{BL,y}$) given in the methodologies. In the case of this CPA only scenario (a) is applicable, therefore only this parameter is shown in the equations below.

Emission reductions in year *y* are calculated as follows:

$$ER_y = EG^{a}_{Solar\ systems,y} \cdot EF_{grid,CM} \quad \text{(B.5-1)}$$

Where:

ER_y = Emission reductions in year *y* (tCO_2/y)

$EG^{a}_{Solar\ systems,y}$ = Net quantity of electricity supplied to end users from all independent activities (solar electrical systems installed) under the CPA in year *y* (MWh)

[22] http://www.nersa.org.za/Admin/Document/Editor/file/Electricity/Consultation/Documents/Review%20of%20Renewable%20Energy%20Feed-In%20Tariffs%20Consultation%20Paper.pdf

$EF_{grid,CM}$ = Combined margin CO_2 emission factor for grid connected power generation calculated ex ante (tCO_2/MWh)

For assessment purposes emission reductions in year *y* are calculated as follows:

$$ER_y = P^a_{Solar\ systems,y} \cdot LF_{Solar\ systems} \cdot Hours_y \cdot EF_{grid,CM} \quad \text{(B.5-2)}$$

Where:

$P^a_{Solar\ systems,y}$ = Total capacity of all independent activities which supply electricity to end users under the CPA in year *y* (MW)

$LF_{Solar\ systems}$ = Load factor of solar electrical systems, $LF_{Solar\ systems} = 0.18$

$Hours_y$ = Amount of hours in the year *y*

Combined margin CO_2 emission factor for grid connected power generation calculated ex ante is fixed for all CPAs of the PoA (see Section E.6.2 of the PoA-DD) and equal to 0.988 tCO_2/MWh.

Since the numbers of solar electrical systems vary from year to year for this CPA (with more systems added each year), only the calculation for one full year will be shown here with similar calculations to be done for all of the others years. It is expected that every year an additional 3MW of activities will be added to this CPA until a maximum of 15 MW is reached.

The first year will be used as a sample calculation. At the start of the crediting period there will be a total of 0.0024 MW installed and it is estimated that an additional 2.9976MW of activities will be included into this CPA throughout the year; therefore the total installed capacity at the end of the year will be 3.0 MW. Since the total installed capacity over the year will not be constant, an average of the total installed capacity over the year will be used to determine the CER's. This average is determined by adding the total installed capacity at the beginning of a particular year, with the total installed capacity at the end of that particular year and dividing by two. Therefore in this case it would be = (0.0024MW + 3.0MW)/2 = (3.0024MW)/2 = 1.5012 MW (as can be seen in section B.6.1).

This value is then used in equation B.5-2 along with a load factor of 0.18 and emission factor of 0.988 tCO_2/MWh, we get (with values being rounded down to be conservative)

$$ER_y = 1.5012MW \times 0.18 \times 8760 \frac{hr}{year} \times EF_{grid,CM} = 2367 \frac{MWh}{year} \times 0.988 \frac{tCO_2}{MWh} = 2338 \frac{tCO_2}{year}$$

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)
2013	0	2 338	0	2 338
2014	0	7 009	0	7 009
2015	0	11 684	0	11 684
2016	0	16 357	0	16 357
2017	0	21 030	0	21 030
2018	0	23 368	0	23 368
2019	0	23 368	0	23 368
Total (tonnes of CO_2 e)	**0**	**105 154**	**0**	**105 154**

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

B.6.1. Description of the monitoring plan:

The monitoring plan is designed to calculate the GHG emission reductions at the CPA level. The monitoring plan was designed based on AMS-I-D., AMS-I-F and "General Guidelines to SSC CDM methodologies" (Version 17)[23]. The following procedures shall be applied to the monitoring for this CPA:

1. Monitoring period

The 7-year renewable crediting period was chosen for the CPA. The monitoring period starts from the date of commissioning of the first activity under the CPA or the date of registration of the proposed CPA under the PoA (whichever is later). At the end of each reporting year monitored data shall be aggregated to a monitoring report.

2. Data monitored and sources

Quantity of net electricity supplied to end users from all independent activities (solar electrical systems installed) under the CPA in year *y*, and quantity of net electricity supplied to the national grid of the RSA from all independent activities (solar electrical systems installed) under the CPA in year *y*, shall be determined on the basis of electricity meters.

