



**Programme of activities design document form
(Version 09.0)**

Complete this form in accordance with the instructions attached at the end of this form.

BASIC INFORMATION

Title of the PoA	CDM Africa Wind and Solar Programme of Activities for South Africa
Version number of the PoA-DD	12
Completion date of the PoA-DD	04 October 2021
Coordinating/managing entity	PoA Africa Wind and Solar (Pty) Ltd
Host Parties	South Africa
Applied methodologies and standardized baselines	ACM0002 Version 20.0: "Large-scale Consolidated Methodology for Grid-connected electricity generation from renewable sources" ASB0040-2018 Grid emission factor for the Southern African power pool" (The relevant version at the time of CPA inclusion in the PoA).
Sectoral scopes	Scope 1 (Energy industries (renewable / non-renewable sources))

PART I. Programme of activities (PoA)

SECTION A. Description of PoA

A.1. Purpose and general description of PoA

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BACKGROUND

South Africa has approximately 37,745 MW of installed capacity for power generation, out of which the contribution of renewable energy sources is negligible. As of 5 December 2011 the installed capacity for grid connected power generation from solar technologies (PV and solar thermal) is 0%¹ and for wind technology is less than 0.03%².

The coordinating & managing entity (CME) "PoA Africa Wind and Solar (Pty) Ltd" has initiated the proposed PoA "CDM Africa Wind and Solar Programme of Activities for South Africa" to promote the development and implementation of renewable energy, grid connected wind power projects, grid connected solar photovoltaic (PV) projects and grid connected solar thermal without fossil fuel backup projects, with the objective to contribute towards increased electricity generation from renewable energy in South Africa.

1. GENERAL OPERATING AND IMPLEMENTING FRAMEWORK OF POA

The programme of activities (hereafter referred to as "the PoA") is a programme for the installation of either wind or solar projects generating electricity into the national grid across South Africa. Both Photovoltaic ("PV") and solar thermal technologies are included in the PoA. In the case of solar thermal applications, only power plants that do not use fossil fuels as a backup energy source to generate electricity into the grid are allowed to participate under the PoA. Each CDM programme activity (CPA) will be implemented in a geographically distinct area within South Africa. The CME, PoA Africa Wind and Solar (Pty) Ltd will manage the PoA and the inclusion of each CPAs.

The PoA would cover grid-connected renewable power generation project activities that (a) install a new wind power plant at a site where no wind power plant was operated prior to the implementation of the CPA, i.e. greenfield plant or (b) involve a capacity addition of wind power to an existing wind power plant or (c) install a new solar PV power plant at a site where no solar PV power plant was operated prior to the implementation of the CPA, i.e. a greenfield plant or (d) involve a capacity addition of solar PV to an existing solar PV power plant or (e) install a new solar thermal power plant without fossil fuel backup at a site where no solar thermal power plant was operated prior to the implementation of the CPA, i.e. greenfield plant or (f) involve a capacity addition of solar thermal to an existing thermal solar power plant with no fossil fuel backup in the original plant or in the capacity addition.

A CPA can implement any one of the following renewable energy technologies under the PoA:

¹ Refer to (1)SASTELA - SA s first solar plants.pdf, <http://www.sastela.org/services.html>. The Southern African Solar Thermal and Electricity Association (SASTELA) indicates that the first three solar thermal power plants will be established soon, but as of 26 October 2012 these have not been started and (2)Letter from SAPVIA (South African PV Industry Association).

² Appendix 70_Letter from South African Wind Energy Association (SAWEA) dated 5 December 2011. The letter confirms that a total of 10.16MW wind power capacity is installed in South Africa. The capacity of the grid is 37,745MW (refer to Eskom Generation mix.pdf, published by Eskom, accessed on 26 October 2011 at www.eskom.co.za/content/Generation%20Mix.pdf), therefore the wind power contribution of installed capacity is less than 0.03%

- Wind Power;
- Solar Power PV;
- Solar thermal only if the solar thermal power plant does not use fossil fuels as backup to generate electricity into the grid.

The CPA can only apply the 10-year crediting period option.

2. POLICY/MEASURE OR STATED GOAL OF THE POA

Objective of the PoA

The objective of the CDM Africa Wind and Solar Programme of Activities for South Africa is to develop a multi-track platform for overcoming regulatory, institutional, financial and structural hurdles for the roll-out of wind and solar power in South Africa by providing access to carbon finance. Thus, whether projects are pursued under a government procurement programme (“RIEPP” as described below), a possible future Renewable Energy Feed-in Tariff Scheme, under a private Power Purchase Agreement (PPA), the CDM Africa Wind and Solar Programme of Activities for South Africa is intended to provide a platform that can leverage carbon finance to overcome the barriers to implementation that renewable energy power plants face in South Africa.

Background on regulatory framework and status quo of wind and solar power in South Africa

In spite of abundant resources³, grid connected renewable energy contributes only a negligible share (less than 0.03% for wind and 0% for solar as of October 2011) to South Africa’s installed power capacity. Primary reason for the current situation is the cost of the renewable energy as compared to conventional non-renewable energy.

The average (grid) electricity selling price is presently around 65c/kWh - still much lower than the electricity price renewable technologies require to be feasible. The low penetration of solar and wind technologies is due amongst other things to the higher cost of electricity generated from renewable energy vis-à-vis electricity generated from fossil fuel energy and the dominance of the state utility, Eskom, that has been generating electricity from mainly fossil fuels⁴

Unsuccessful efforts to boost renewable energy production

Various efforts have been made to bolster renewable energy in the country, so far without success. The White Paper on Energy (1998) and the Renewable Energy White Paper (2003) were foremost amongst these⁵. In the interim, all efforts to galvanise the renewable energy industry have failed.

The initial plan to bolster renewable energy in the country was to create a system that would pay producers of renewable energy a fixed tariff that would be sufficient to enable renewable energy plants to be successful. This plan thus aimed at a Renewable Energy Feed-in Tariff (“REFIT”) scheme, as it has been implemented in some other countries internationally. The National Energy Regulator of South Africa (“NERSA”) had public consultations and confirmed in 2009 that ZAR1.25/kWh is required for wind power plant feasibility⁶ and in excess of ZAR2,00/kWh for solar

³ See <http://www.news24.com/SciTech/News/Solar-could-supply-SA-energy-expert-20120723#.UA0insCtwP0.mailto>

⁴ Electricity Supply Industry of South Africa Report, General information for potential investors, May 2008, U.S. Agency for International Development, page 6, submitted to the DOE as Appendix 33.

⁵ For a general background on the development see the following: White paper on Energy <http://www.info.gov.za/whitepapers/1998/energywp98.htm> (par 7.7); White paper on renewable energy http://unfccc.int/files/meetings/seminar/application/pdf/sem_sup1_south_africa.pdf (executive summary on page vii).

⁶ NERSA REFIT announcement 1, March 2009. Submitted as Appendix 90 to DOE_ Appendix 90_NERSA DECISION ON RENEWABLE ENERGY FEED-IN TARIFF (REFIT), 2009-04-07, News from DPE.

power plants. These prices at the time were determined in order to establish what the level of fixed prices should be under a REFIT scheme.

Present procurement system

Subsequently, the Renewable Energy Feed-In Tariff (REFIT) system was abandoned and replaced with a competitive bidding system known as the Renewable Energy Independent Power Producer Procurement Programme (“REIPPP”). The procurement under this initiative takes place as follows: projects are allowed a ceiling price lower than the previous NERSA REFIT determination and have to compete with each other to be allocated contracts to sell power to the National Utility. This means that projects with the lowest prices will generally prevail – in determining which projects to allocate contracts to, the procurement scoring system will allocate 70% of the marks for price.

The other 30% of the marks in the bid evaluation process will be allocated according to the degree to which the bidding project contributes to socio-economic development in South Africa. The efforts project developers make to leverage socio-economic development are likely to also create sustainable development benefits as envisioned by the CDM.

The PoA will aim to assist project developers through carbon finance to overcome the financial and other barriers that have been preventing the implementation of renewable energy in the country at a meaningful scale.

Carbon finance to assist with overcoming barriers

It may be that the REIPPP Programme will be the major method for procuring renewable energy, and that carbon finance will assist in overcoming the barriers.

Even in the case of generation for own use, wind and solar projects would have to compete against the cost of grid electricity, and again carbon finance would be able to assist in overcoming the barriers.

To reach the stated goal of the PoA, the CME will raise awareness among developers on opportunities for generating CDM revenues and provide standardized and streamlined access to CDM services for renewable energy projects in South Africa. The CME will ensure that CPA's are eligible before joining, avoid double counting, coordinate the inclusion of the CPA's in the PoA, conduct the inclusion to the PoA of the CPA's, provide monitoring and verification services to all CPAs, and support the effective commercialization of CERs.

In this way, the renewable energy PoA will promote the development of renewable energy wind and solar projects and facilitate the mitigation of greenhouse gas (GHG) emissions through the displacement of electricity generated by grid connected power plants that contain a majority of fossil-fuel fired installations.

Sustainable development benefits

With reference to the sustainable development criteria of the South African DNA under the Ministry of Energy the PoA will make the following contributions

Social benefits:

- Temporary and permanent jobs will be created in the construction and operation phases of the CPA projects;

- There will be an excellent opportunity to improve skills levels, especially as the need for local labour to operate and maintain the installations grows⁷.

Environmental benefits:

- The PoA encourages the development of wind and solar power plants that replace non-renewable, conventional fossil fuel power plants and reduce emissions of pollutants (per unit of energy generated) including GHG emissions.
- In contrast to most other sources of power, technologies included in this PoA, (wind power and solar power), do not produce solid waste; which addresses the problem of solid waste disposal encountered by most other sources of power.

When used to generate electricity, wind and solar energy contributes to natural resource conservation, for instance coal.

Economic benefits:

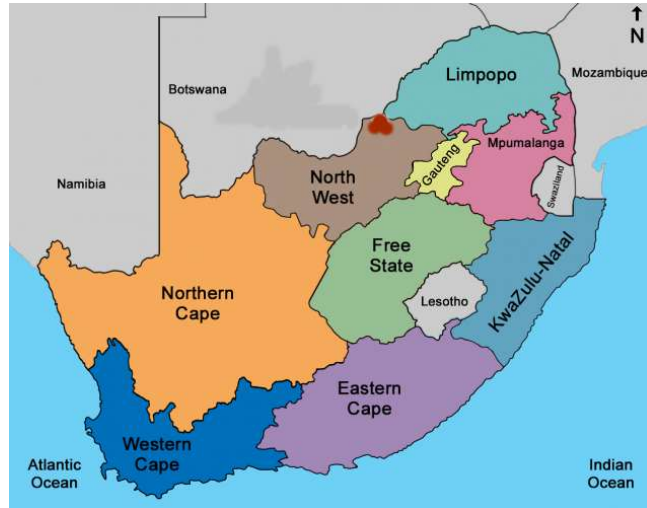
- The PoA increases employment opportunities in the area where each CPA is located, leading to a general increase in local-community income because during construction at least, people from the nearby communities will be employed. In time the original equipment suppliers will transfer operation and maintenance skills to South African workers and the industry employment will grow.
- The PoA enhances the local investment environment and improves the local economy. The PoA diversifies sources of electricity generation so increasing energy security.

A.2. Physical/geographical boundary of PoA

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The political boundary of South Africa is chosen as the geographical boundary of the PoA. The CPAs that will be included under the PoA will be in compliance with all applicable national policies and regulations.

⁷ See "Options for the Establishment of a South African Wind Energy Centre (SAWEC)" by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the Centre for Renewable and Sustainable Energy Studies (CRSES), Stellenbosch University, pages 57 – 70 (supplied to validators), http://greencape.co.za/upload/SAWEC_Report_final_draft_June11.pdf. While the potential for job creation through Solar PV or Solar Thermal power has not been quantified to this level of detail, the pattern will be similar.



