PROGRAMME DESIGN DOCUMENT FORM FOR CDM PROGRAMMES OF ACTIVITIES (F-CDM-PoA-DD) Version 02.0

PROGRAMME OF ACTIVITIES DESIGN DOCUMENT (PoA-DD)

PART I. Programme of activities (PoA)

SECTION A. General description of PoA

A.1. Title of the PoA

Green Power for South Africa
Version 10
05/12/2012

A.2. Purpose and general description of the PoA

1. ***General Operating and Implementing Framework of PoA***

The Green Power for South Africa Programme of Activities ("PoA") will consist of a series of projects consisting of wind and solar power, implemented by participating organisations. Standard Bank Plc (hereon referred to as Standard Bank) will act as the Coordinating/Managing Entity ("CME") for the PoA, and will provide an open platform for different technology and service suppliers to participate in the PoA by developing their own Clean Development Mechanism ("CDM") Programme Activities ("CPAs").

Only a few, very small renewable energy projects exist in South Africa due to a number of critical barriers. Eskom, the state-owned electricity supplier, dominates the generation capacity and has historically supplied electricity at exceptionally inexpensive rates[1], largely due to an over-capacity expansion programme in the 1970s and extensive supplies of cheap coal.

South Africa is however experiencing growth that is outstripping its energy supplies, as revealed in 2008 when Eskom was unable to supply the more than 220 TWh of demand, and the country suffered from major power cuts. In addition, about 30% of South African households are not connected to the electricity supply grid[2] and are living in so-called 'energy poverty', further indicating the need for alternative energy sources in this developing country.

South Africa is very fortunate in that it regularly experiences excellent solar and wind conditions. A number of research reports estimate the technical energy supply potential to be 80 TWh for wind and 1 000 TWh for both photovoltaic ("PV") and concentrated solar power ("CSP") by 2030[3]. The South African Integrated Resource Plan 2012-2030[4] further envisages that by 2030 the technologies under this PoA will account for 42% of the national energy mix:

- Solar CSP: 1 GW
- Solar PV: 8 GW
- Wind: 8.4 GW

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[1] Edkins, M., Marquard, A. and Winkler, H. 2010. *Assessing the effectiveness of national solar and wind energy policies in South Africa*. Pg 12.

[2] Ibid, page 30.

[3] Ibid, page 6.

[4] http://www.doe-irp.co.za/

The emission reductions in this programme therefore arise from the substitution of grid electricity, which mainly comes from centralised coal-fired power stations, with the utilisation of solar and wind energy. The renewable energy plants will provide electricity into the national grid system. The emission reductions under this programme will therefore be calculated according to the consolidated CDM methodology "ACM0002: Baseline methodology for grid-connected electricity generation from renewable sources", Version 12.3.0.

The projects will be implemented under the PoA approach and will be designed in such a way that individual, national and international project developers and financiers may join the programme to improve the financial viability of the projects with the introduction of carbon revenues.

Each CPA will be technology specific, i.e. either solar power or wind power, and will be developed as separate facilities.

2. Policy/Measure or Stated Goal of the PoA

The stated goals of this programme are to supply, install and finance wind and solar CPAs to provide renewable energy into the South African grid and reduce greenhouse gas ("GHG") emissions through the avoidance of electricity generated by the combustion of fossil fuels.

- The PoA assists in fulfilling key economic and development objectives as described in the following pieces of non-mandatory legislation:
  - The National Energy Efficiency Plan
  - The White Paper on Renewable Energy Policy in which energy efficiency improvements and the development of 10 000 GWh renewable energy are stated goals[5]
  - The Constitution of the Republic of South Africa (Act 108 of 1996)[6] which states that everyone has a right to a non-threatening environment and that reasonable measure are applied to protect the environment. This includes preventing pollution and promoting conservation and environmentally sustainable development, while promoting justifiable social and economic development
- The PoA further assists in fulfilling national sustainable development criteria determined by the Department of Energy of South Africa and contributes to sustainable development as follows[7]:

  - **Economic Dimension:**

    Load shedding is a major problem in South Africa. Current electricity supply is not enough to meet projected future demand and it is hindering the fast growing economy of the country. The efficient use of electricity has become a national priority, a necessity for the future development of the South African economy and effective provision of electricity. The proposed PoA will therefore provide sustainable, renewable energy generation capacity which will help the country decarbonise and diversify the current energy mix. Furthermore the project will create much needed local job opportunities, and will simultaneously attract direct foreign investments into the country, thereby facilitating the development of new technology and skills transfers.

  - **Environmental Dimension:**

    By making use of renewable energy, the PoA will contribute towards a sustainable low carbon economy by reducing the amount of GHG produced by fossil fuel combustion at the

[5] White Paper on Renewable Energy, November 2003. Page 25

[6] http://www.info.gov.za/documents/constitution/1996/a108-96.pdf

[7] Sustainable development criteria for approval of clean development mechanism projects by the designated national authority of the CDM, 2004, Department of mineral and energy, p. 3, available under: http://www.dme.gov.za/dna/pdfs/sustainable_criteria.pdf

national electricity grid level. Furthermore the reduction of fossil fuel consumption will also mitigate the emission of pollutants such as sulphur dioxide and dust, which occur as a result of fossil fuel combustion.

To the degree that wind and solar energy sources reduce the need for electricity generation using fossil fuel sources of energy, they can reduce the adverse environmental impacts of those sources, such as production of atmospheric and water pollution (including greenhouse gases); production of nuclear wastes and the degradation of landscapes due to mining activity. The reason being is that the generation of electricity by wind and solar sources does not result in air or water pollution, and poses no threat to public safety.

- **Social Dimension:**

During construction phases of the wind and solar projects, engineering and construction will employ between 500 and 800 people (relative to the project size).

The operational phase of the projects will likely directly employ approximately 8 people and outsourced services (asset management, site maintenance, security services, monitoring services etc.) will account for the employment of 20-30 people.

Training will also be provided for technical positions, which will lead to the transfer and development of skills and expertise. The majority of jobs created will be at a level where currently unskilled or low skilled labour can be easily incorporated. During the course of this programme workers will be equipped with valuable electrical artisanal skills.