For all activities the applicable parameter in section B.6 will be monitored continuously and recorded at least on a monthly basis by the CPA personnel. Data on electricity supply will be digitally archived and submitted to the CME.

The sources of data for calculation of GHG emission reductions in the course of monitoring shall be the internal electricity meter reports of the solar electrical systems.

GHG emission reductions for this CPA types shall be calculated using formula B.5-1).

[23] http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid06.pdf

3. The monitoring team

The management of BWCC is fully responsible for the coordination and overall control of this CPA.

The personnel of the seller of solar electrical systems as well as the independent activity owners are responsible for correct installation and maintenance of solar electrical systems.

The company staff that will collect the data will undergo the necessary training for this. Operation and maintenance of the solar electrical system will be done by either the trained personnel of the solar electrical system suppliers or by the trained personnel employed by the owners of the system.

The CPA shall be monitored by BWC. BWC will undertake, either itself or through another credible company specially appointed for that, to install meters and/or other instrumentation and measurement equipment as is necessary to provide for accurate data needed for the calculation of GHG emission reductions, and to collect such data in a timely manner.

The GHG emission reductions shall be calculated by BWC specialists on the basis of data representing operation of solar electrical systems collected by BWC or by another company employed by BWC. In case of any doubts as to the accuracy of the input data, the specialists of the company shall check and correct the data. The preliminary monitoring report shall be submitted to BWCC for review. In case any mistakes are found, BWC will undertake to correct such.

4. Data storage

All data collected as part of monitoring should be archived electronically and kept at least for 2 years after the end of the crediting period. Data collection will occur on a monthly basis

5. Instrumentation calibration

BWC or another company employed by BWC will be responsible for timely calibration of all installed meters, instrumentation and other measurement equipment in accordance with the manufacturer's requirements and the South African Bureau of Standards (SABS)[24].

6. Emergency situations

In case of breakdown of any of the solar electrical system the electricity generation will go down, and amount of net electricity supplied by the system will be reduced. If any measuring instrument that is used in the monitoring process fails, either BWC or another company employed by BWC shall remedy or, if necessary, replace it as soon as possible.

Data to be monitored

Data / Parameter:	$EG^{a}_{Solar\ systems,y}$
Data unit:	MWh
Description:	Net quantity of electricity supplied to end users from all independent activities (solar electrical systems installed) under the CPA in year *y*
Source of data to be used:	Measurement with electricity meters
Value of data:	

[24] SANS 474:2009 Edition 1.1: Code of practice for electricity metering

	<table><tr><th>Year</th><th>Value (MWh)</th></tr><tr><td>2013</td><td>2 367</td></tr><tr><td>2014</td><td>7 095</td></tr><tr><td>2015</td><td>11 826</td></tr><tr><td>2016</td><td>16 556</td></tr><tr><td>2017</td><td>21 286</td></tr><tr><td>2018</td><td>23 652</td></tr><tr><td>2019</td><td>23 652</td></tr></table>
Description of measurement methods and procedures to be applied:	Measurement by means of electricity meters installed for each independent activity under the CPA. Net electricity supplied will be calculated by deducting electricity import from electricity export. The generated electricity will be continuously measured and recorded. Data on electricity supply will be digitally archived at least on a monthly basis.
QA/QC procedures to be applied:	Electricity meters are regularly calibrated. In the case of electricity sold to a third party, measurement results shall be cross-checked with records of sold/purchased electricity (e.g. invoices/receipts).
Any comment:	This parameter will be used instead of $EG_{BL,y}$, in order to clarify that this is applicable to scenario (a).

Data / Parameter:	$P^{a}_{Solar\ system,\ y}$
Data unit:	MW
Description:	Total capacity of all independent activities which supply electricity to end users under the CPA in year *y*. (given as an average over the year)
Source of data used:	BWC
Value applied:	<table><tr><th>Year</th><th>Value (MW)</th></tr><tr><td>2013</td><td>1.50</td></tr><tr><td>2014</td><td>4.50</td></tr><tr><td>2015</td><td>7.50</td></tr><tr><td>2016</td><td>10.50</td></tr><tr><td>2017</td><td>13.50</td></tr><tr><td>2018</td><td>15.00</td></tr><tr><td>2019</td><td>15.00</td></tr></table>
Justification of the choice of data or description of measurement methods and procedures actually applied :	Forecast
Any comment:	This parameter will be used in order to clarify that this is applicable to scenario (a).