South Africa in global context and country map (Sources: Internet maps)

A.3. Technologies/measures

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The CPAs will utilise wind turbines or solar panels as well as the appropriate materials and technology for balance of plant and electrical connections. In the case of solar power plants, both PV and solar thermal installations are included in the PoA, but in the case of solar thermal installations, fossil fuel sources will not be used as backup energy source to generate electricity into the grid.

A CPA consists of one of the following:

1. (1) a **newly-built (greenfield)** grid-connected solar PV power plant or solar thermal without the use of fossil fuel as backup energy source or wind power plant; or
2. (2) grid-connected solar PV or solar thermal without the use of fossil fuel as backup energy source or wind power **capacity addition** to an existing grid-connected power plant of the same technology.

Wind Farms

A description of the equipment(s) and systems that will be installed within the CPA will be provided in the CPA-DD. For wind farms, it typically includes the following:

- Wind turbines;
- Concrete foundations to support the turbine towers;
- Electrical distribution cabling between the turbines;
- Substations on the site in an appropriate position to receive generated power via underground distribution cabling from each wind turbine;
- Overhead power lines;

- Roads to the site from the main road/s within the area.

Solar PV plants

A description of the equipment(s) and systems that will be installed within the CPA will be provided in the CPA-DD. It typically includes the following:

- Solar receptors in the form of solar photovoltaic (PV) panels;
- Metal frames on which panels are mounted;
- The frames are anchored in concrete foundations;
- The panels are built in an array with cabling linking the PV panels to inverters;
- An Electricity Collector;
- Electrical Infrastructure;
- Substations;
- Internal Roads;
- Fencing.

Solar Thermal, i.e. Concentrated Solar Power (“CSP”) plants

A description of the equipment(s) and systems that will be installed within the CPA will be provided in the CPA-DD. It typically includes the following:

- Solar receptors in the form of parabolic trough mounted on a metal frame or a power tower which is a vertical structure with focussed mirrors;
- Electrical Infrastructure including substations;
- A water supply system;
- The “power block” including a steam turbine and possibly including infrastructure aimed at thermal heat storing;
- Roads;
- Fencing;
- A generation turbine.

Monitoring Equipment installation by the CPA operator

The main data parameter that is metered by the CPA operator on site during the crediting period, is $EG_{PJ,y}$ which is equal to $EG_{facility,y}$ (net electricity supplied to grid by the wind power plant or solar power plant in year y) metered by electricity meters.

Technology Transfer

In cases where technology is developed and imported from Annex 1 countries, the PoA will contribute to technology transfer to the host country South Africa. The country where the technology originates from is provided in the CPA-DD.

A.4. Coordinating/managing entity

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PoA Africa Wind and Solar (Pty) Ltd

A.5. Parties and project participants

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Host Party South Africa	CDM Africa Climate Solutions (Pty) Ltd	No

Parties involved	Project participants	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Host Party South Africa	PoA Africa Wind and Solar (Pty) Ltd	No

A.6. Public funding of PoA

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No public funding has been used or will be used in the financing of the establishment of the PoA framework. Each CPA will provide information regarding public funding of the specific CPA and if public funding is applied to finance a specific CPA, the CPA operator will confirm that public funding is not a diversion of ODA.

SECTION B. Management system

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Description of the operational and management arrangements established by the CME entity for the implementation of the PoA, including:

- (i) a record keeping system for each CPA under the PoA,
- (ii) a system/procedure to avoid double counting e.g. to avoid the case of including a new CPA that has been already registered either as CDM project activity or as a CPA of another PoA,
- (iii) the provisions to ensure that those operating the CPA are aware and have agreed that their activity is being subscribed to the PoA;
- (iv) roles and responsibilities;
- (v) training;
- (vi) arrangements for technical review.

The proposed PoA involves a range of operational activities in order to implement and manage each CPA by the CME and CPA operator within the PoA.

The roles and responsibilities will be as follows:

Table 1: High level Responsibilities for the CME and CPA operator

CME	CPA operator
Ensure that all eligibility criteria of each CPA application are met before submitting the PoA for validation.	Manage the construction, daily operation, and maintenance of power plant.
Conduct the necessary training for CPA operators to ensure that data metering and collation is done according to the relevant CDM requirements.	Monitor and record the plant operation data.
Collect monitoring data.	Maintenance of monitoring equipment.
Prepare monitoring reports for emission reduction verification.	
Support in validation, registration and verification of the CPAs.	

In addition to the above management tasks, the CME will implement the following operational elements to ensure proper management and oversight of the proposed PoA.

- (i) A record keeping system for each CPA under the PoA

A full system to ensure that documentation control is effectively managed is detailed in “PoAAWS-DC (document control).002” and emphasizes the document controls.

In order to unambiguously identify the renewable energy plant participating in the PoA, a serial numbering system is implemented that uniquely identify each power plant through numbers and letters for the CPA and the type of renewable power generated. The numbering system will indicate each distinct wind farm with the starting letter “W” and each solar PV plant with a “SPV” and for each solar thermal plant an “ST”. This serial numbering system will be used to record baseline data and monitoring data on a continuous basis. In this way, the CME entity will be able to track the emission reductions of each CPA over the full duration of the crediting period.

In summary, the CME will record and document CPA detail in the CME database as follows:

For wind:

Table 2: Information that will be recorded for Wind CPAs

CPA number
CPA operator name, address
Type of equipment
Turbine make
Turbine model
Turbine rated capacity
GPS coordinates of CPA
City/Town/village
Province
Country
Maximum capacity that can be implemented on the site according to environmental approvals
Actual CPA installed capacity (MW)
Commissioning date
Starting date of the crediting period
The verification status (number of verification and associated monitoring period)

For Solar PV:

Table 3 Information that will be recorded for Solar PV CPAs

CPA number
CPA operator name, address
Type of solar PV equipment
Solar PV equipment make
Solar PV equipment model
Solar PV equipment rated capacity
GPS coordinates of CPA
City/Town/village
Province
Country
Nominal installed capacity in Direct Current (DC) and installed capacity in Alternating Current (AC) according to environmental approvals or the technical feasibility report
Actual CPA installed capacity (MW)
Commissioning date
Starting date of the crediting period
The verification status (number of verification and associated monitoring period)

For Solar Thermal:

Table 4: Information that will be recorded for Solar Thermal (CSP) CPAs

CPA number
CPA operator name, address
Type of equipment
Solar thermal equipment make
Solar thermal equipment model
Solar thermal equipment rated capacity
GPS coordinates of CPA
City/Town/village
Province
Country
Maximum capacity according to environmental approvals
Actual CPA installed capacity (MW)
Commissioning date
Starting date of the crediting period
The verification status (number of verification and associated monitoring period)

The CME will be responsible for the management of records and data associated with each CPA. The database will be updated manually/electronically using the data supplied by the participating CPAs. It will form the basis for the verification of CPAs and be available for inspection by the DOE at any point in time.

- (ii) A system/procedure to avoid double counting 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.

The database described above will be used to perform a double counting check. Every new CPA will be compared to the already existing database and the list of project activities and CPAs that are under validation or registered at the UNFCCC. Moreover as shown below, the CPA operators will be informed of the double counting principle and will certify that the proposed CPA is not participating in any other PoA or registered under the Clean Development Mechanism of the UNFCCC. Should such a case occur then the CME will not proceed with inclusion of the corresponding CPA in the proposed PoA.

Procedure to Avoid Double Counting

Given that each CPA included in the PoA will be identified by geographical location and that the installed capacity of each CPA will be recorded, it is possible to identify CPAs or CDM project activities operating in the same area. The geographical boundary of each CPA is determined by the location of the wind or solar power plant. The address or GPS coordinates for each CPA will be collected and logged in a database managed by the CME. The CME will conduct a check to establish if any other CPAs or PoAs are implemented in the geographic area where the new CPA operator is aiming to implement a CPA.

Prior to registering a new CPA within the proposed PoA, the CME will conduct a search in the CDM project database to establish whether a project activity or CPA of another PoA implementing wind or solar technologies has already been registered in the same geographic area. This search will cover registered project activities, project activities requesting registration, project activities under review and project activities for which either a review or corrections have been requested and projects submitted for validation.

The list of wind and solar power plants that are implemented in the POA cannot contain any duplicate entries. This duplication rule applies *within* each CPA (i.e. a wind or solar power plant cannot participate more than once during each CPA), and *between* CPAs (i.e. one wind or solar power plant cannot participate in more than one CPA).

If other CPAs or another PoA or distinct other CDM project activities is/are under implementation in the same geographic area where the new CPA is aiming to implement the rollout of wind or solar power plants, the CME will liaise with the managing entity of the other PoA or project participant of the distinct CDM project activity, to assess and check that the wind or solar power plants are not logged under more than one CPA or PoA, nor as a distinct CDM project activity. Because the owner, location, GPS coordinates and installed capacity for each wind or solar power plant are logged in a database, a database search to highlight any double entries of the same wind or solar power plant is simple.

In the event of a capacity expansion the same procedure will be followed. In such a case the search will show another CPA with the same GPS coordinates or range of coordinates. A distinct CPA will thus be added to the PoA to represent only the added capacity while the original installed capacity will continue to be represented by the original CPA. In this manner double counting will be avoided during capacity expansions.

(iii) 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 that the CPA operator is aware of and has agreed that their activity is being subscribed to the PoA, the CPA operator shall enter into a contractual arrangement with the CME including respective provisions that:

- The CPA has not been and will not be registered as a single project activity or as a CPA under another PoA.
- The project implementer is aware that the CPA will be subscribed to the present PoA.
- The project implementer waives its rights to claim and own emission reductions under the Clean Development Mechanism of the UNFCCC or any voluntary scheme to the managing entity of the PoA and accepts that these rights will arise in the name of the CME.

(iv) Roles and responsibilities

The document "PoAAWS-MS (managing structure and responsibilities) 002", describes the procedures applied and covers the following: (1)the scope of the document, i.e. "The scope of this procedure covers the Organisational Structures, Top Management Responsibility and System Structure for all areas of the PoA Africa Wind and Solar Management System.", (2) the purpose of the document, i.e. "The purpose of this procedure is to ensure that the PoA Africa Wind and Solar Management System is defined to show both the System Structure and the Management Structures and Responsibilities.", and (3)it defines the responsibilities and authorities.

(v) Training

The document "PoAAWS-TR (training).002" dealing with QUALIFICATIONS & TRAINING, describes the procedures applied and covers the following: (1)the scope of the document, i.e. "The scope of this procedure covers the Control and Recording of Qualification and Training Requirements of Team Members involved in CPA Activities.", (2) the purpose of the document, i.e. "The purpose of this procedure is to ensure that Control and Records of Qualification and Training Requirements of Team Members involved in CPA Activities under the responsibility of PoAAWS are defined, checked and recorded", and (3)it defines the responsibilities and authorities, and (4)it describes the activities covered by the procedures, i.e.:

- Review of Training requirements of all Team Members involved in active CPAs
- Records
- Training Review
- Training Needs
- Training arrangements
- Records of Training
- Maintenance of the PoAAWS Database

(vi) Arrangements for technical review

Procedures have been developed to ensure that all technical elements of the CPA inclusion process have been investigated and covered. This includes supporting documentation and collation of evidence as required by the processes. A description of the inclusion management process is described in "PoAAWS-PC (process control).002".

(vii) Measures for continuous improvements of the PoA management system

Procedures have been defined to ensure that monitoring activities and corrective actions are adopted in order to conform to ISO 9001. These procedures are identified in "PoAAWS-CI (continuous improvement procedure).002".

SECTION C. Demonstration of additionality of PoA

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Demonstration of additionality of the PoA is not applicable for renewal of the crediting period following §285 of the CDM Project Standard for Programme of Activities (version 2.0).