Standard Bank is the coordinating entity and will ensure that all participating organisations/ subcontractors and technologies meet the specified standards of the programme, thereby ensuring that the quality of both the systems and the installations are not compromised.

3. *Confirmation that the Proposed PoA is a Voluntary Action by the CME*

This project is a voluntary initiative coordinated by Standard Bank and participating organisations. There are no laws or regulations in South Africa requiring the use of renewable energy or the installation of solar or wind plants. The parties will market, supply and install the relevant wind and solar technologies.

The measures are voluntary and consistent with mandatory laws and regulations:

- There are no laws or regulations preventing the continued use of fossil fuels for the generation of energy
- There are no laws preventing the development of wind or solar plants
- There are currently no mandatory regulations requiring the partial or full use of energy from renewable sources

The projects under the PoA will apply to the Department of Energy's Independent Power Producer ("IPP") procurement programme which is a competitive bidding process based on the request for proposals issued in July 2011[8]. Projects are technology specific, i.e. there are no combinations of technologies. Potential applicants to this programme must present their renewable energy projects, where the evaluation criteria are heavily weighted to favour those projects with low bid-tariffs. Successful bidders will enter into an implementation agreement with the Department of Energy, as well as a power purchase agreement with a "buyer", within state-owned Eskom[9].

[8] http://www.engineeringnews.co.za/article/nersa-concurs-with-renewables-bidding-process-2011-08-10

[9] http://m.engineeringnews.co.za/article/sa-finally-sets-renewables-bidding-process-in-motion-2011-07-31 and APPENDIX K2 - IPP PPA (PV) Final 030811.

The Department of Energy's IPP programme is not mandatory, and has been developed in order to stimulate growth in the South African renewable energy market. To date however there are no large-scale or commercial solar PV plants or wind farms in the country.

A.3. CMEs and participants of PoA

The coordinating and managing entity of the PoA is Standard Bank Plc.

A.4. Party(ies)

Name of Party involved (host) indicates a host Party	Private and/or public entity(ies) project participants (as applicable)	Indicate if the Party involved wishes to be considered as project participant (Yes/No)
Republic of South Africa	The Standard Bank of South Africa Limited	No
United Kingdom	Standard Bank Plc	No

A.5. Physical/ Geographical boundary of the PoA

The PoA is located within the geographical boundaries of South Africa.

Figure 1: Map of South Africa

Source: www.places.co.za

The boundary of the PoA is defined as the geographical area within which all the implemented CPAs included in the PoA will occur. All wind and solar activities in the CPAs included in this PoA will be installed within the borders of the Republic of South Africa. Therefore, the boundary of the PoA is defined as the Republic of South Africa.

The programme will be designed so that individual CPAs can be included in the PoA within the Republic of South Africa. Each CPA will be identified uniquely with the help of addresses and GPS coordinates. A typical CPA will consist of either wind or solar power unit(s) in specific areas. All CPAs under the Green Power for South Africa Programme will be large, commercial plants that can be easily identified with GPS coordinates, which will prevent incidences of double counting.

As the programme will replace grid electricity and hence the project boundary will include all the power plants connected physically to the national electricity system. The CO_2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the PoA activities are included under this programme.

A.6. Technologies/measures

The programme envisages implementation of wind and solar power projects, with capacities varying from small (< 5 MW) to large (>100 MW) renewable energy developments. The wind conditions are most preferable along the coastline in the Western Cape, parts of the Northern Cape and the Eastern Cape[10]. The best solar potential is in the Northern Cape[11].

Wind Power

Wind turbines produce electricity by using the natural power of wind to drive a generator. Wind has considerable amounts of kinetic energy when blowing at high speeds. When this kinetic energy passes over the blades of the wind turbines, it is converted into mechanical energy and rotates the wind blades. When the wind blades rotate, the connected generator also rotates, thereby producing electricity.

There are four key parts to a typical modern wind turbine: the blade assembly; nacelle; tower and foundations. Wind turbines are manufactured in a range of vertical and horizontal axis types[12]. Horizontal-axis wind turbines have the electrical generator and main rotor shaft at the top of a tower, and must be pointed into the wind. Most have a gearbox, which turns the slow rotation of the blades into a quicker rotation that is more suitable to drive an electrical generator.

Vertical-axis wind turbines have the main rotor shaft arranged vertically. Key advantages of this arrangement are that the turbine does not need to be pointed into the wind to be effective. With a vertical axis, the generator and gearbox can be placed near the ground, using a direct drive from the rotor assembly to the ground-based gearbox, hence improving accessibility for maintenance.

Turbines used in wind farms for commercial production of electric power are usually three-bladed and pointed into the wind by computer-controlled motors[13]. These have high tip speeds of over 320 kilometres per hour, high efficiency, and low torque ripple, which contribute to good reliability. The blades are usually coloured light grey to blend in with the clouds and range in length from 20-40 metres or more. The tubular steel towers range from 60-90 metres tall[14]. The blades rotate at 10-22 revolutions per minute. At 22 rotations per minute the tip speed exceeds 90 metres per second. A gear box is commonly used for stepping up the speed of the generator, although designs may also use direct drive of an annular generator. Some models operate at constant speed, but more energy can be collected by variable-speed turbines which use a solid-state power converter to interface to the transmission system.

[10] Edkins, M., Marquard, A. and Winkler, H. 2010. *Assessing the effectiveness of national solar and wind energy policies in South Africa*. Pg 7.

[11] Ibid, page 12.