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:

The environmental analysis is undertaken at the CPA level. The environmental impact of the solar electrical systems depends on the particular location, size, how the system is embedded in its environment as well as its uptake in the local community.

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

As mentioned in the PoA, within the framework of CPA type 1, there will be installed independent activities with capacity of up to 0.15 MW each and hence both EIA and Basic Assessment are not required for the measures undertaken under this CPA. Since the activities in this CPA are CPA Type 1, both EIA and Basic Assessment are not required.

The following case is considered under this CPA:

1. Greenfield installation (the solar electrical system is to be installed at the site where there was no infrastructure).

The potential impacts of the independent activities under the CPA are as follows:

Impact	Case 1
Impact on avifauna	The development will have no significant or long term impacts on avifauna.
Impact on geology and soils	The development will have no significant or long term impacts on geology and soils.
Impact on heritage sensitivity	The development will have no impact on heritage sensitivity.
Impact on paleontology	The development will have no impact on paleontology.
Visual impact	The development will have a visual impact on the nearest settlements. But his influence is negligible.
Noise Impact	Effect of noise impact would be considered in the basic assessment.
Impact on social	The negative impacts are associated with the

Impact	Case 1
environment as a result of construction	presence of construction workers, impact of heavy vehicles, and possible loss of agricultural land. But their influence will be negligible.
Impact on natural resources	Impact on natural resources will be a potential loss of arable agricultural land. However, overall its effect will be *low – zero*.
Impact on the atmosphere	The main impact is related to formation of dust during the construction period from land excavation and transportation vehicles. It should be mentioned that combustion of fossil fuels (mostly coal) at the Eskom power stations and hereby emissions of the harmful substances into the atmosphere, such as flue ash, oxides of sulphur and nitrogen will be reduced due to the project implementation.

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:

Within the framework of CPA Type 1, there will be installed independent activities with capacity of up to 0.15 MW each and hence both EIA and Basic Assessment are not required for the measures undertaken under this CPA.

SECTION D. Stakeholders' comments

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

✔ Please tick if this information is provided at the PoA level. In this case sections D.2. to D.4. need not be completed in this form.

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

Not applicable

D.3. Summary of the comments received:

Not applicable

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

Not applicable

Annex 1

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

Organization:	Blue World Carbon Capital PCC (BWCC)
Street/P.O.Box:	Green Street
Building:	Channel House
City:	St Helier
State/Region:	
Postfix/ZIP:	
Country:	Jersey
Telephone:	
FAX:	
E-Mail:	
URL:	
Represented by:	
Title:	
Salutation:	Mr.
Last Name:	Van Lier
Middle Name:	
First Name:	Joost
Department:	
Mobile:	+27 (0)71 609 2276
Direct FAX:	+27 (0)86 609 2770
Direct tel:	
Personal E-Mail:	joost.van.lier@blueworldcarbon.com

Annex 2

INFORMATION REGARDING PUBLIC FUNDING

Annex 3

BASELINE INFORMATION

BASELINE INFORMATION (This is a fixed value for all the CPAs during first crediting period, but needs to be calculated again when applying for renewal of crediting period)

Annex 3-1. Eskom electricity network[25]

[25] http://www.eskom.co.za/content/2008EskomPoster.jpg

Annex 3-2. Data on Eskom's grid-connected power plants (at the 31st of March 2010)[26,27]