According to §285 of the CDM PS for Programmes of Activities (v2.0), the coordinating/managing entity is not required to reassess the additionality of the PoA nor update the section of the PoA-DD relating to additionality while renewing the PoA period of a registered CDM PoA.

The additionality of each CPA shall be demonstrated and assessed using the "Tool for the demonstration and assessment of additionality, Version 07.0.0".

Additionality will be proven on the CPA level for each CPA separately following the approach summarised below and further defined in part II Section K.

Demonstration of Additionality

For identification of realistic and credible alternative baseline scenarios for power generation will be applied.

Identify realistic and credible alternative baseline scenarios for power generation

According to ACM0002, if the CPA is the installation of a new grid-connected renewable power plant (wind or solar) electricity delivered to the grid by the CPA would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in their the CPA is the installation of a new grid-connected renewable power plant (wind or solar), the baseline scenario is the following: Electricity delivered to the grid by the CPA would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the "Tool to calculate the emission factor for an electricity system".

If the CPA is a capacity addition to an existing grid-connected renewable power plant/unit, the baseline scenario is the following: In the absence of the CPA, the existing facility would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted ($DATE_{BaselineRetrofit}$). From that point of time onwards, the baseline scenario is assumed to correspond to the CPA, and no emission reductions are assumed to occur.

The alternative baseline scenarios include the following:

Alternative 1: The proposed CPA undertaken without being registered as a CDM project;

Alternative 2: Electricity delivered to the grid by the CPA would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

Sub-step 1b: Consistency with mandatory laws and regulations

Alternative 2 is consistent with mandatory laws and regulations as it is legal for the utility to generate electricity in the grid. The CPA should demonstrate that it complies with regulations and the project without CDM complies with all regulations (alternative 1).

If the only two realistic and credible alternative options are the ones described above, progress to the next step.

CPAs applying the Investment analysis should progress to Step 2.

Step 2: Investment Analysis

Sub-step 2a. Determine appropriate analysis method

The analysis will be analyzed through Option III of the additionality tool, i.e. benchmark analysis. This method is applicable because:

- Option I: Simple cost analysis, does not apply as the project generates economic returns through the sale of electric power to the grid. Other than CDM related income, the project produces economic benefit through the sale of electricity generated by the CPA.
- Option II: Investment comparison analysis is not used, as there is no realistic alternative for the project (provision of power to the grid) involving investments. In other words, the investment comparison analysis is not applicable to the project because the alternative of the project is "Equivalent electricity service provided by the grid", which is not a single project.
- Option III, Benchmark analysis can be transparently demonstrated using financial/economic information for the proposed CPA and compare financial indicators against a relevant industry benchmark hurdle rate.

According to paragraph 19 of Annex 13, EB 6, the benchmark approach is suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest. In the case of this CPA, the baseline is the national grid and is outside of the control of the project developer.

Conclusion: Option III is applicable to the CPA as transparent data on the CPA and relevant industry benchmark is available. Hence, the benchmark analysis is applied and the Equity Internal Rate of Return (IRR) is used to assess the financial viability of the CPA.

Sub-step 2b. Option III. Apply benchmark Analysis

The benchmark is determined at PoA level and will be updated every two years and presented to the CDM EB as per the procedures established by the UNFCCC, based on the latest information available in South Africa.

Determining the appropriate benchmark:

The benchmark will be the latest published data from the National Energy Regulator of South Africa ("NERSA"). NERSA has over a period of two years in three different discussion papers investigated price levels for renewable/clean energy in South Africa. In each instance NERSA indicated that the required return for investors in renewable energy/clean projects is a 17% real equity IRR.

The following documents have been supplied to the validating DOE as supporting documentation. The relevant pages are July 2009 REFIT paper, page 16, Table 2; NERSA REFIT March 2011 paper Table 4, page 22; NERSA January 2011 COFIT paper Table 3, page 17.

This is the benchmark at PoA level and will be updated every two years with any new publications by NERSA.

Sub-step 2c. Calculation and comparison of financial indicators – equity IRR

The CPA operator will calculate the equity IRR, in accordance with the guidance provided in the Tool for the demonstration and assessment of additionality.

The CPA operator should demonstrate that the following requirements are met in the financial model:

- Base all the equipment, operation and maintenance costs and grid connection costs on actual quotes received from suppliers;
- Information used in the financial model must be supported by a Technical feasibility study;
- The financial assessment should be based on the wind or solar resource assessment report specifying likely energy yield, done by an independent and credible expert, for the actual equipment that is to be installed and for the installed capacity that is to be built;
- The financial model must be submitted to a registered financial auditor (registered with SAICA, South African Institute of Chartered Accountants) and the auditor must confirm the integrity of the financial model;
- The CPA operator should submit the outcome of the audit to the CME.

Comparison of benchmark indicator for the proposed CPA

In accordance with the benchmark analysis, the proposed project is not considered as financially attractive if its equity IRR is lower than the benchmark equity IRR requirements.

Sub-step 2d. Sensitivity analysis

The purpose of the sensitivity analysis is to examine whether the conclusion regarding the financial viability of the proposed project is sound and tenable with those reasonable variations in the assumptions.

The investment analysis provides a valid argument in favour of additionality only if it consistently supports (for a realistic range of assumptions) the conclusion that the CPA is unlikely to be the most financially attractive or is unlikely to be financially attractive.

For the proposed CPA, identify only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues. Use these parameters as the variable factors for sensitivity analysis of financial attractiveness.

Present the impact on the Equity IRR of fluctuations in the financial parameters (not considering CERs income) in the CPA-DD.

Step 3: Barrier Analysis

As alternative to the investment analysis the CPA will be entitled to utilize the barrier analysis as per the additionality tool to show that the project is additional. Only one barrier is permissible under this PoA, i.e. barriers due to prevailing practice, specifically first of its kind.

The CPA operator will apply the following Sub-steps:

Sub-step 3a: Identify barriers that would prevent the implementation of the proposed CPA

The only barrier that is admissible in terms of PoA is barriers due to prevailing practice as described in the "Tool for the demonstration and assessment of additionality", where the CPA is the "first of its kind".

The selected geographic area is South Africa. Reference to the neighboring countries is not appropriate as the regulatory, commercial and technical hurdles and entire procurement system within which renewables operate in South Africa is entirely unique to the country. The barriers to project implementation and investment and access to finance differ between South Africa and the neighboring countries. The investment climate, both for foreign and local investment are very different between South African and any of the African countries. The established infrastructure, both logistical and electrical in South Africa is more developed than any of the other Southern African countries, some of which are categorized as LDCs.

The procedure to demonstrate first of its kind is provided in the CPA DD. The justification and evidence to support each of the barrier claims will be elaborated on in the CPA-DD, under Barrier Analysis.

Step 4: Common practice analysis

In the event that a project is shown to be first-of-kind, no common practice analysis will be carried out. In other cases, the common practice test will be applied as described in the CPA-DD.

SECTION D. Start date and duration of PoA

D.1. Start date of PoA

>>
26 October 2011

D.2. Duration of PoA

>>
28 years 0 months.

SECTION E. Environmental impacts

E.1. Level at which environmental impacts analysis is undertaken

>>
Environmental Analysis is done at CPA level

CPAs are typically unique in their impact on the environment. Moreover, the mere existence of the PoA has no impact on the environment of itself. The South African law will require the assessment of environmental impact by CPAs in any event through the provisions of the National Environment Management Act (NEMA) and related legislation and regulations. For these reasons the environmental assessment should be conducted at CPA level.

E.2. Analysis of environmental impacts

>>
Not applicable. Environmental analysis is carried out at the CPA level.

E.3. Environmental impact assessment

>>
Not applicable. Environmental analysis is carried out at the CPA level.

SECTION F. Local stakeholder consultation

F.1. Level at which local stakeholder consultation is undertaken

>>
The stakeholder consultations are held at CPA level, because of the different circumstances and conditions of every social environment in which each CPA is located.

F.2. Modalities for local stakeholder consultation

>>
Not applicable. Stakeholder consultation is done at the CPA level.

F.3. Summary of comments received

>>

Not applicable. Stakeholder consultation is done at the CPA level.

F.4. Consideration of comments received

>>

Not applicable. Stakeholder consultation is done at the CPA level.

SECTION G. Approval and authorization

>>

The letter of approval and authorization has been issued on the 09/07/2012 by the South African DNA.

PART II. Generic component project activity (CPA)**SECTION H. Description of generic CPA****H.1. Title of generic CPA**

>>

[Insert name of the CPA] in South Africa
Version [Insert version number]
Date: [Insert date]

H.2. Reference number of generic CPA

>>

[Insert reference number of the CPA]

H.3. Purpose and general description of generic CPA

>>

The CPA operator is proposing to establish a commercial Wind Energy Facility or Solar PV or Solar thermal facility and associated infrastructure on a site in South Africa.

Purpose of the CPA

The proposed CPA is an initiative to export renewable electricity generated by the CPA operator to the national grid in South Africa. The wind or solar PV or solar thermal power generated from the project site will be displacing electricity from the national grid in South Africa.

Pre-project scenario

*The pre-project scenario can be one of the following. The CPA DD will select and describe the relevant scenario. In the CPA DD the relevant capacities (MW) will be described for the relevant scenario.

The proposed CPA is a green field project. Currently, there is no power plant installed on the project site.

OR

The proposed CPA is the capacity addition of a [insert the capacity in MW] wind power plant/unit at an existing wind power plant with an installed design capacity of [insert the installed design capacity] MW.

OR

The proposed CPA is the capacity addition of a solar PV power plant/unit at an existing solar PV power plant.

OR

The proposed CPA is the capacity addition of a solar thermal power plant/unit at an existing solar thermal power plant without fossil fuel backup.

Baseline scenario

*The relevant scenario will be selected and described in the CPA DD.

According to ACM0002, if the CPA is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

Electricity delivered to the grid by the CPA would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations, described in the “Tool to calculate the emission factor for an electricity system”.

For capacity additions to an existing grid-connected renewable power plant, the baseline scenario is that the existing facility would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted ($DATE_{BaselineRetrofit}$), and electricity delivered to the grid by the added capacity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in “TOOL07: Tool to calculate the emission factor for an electricity system”. From that point of time onwards, the baseline scenario is assumed to correspond to the CPA, and no emission reductions are assumed to occur.

CPA

*The relevant technology option from the ones below will be selected in the CPA DD.

WIND

The CPA proposed is a green field project OR capacity addition of a wind power plant/unit to an existing wind power plant. It is proposed for a wind energy facility to be constructed over a broader study area approximately [insert the area] [hectares or km²] in extent. Based on a wind turbine generator capacity of [insert capacity] MW, a [insert number of turbines] turbine wind energy facility represents a total installed capacity of [enter the installed capacity of the CPA] MW, delivering [insert estimated figure] MWh per year.

This facility will include the following: [insert the number of turbines] wind turbine generators, [insert number of substations, if any] substation(s), distribution power lines as well as internal access roads.

SOLAR PV

The CPA proposed is a [green field project OR capacity addition of a solar PV power plant/unit to an existing solar PV plant]. The power plant will employ [insert the type of technology] technology and have a technical lifetime of [insert number of years] years and will have an installed capacity of [insert installed capacity of the CPA] MW. The power plant is expected to be constructed during [insert years during which construction is expected].

SOLAR THERMAL

The CPA proposed is a [green field project OR capacity addition of a solar thermal power plant/unit to an existing solar thermal power plant]. The power plant will employ [insert the type of technology] technology and have a technical lifetime of [insert number of years] years and will have an installed capacity of [insert installed capacity of the CPA] MW. The power plant is expected to be constructed during [insert years during which construction is expected].

The project will be supplying an average total of approximately [insert figure] MWh of net electricity per year to the national grid with an estimated average net capacity factor of approximately [insert capacity factor]%. There are currently [insert number] other [wind / solar PV / solar thermal] power plants with a capacity of [-50% of the CPA MW capacity to +50% of the CPA MW capacity] in commercial operation in South Africa⁸.