[12] Wikipedia.org: http://en.wikipedia.org/wiki/Wind_turbine

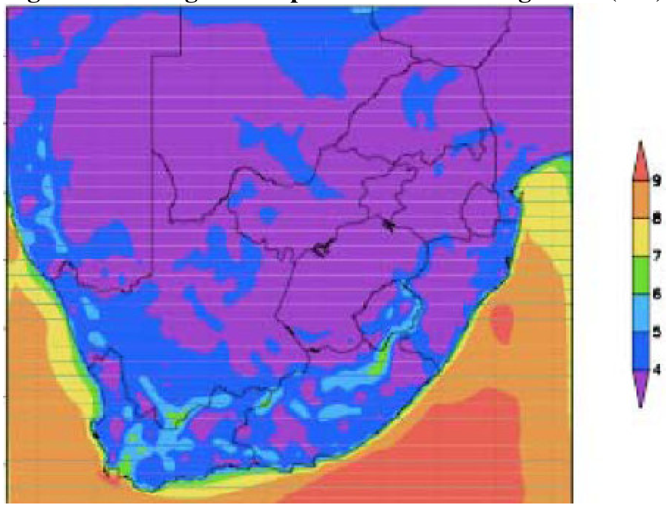
[13] Ibid.

[14] http://www.aweo.org/windmodels.html

All turbines are equipped with protective features to avoid damage at high wind speeds, by feathering the blades into the wind which ceases their rotation, supplemented by brakes.

Recent studies indicate that the best potential for wind energy is found in the Western Cape and parts of the Northern Cape and the Eastern Cape:

Figure 2: Average wind speeds at 10m above ground (m/s)



Source: Hagemann (2008)

Solar Power

Solar power plants convert sunlight into electricity directly using PV methods, or indirectly using CSP.

In PV plants, solar radiation is converted into electricity using semiconductors that exhibit the PV effect by employing solar panels containing PV semiconductor materials such as monocrystalline or polycrystalline silicon.

When sunlight is absorbed by a PV cell, electricity is generated. The energy of the absorbed light is transferred to electrons in the atoms of the PV cell. With this energy, these electrons escape from their normal positions in the atoms of the semiconductor PV material and become part of the electrical current in an electrical circuit. The "built-in electric field" of the PV cell provides the voltage needed to drive the current through an external load, such as a light bulb.

Commonly known as solar cells, individual PV cells are electricity-producing devices that can be connected together to form PV modules that may in turn be combined and connected to form PV arrays of different sizes and power output. The modules of the array make up the major part of a PV system, which can also include electrical connections, mounting hardware, power-conditioning equipment, and batteries that store solar energy for use when the sun is not shining.

There are three main types of materials used for solar cells including silicon which can be used in various forms, including single-crystalline, multicrystalline and amorphous. The second type is polycrystalline thin films and the third is single-crystalline thin film[15].

CSP systems use mirrors or lenses to concentrate a large area of sunlight, onto a small area. Electrical power is produced when the concentrated light is converted to heat which drives a steam turbine connected to an electrical power generator. A wide range of concentrating technologies exist which can

[15] http://web.archive.org/web/20080703184821/http://www1.eere.energy.gov/solar/pv_physics.html

provide medium to high temperature heat. This heat is then used to operate a conventional power cycle, for example through a steam turbine or a Stirling engine. Alternative operations including the parabolic trough, the concentrating linear fresnel reflector, the Stirling dish and the solar power tower. Four main elements are required: a concentrator, a receiver, some form of transport media or storage, and power conversion.

Various techniques are used to track the sun and focus light. In all of these systems a working fluid is heated by the concentrated sunlight, and is then used for power generation or energy storage. Solar heat collected during the day can also be stored in liquid or solid media like molten salts, ceramics, concrete or, in the future, phase-changing salt mixtures. At night, it can be extracted from the storage medium and, thus, continues turbine operation.[16]

Typically, one square kilometre of land is enough to generate 100-130 gigawatt hours ("GWh") of solar energy per annum using solar thermal technology. This equates to the annual production of a 50 MW conventional coal- or gas-fired mid-load power stations.[17]

While the primary focus of the PV centre will be the generation of power, other agricultural activities needs not be precluded from the site. As such, grazing of livestock may be pursued onsite (underneath the structures), while the maintenance of the panels is generally considered to be routine and innocuous in nature.

The final layout of the PV centre will be determined by topography and other bio-physical criteria as determined through the EIA process, and will consider:

- Proximity to power lines
- Positioning and proximity of substations
- Access routes for delivery and maintenance of sub stations and PV panels
- Agricultural issues
- Bio-physical controls
- Visual intrusion

The Northern Cape Province has the best solar resource in the country (see below). The Free State, North West, Limpopo and in the interior parts of the Western Cape and the Eastern Cape also have excellent solar resource, in addition to the rest of the country which is considered to have good solar resources.

[16] Aringhoff, A., Brakmann, G. and Geyer, M. 2005. Concentrated Solar Thermal Power – Now! Page 4.

[17] Ibid, page 6.

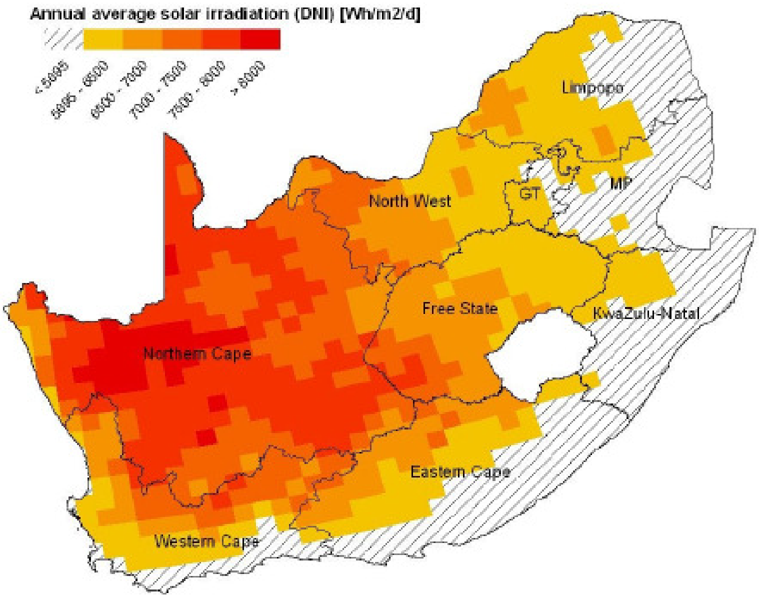


Figure 3: Overview of South Africa annual direct normal irradiation. Source: Fluri (2009)[18]

The Northern Cape region is particularly economically disadvantaged due to its arid climate, challenging agricultural conditions, lack of water and limited natural resources. The establishment of renewable energy projects could be essential to the economic development of the region.