Name of power plant	Location	Type of power plant (PP)	Type of fuel	Date of commissioning/ (Re-commissioning)*	Total net maximum capacity, MW
Arnot	Middelburg, Mpumalanga	Thermal PP	Coal	1971.09.21	2 232
Camden[28]	Ermelo, Mpumalanga	Thermal PP	Coal	(2005.03.31)	1 440
Duvha	Witbank, Mpumalanga	Thermal PP	Coal	1980.01.18	3 450
Grootvlei[29]	Balfour, Mpumalanga	Thermal PP	Coal	(2008.03.31)	760
Hendrina	Mpumalanga	Thermal PP	Coal	1970.05.12	1 865
Kendal	Witbank, Mpumalanga	Thermal PP	Coal	1988.10.01	3 840
Komati[30]	Middelburg, Mpumalanga	Thermal PP	Coal	(2009.01.05)	170
Kriel	Bethal, Mpumalanga	Thermal PP	Coal	1976.05.06	2 850
Lethabo	Viljoensdrift, Free State	Thermal PP	Coal	1985.12.22	3 558
Majuba	Volksrust, Mpumalanga	Thermal PP	Coal	1996.04.01	3 843
Matimba	Lephalale, Limpopo	Thermal PP	Coal	1987.12.04	3 690

[26] Eskom Annual Report 2010, page 298, http://financialresults.co.za/2010/eskom_ar2010/downloads/eskom_ar2010.pdf

[27] Data Requirements for Calculating the Carbon Emission Factor (CEF) for the South African Grid, General Information, http://www.eskom.co.za/content/calculationTable.htm

[28] Re-commissioned power plant, Eskom Annual Report 2009, page 63 http://www.financialresults.co.za/eskom_ar2009/ar_2009/downloads.htm

[29] Re-commissioned power plant, Eskom Annual Report 2010, page 126, http://financialresults.co.za/2010/eskom_ar2010/downloads/eskom_ar2010.pdf

[30] Re-commissioned power plant, Eskom Annual Report 2010, page 127, http://financialresults.co.za/2010/eskom_ar2010/downloads/eskom_ar2010.pdf

Name of power plant	Location	Type of power plant (PP)	Type of fuel	Date of commissioning/ (Re-commissioning)*	Total net maximum capacity, MW
Matla	Bethal, Mpumalanga	Thermal PP	Coal	1979.09.29	3 450
Tutuka	Standerton, Mpumalanga	Thermal PP	Coal	1985.06.01	3 510
Acacia	Cape Town, Western Cape	Gas turbine PP	Kerosene	1976.05.13	171
Port Rex	East London, Eastern Cape	Gas turbine PP	Kerosene	1976.09.30	171
Ankerlig	Atlantis, Western Cape	Gas turbine PP	Natural gas	2007.03.29	1 327
Gourikwa	Mossel Bay, Western Cape	Gas turbine PP	Natural gas	2007.03.30	740
Colley Wobbles	Mbashe River, Eastern Cape	Hydro PP	-	1900.01.01	0
Ncora	Ncora River, Eastern Cape	Hydro PP	-	1900.03.01	0
First Falls	Umtata River, Eastern Cape	Hydro PP	-	1900.02.01	0
Gariep	Norvalspont, Free State	Hydro PP	-	1971.09.08	360
Second Falls	Umtata River, Eastern Cape	Hydro PP	-	1900.04.01	0
Vanderkloof	Petrusville, Northern Cape	Hydro PP	-	1977.01.01	240
Drakensberg	Bergville Kwazulu-Natal	Hydroelectric Pumped Storage PP	-	1981.06.17	1 000
Palmiet	Grabouw, Western Cape	Hydroelectric Pumped Storage PP	-	1988.04.18	400
Koeberg	Cape Town, Western Cape	Nuclear PP	-	1984.07.21	1 800
Klipheuwel	Klipheuwel, Western Cape	Wind farm	-	**	3

* Re-commissioned units are: Camden, Grootvlei and Komati.

**No data available

Annex 3-3. Data on operation of Eskom's grid-connected power plants included into the operating margin for the 3 most recent reporting years

The list of power plants included into the operating margin[31]

Name of power plant	Type of power plant (PP)	Type of fuel	Total net maximum capacity, MW
Arnot	Thermal PP	Coal	2 232
Camden	Thermal PP	Coal	1 440
Duvha	Thermal PP	Coal	3 450
Grootvlei	Thermal PP	Coal	760
Hendrina	Thermal PP	Coal	1 865
Kendal	Thermal PP	Coal	3 840
Komati	Thermal PP	Coal	170
Kriel	Thermal PP	Coal	2 850
Lethabo	Thermal PP	Coal	3 558
Majuba	Thermal PP	Coal	3 843
Matimba	Thermal PP	Coal	3 690
Matla	Thermal PP	Coal	3 450
Tutuka	Thermal PP	Coal	3 510
Ankerlig	Gas turbine PP	Natural gas	1 327
Gourikwa	Gas turbine PP	Natural gas	740

[31]Kerosene-fired gas turbine power plants were excluded from the operating margin since they were not operated for the 3 most recent reporting years.