The proposed development represents an investment in clean, renewable energy in South Africa, a country that is dependent for its electricity on a national grid that relies on mostly coal fired power stations for the generation of electricity.

Emission Sources

CO₂ emissions from the power plants generating electricity in the national grid. The implementation of the project will reduce GHG emissions from the national grid.

H.4. Technologies/measures

>>

The CPAs will utilise wind turbines or solar panels as well as the appropriate materials and technology for balance of plant and electrical connections. In the case of solar power plants, both PV and solar thermal installations are included in the PoA, but in the case of solar thermal installations, fossil fuel sources will not be used as backup energy source to generate electricity into the grid.

Wind Farms

A description of the equipment(s) and systems that will be installed within the CPA will be provided in the CPA-DD. For wind farms, it typically includes the following:

- Wind turbines;
- Concrete foundations to support the turbine towers;
- Electrical distribution cabling between the turbines;
- Substations on the site in an appropriate position to receive generated power via underground distribution cabling from each wind turbine;
- Overhead power lines;
- Roads to the site from the main road/s within the area.

Solar PV plants

A description of the equipment(s) and systems that will be installed within the CPA will be provided in the CPA-DD. It typically includes the following:

- Solar receptors in the form of solar photovoltaic (PV) panels;

⁸ Insert the reference for this information

- Metal frames on which panels are mounted;
- The frames are anchored in concrete foundations;
- The panels are built in an array with cabling linking the PV panels to inverters;
- An Electricity Collector;
- Electrical Infrastructure;
- Substations;
- Internal Roads;
- Fencing.

Solar Thermal, i.e. Concentrated Solar Power (“CSP”) plants

A description of the equipment(s) and systems that will be installed within the CPA will be provided in the CPA-DD. It typically includes the following:

- Solar receptors in the form of parabolic trough mounted on a metal frame or a power tower which is a vertical structure with focussed mirrors;
- Electrical Infrastructure including substations;
- A water supply system;
- The “power block” including a steam turbine and possibly including infrastructure aimed at thermal heat storing;
- Roads;
- Fencing;
- A generation turbine.

Monitoring Equipment installation by the CPA operator

The main data parameter that is metered by the CPA operator on site during the crediting period, is $EG_{\text{facility},y}$ (net electricity supplied to grid by the wind power plant or solar power plant in year y) metered by electricity meters.

Technology Transfer

In cases where technology is developed and imported from Annex 1 countries, the PoA will contribute to technology transfer to the host country South Africa. The country where the technology originates from is provided in the CPA-DD.

SECTION I. Application of methodologies and standardized baselines

I.1. References to methodologies and standardized baselines

>>

Methodology:

ACM0002: Large-scale Consolidated Methodology for Grid-connected electricity generation from renewable sources, Version 20.0.

This methodology also refers to the latest approved versions of the following tools:

- Tool for the demonstration and assessment of additionality (version 7.0.0);
- Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (version 3.0)
- Tool to calculate the emission factor for an electricity system (version 7.0)
- Tool to determine the remaining lifetime of equipment (Version 01)

Standardised Baseline

ASB0040-2018 Grid emission factor for the Southern African power pool” (Version 01.0). At the time of CPA inclusions, the latest version will be applied.

For more information regarding the methodology and the tools as well as their consideration by the Executive Board please refer to <http://cdm.unfccc.int/methodologies/PAmethodologies/approved.html>.

I.2. Applicability of methodologies and standardized baselines

>>

Table 1 provides a list of the Applicability Criteria as described in ACM0002 and provides justifications as to how and why the PoA and the underlying CPAs comply with the methodology and the relevant Tools.

Table 1: Applicability Assessment against ACM0002 and the “Tool to calculate the emission factor for an electricity system”

Applicability Criteria	Generic CPA Justification
Tool for the demonstration and assessment of additionality’ (version 7.0.0).	The additionally tool is included in the approved methodology, its application by the CPAs are therefore mandatory.
Tool to determine the remaining lifetime of equipment (Version 01).	The tool is used for project activities which involve the replacement of existing equipment with new equipment or which retrofit existing equipment, therefore is applicable to capacity addition projects. CPAs will apply the tool to determine the remaining lifetime of the relevant equipment.
This methodology is applicable to grid-connected renewable power generation project activities that a) Install a Greenfield power plant; (b) involve a capacity addition to (an) existing plant(s); (c) involve a retrofit of (an) existing operating plants/units; or (d) involve a replacement of (an) existing plant(s); or (e) Involve a rehabilitation of (an) existing plant(s)/unit(s).	The PoA requires that each CPA is a grid connected renewable power generation activity that (a) Installs a Greenfield power plant or (b) involves a capacity addition of a renewable energy technology to an existing renewable energy plant of the same technology. In this PoA retrofits, rehabilitation of existing plants and replacements of existing plants are excluded.
The project activity may include renewable energy power plant/unit of one of the following types: -hydro power plant/unit with or without reservoir, -wind power plant/unit, -geothermal power plant/unit, -solar power plant/unit, -wave power plant/unit or -tidal power plant/unit;	Each CPA in the PoA is the installation of a new grid connected wind or solar PV or solar thermal power plant or capacity addition of a wind or solar PV or solar thermal power plant to an existing power plant of the same technology type. Retrofits or replacements of a power plant/unit are excluded in this PoA. Note: Compliance with applicability criterion 3 in the Eligibility Table in Section F in the CPA-DD would ensure compliance of the PoA and all the CPAs with this applicability criteria from ACM0002.
In the case of capacity additions, retrofits, rehabilitations or replacements (except for wind, solar, wave or tidal power capacity addition projects) the existing plant started commercial operation prior to the start of a minimum historical reference period of five years, used for the calculation of baseline emissions and defined in the baseline emission section, and no capacity expansion or retrofit or rehabilitation of the plant has been undertaken between the start of this minimum	CPAs in the PoA could be the implementation of capacity additions in wind or solar power plants, but the CPA operator shall confirm that the capacity addition will not affect the electricity generation of the existing power plants. Retrofits or replacements of a power plant/unit are excluded in this PoA.

Applicability Criteria	Generic CPA Justification
<p>historical reference period and the implementation of the project activity;</p>	
<p>In case of hydro power plants, one of the following conditions shall apply:</p> <p>a)The project activity is implemented in existing single or multiple reservoirs, with no change in the volume of any of the reservoirs; or</p> <p>b)The project activity is implemented in existing single or multiple reservoirs, where the volume of the reservoir(s) is increased and the power density, calculated using equation (7), is greater than 4 W/m²; or</p> <p>c)The project activity results in new single or multiple reservoirs and the power density, calculated using equation (7), is greater than 4 W/m²; or</p> <p>d)The project activity is an integrated hydro power project involving multiple reservoirs, where the power density for any of the reservoirs, calculated using equation (7), is lower than or equal to 4 W/m², all of the following conditions shall apply:</p> <p>-The power density calculated using the total installed capacity of the integrated project, as per equation (8), is greater than 4 W/m²;</p> <p>-Water flow between reservoirs is not used by any other hydropower unit which is not a part of the project activity;</p> <p>-Installed capacity of the power plant(s) with power density lower than or equal to 4 W/m² shall be:</p> <ul style="list-style-type: none"> • Lower than or equal to 15 MW; and • Less than 10 per cent of the total installed capacity of integrated hydro power project. 	<p>The PoA does not include projects relating to the implementation of a Hydro plant – therefore these applicability criteria do not apply to the PoA.</p>

Applicability Criteria	Generic CPA Justification
<p>In the case of integrated hydro power projects, project proponent shall:</p> <p>(a) Demonstrate that water flow from upstream power plants/units spill directly to the downstream reservoir and that collectively constitute to the generation capacity of the integrated hydro power project; or</p> <p>(b) Provide an analysis of the water balance covering the water fed to power units, with all possible combinations of reservoirs and without the construction of reservoirs. The purpose of water balance is to demonstrate the requirement of specific combination of reservoirs constructed under CDM project activity for the optimization of power output. This demonstration has to be carried out in the specific scenario of water availability in different seasons to optimize the water flow at the inlet of power units. Therefore, this water balance will take into account seasonal flows from river, tributaries (if any), and rainfall for minimum of five years prior to the implementation of the CDM project activity.</p>	<p>The PoA does not include projects relating to the implementation of a Hydro plant – therefore these applicability criteria do not apply to the PoA.</p>
<p>The methodology is not applicable to the following:</p> <ul style="list-style-type: none"> - Project activities that involve switching from fossil fuels to renewable energy sources at the site of the project activity, since in this case the baseline may be the continued use of fossil fuels at the site; - Biomass fired power plants/units. 	<p>The PoA excludes projects where there is a switch from a fossil fuel plant to a wind or solar power plant at the site of the CPA. The CPA site in each instance has no fossil fuel power generation facility constructed at the time when the wind/solar power plant will be established.</p> <p>The PoA excludes projects relating to any biomass fired power plants.</p>
<p>In the case of retrofits, rehabilitations, replacements, or capacity additions, this methodology is only applicable if the most plausible baseline scenario, as a result of the identification of baseline scenario, is the continuation of the current situation, i.e. to use the power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance.</p>	<p>Replacements and retrofits are excluded from the scope of the PoA.</p> <p>In the case of capacity additions: In the absence of the CPA, the existing facility would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted (DATE_{BaselineRetrofit}). From that point of time onwards, the baseline scenario is assumed to correspond to the CPA, and no emission reductions are assumed to occur. In the case of capacity additions, the <i>CPA will demonstrate</i> that the most likely baseline scenario is the continuation of the current situation.</p>
<p>Applicability criteria for the “Tool to calculate the emission factor for an electricity system”. 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</p>	<p>The PoA requires that the CPAs supply electricity to a grid. The Tool is applied to determine the CM for calculating the baseline emissions.</p> <p>Note: Compliance with applicability criteria 3 the Eligibility Table in Section F of the CPA-DD would ensure compliance of the PoA and all the CPAs with this applicability criteria.</p>

Applicability Criteria	Generic CPA Justification
<p>have been provided by the grid (e.g. demand-side energy efficiency projects).</p>	
<p>Under this tool, the emission factor for the project electricity system can be calculated either for grid power plants only or, as an option, can include off-grid power plants. In the latter case, two sub-options under the step 2 of the tool are available to the project participants, i.e. option IIa and option IIb. If option IIa is chosen, the conditions specified in “Appendix 1: Procedures related to off-grid power generation” should be met. Namely, the total capacity of off-grid power plants (in MW) should be at least 10 per cent of the total capacity of grid power plants in the electricity system; or the total electricity generation by off-grid power plants (in MWh) should be at least 10 per cent of the total electricity generation by grid power plants in the electricity system; and that factors which negatively affect the reliability and stability of the grid are primarily due to constraints in generation and not to other aspects such as transmission capacity.</p>	<p>The emission factor for the project electricity system will be calculated for grid power plants only and will exclude off-grid power plants.</p> <p>Note: The PoA complies with the applicability criteria.</p>
<p>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.</p>	<p>The project electricity system is not located partially in an Annex 1 country. All South Africa’s neighbouring countries are developing countries.</p> <p>Note: The PoA complies with the applicability criteria, because the CPAs will be implemented in South Africa.</p>
<p>Under this tool, the value applied to the CO2 emission factor of biofuels is zero.</p>	<p>In such a case that biofuels are used in plants connected to the electricity system, this condition will be applied in the PoA calculations.</p>
<p>Applicability conditions of TOOL05: “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation” (Version 03.0).</p>	
<p>1. This tool can be referred to in methodologies to provide procedures to monitor amount of electricity generated in the project scenario, only if one out of the following three project scenarios applies to the recipient of the electricity generated:</p> <p>(a) Scenario I: Electricity is supplied to the grid; (b) Scenario II: Electricity is supplied to consumers/electricity consuming facilities; or (c) Scenario III: Electricity is supplied to the grid and consumers/electricity consuming facilities.</p>	<p>The PoA requires that the CPAs supply electricity to a grid.</p>
<p>2. This tool is not applicable in cases where captive renewable power generation technologies are installed to provide electricity in the project activity, in the baseline scenario or to sources of leakage. The tool only accounts for CO2 emissions.</p>	<p>No captive renewable power generation technology is installed.</p>