All power generated from the projects in this PoA will be fed into the national grid and hence will displace the electricity generated from thermal, coal-fired power stations feeding into the national grid.

A typical CPA consists of a wind or solar PV/CSP powered facilities of varying capacities from small (< 5 MW) to large (> 100 MW) renewable energy developments.

A.7. Public funding of PoA

The proposed PoA will not receive any public funding from Parties included in Annex I.

SECTION B. Demonstration of additionality and development of eligibility criteria
B.1. Demonstration of additionality for PoA

The Green Power for South Africa PoA is a voluntary coordinated action and all parties participating in the CPAs under the PoA will join the PoA through a voluntary collaboration.

The measures are consistent with mandatory laws and regulations in the various host countries:
- There are no laws or regulations preventing the continued use of fossil fuels for the generation of energy
- There are no laws preventing the development of wind or solar plants
- There are currently no mandatory regulations requiring the partial or full use of energy from renewable sources

The PoA will use the large-scale methodology ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 12.3.0, and as such, will assess

[18] Cited in Edkins, M., Marquard, A. and Winkler, H. 2010. *Assessing the effectiveness of national solar and wind energy policies in South Africa*. Page 15.

additionality against one or more of the barriers listed in the "Tool for the demonstration and assessment of additionality" (Version 06.0.0) as well as the "Combined tool to identify the baseline scenario and demonstrate additionality", Version 04.0.0 (see the steps below) as the project activities entail the replacement of existing grid-connected renewable power plant/unit(s) at the project sites.

STEP 1: IDENTIFICATION OF ALTERNATIVE SCENARIOS
Sub-step 1: Define alternative scenarios to the proposed CDM project activity

The following alternative scenarios to the proposed PoA activities were considered:

Scenario A: The proposed project activity undertaken without being registered as a CDM project activity
This scenario presupposes that the proposed wind and solar PV and CSP programme activities are undertaken without being registered as CDM project activities. Commercial and industrial organisations would thus choose to develop renewable energy power plants comparable to those envisaged by the proposed PoA.

In 2003, the South African government approved private-sector participation in the electricity industry and decided that future power generation capacity will be divided between Eskom (70 %) and IPPs (30 %)[19]. However, currently less than 5 % of South Africa's electricity is provided by IPPs. While the potential energy supplies from wind and solar sources in South Africa have been well established, there are no large-scale or commercial wind or solar projects commissioned in South Africa[20], indicating that these initiatives are not common practice.

The unstable regulatory environment coupled with high capital outlays and the perceived riskiness of new technologies, markets, distributions systems etc. have deterred private sector involvement in local renewable energy projects, further strengthening Eskom's position as the dominant industry player wherein it can charge comparatively economical rates based on its economies of scale, and cheap, plentiful sources of coal.

The South African government has acknowledged that such barriers are constraining development in this sector, and as a result developed the REFIT programme, which after nearly half a decade of discussions has now been finalized and is a bidding process (the Department of Energy's IPP procurement programme). In order to tender for to the programme however, project developers must first secure land; complete environmental impact assessments as required; secure finance and commission the drawing-up of technical designs. Furthermore, prospective bidders are required to pay a non-refundable fee of R15 000 to access the request for proposal documentation, in addition to a bid bond of R100 000 for every megawatt of capacity bid[21].

These significant development cost are undertaken at risk, before knowing whether or not submissions will be awarded Preferred Bidder status in the programme.

The Department of Energy's IPP contractual agreements further require that the IPP take on the responsibility of certain risks, many of which are onerous and have potentially large repercussions,

[19] http://www.energy.gov.za/files/electricity_frame.html
[20] Edkins, M., Marquard, A. and Winkler, H. 2010. Assessing the effectiveness of national solar and wind energy policies in South Africa
[21] http://www.engineeringnews.co.za/article/sa-unveils-the-names-of-first-28-preferred-renewables-bidders-2011-12-07

especially for smaller plants. Of note are the following requirements identified by an independent technical advisor[22]:

- Damages and liability of unavailable grid – lost benefits

Risks associated with Eskom's performance (e.g. connection delays and network failures) may result in grid unavailability which can lead to reduced revenues. Such losses cannot be passed-on to the operations and maintenance contractor and must be considered in the financial models.

- Timing of connection

A key risk associated with the distribution and transmission connection is associated with the timing of the connection - both in terms of works carried out by the distribution and network owner (likely to be Eskom) and the EPC (engineering, procurement and construction) contractor, and availability of the connection in the case of a premium connections. While the transmission network operator is responsible for any damages caused to the IPP due to delays in achieving connection to a max of 5 % of the connection charge, the cost incurred to the IPP due to the delay of connecting the premium equipment may exceed this limit.

- Connection point

The connection point must be within the boundaries of the IPP and land must be owned and made available for the connection site. Lack of connection point access can endanger the whole permit of the Eskom licence. Land ownership must therefore be ascertained with provisional agreements from an early point in the planning stage.

- Construction risk

The IPP is obligated to commence the generation at the latest 18 months after the commercial operation date. While 18 months construction delay is generally uncommon, with the main risk being supply chain, the Department of Energy's stipulated PPA requires that one day of project delay, beyond last Commercial Operation Date, will reduce the operating period by two days.

These and other risks make the development of renewable energy projects under the DoE IPP programme an intensive process which requires guidance (and remuneration) of various specialists such as legal and engineering consultants.

The evaluation of bids considers the fulfilment or mitigation of the risks and other requirements stipulated in the formal Request for Proposals documentation. However, the financial competitiveness of the respective bids is by far the overwhelming consideration of a successful application because 70 % of the final bidding evaluation is based on the cheapest tariff proposal (and the remaining 30 % is based on performance on economic development obligations).

Investor/financier concerns in this regard often revolve around the unstable regulatory environment, technology barriers and the lack of large scale operational renewable energy facilities in the country compared to the prevailing practice which is the provision of cheaper and more convenient electricity supplies from Eskom. The inclusion therefore of a carbon revenue stream allows bidders to increase the competitive strength of the respective bids.