Net quantity of electricity generated and delivered to the grid by the power plants included into the operating margin ($EG_{m,y}$)[32]

Name of power plant	Type of fuel	Unit	Years*			Total 04.2007 - 03.2010
			04.2007 - 03.2008	04.2008 - 03.2009	04.2009 - 03.2010	
Arnot	Coal	MWh	11 905 060	11 987 281	13 227 864	37 120 205
Camden	Coal	MWh	5 171 057	6 509 079	7 472 070	19 152 206
Duvha	Coal	MWh	23 622 732	21 769 489	22 581 228	67 973 449
Grootvlei	Coal	MWh	237 138	1 249 556	2 656 230	4 142 924
Hendrina	Coal	MWh	13 756 351	12 296 687	12 143 292	38 196 330
Kendal	Coal	MWh	26 517 420	23 841 401	23 307 031	73 665 852
Komati	Coal	MWh	0	0	1 016 023	1 016 023
Kriel	Coal	MWh	17 762 398	18 156 686	15 906 816	51 825 900
Lethabo	Coal	MWh	25 701 723	23 580 232	25 522 698	74 804 653
Majuba	Coal	MWh	23 680 971	22 676 924	22 340 081	68 697 976
Matimba	Coal	MWh	29 021 742	26 256 068	27 964 141	83 241 951
Matla	Coal	MWh	24 549 833	21 863 400	21 954 536	68 367 769
Tutuka	Coal	MWh	20 980 242	21 504 122	19 847 894	62 332 258
Ankerlig**	Natural gas	MWh	1 153 000	143 000	49 000	1 345 000
Gourikwa**	Natural gas	MWh				
					Total net electricity generation:	651 882 496

*A reporting year for Eskom starts on the 1st of April and finishes on the 31st of March

**Data was taken from Table B.6-1.

[32]Data Requirements for Calculating the Carbon Emission Factor (CEF) for the South African Grid, General Information, http://www.eskom.co.za/content/calculationTable.htm

Amount of fossil fuel consumed by the power plants included into the operating margin ($FC_{i,m,y}$)[33]

Name of power plant	Type of fuel	Unit	Years*			Total 04.2007 - 03.2010
			04.2007 - 03.2008	04.2008 - 03.2009	04.2009 - 03.2010	
Arnot	Coal	tonnes	6 210 700	6 395 805	6 794 134	19 400 639
Camden	Coal	tonnes	3 218 873	3 876 211	4 732 163	11 827 247
Duvha	Coal	tonnes	12 425 531	11 393 553	11 744 606	35 563 690
Grootvlei	Coal	tonnes	130 748	674 538	1 637 371	2 442 657
Hendrina	Coal	tonnes	7 794 220	7 122 918	6 905 917	21 823 055
Kendal	Coal	tonnes	15 986 131	15 356 595	13 866 514	45 209 240
Komati	Coal	tonnes	0	0	664 497	664 497
Kriel	Coal	tonnes	9 059 934	9 420 764	8 504 715	26 985 413
Lethabo	Coal	tonnes	18 314 572	16 715 323	18 170 227	53 200 122
Majuba	Coal	tonnes	12 853 342	12 554 406	12 261 833	37 669 581
Matimba	Coal	tonnes	14 862 323	13 991 453	14 637 481	43 491 257
Matla	Coal	tonnes	13 795 309	12 689 387	12 438 391	38 923 087
Tutuka	Coal	tonnes	10 627 575	11 231 583	10 602 839	32 461 997
Ankerlig	Natural gas	thousand m^3	N/A**	N/A	N/A	N/A
Gourikwa	Natural gas	thousand m^3	N/A	N/A	N/A	N/A
					Total coal consumption:	369 662 482

*A reporting year for Eskom starts on the 1st of April and finishes on the 31st of March

**No data available

[33]Data Requirements for Calculating the Carbon Emission Factor (CEF) for the South African Grid, General Information, http://www.eskom.co.za/content/calculationTable.htm