Applicability Criteria	Generic CPA Justification
<p>Applicability criteria for the “Standardized baseline Grid emission factor for the Southern African power pool, Version 01.0”.</p>	
<p>1. This standardized baseline is applicable to the CDM projects in the following countries, which are the SAPP member countries and is connected to the SAPP:</p> <p>(a) The Republic of Botswana; (b) The Democratic Republic of the Congo (DRC); (c) The Kingdom of Lesotho; (d) The Republic of Mozambique; (e) The Republic of Namibia; (f) The Republic of South Africa; (g) The Kingdom of Swaziland; (h) The Republic of Zambia; (i) Zimbabwe.</p>	<p>The CPAs are developed in South Africa.</p>
<p>The CDM project activities can apply this standardized baseline under the following conditions:</p> <p>(a) The project activity is connected to the project electricity system;</p> <p>(b) The CDM approved methodology that is applied to the project activity requires the determination of CO2 emission factor(s) through the application of the grid tool; and</p> <p>(c) The project activity uses the ex-ante options for both the operating margin and build margin grid emissions factors, as described in the grid tool, and therefore no monitoring or recalculation of the emission factor during the crediting period is required.:</p> <p>(i) In the case that the project activity uses the ex ante option of data vintage, as per the tool, the latest approved values of this standardized baseline shall be used for calculation of emission reduction for the entire first, or entire second or entire third crediting period;</p> <p>(ii) In the case that the project activity uses the ex post option of data vintage as per the tool, the latest approved values of this standardized baseline valid at the end of the monitoring period shall be used for calculation of emission reduction for that monitoring period.</p>	<p>Each CPA in the PoA is the installation of a new grid connected wind or solar PV or solar thermal power plant or capacity addition of a wind or solar PV or solar thermal power plant to an existing power plant of the same technology type.</p> <p>ACM0002, version 20: Grid-connected electricity generation from renewable sources, applies the tool for the determination of baseline emissions, project emissions and leakage emissions.</p> <p>The requirements regarding the application of values in the Standardized baseline Grid emission factor for the Southern African power pool, will be applied in the CPA DD as described in bullet (c).</p>
<p>The latest approved and valid values of this standardized baseline are the only values of the CO2 emission factor(s) that shall be applied for the project electricity system in the SAPP member countries listed in this section.</p>	<p>This will be applied in the CPA DD.</p>

Furthermore, ACM0002, para. 65 states that “the monitoring provisions in the tools referred to in this methodology apply. Accordingly, $EG_{\text{facility},y}$ and $EG_{\text{PJ_Add},y}$ should be determined as per TOOL05: “Baseline, project and/or leakage emissions from electricity consumption and monitoring of electricity generation”. Scenario I (“Electricity is supplied to the grid”) in para. 6 (a) of the tool is applicable. There are no further applicability conditions in the tool.

I.3. Application of multiple methodologies

>>

The generic CPA does not apply a combination of multiple methodologies in accordance with the project standard.

I.4. Project boundary, sources and greenhouse gases (GHGs)

>>

The spatial extent of the project boundary includes the project site and all the power plants connected physically to the electricity system. The project electricity system is defined by the spatial extent of the power plants that can be dispatched without significant transmission constraints.

Project electricity system

If the DNA of South Africa has published or endorsed a delineation of the project electricity system and/or connected electricity systems, then use this published delineation.

Electricity generated by the proposed CPA will displace the power production in the national grid of South Africa, which is defined as the project electricity system by default.

The project electricity system forms part of a connected electricity system whereby it is connected by transmission lines to the national grid of Botswana (Botswana Power Corporation), Mozambique, Namibia (NamPower), Zimbabwe (ZESA), Lesotho (Lesotho Electricity Company), Swaziland and Zambia (ZESC

	Source	GHG	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 ₂ O	No	Minor emission source
Project activity	For geothermal power plants, fugitive emissions of CH ₄ and CO ₂ from non-condensable gases contained in geothermal steam	CO ₂	No	Not applicable to Wind/Solar PV/Solar Thermal
		CH ₄	No	Not applicable to Wind/Solar PV/Solar Thermal
		N ₂ O	No	Not applicable to Wind/Solar PV/Solar Thermal
	CO ₂ emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO ₂	No	Not applicable because only solar thermal plants that do not use fossil fuels to generate electricity into the grid are included in the PoA. Geothermal power plants are not included in the PoA.
		CH ₄	No	Not applicable to wind/solar PV/solar thermal
		N ₂ O	No	Not applicable to wind/solar PV/solar thermal

Source	GHG	Included?	Justification/Explanation
For hydro power plants, emissions of CH ₄ from the reservoir	CO ₂	No	Not applicable to wind/solar PV/solar thermal
	CH ₄	No	Not applicable to wind/solar PV/solar thermal
	N ₂ O	No	Not applicable to wind/solar PV/solar thermal

I.5. Establishment and description of baseline scenario

>>

Baseline scenario

[Select the appropriate baseline scenario below and delete which is not relevant.]

According to ACM0002, if the CPA is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

Electricity delivered to the grid by the CPA would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations, described in the “Tool to calculate the emission factor for an electricity system”.

For capacity additions to an existing grid-connected renewable power plant, the baseline scenario is that the existing facility would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted ($DATE_{BaselineRetrofit}$) and electricity delivered to the grid by the added capacity would have otherwise been generated by the operation of grid connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in “TOOL07: Tool to calculate the emission factor for an electricity system”. From that point of time onwards, the baseline scenario is assumed to correspond to the CPA, and no emission reductions are assumed to occur.

I.6. Estimation of emission reductions

I.6.1. Explanation of methodological choices

>>

The approved baseline and monitoring methodology of the Large-scale Consolidated Methodology: Grid-connected electricity generation from renewable sources, is applied to renewable energy projects generating electricity into a grid.

According to the ACM0002, if the CPA is the installation of a new grid-connected renewable power plant/unit, the baseline scenario is the following:

Electricity delivered to the grid by the CPA would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system”.

If the CPA is a capacity addition to existing grid-connected renewable power plant/unit, the baseline scenario is the following, the baseline scenario is the existing facility that would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted ($DATE_{BaselineRetrofit}$), and electricity delivered to the grid by the added capacity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the Tool to calculate the emission factor for an electricity system. From that point of time onwards,

the baseline scenario is assumed to correspond to the project activity, and no emission reductions are assumed to occur. Capacity additions need to demonstrate that the most plausible baseline scenario is the continuation of the current situation

Project emissions

These emissions shall be accounted for as project emissions by using the following equation:

$$PE_y = PE_{FF,y} + PE_{GP,y} + PE_{HP,y} \quad \text{Equation (1)}$$

Where:

- PE_y = Project emissions in year y (t CO₂e/yr)
- $PE_{FF,y}$ = Project emissions from fossil fuel consumption in year y (t CO₂/yr)
- $PE_{GP,y}$ = Project emissions from the operation of dry, flash steam or binary geothermal power plants in year y (t CO₂e/yr)
- $PE_{HP,y}$ = Project emissions from water reservoirs of hydro power plants in year y (t CO₂e/yr)

The PoA does not include geothermal power plants or water reservoirs of hydro power, therefore $PE_{GP,y} = 0$ and $PE_{HP,y} = 0$.

Project emissions are zero for CPAs, i.e. $PE_y = 0$.

Motivation: CPAs eligible for inclusion in this PoA may utilise solar thermal, photovoltaic or wind power. The eligibility criteria specify that solar thermal CPAs are eligible only if they do not use fossil fuel as backup fuel for generating electricity into the grid, therefore removing the need to consider project emissions.

Baseline Emissions

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity. The methodology assumes that all project electricity generation above baseline levels would have been generated by existing grid-connected power plants and the addition of new grid-connected power plants. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} \times EF_{grid,CM,y} \quad \text{Equation (2)}$$

Where:

- BE_y = Baseline emissions in year y (t CO₂/yr)
- $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CPA in year y (MWh/yr)
- $EF_{grid,CM,y}$ = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the “Standardized baseline: Grid emission factor for the Southern African power pool, latest version available at the time of CPA inclusion” (tCO₂/MWh)

Calculation of $EG_{PJ,y}$

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

Greenfield power plants

If the project activity is the installation of a Greenfield power plant, then:

$$EG_{PJ,y} = EG_{facility,y} \quad \text{Equation (3)}$$

Where:

- $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CPA in year y (MWh/yr)
- $EG_{facility,y}$ = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh/yr)

Capacity addition to wind and solar

In the case of wind and solar it is assumed that the addition of new capacity does not significantly affect the electricity generated by existing plants/units.⁹ In this case, the electricity fed into the grid by the added power plants/units shall be directly metered and used to determine $EG_{PJ,y}$.

$$EG_{PJ,y} = EG_{PJ_Add,y} \quad \text{Equation (4)}$$

Where:

- $EG_{PJ,y}$ = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CPA in year y (MWh/yr)
- $EG_{PJ_Add,y}$ = Quantity of net electricity generation supplied to the grid in year y by the project plant/unit that has been added under the project activity (MWh/yr)

Leakage

No other leakage emissions are considered.

⁹ In this case of wind power capacity additions, some shadow effects can occur, but are not accounted under this methodology.

I.6.2. Data and parameters fixed ex ante

(Copy this table for each piece of data and parameter.)

Data/Parameter	EF _{grid,CM,y}
Data unit	tCO ₂ /MWh
Description	Combined margin CO ₂ emission factor for the project electricity system applicable to the wind or solar power generation
Source of data	Version applicable at the time of including the CPA of Standardized baseline: Grid emission factor for the Southern African power pool
Value(s) applied	To be inserted in the CPA DD
Choice of data or Measurement methods and procedures	Latest version of Standardized baseline: Grid emission factor for the Southern African power pool
Purpose of data	Calculation of baseline emissions
Additional comment	The purpose of this data is to determine the combined margin emission factor.

I.6.3. Modalities for ex ante calculation of emission reductions

>>

Estimation of emission reductions prior to validation

The combined grid emission factor (EF_{grid,CM,y}) is determined ex ante and is determined from the latest version of Standardized baseline: Grid emission factor for the Southern African power pool.

Baseline emissions

Baseline emissions include only CO₂ emissions from electricity generation in fossil fuel fired power plants that are displaced due to the CPA. The baseline emissions are to be calculated as follows:

$$BE_y = EG_{PJ,y} * EF_{GRID,CM,y} \quad \text{Equation (5)}$$

Where:

- BE_y = Baseline emissions in year y (tCO₂)
- EF_{grid,CM,y} = Combined margin CO₂ emission factor for grid connected power generation in year y calculated using the relevant version of Standardized baseline: Grid emission factor for the Southern African (tCO₂/MWh)
- EG_{PJ,y} = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CPA in year y (MWh)

$$BE_y = [\textit{insert figure}] * [\textit{insert figure}]$$

$$BE_y = [\textit{insert figure}]$$

Calculation of EG_{PJ,y}

The calculation of EG_{PJ,y} is different for (i) greenfield plants, and (ii) capacity additions. Select the appropriate option (i) or (ii) below that applies to the CPA and delete the text that does not apply.