Scenario B: Other plausible and credible alternative scenarios to the project activity scenario, including the common practices in the relevant sector, which deliver outputs or services

[22] ARUP Tech Report, Phase 1, 2011 10 19, page 74-77.

The South African electricity sector is dominated by the government parastatal, Eskom, which until recently monopolised the industry. The country has since deregulated this sector, opening the way for independent power producers.

The alternative renewable energy technologies (to wind and PV and CSP solar) applicable to the IPP bid include[23]:

- Solar thermal generation
- Biomass
- Biogas
- Landfill gas
- Small hydro

Renewable energy development is however generally tied to a specific technology relevant to that technology provider. Furthermore the specific location where land is secured suits specific technological applications. For example, hydroelectric installations require adequate water supplies, landfill gas to energy projects require applicable landfill sites, and biomass projects are subject to biomass availability in a specific region.

These constraints therefore make the development of other renewable technology alternatives very difficult for the relevant project developer. The reality is that there are unfortunately very few alternatives to Eskom's coal-fired power stations existent in South Africa, proven by the fact that there are no large scale solar projects in operation in South Africa even though there are various supporting mechanisms in place. The continuation of the common practice, the generation of electricity from fossil fuels, will dominate the energy supply in South Africa for many years to come. Should such projects be developed, it is therefore unlikely that the renewable energy technologies listed above (other than concentrated solar thermal) will be developed in close proximity to SSL CPA-001. The reason for this is that the proposed location in the Northern Cape, which is the largest province with the smallest population of inhabitants, is an idea environment for the generation of electricity through the conversion of solar energy because of the hot and arid climate. It has little industry and the agricultural potential is poor considering the harsh natural environment.

Scenario C: Continuation of the current situation

Considering that the wind and solar installations in this PoA will all be greenfield power projects, an alternative scenario may be that the project participants would not invest in another power plant but that power would be generated in existing and/or new power plants on the electricity grid.

For example: in the recent years, Eskom has faced considerable challenges in providing the required electrical capacity for South Africa's needs. As a result, the parastatal has initiated the construction of two open-cycle gas turbine power stations and the recommissioning of three mothballed coal-fired power stations to address these challenges.

The continued use of fossil fuels (primarily coal) for the generation of energy is therefore currently the most economical state of affairs. This scenario is however only available for Eskom (in the development of coal-fired power stations) and is not permitted for use by IPPs.

According to the Department of Energy[24], almost 90 % of South Africa's electricity is generated in coal-fired power stations. Koeberg, a large nuclear station near Cape Town, provides about 5 % of capacity. A further 5 % is provided by hydroelectric and pumped storage schemes.

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[23] http://www.ipp-renewables.co.za/

[24] http://www.energy.gov.za/files/electricity_frame.html

Generation is dominated by Eskom, the national wholly state-owned utility, which also owns and operates the national electricity grid. In global terms, the utility is among the top seven in generating capacity, among the top nine in terms of sales, and has one of the world's biggest dry-cooled power stations: Matimba Power Station.

Eskom was converted into a public company on 1 July 2002. It is financed by net financial market liabilities and assets as well as reserves. While Eskom does not have exclusive generation rights, it has a practical monopoly on bulk electricity. It also operates the integrated national high-voltage transmission system and supplies electricity directly to large consumers such as mines, mineral beneficiators and other large industries.

The IPP procurement programme discussed above was initiated from such pressures but to date no IPPs have commissioned facilities.

Therefore in considering the barriers to implementing renewable energy projects in South Africa discussed above in Scenarios A and B, it is clear that the most viable and likely scenario is C, continuation of the current situation.

Sub-step 1b: Consistency with mandatory laws and regulations:
All three possible alternative scenarios outlined above (Scenarios A, B and C) are **consistent with local mandatory laws and regulations** in that there are no laws or regulations preventing the continued use of fossil fuels for the generation of energy or the development of renewable energy projects; there are no laws preventing the development of wind or solar plants and there are currently no mandatory regulations requiring the partial or full use of energy from renewable sources.

Concluding Remarks
There are a number of alternatives to the proposed activities under this PoA. Although the long-awaited finalisation of the non-mandatory IPP procurement programme (1st results of successful applicants were released on 25 November 2011) will facilitate the development of renewable energy projects, successful applications will be assessed on the competitive nature of their final electricity prices and it is therefore anticipated that the addition of a carbon revenue line will be a powerful factor that will increase the potential competitive advantage of such bidding proposals, making Scenarios A and B unlikely without participation in the CDM.

The most economical and viable alternative is therefore Scenario C, the continuation of the current situation, which comprises the generation of electricity from fossil fuels, predominantly coal, by the former industry monopoly – Eskom. This is the cheapest, most easily accessible source of energy in South Africa and in the absence of the PoA, fossil fuels would continue to be used in the generation of energy. Furthermore without the proposed CDM PoA, it is unlikely that there will be an autonomously generated improvement in the development of renewable energy projects on the same scale as the proposed PoA.

The lack of mandatory policies or legislation regarding the uptake of renewably energy sources will further support the continuation of the prevailing electricity generation practices in South Africa.

STEP 2: INVESTMENT ANALYSIS
This step is discussed further at the CPA level in section E.5 below, and will be undertaken in detail in each CPA to determine additionality based on whether the relevant project activity is not:

- the most economically or financially attractive; or

- economically or financially feasible, without the revenue from the sale of certified emission reductions (CERs).

The following sub-steps will be undertaken in accordance with the "Tool for the demonstration and assessment of additionality", Version 06.0.0:

- 2a: Determine appropriate analysis method
- 2b: Option I. Apply simple cost analysis **or** Option II. Apply investment comparison analysis **or** Option III. Apply benchmark analysis
- 2c: Calculation and comparison of financial indicators (only applicable to Options II and III in sub-step 2b)
- 2d: Sensitivity analysis (only applicable to Options II and III in sub-step 2b)

The Tool advises that if after the sensitivity analysis (sub-step 2d) it is concluded that the proposed CDM project activity is unlikely to be the most financially/economically attractive (as per Step 2c paragraph 11a of the Tool) or is unlikely to be financially/economically attractive (as per Step 2c paragraph 11b of the Tool), then the analysis can immediately proceed to Step 4 (Common practice analysis).