Annex 3-4. Determination of power units included into the build margin[34]

Determination of the set of power units SET_{sample}

			Name of power plant	Type of power plant (PP)	Type of fuel	Date of commissioning	Net electricity generation ($EG_{n,y}$), MWh	Weight fraction in total net electricity generation*	Accumulated weight fraction
SET_{sample}	$SET_{\geq 20\%}$	$SET_{5\text{-units}}$	Komati	Thermal PP	Coal	2009.01.05	1 016 023	0.0044	0.0044
			Grootvlei	Thermal PP	Coal	2008.03.31	2 656 230	0.0114	0.0158
			Gourikwa	Gas turbine PP	Natural gas	2007.03.30	49 000	0.0002	0.0160
			Ankerlig	Gas turbine PP	Natural gas	2007.03.29			
			Camden	Thermal PP	Coal	2005.03.31	7 472 070	0.0321	**0.0481**
			Majuba	Thermal PP	Coal	1996.04.01	22 340 081	0.0960	0.1440
			Kendal	Thermal PP	Coal	1988.10.01	23 307 031	0.1001	**0.2441**

*Total net electricity generation in 2010 reporting year is 232 812 GWh (see Table B.6-1).

$AEG_{SET\text{-}5\text{-}units}$ =11 193 323 MWh,

$AEG_{SET\text{-}\geq 20\%}$ = 56 840 435 MWh.

[34] Based on data presented in Annexes 3-2 and 3-3

The sets of power units $SET_{sample\text{-}CDM}$

	Name of power plant	Type of power plant (PP)	Type of fuel	Date of commissioning	Net electricity generation ($EG_{n,y}$), MWh	Weight fraction in total net electricity generation*	Accumulated weight fraction
$SET_{sample\text{-}CDM}$	Bethlehem Hydro	Small Scale Hydro	Renewable	2009.07.18	34 031	0.0001	0.0001
	Komati	Thermal PP	Coal	2009.01.05	1 016 023	0.0044	0.0045
	Grootvlei	Thermal PP	Coal	2008.03.31	2 656 230	0.0114	0.0159
	Gourikwa	Gas turbine PP	Natural gas	2007.03.30	49 000	0.0002	0.0161
	Ankerlig	Gas turbine PP	Natural gas	2007.03.29			
	Camden	Thermal PP	Coal	2005.03.31	7 472 070	0.0321	0.0482

*Total net electricity generation in 2010 reporting year including power units registered as CDM project activities is 232 846 GWh (see Annex 3-5)

$AEG_{SET\text{-}sample\text{-}CDM}$ = 11 227 354 MWh

Data on operation of Eskom's grid-connected power plants and power plants registered as CDM project activities included into the build margin during 2010 reporting year

Name of power plant	Type of power plant (PP)	Type of fuel	Date of commissioning	Fuel consumption ($FC_{i,n,y}$), tonnes	Net electricity generation ($EG_{n,y}$), MWh	Weight fraction in total net electricity generation*	Accumulated weight fraction
Bethlehem Hydro[35]	Small Scale Hydro	Renewable	2009.07.18	0	34 031	0.0001	0.0001
Komati	Thermal PP	Coal	2009.01.05	664 497	1 016 023	0.0044	0.0045
Grootvlei	Thermal PP	Coal	2008.03.31	1 637 371	2 656 230	0.0114	0.0159
Gourikwa	Gas turbine PP	Natural gas	2007.03.30	N/A**	49 000	0.0002	0.0161
Ankerlig	Gas turbine PP	Natural gas	2007.03.29				
Camden	Thermal PP	Coal	2005.03.31	4 732 163	7 472 070	0.0321	0.0482
Majuba	Thermal PP	Coal	1996.04.01	12 261 833	22 340 081	0.0959	0.1442
Kendal	Thermal PP	Coal	1988.10.01	13 866 514	23 307 031	0.1001	**0.2443**

*Total net electricity generation in 2010 reporting year including power units registered as CDM project activities is 232 846 GWh (see Annex 3-5)

**No data available

[35] http://cdm.unfccc.int/Projects/DB/SGS-UKL1245061289.99, CDM PDD, page 12

Annex 3-5. The calculation of the combined margin emission factor

Total net electricity generation in 2010 reporting year including power units registered as CDM project activities, MWh