- i) Greenfield renewable energy power plants

If the CPA is the installation of a new grid-connected renewable power plant/unit at a site where no renewable power plant was operated prior to the implementation of the CPA, then:

$$EG_{PJ,y} = EG_{Facility,y} \qquad \qquad \qquad EG_{PJ,y} = [insert\ figure] \qquad \qquad \qquad \text{Equation (6)}$$

Where

- EF_{Facility,y} = Quantity of net electricity generation supplied by the project plant/unit to the grid in year y (MWh)
- EG_{PJ,y} = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CDM CPA in year y (MWh)

ii) Capacity Addition

In the case of wind, solar, wave or tidal power plants, it is assumed that the addition of new capacity does not significantly affect the electricity generated by existing plant(s) or unit(s). In this case, the electricity fed into the grid by the added power plant(s) or unit(s) could be directly metered and used to determine EG_{PJ,y}.

For wind and solar power plant(s) or unit(s), the following approach is to be used provided that the electricity fed into the grid by the added power plant(s) or unit(s) addition is separately metered:

$$EG_{PJ,y} = EG_{PJ_Add,y} \qquad \qquad \qquad EG_{PJ,y} = [insert\ figure] \qquad \qquad \qquad \text{Equation (7)}$$

Where:

- EG_{PJ,y} = Quantity of net electricity generation that is produced and fed into the grid as a result of the implementation of the CPA in year y (MWh)
- EG_{PJ_Add,y} = Quantity of net electricity generation supplied to the grid in year y by the project plant/unit that has been added under the CPA (MWh)

Determination of EF_{GRID,CM,y}

The baseline emission factor is calculated as a combined margin (CM), consisting of the combination of operating margin (OM) and build margin (BM) factors.

According to the PoA, the combined margin CO₂ emission factor is calculated for each CPA at the time of CPA inclusion, before submission for validation to the DOE. The standardised baseline gives values for the CM for renewable energy technologies.

Project emissions

Project emissions are zero.

$$PE = 0 \qquad \qquad \qquad \text{Equation (8)}$$

Leakage

No leakage emissions are considered. The main emissions potentially giving rise to leakage in the context of electric sector projects are emissions arising due to activities such as power plant construction and upstream emissions from fossil fuel use (e.g. extraction, processing, transport). These emissions sources are omitted.

$$LE = 0 \qquad \qquad \qquad \text{Equation (9)}$$

Emission reductions

Emission reductions are calculated as follows:

$$ER_y = BE_y - PE_y$$

$$ER_y = [insert\ figure] - [insert\ figure]$$
$$ER_y = [insert\ figure]$$

Equation (10)

Where:

ER_y = Emission reductions in year y (t CO₂e)

BE_y = Baseline emissions in year y (t CO₂)

PE_y = Project emissions in year y (t CO₂e)

I.7. Monitoring plan

I.7.1. Data and parameters to be monitored

(Copy this table for each piece of data or parameter.)

Data/Parameter	$EG_{P,j,y}$
Data unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year y
Source of data	Readings of electricity meter installed electricity meters installed at the grid interface for electricity export to grid.
Value(s) applied	[Insert figure] and indicate on which supporting document the figure is based.
Measurement methods and procedures	<ul style="list-style-type: none"> • The readings of the electricity meter will be continuously measured and monthly recorded. • Storage of data: Data will be archived electronically for 2 years after the end of the crediting period and paper backup copies will be archived. • The precision of the meter is not lower than 0.5s. • The net electricity supplied to the grid by the proposed project will be monitored using bi-directional energy meter or calculated through electricity supplied by the project to the grid ($EG_{output,y}$) deducting electricity purchased from the grid. If it is calculated, then the following parameters shall be measured: (a) The quantity of electricity supplied by the project plant/unit to the grid; and (b) The quantity of electricity delivered to the project plant/unit from the grid.
Monitoring frequency	The readings of the electricity meter will be continuously measured and monthly recorded.
QA/QC procedures	<ul style="list-style-type: none"> • Cross check measurement results with records for sold electricity. • The electricity supplied to the grid will be monitored and recorded at the central control room. The project operator is responsible for recording such data. • Electricity sales receipts will be kept for cross checking purposes. • The calibration frequency is at least once a year or as specified by the equipment supplier.
Purpose of data	Insert
Additional comment	-

Data/Parameter	EG _{PJ_Add,y}
Data unit	MWh
Description	Quantity of net electricity generation supplied to the grid in year y by the project plant/unit that has been added under the CPA
Source of data	Readings of electricity meter installed at the project site
Value(s) applied	[Insert figure] and indicate on which supporting document the figure is based.
Measurement methods and procedures	<ul style="list-style-type: none"> - Frequency: The electricity meter readings will be continuously metered and monthly recorded. - Storage of data: Data will be archived electronically for 2 years after the end of the crediting period and paper backup copies will be archived. - Accuracy: The precision of the meter is not lower than 0.5s. - Calculation procedure: The net electricity supplied to the grid by the proposed project will be calculated through electricity supplied by the project to the grid (EG_{output,y}) deducting electricity purchased from the grid.
Monitoring frequency	
QA/QC procedures	<ul style="list-style-type: none"> - The electricity supplied to the grid will be monitored and recorded at the central control room. - The project operator is responsible for recording such data. - Electricity sales receipts will be kept for cross checking purposes. - The calibration frequency is at least once a year or as specified by the equipment supplier.
Purpose of data	Insert
Additional comment	Applicable to wind and solar power plant(s) or unit(s), provided that option 2 in the baseline methodology is applied

1.7.2. Sampling plan

>>

No sampling will be done within any specific CPA and no sampling of CPAs within the PoA will be done.

1.7.3. Other elements of monitoring plan

>>

1. Monitoring management structure

To obtain effective monitored data, [insert CPA operator name] will identify the responsible persons for monitoring, data collection and archiving.

Selection procedure:

[Confirm that there will be a monitoring officer who will be responsible for monitoring. Mention whether this person will undergo training in the monitoring requirements and procedures.]

Tasks and responsibilities:

[Confirm that the monitoring officer will be responsible for the following tasks]

The Monitoring Officer will be responsible for carrying out the following tasks:

[Provide a list of the responsibilities of the monitoring officer]

2. Standards

[Provide information regarding industry standards that will apply to equipment, if there are any.]

3. Calibration of Meters

The calibration frequency is at least once a year or as specified by the equipment supplier.

4. Data Collection

i. Responsible entities that will collect and store data

The responsibility for monitoring lies with the CPA operator, who operates the proposed CPA. The CPA operator will be directly responsible for monitoring and reporting net electricity supplied by the CPA to the grid. The CPA operator will oversee the monitoring in partnership with relevant parties (e.g. Grid Company, owners engineer, consultants and EPC contractor when necessary).

Data will be collected by each CPA operator on site. The data will be entered into an excel spreadsheet for which the template will be provided to [insert CPA operator name]. The information from the excel spreadsheet will be transferred into the database on a monthly basis. [insert CPA operator name] will collect the relevant evidences for power delivered to the grid by the wind/solar energy facility and additional data (including the amount of electricity purchased from the grid).

ii. Data transfer and storage

The information that is entered by [insert CPA operator names] into the excel template on a monthly basis will be transferred into the CME database on a monthly basis. The information will be stored in the CME database for the full duration of the POA.

iii. Quality control

The CME will conduct an audit on each CPA every 6 months to ensure that all the relevant data is collected and that the necessary support documentation is collected and stored adequately for verification purposes.

iv. Duration of archiving of information at the CPA site

All data for the CPA will be archived for a minimum period of 2 years after the end of the crediting period for the CPA.

5. Location of monitors installed on site

[Provide information regarding the installation of the electricity meters, including information regarding back-up metering equipment. If information regarding the proposed location of the monitors is available at the time that the CPA DD is submitted, please provide a schematic diagram of the location of the monitors in the relevant section of the CPA-DD.]

6. Training and Monitoring Personnel

[Insert CPA operator name] will provide a list of the persons that participate in the monitoring process and the CME will provide these people with the relevant training on the application of the monitoring plan. [The CPA operator can provide additional description here regarding training and monitoring if the feel it is relevant.]

7. Capabilities of meters

[Confirm that the electricity meters shall be capable of measuring and recording the following parameters for various time and frequency blocks]

- Energy Output and Reactive Energy Output;
- Instantaneous voltage, current and power factor;

- Frequency;
- Maximum demand in MVA/MW for each demand period and for the total period since the last reset;
- MWh/MVARh since last reading;
- Real time and time of day metering; and
- Number of resets.

The Metering Installation shall have the capability to download and transmit such real time data to a Supervisory Control and Data Acquisition ("SCADA") system, in a form and format suitable for SCADA.

8. Testing and inspection

[Provide information regarding the testing and inspection procedures of the metering installations]

9. Readings and inaccuracy

The CPA operator shall be responsible for retrieving and analysing data from the Facility Metering Installation.

[Provide information regarding readings and inaccuracy procedures]

10. Quality control

10.1 Audit

[Provide information regarding audit procedures if applicable]

11. Reporting

The Monitoring Report will describe the monitoring procedures, approved and signed off metering data, corrected errors, and the emission reduction calculations.

With the Monitoring Report, the calibration records are presented for verification.

SECTION J. Crediting period type and duration

>>

The CPA can only apply the 10-year crediting period option.

SECTION K. Eligibility criteria for inclusion of CPAs

>>

The CPA will be assessed against this list of criteria in the table below by the CME at the time when the CPA applies for inclusion in the POA.

The CME will ensure that no CPA under the PoA is registered as an individual CDM project activity or included in another registered PoA, and that the CPA is subscribed to this PoA exclusively.

According to the "Standard for CDM project standard for programmes of activities", (Version 02.0) if version 20 of ACM0002 applied by the PoA is revised or replaced, subsequent to being placed on hold or withdrawn, PoA Africa Wind and Solar (Pty) Ltd as the CME shall update the eligibility criteria to the requirements of the revised or new methodology with immediate effect and include them in a new version of the PoA DD and new generic CDM-CPA-DD validated by a DOE, and shall submit it to the Board for approval.

Notes:

1. Each CPA that wants to have CERs issued will undergo verification. No sampling will be done within any specific CPA and no sampling of CPAs within the PoA will be done.

2. Given that ACM0002 will be used for all projects, the following requirements from the “Standard for CDM project standard for programmes of activities”, (Version 02.0), section 7.12.6. Eligibility criteria for inclusion of component project activities”, are not relevant to this PoA:

-(l) If the generic CPA applies sampling for the determination of parameter values for calculating GHG emission reductions or net anthropogenic GHG removals, conditions related to sampling requirements for the PoA in accordance with the “Standard: Sampling and surveys for CDM project activities and programme of activities”;

-(m) If the generic CPA is small-scale or microscale, conditions to ensure that CPAs that will be included meet the small-scale or microscale thresholds and remain within those thresholds throughout the crediting period of the CPAs. However, if the generic CPA consists solely of units that qualify as “microscale CDM units” as defined in the “Methodological tool: Demonstration of additionality of microscale project activities”, these conditions are not required;

-(n) If the generic CPA is small-scale or microscale, conditions for the debundling check based on the “Methodological tool: Assessment of debundling for small-scale project activities”. However, if the generic CPA consists solely of units that qualify as “microscale CDM units”, these conditions are not required.

The applicability criteria above will not be reflected in the Eligibility Criteria for each CPA in the CPA-DD, because they do not apply to the CPAs.

Table 6: Eligibility Criteria

No.	Eligibility criterion - Category	Eligibility criterion - Required condition	Supporting evidence for inclusion
1	Geographical Boundary	The renewable energy power plant (the CPA) must be grid connected to the South African national electricity grid which forms part of the Southern African Power Pool and fall within the boundaries of the Republic of South Africa, as they may exist at the time of CPA inclusion.	<ol style="list-style-type: none"> 1. Provide the GPS coordinates of the proposed CPA site as Addendum A to the PoA application submitted to the CME. 2. Provide the design electrical reticulation system or the draft “Distribution connection and use-of-system agreement with generators” or the communication document with the grid operator (utility) to demonstrate that the power plant will be grid connected.