If this is not the case, then the barrier analysis step as discussed below must be undertaken to prove that the proposed project activities face barriers that do not prevent at least one alternative from occurring, justifying the additional nature of the proposed CPAs.

STEP 3: BARRIER ANALYSIS

This analysis will be discussed in detail at the relevant CPA level, and will be used to determine whether the proposed project activity faces barriers that:

- prevent the implementation of this type of proposed project activity; and
- do not prevent the implementation of at least one of the alternatives

Sub-step 3a: Identify barriers that would prevent the implementation of alternative scenarios

Barrier 1: Access-to-Finance Barriers

Despite recognition of the advantages of developing renewable energy projects, most opportunities remain unrealised in South Africa due largely to the significant "investment gap" that exists between the theoretical returns and the limited capital that is available to make those investments. Evidence of this is the total lack of large CSP or PV plants (>1MW) PV plants connected to the national grid in South Africa, and for wind only one power plant and two demonstration plants exist in the country. These include the Eskom Klipheuwel Wind Energy Demonstration Facility (three units with a total capacity of 3.2 MW) and the Darling Wind Farm (with a capacity of 5.2 MW).

The Darling Wind Farm was developed with official development aid from the Danish Government (an Annex I country) as well as funding from State owned CEF (Pty) Ltd, further evidence of financial barriers to the development of such projects which are perceived as risky, thus restricting financial investments by the private sector.

Furthermore there have been only 21 projects registered with the CDM framework since 2006, seven of are registered to generate renewable energy:

- PetroSA biogas to energy – (Registered 29/09/2006)
- Durban landfill gas to electricity – Marianhill and La Mercy landfills (Registered 15/12/2006)
- Kanhym farm manure to energy project – (Registered 18/07/2008)
- Durban landfill gas – Bisasar Road (Registered (26/03/2009)

- Alton landfill gas to energy project – (Registered 24/08/2009)
- Bethlehem hydroelectric – (Registered 08/10/2009)
- Ekurhuleni landfill gas recovery project – South Africa (Registered 26/10/2010)

Only four of these projects appear to operational (viz. latest monitoring reports available on the UNFCCC portal for the PetroSA biogas to energy project; the Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills; the Durban landfill gas Bisasar Road project and the Bethlehem hydroelectric project).

Traditionally low energy prices have been identified as a major barrier to stimulating growth in the South African renewable energy sector because the most economical measure is to maintain the business-as-usual scenario i.e. electricity generation from coal-fired power stations. While recent increases are shifting the dynamics and improving the economics of renewable energy investments (prices approved by NERSA will result in annual increases in the average electricity tariff of approximately 25% between 2010 and 2013[25]), it is the higher upfront costs and additional financing requirements required that act as considerable barriers to the development of renewable energy projects in South Africa.

Finance barriers in this regard come in two interrelated forms which the PoA helps to overcome:

- A lack of available capital to make required investments in renewable energy projects
- The perception that renewable energy project investments are high-risk which discourages deployment of any available capital

Capital Availability

The high capital costs of renewable energy projects present significant barriers to the development of such initiatives. Undertaking such projects represents a considerable up-front investment when compared to the development of fossil fuel based energy sources.

Without the PoA and the additional revenue stream from the sale of CERs (which will increase the potential of successfully competing in the South African renewable energy market), it is unlikely that investors will undertake such developments where the risks are comparatively high, due largely to uncertainties in the regulatory environment.

The PoA will address access to capital barriers by providing investors with the added security that the programme activities will be able to compete in the IPP bidding process. The inclusion of the CER revenue line will allow the projects developers to reduce the levelised electricity price to a very competitive range while simultaneously ensuring that the project returns meet the standards required by the project investors.

Risk Perceptions

In addition to capital investment barriers, renewable energy projects are also hindered by the perception that such investments are high risk. Various studies[26] show that uncertainties regarding realisable cost savings, and therefore return on investment, are major reasons investors avoid such projects.

[25] Source: NERSA Media Statement 24th February 2010 "NERSA's decision on Eskom's required revenue application – multi-year price determination 2010/11 to 2012/13 (MYPD 2)", available at: http://www.eskom.co.za/live/content.php?Category_ID=564

[26] Examples include: International Energy Agency/OECD, 2007. "Mind the Gap: Quantifying Principal-Agent Problems in Energy Efficiency". In support of the G8 Plan of Action. Paris; and Clinton Climate Initiative, 2009. "An Introduction to Energy Performance Contracting".

Furthermore the renewable energy industry in South Africa is young, which is another cause for concern as there are subsequently very few relevant technology suppliers and maintenance personnel available locally.

The PoA helps to overcome these perception barriers which impede investment in renewable energy projects by providing a consolidated source of information, technology and services which are validated by the UNFCCC/CDM monitoring framework. Furthermore by providing the financial incentive of the CER revenue stream, investor-risk is reduced thus encouraging investment in the respective projects.

Barrier 2: Technological Barriers
Considering that only few small scale renewable energy projects exist in South Africa, particularly relating to wind and solar plants, it is not surprising that there is a lack of skilled and properly trained labour to operate and maintain the technology in the country.

Furthermore, the risk of technological failure (viz. risk of equipment disrepair and malfunctioning or other underperformance) in wind and solar plants in South Africa is significantly greater than for other dominant technologies for electricity generation (coal-fired power stations) that are comparable in energy output, because coal-fired technologies are well established in South Africa with an extensive support industry of technical personnel that has been developed over the years. In general, technological risks are reduced as time and experience are increased, making the young nature of the renewable energy industry in South Africa a considerable challenge to maintaining required performance standards. The result is further conservatism on the part of private investors to develop such projects and finance them accordingly.