Net electricity generation	Value
Total Eskom	232 812 000
Bethlehem Hydro	34 031
Total	**232 846 031**

CO_2 emission factors of power units *m* in year *y* ($EF_{EL,m,y}$), tCO_2/MWh

Name of power plant	Years		
	04.2007 - 03.2008	04.2008 - 03.2009	04.2009 - 03.2010
Arnot	0.929	0.950	0.915
Camden	1.109	1.061	1.128
Duvha	0.937	0.932	0.926
Grootvlei	0.982	0.961	1.098
Hendrina	1.009	1.032	1.013
Kendal	1.074	1.147	1.060
Komati	-	-	1.165
Kriel	0.908	0.924	0.952
Lethabo	1.269	1.263	1.268
Majuba	0.967	0.986	0.978
Matimba	0.912	0.949	0.932
Matla	1.001	1.034	1.009
Tutuka	0.902	0.930	0.951
Ankerlig	0.495	0.495	0.495
Gourikwa			

CO_2 emissions of power units *m* in year *y* ($EG_{m,y} \cdot EF_{EL,m,y}$), tCO_2

Name of power plant	Years			Total 04.2007 - 03.2010
	04.2007 - 03.2008	04.2008 - 03.2009	04.2009 - 03.2010	
Arnot	11 061 567	11 391 248	12 100 692	34 553 508
Camden	5 732 974	6 903 726	8 428 219	21 064 918
Duvha	22 130 492	20 292 488	20 917 731	63 340 710
Grootvlei	232 868	1 201 386	2 916 240	4 350 494
Hendrina	13 881 896	12 686 273	12 299 783	38 867 952
Kendal	28 472 099	27 350 864	24 696 955	80 519 917
Komati	0	0	1 183 502	1 183 502
Kriel	16 136 195	16 778 852	15 147 323	48 062 370
Lethabo	32 619 168	29 770 826	32 362 083	94 752 077
Majuba	22 892 445	22 360 025	21 838 938	67 091 407
Matimba	26 470 540	24 919 477	26 070 086	77 460 103
Matla	24 570 135	22 600 433	22 153 396	69 323 964
Tutuka	18 928 242	20 004 011	18 884 186	57 816 440
Ankerlig	570 604	70 769	24 249	665 622
Gourikwa				
		Total emissions:		659 052 985

Calculation of simple operating margin CO_2 emission factor ($EF_{grid,OMsimple}$)

Parameter	Unit	Value
Total net electricity generation of power units *m* for the 3 most recent reporting years	MWh	651 882 496
Total CO_2 emissions of power units *m* for the 3 most recent reporting years	tCO_2	659 052 985
Simple operating margin CO_2 emission factor	**tCO_2/MWh**	**1.011**

Calculation of build margin CO_2 emission factor ($EF_{grid,BM,y}$)

Name of power plant	Net electricity generation ($EG_{n,y}$), MWh	CO_2 emission factor ($EF_{EL,n,y}$), tCO_2/MWh	CO_2 emissions ($EG_{n,y} \cdot EF_{EL,n,y}$), tCO_2	Build margin CO_2 emission factor ($EF_{grid,BM,y}$), tCO_2/MWh
Bethlehem Hydro	34 031	0	0	-
Grootvlei	2 656 230	1.098	2 916 240	-
Komati	1 016 023	1.165	1 183 502	-
Gourikwa	49 000	0.495	24 249	-
Ankerlig				
Camden	7 472 070	1.128	8 428 219	-
Majuba	22 340 081	0.871*	19 453 984	-
Kendal	23 307 031	0.871*	20 296 015	-
Total:	**56 874 466**	-	**52 302 209**	**0.920**

* Recalculated emission factor for power plants which started to supply electricity to the grid more than 10 years ago

Calculation of combined margin CO_2 emission factor ($EF_{grid,CM}$)

Parameter	Unit	Value
Operating margin CO_2 emission factor	tCO_2/MWh	1.011
Weighting of operating margin emission factor	-	0.75
Build margin CO_2 emission factor	tCO_2/MWh	0.920
Weighting of build margin emission factor	-	0.25
Combined margin CO_2 emission factor	**tCO_2/MWh**	**0.988**

Annex 4

MONITORING INFORMATION