<p>2</p>	<p>Double-counting of project activities</p>	<p>The CPA operator must demonstrate that double counting does not occur with the particular CPA.</p> <p>The CME will check that the CPA is not included in another PoA or registered as a single project activity or under validation. The procedure is described in Section A.4.4.1 of the PoA-DD.</p>	<ol style="list-style-type: none"> 1. Provide the GPS coordinates of the proposed CPA site as Addendum A to the PoA application submitted to the CME. 2. Confirms that the CPA is not developed as part of another PoA or an individual CDM project activity. 3. Submit a wind or solar resource assessment report specifying likely energy yield, done by an independent and credible expert, for the actual equipment that is to be installed and for the installed capacity that is to be built. 4. Provide the start date of the crediting period based on the project schedule. 5. Provide the end date of the crediting period (based on the start date of the crediting period).
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<p>3</p>	<p>Technology</p> <p>Criteria is constructed based on 16(i) in the “Standard for demonstration of additionality, development of eligibility criteria and application of multiple methodologies for programme of activities”, Version 02.0, “Where applicable, target group (e.g. domestic/commercial/ industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation)”. The target group is prospective wind and solar project developers in South Africa.</p>	<p>The CPA must implement one of the following renewable energy technologies:</p> <ul style="list-style-type: none"> - Wind; or - Solar PV; or - Solar thermal without fossil fuel backup. <p>The CPA must be grid connected, i.e. the type of service delivered by each CPA must be electricity to the national grid.</p> <p>The CPA must either be a new facility or capacity addition to an existing facility of the same technology.</p> <p>[Note that this criteria covers the relevant Applicability Criteria from ACM0002¹⁰.</p>	<p>The following documentation can be submitted to the CME as supporting documentation:</p> <ul style="list-style-type: none"> -Environmental Impact Assessment; -Technical Feasibility Study or the Resource Assessment Report/Study; -Record of Decision issued by the Department of Environment; -Detailed Design Drawings of the project submitted to the local authorities. <p>The CPA is one of the following:</p> <ul style="list-style-type: none"> - a grid-connected greenfield wind power plant at a site where no renewable power plant was operated prior to the implementation of the CPA; - a grid-connected greenfield solar PV power plant at a site where no renewable power plant was operated prior to the implementation of the CPA; - a grid-connected greenfield solar thermal power plant at a site where no renewable power plant was operated prior to the implementation of the CPA; - a grid-connected capacity addition of a wind power plant to an existing wind power plant; - a grid-connected capacity addition of a solar PV power plant to an existing solar PV power plant; - grid-connected capacity addition of a solar thermal power plant to an existing solar thermal power plant.
<p>4</p>	<p>Other</p>	<p>[Only for Solar thermal applications]</p> <p>For solar thermal plants, only CPAs that do not use fossil fuels to generate electricity into the grid can be included into the PoA.</p>	<p>The CPA operator must confirm that fossil fuels are not utilised on the site to generate electricity into the grid. The technical design document of the project must be submitted to the CME.</p>
<p>5</p>	<p>Other</p>	<p>The CPA must demonstrate that the wind technology or solar technology complies with the relevant international or local quality standards.</p>	<p>CPA operator provides the relevant equipment certificate that confirms that the equipment complies with an acceptable international or South African standard to the CME when submitting the CPA for PoA inclusion.</p>

¹⁰ Number 3 under Applicability in ACM0002 version 20.

6	Start date	<p>If the start has occurred at the time when the CPA operator submits the CPA for PoA inclusion, the CPA operator will provide documentary evidence of real action towards the CPA in order to motivate the start date.</p> <p>The start date of a CPA cannot be earlier than the starting date of the PoA, i.e. 26 October 2011.</p>	<p>If the start date has occurred at the time when the CPA operator submits the CPA for PoA inclusion, the CPA operator will provide documentary proof of real action towards the CPA in line with the EB guidelines.</p> <p>Examples of supporting documentation include the following, but are not exclusive:</p> <ul style="list-style-type: none"> - The CPA operator provides proof that the deposit was paid for the equipment. - In the event that the CPA is participating in a government procurement process, the start date may be the date that the CPA posted their preferred bidder bond as required by the government procurement processes. This is a compulsory posting of a commitment in the form of a monetary security bond that has to be posted upon being awarded with preferred bidder status and the money can be forfeited if the CPA operator fails to deliver key deliverables in time. <p>2. Confirm and provide evidence that the starting date of the CPA is after 26 October 2011.</p>
7	Other	<p>[For capacity additions only] The electricity generated from the capacity addition must not affect the generation of electricity in the existing power plant.</p> <p>The electricity fed into the grid by the added power plant(s) or unit(s) addition must be separately metered.</p>	<p>1. The CPA operator shall provide the technical detail of the plant design (technical feasibility study report) or a study report conducted by an expert to substantiate whether the capacity addition will impact electricity generation of the existing power plant.</p> <p>2. The impact of the capacity addition on the existing power plant should be covered in the technical feasibility study report or the expert report.</p> <p>3. The reports and/or drawings referred to above should make it clear that the pre-existing and the new plant shall be separately metered.</p>

8	Additionality	<p>The CPA operator must demonstrate that the project is additional as per Section E.5. of the PoA-DD:</p> <p>Note: For the Investment analysis the benchmark approach is applied with equity IRR as the parameter that should be determined.</p> <p>The CPA operator must complete the additionality section of the CPA-DD and provide all the required evidence to demonstrate that the proposed CPA is additional.</p>	<p>If investment analysis is applied to demonstrate additionality then:</p> <ol style="list-style-type: none"> 1. The CPA operator must apply the benchmark approach to demonstrate additionality, and 2. The proposed project's equity return without carbon finance should be lower than the benchmark requirements. <p>The benchmark is determined at PoA level by referring to the published National Energy Regulator of Southern Africa (NERSA) figure of a 17% real equity IRR required by investors in renewable energy detailed in Section C. This benchmark will be updated every two years at PoA level with any new published figures that NERSA may have published in the interim.</p> <p>Barrier analysis is limited to demonstrating the following barriers: Barriers due to prevailing practice – the project is a first of its kind;</p>
9	Local stakeholder consultations and environmental impact analysis	<p>Each CPA has to do a local stakeholder participation process.</p> <p>The CPA must submit a Project Idea Note to the South African DNA as a public consultation mechanism.</p> <p>The CPA must carry out an Environmental Impact Assessment (EIA) in the format required by South African law, as it exists at the time of CPA inclusion. [Note that the EIA process in South Africa requires an extensive stakeholder participation process. (Refer to the relevant Impact Assessment Regulations, where the stakeholder participation process requirements are described).]</p> <p>In the case where the project is exempt from conducting an EIA under South African law, public participation must still occur through the liaison with the DNA and liaison with at least the CPA project neighbors and local municipality.</p>	<ol style="list-style-type: none"> 1. Complete the PIN and submit to the South African DNA. Provide a copy of the PIN and confirmation that the South African DNA has received the PIN to the CME. 2. Submit the information regarding the EIA status to the CME when the application to participate in the PoA is submitted to the CME. 3. If the CPA is exempt from conducting an EIA, the CPA operator must provide documented evidence to the CME that confirms that stakeholder participation was conducted that covered the CDM component of the CPA.
10	ODA diversion	<p>No ODA will be diverted as a result of the CPA.</p>	<p>Confirms whether or not public funding is used in the CPA. If public funding is used, the CPA operator has to provide evidence and a declaration that the public funding is not a diversion of ODA.</p>

11	Other	The CPA must be a voluntary initiative by the CPA operator and not the implementation of any mandatory policy or regulation.	Confirms that the CPA is a voluntary initiative and not the implementation of a mandatory policy or regulation and submits a declaration in this regard when submitting an application form to the CME to participate in the PoA.
12	Other	The CPA must have a contract of services and rights with and vis-a-vis the CME that governs the CPAs participation in the PoA and complies with the code of conduct of the CME.	Sign an agreement with the CME to show that the CPA operator intends to comply with the code of conduct of the CME.
13	Other	The CPA has to comply with South African national laws and regulations in force at the time of inclusion of the CPA into the PoA.	<ol style="list-style-type: none"> 1. The CPA operator will confirm in a declaration that the implementation and operation of the CPA complies with the relevant laws and regulations in South Africa at the time of inclusion of the CPA into the PoA. 2. Submit the declaration to the CME in this regard.
14	Other	In the case of capacity additions, the CPA operator has to demonstrate that the most plausible baseline scenario is to use the power generation equipment that was already in use prior to the implementation of the CPA and undertaking business as usual maintenance.	<ol style="list-style-type: none"> 1. The CPA operator will submit the technical feasibility study or resource assessment report for the capacity addition CPA in order to demonstrate that in the absence of the CPA, the existing facility would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted (DATE_{BaselineRetrofit}). 2. The technical feasibility study or the resource assessment report should clearly define DATE_{BaselineRetrofit}

The below approach provides a description of the assessment of Additionality.

Demonstration of Additionality

Step 0: Demonstration whether the proposed project activity is the first-of- its-kind

The selected geographic area is South Africa. Reference to the neighboring countries is not appropriate as the regulatory, commercial and technical hurdles and entire procurement system within which renewables operate in South Africa is entirely unique to the country. The barriers to project implementation and investment and access to finance differ between South Africa and the neighboring countries. The investment climate, both for foreign and local investment are very different between South African and any of the African countries. The established infrastructure, both logistical and electrical in South Africa is more developed than any of the other Southern African countries, some of which are categorized as LDCs.

Outcome of Step 0:

If the proposed project is the first-of-its-kind, its additionality is demonstrated; otherwise, proceed to Step 1a.

Sub-step 1a. Identify realistic and credible alternative baseline scenarios for power generation

According to ACM0002, if the CPA is the installation of a new grid-connected renewable power plant (wind or solar), the baseline scenario is defined as follows:

“Electricity delivered to the grid by the CPA would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “TOOL07: Tool to calculate the emission factor for an electricity system”.

If the CPA is a capacity addition to an existing grid-connected renewable power plant/unit, the baseline scenario is defined as follows:

“The existing facility that would continue to supply electricity to the grid at historical levels, until the time at which the generation facility would likely be replaced or retrofitted ($DATE_{BaselineRetrofit}$), and electricity delivered to the grid by the added capacity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in “TOOL07: Tool to calculate the emission factor for an electricity system”. From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and no emission reductions are assumed to occur.

The alternative baseline scenarios include the following:

Alternative 1: The proposed CPA undertaken without being registered as a CDM project;

Alternative 2: Electricity delivered to the grid by the CPA would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources.

Hence, in accordance with methodology ACM0002, version 20.0, and the “Tool to calculate the emission factor for an electricity system”, Version 7.0, baseline emissions are equal to power generated by the project activity and delivered to the grid, multiplied by the baseline emission factor.

Therefore, no further analysis of the alternatives to the project activity is required.

Sub-step 1b. Consistency with mandatory laws and regulations

Alternative 2 is consistent with mandatory laws and regulations as it is legal for the utility to generate electricity in the grid. The CPA should demonstrate that it complies with regulations and the project without CDM complies with all regulations (alternative 1).

If the only two realistic and credible alternative options are the ones described above, progress to the next step.

CPAs applying the Investment analysis should progress to Step 2.

Step 2: Investment Analysis

Sub-step 2a. Determine appropriate analysis method

The analysis will be analyzed through Option III of the additionality tool, i.e. benchmark analysis. This method is applicable because:

- Option I: Simple cost analysis, does not apply as the project generates economic returns through the sale of electric power to the grid.
- Option II: Investment comparison analysis is not used, as there is no realistic alternative for the project (provision of power to the grid) involving investments. In other words, the investment comparison analysis is not applicable to the project because the alternative of the project is “Equivalent electricity service provided by the grid”, which is not a single project.