The development of wind and solar plants under this PoA will therefore be of particular relevance in reducing investor risk-perceptions in this regard, considering that there are no operational and commercial plants of comparable size in existence in South Africa yet. This has resulted in a lack of technological-know-how in the country, which acts as another barrier that carries both technical and financial risks. Furthermore, the areas in which wind and solar plants are best suited are comparatively remote and un-urbanised, reducing the already limited access to the skilled and experienced personnel required. The commissioning of such facilities will thus open up the market, bringing in professionals from around the country and abroad to train and develop local staff in order to prove the technologies and processes. This will result in technology development and transfer, and will also provide much need local employment opportunities while assisting in the development of clean and green industries in the country as a whole.

Barrier 3: Lack of Prevailing Practice
Considering the total lack of large scale wind and solar projects in tangent with the large investment barriers, it is clear that such projects are not the prevailing practice in South Africa. As discussed below in the Common Practice Analysis, there are only a few small scale PV solar and wind farms (and no CSP plants) currently in operation in South Africa.

Only 21 projects have been registered with the CDM framework since 2006, seven of which are registered to generate renewable energy:

- PetroSA biogas to energy – (Registered 29/09/2006)
- Durban landfill gas to electricity – Marianhill and La Mercy landfills (Registered 15/12/2006)
- Kanhym farm manure to energy project – (Registered 18/07/2008)
- Durban landfill gas – Bisasar Road (Registered (26/03/2009)
- Alton landfill gas to energy project – (Registered 24/08/2009)
- Bethlehem hydroelectric – (Registered 08/10/2009)
- Ekurhuleni landfill gas recovery project – South Africa (Registered 26/10/2010)

However, only four of these projects appear to operational (viz. latest monitoring reports available on the UNFCCC portal for the PetroSA biogas to energy project; the Durban Landfill-gas-to-electricity project – Mariannhill and La Mercy Landfills; the Durban landfill gas Bisasar Road project and the Bethlehem hydroelectric project).

Sub-step 3 b: Show that the identified barriers would not prevent the implementation of at least one of the alternatives

As per the analysis undertaken in Step 1, the most viable alternative to the proposed programme activities is Scenario C, the continuation of the current situation. This comprises the generation of electricity from coal fired power stations which do not face any of the barriers listed above. This long standing practice in South Africa is tried and proven, facilitated by plentiful reserves of cheap coal, existing markets and distribution channels and well developed networks of professionals involved in the development, operation and maintenance of plants.

Investors are therefore keen to participate in such projects in South Africa thus reducing the barriers to accessing finance because the technological and lack of prevailing practice barriers do not affect this business-as usual-scenario on the same scale as they affect the development of renewable energy projects.

Concluding Remarks

There are significant barriers to developing renewable energy projects in South Africa, largely due to the high development costs (which must be undertaken at risk before bidding for the potential tariff) and the related investor/financier risk-perceptions. It is therefore likely that without the assistance of carbon revenues (which will increase the competitive nature of bids to the IPP procurement programme), Scenarios B and C discussed above are most likely to prevail because they revolve around the comparatively easy and economical continuation of business as usual i.e. electricity generation from coal-fired power stations.

The development and continuation of traditional coal-fired electrical power stations do not suffer from the barriers discussed above as such facilities are more financially feasibility than renewable energy projects due to lower development costs, related to economies of scale, and thus dramatically lower unit selling prices. These competitive advantages are further combined with existing markets and distribution networks (most of which are owned by Eskom).

Furthermore such developments are considered less risky than renewable energy projects (thereby increasing the availability of capital from commercial and industrial investors and financiers) because the technologies in question are tried and tested, and the market and distribution networks are already firmly established. The serious impacts of the barriers discussed and their comparatively insignificant effects on the prevailing practice clearly indicate the additional nature of the proposed activities under this programme.

STEP 4: COMMON PRACTICE ANALYSIS

Unless the proposed activity in the PoA is demonstrated to be first-of-its kind (according to Sub-step 3a), the common practice analysis will be undertaken to determine the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region in South Africa.

Sub-step 4a: Analyse other activities similar to the proposed project activity

The Tool defines similar activities as those activities (i.e. technologies or practices) that are of similar scale, take place in a comparable environment, inter alia, with respect to the regulatory framework and are undertaken in the relevant geographical area.

There are various mechanisms aimed at facilitating the development of such projects such as the Department of Energy's IPP procurement programme and the Renewable Energy Market Transformation[27] ("REMT"). The former is an example of a financial-incentive mechanism that was initiated in April 2008 by the Department of Energy, in partnership with the Development Bank of South Africa and the World Bank acting as implementing agencies for the Global Environment Facility.

Even so, there are currently no large-scale wind or solar plants operating in South Africa.

Sub-step 4b: Discuss any similar Options that are occurring

There are a few small-scale or pilot projects of similar technologies in operation in South Africa that are worth noting:

Solar

- The 60 kW Cape Solar Plant[28] that powers the Aquila Private Game Reserve in the Western Cape was launched in 2010 by Germany's Concentrix Solar.
- 7kW PV facility in Copperton, Karoo[29] installed by Mulilo Renewable Energy (MRE) and its Chinese Shareholder Yingli Green Energy in April 2010 is producing 10MWh/yr power.

Wind

- The Darling Wind Farm[30] has an installed capacity of 5.2 MW and is a national demonstration project funded in part by the state entity, CEF (Pty) Ltd and with help of official development aid from the Danish Government ;
- Eskom's test site at Klipheuwel[31] has a theoretical installed capacity of 3.2 MW. Three small wind turbines have been erected at this experimental wind energy farm so that Eskom can demonstrate and assess their different mechanical and electrical performances;
- Belgian developer Electrawinds[32] installed a single 1.8 MW turbine at the Coega industrial development zone as a public relations exercise ahead of the FIFA World Cup in South Africa in 2010, ahead of a large proposed commercial development which has yet to be completed.

All the installations discussed above are either pilot projects or national demonstration facilities, and not commercial power plants. The factors behind the slow growth of the renewables industry in South Africa can largely be attributed to the unstable regulatory environment which has imposed major barriers to the development of independent power producers, as well as the high capital outlays required during project development.