- Option III, Benchmark analysis can be transparently demonstrated using financial/economic information for the proposed CPA and compare financial indicators against a relevant industry benchmark hurdle rate.

According to paragraph 19 of Annex 13, EB 6, the benchmark approach is suited to circumstances where the baseline does not require investment or is outside the direct control of the project developer, i.e. cases where the choice of the developer is to invest or not to invest. In the case of this CPA, the baseline is the national grid and is outside of the control of the project developer.

Conclusion: Option III is applicable to the CPA as transparent data on the CPA and relevant industry benchmark is available. Hence, the benchmark analysis is applied and the Equity Internal Rate of Return (IRR) is used to assess the financial viability of the CPA.

Sub-step 2b. Option III. Apply benchmark Analysis

The benchmark is determined at PoA level and will be updated every two years and presented to the CDM EB as per the procedures established by the UNFCCC, based on the latest information available in South Africa.

Determining the appropriate benchmark:

The benchmark will be the latest published data from the National Energy Regulator of South Africa ("NERSA"). NERSA has over a period of two years in three different discussion papers investigated price levels for renewable/clean energy in South Africa. In each instance NERSA indicated that the required return for investors in renewable energy/clean projects is a 17% real equity IRR.

The following documents have been supplied to the validating DOE as supporting documentation. The relevant pages are July 2009 REFIT paper, page 16, Table 2; NERSA REFIT March 2011 paper Table 4, page 22; NERSA January 2011 COFIT paper Table 3, page 17.

This is the benchmark at PoA level and will be updated every two years with any new publications by NERSA.

Sub-step 2c. Calculation and comparison of financial indicators – equity IRR

The CPA operator will calculate the equity IRR, in accordance with the guidance provided in the Tool for the demonstration and assessment of additionality.

The CPA operator should demonstrate that the following requirements are met in the financial model:

- Base all the equipment, operation and maintenance costs and grid connection costs on actual quotes received from suppliers;
- Information used in the financial model must be supported by a Technical feasibility study;
- The financial assessment should be based on the wind or solar resource assessment report specifying likely energy yield, done by an independent and credible expert, for the actual equipment that is to be installed and for the installed capacity that is to be built;
- The financial model must be submitted to a registered financial auditor (registered with SAICA, South African Institute of Chartered Accountants) and the auditor must confirm the integrity of the financial model;
- The CPA operator should submit the outcome of the audit to the CME.

Comparison of benchmark indicator for the proposed CPA

In accordance with the benchmark analysis, the proposed project is not considered as financially attractive if its equity IRR is lower than the benchmark equity IRR requirements.

Sub-step 2d. Sensitivity analysis

The objective of the sensitivity analysis is to quantify the impact of reasonable variations of critical variables in the financial indicator (e.g. project IRR) of the proposed project activity.

The investment analysis provides a valid argument in favour of additionality only if it consistently supports (for a realistic range of assumptions) the conclusion that the CPA is unlikely to be the most financially attractive or is unlikely to be financially attractive.

According to the UNFCCC “Guidance on the Assessment of Investment Analysis” (version 5) variables that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation.

For the proposed CPA, identify only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues. Use these parameters as the variable factors for sensitivity analysis of financial attractiveness.

The financial analysis shall be performed by modifying each of the parameters by at least up to +/- 10%, band assessing the impact on the financial indicator (without revenues from selling CERs). In the case a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative the DOE shall provide an assessment of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity. If the DOE assumes a high likelihood of the scenario to happen when the project IRR passes the benchmark, the project is deemed as financially attractive and cannot be included in the PoA. Otherwise it shall be proceeded with Step 4.

Present the impact on the Equity IRR of fluctuations in the financial parameters (not considering CERs income) in the CPA-DD.

When performing the investment analysis, the CDM “Guidelines On The Assessment Of Investment Analysis” (Version 05) should be considered. It is recommended to check that all guidance are met and followed.

Step 4: Common practice analysis

In the event that a project is shown to be first-of-kind, no common practice analysis will be carried out. In other cases, the common practice test will be applied as described in the Tool.

This analysis is to be developed in the CPA-DD form based on the definition of “similar activities” as: wind power or solar power, following the Sub-steps presented in the “Tool for the demonstration and assessment of additionality”, Version 7.0.0. and the “ Guidelines on Common Practice” (version 1.0):

Sub-Step 4a. Analyse other activities similar to the proposed project activity

An analysis of any other activities that are operational and that are similar to the proposed CPA should be provided. Projects are considered similar if they are in the same country and if they rely on a broadly similar technology, are of a similar scale, and take place in a comparable environment with respect to regulatory framework, investment climate, access to technology, access to financing, etc.

Other CDM project activities (registered project activities and project activities which have been published on the UNFCCC website for global stakeholder consultation as part of the validation process) are not to be included in this analysis.

Sub-Step 4b. Discuss any similar options that are occurring

If similar activities are identified above, then it is necessary to demonstrate why the existence of these activities does not contradict the claim that the proposed CPA is financially/economically unattractive or subject to barriers. This can be done by comparing the proposed CPA to the other similar activities, and pointing out and explaining essential distinctions between them that explain why the similar activities enjoyed certain benefits that rendered it financially/economically attractive (e.g., subsidies or other financial flows) and which the proposed CPA cannot use or did not face the barriers to which the proposed project activity is subject. If necessary data/information of some similar projects are not accessible for PPs to conduct this analysis, such projects can be excluded from this analysis. In case similar projects are not accessible, the CPA-DD should include justification about non-accessibility of data/information.

Essential distinctions may include a serious change in circumstances under which the proposed CPA will be implemented when compared to circumstances under which similar projects were carried out. For example, new barriers may have arisen, or promotional policies may have ended, leading to a situation in which the proposed CPA would not be implemented without the incentive provided by the CDM. The change must be fundamental and verifiable.

In order to clearly identify the similar activities to a CPA, the common practice analysis shall be conducted as per paragraph 47 of the Tool for the demonstration and assessment of additionality, version 7.0.0.

Step 1:

Calculate applicable output range as +/-50% of the design output or capacity of the proposed CPA.

Step 2:

In the applicable geographical area, identify all plants that deliver the same output or capacity, within the applicable output range calculated in Step 1, as the proposed project activity and have started commercial operation before the start date of the project. Note their number Nall. Registered CDM project activities shall not be included in this step.

The following rationale should be followed:

1. Projects with an installed capacity below the capacity of the proposed CPA minus 50% and higher than the capacity of the proposed CPA plus 50% are discarded from project list.
2. Describe other criteria that trigger the exclusion of a project in the list e.g. from the remaining projects, projects inactive or under construction.
3. From the remaining projects, CDM projects are excluded.
4. The amount of the remaining projects is considered "Nall".

Step 3:

Within plants identified in Step 2, identify those that apply technologies different than the technology applied in the proposed CPA. Note their number Ndiff. Different technologies are technologies that deliver the same output and differ by at least one of the following:

- (a) Energysource/fuel;
- (b) Feed stock;
- (c) Sizeofinstallation(powercapacity):
 1. Micro (as defined in paragraph 24 of Decision 2/CMP.5 and paragraph 39 of Decision 3/CMP .6);
 2. Small (as defined in paragraph 28 of Decision 1/CMP.2)

3. Large
- (d) Investment climate in the date of the investment decision, inter alia:
4. Access to technology;
 5. Subsidies or other financial flows;
 6. Promotional policies
 7. Legal regulations:
- (e) Other features, inter alia:
1. Unit cost of outputs if they differ by at least 20%

Step 4:

Calculate factor $F = 1 - N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed CPA in all plants that deliver the same output or capacity as the proposed CPA.

According to the “Tool for the demonstration and assessment of additionality”, version 7.0.0, a project activity is “common practice” within a sector in the applicable geographical area if the factor F is greater than 0.2 and if $N_{all} - N_{diff}$ is greater than 3.

In case the CPA is not common practice and passed all previous steps it is deemed as additional.

Appendix 1. Contact information of coordinating/managing entity and project participants

Coordinating/managing entity and/or project participants	<input type="checkbox"/> Coordinating/managing entity X <input type="checkbox"/> Project participant
Organization name	CDM Africa Climate Solutions (Pty) Ltd
Country	South Africa
Address	14 – 13 th Street, Parkhurst Johannesburg
Telephone	+27827463364
Fax	-
E-mail	jvandenbergs@skranders.net
Website	www.cdmafrica.com
Contact person	Johan van den Berg

Coordinating/managing entity and/or project participants	X <input type="checkbox"/> Coordinating/managing entity <input type="checkbox"/> Project participant
Organization name	PoA Africa Wind and Solar (Pty) Ltd
Country	South Africa
Address	253 Buitekantstreet, Oudtshoorn
Telephone	+27(0)82 898 5750
Fax	-
E-mail	Ciska.terblanche@gmail.com
Website	-
Contact person	Ciska Terblanche

Appendix 2. Affirmation regarding public funding

The CPA operator has to supply information regarding public funding in Annex 2 of the CPA-DD. Please complete the following:

If public funding from an Annex 1 country is involved in this CPA, the Annex 1 party or the CPA operator has to provide affirmation that such funding does not result in a diversion of official development assistance.

Appendix 3. Applicability of methodologies and standardized baselines

No further information

Appendix 4. Further background information on ex ante calculation of emission reductions

No further information

Appendix 5. Further background information on monitoring plan

No further information

Appendix 6. Summary report of comments received from local stakeholders

No further information

Appendix 7. Summary of post-registration changes

None

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
09.0	31 May 2019	Revision to: <ul style="list-style-type: none"> • Ensure consistency with version 02.0 of the “CDM project standard for programmes of activities” (CDM-EB93-A07-STAN); • Make editorial improvements.
08.1	28 June 2017	Revision to: <ul style="list-style-type: none"> • Remove a duplicated instruction; • Make editorial improvement.
08.0	7 June 2017	Revision to: <ul style="list-style-type: none"> • Improve consistency with the “CDM project standard for programmes of activities” and with the PDD and CPA-DD forms; • Make editorial improvement.

Version	Date	Description
07.0	25 May 2017	Revision to: <ul style="list-style-type: none"> • Ensure consistency with the “CDM project standard for programmes of activities” (CDM-EB93-A07-STAN) (version 01.0); • Incorporate the “Programme design document form for small-scale CDM programmes of activities” (CDM-SSC-PoA-DD-FORM); • Make editorial improvement.
06.0	15 April 2016	Revision to ensure consistency with the “Standard: Applicability of sectoral scopes” (CDM-EB88-A04-STAN) (version 01.0).
05.0	9 March 2015	Revision to: <ul style="list-style-type: none"> • Include provisions related to choice of start date of PoA; • Include provisions related to delayed submission of a monitoring plan; • Provisions related to local stakeholder consultation; • Add exception for generic CPA where technology is under positive lists; • Make editorial improvement.
04.1	5 August 2014	Editorial revision to correct the document information table.
04.0	25 June 2014	Revision to: <ul style="list-style-type: none"> • Include the Attachment: Instructions for filling out the project design document form for CDM programme of activities (these instructions supersede the Guideline: Completing the programme design document form for CDM programme of activities (Version 04.0)); • Include provisions related to standardized baselines; • Add contact information on a responsible person(s)/ entity(ies) for the application of the methodology (ies) to the PoA in B.4 and Appendix 1; • Add general instructions on post-registration changes in paragraphs 2 and 3 of general instructions and Appendix 6; • Change the reference number from F-CDM-PoA-DD to CDM-PoA-DD-FORM; • Make editorial improvement.
03.0	3 December 2012	EB 70 Revision to reflect changes to the <i>Guideline: Completing the programme design document form for CDM programmes of activities</i> (EB 70, Annex 6).
02.0	13 March 2012	EB 66 Revision required to ensure consistency with the "Guidelines for completing the programme design document form for CDM programmes of activities" (EB 66, annex 12).
01.0	27 July 2007	EB 33, Annex 41 Initial publication.

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