The measurement for the determination of whether a project activity is common practice or not is subsequently undertaken as per paragraph 47 of the Tool for the Demonstration and Assessment of Additionality, Version 06.0.0:

[27] http://www.remtproject.org/
[28] http://www.southafrica.info/business/investing/concentrix-080910.htm
[29] http://www.engineeringnews.co.za/article/big-scale-up-plans-for-grid-connected-karoo-microsolar-plant-2010-05-28
[30] http://www.darlingwindfarm.co.za
[31] http://www.eskom.co.za/content/RW_0002KliphWindfRev5~2.pdf
[32] http://www.electrawinds.be/electrawinds_powered_by_nature-electrawinds_artikels.asp?artikelID=11521&taal=en

- *Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity*
- *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 and projects activities undergoing validation shall not be included in this step*
- *Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number Ndiff.*
- *Step 4: Calculate factor F=1-Ndiff/Nall representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity. The proposed project activity is a common practice within a sector in the applicable geographical area if both the following conditions are fulfilled:*
  (a) the factor F is greater than 0.2, and
  (b) Nall-Ndiff is greater than 3.

Concluding remarks

Considering the total lack of large scale wind and solar projects discussed above in tangent with the significant investment barriers, it is clear that renewable energy projects of this nature and scale are not common practice in South Africa, proving the additional nature of the proposed activities under this programme.

The barriers remain high, even with the introduction of the IPP procurement process, largely due to the high development costs which must be undertaken at risk before applying to the programme. Investor/financier risk-perceptions are not likely to be allayed by these requirements unless other financial mechanisms (such as the inclusion of carbon revenues) can be included which will increase the competitive nature of the respective bid applications (by reducing the final electricity selling price).

It is clear that the business-as-usual scenarios, generation of electricity from coal-fired power stations, do not face the barriers that renewable energy projects face due to the prevalence of plentiful, cheap coal supplies combined with more competitive development costs for new coal-fired facilities as a result of Eskom's large economies of scale. The end result is the generation of electricity at vastly competitive rates compared to the renewable energy alternatives.

The additionality argument of this PoA project activities is thus affirmed as the common practice of electricity production from coal-fired power stations is clearly the most economically and practically viable alternative to the proposed programme activities. Eskom's generation of electricity from coal-fired facilities will therefore be used as the baseline for calculating the emission reductions under this PoA.

All activities under the PoA will thus feed electricity into the national grid system and will therefore displace electricity created by the combustion of fossil fuels.

B.2. Eligibility criteria for inclusion of a CPA in the PoA

The eligibility criteria for the inclusion of a CPA in the Green Power for South Africa PoA are as follows:

No.	Criteria
1	All installation shall take place within the geographical boundaries of South Africa and shall be connected to the national grid electricity system.
2	Conditions that avoid double counting of emission reductions like unique identifications of plants

	and end-user locations.
3	New wind or solar (PV and CSP) power plants that provide electricity into the national grid are eligible (i.e. no retrofits or capacity additions are included).
4	The starting date of the CPA shall be earliest date at which the project implementation begins, which shall be determined based on the first signed major contract related to the CPA. The CPA starting date needs to be after 18 November 2011.
5	The CPA to be included in this PoA shall meet the applicability requirements of the CDM methodology "ACM0002: Baseline methodology for grid-connected electricity generation from renewable sources" Version 12.3.0.
6	The CPA to be included in this PoA shall assess additionality against one or more of the barriers listed in the "Tool for the demonstration and assessment of additionality" (Version 06.0.0) as well as the "Combined tool to identify the baseline scenario and demonstrate additionality", Version 04.0.0 as per section B.5, and leakage rules as per section B.6.1 of the CPA document.
7	The local stakeholder consultation (LSC) shall take place in CPA level and shall follow the EIA requirements. In case an EIA is not required for the specific CPA a separate LSC process shall take place. This process shall identify the key stakeholder and affected parties, which shall be informed in the most suitable way (e.g. public announcement via newspaper and/or personal invites, presentation and/or project summary and a minimum of 2 weeks commenting period from the announcement/ invite.
8	Wind or solar power plants must obtain the relevant environmental approvals in accordance with the National Environmental Management Act ("NEMA") Environmental Impact Assessment ("EIA") regulations.
9	No CPAs under this programme will receive funding from Annex I parties.
10	Where applicable, target group (e.g. domestic/commercial/industrial, rural/urban, grid connected/ off-grid) and distribution mechanisms (e.g. direct installation).
11	Where applicable, the conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys.
12	Where applicable, the conditions that ensure that every CPA in aggregate meets the small-scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the CPA.
13	Where applicable, the requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories.
14	All power plants shall have a lifetime in excess of 10 years.
15	Each CPA must be approved by the coordinating entity and DOE prior to its incorporation into the PoA.

The coordinating entity will ensure that all CPAs under its PoA are neither registered as individual CDM project activities nor included in another registered PoAs, and that the relevant CPAs are subscribed to the PoA. This is done through the documentation of GPS coordinates and address details for each site, as well as contractual agreements with the relevant CPA participant.

B.3. Application of methodologies

The CPAs included in this PoA comprise new wind and solar (PV and CSP) power plants that provide electricity into the national grid. CPAs will be technology specific, i.e. either solar power or wind power facilities.

The PoA will therefore use the large-scale methodology ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 12.3.0, and as such, will assess additionality against one or more of the barriers listed in the "Tool for the demonstration and assessment of additionality" (Version 06.0.0) as well as the "Combined tool to identify the baseline

scenario and demonstrate additionality", Version 04.0.0 as the project activities entail the replacement of existing grid-connected renewable power plant/unit(s) at the project sites.

In addition, the following tools are referred to in this PoA in conjunction with baseline methodology
- "Tool to calculate the emission factor for an electricity system" Version 02.2.1,
- "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", Version 02.

SECTION C. Management system

As the CME for this PoA, Standard Bank Plc will be responsible for managing the CDM cycle and coordinating the issuance of CERs.

Record keeping system for each CPA and systems/procedures to avoid double accounting
All CPAs under the Green Power for South Africa Programme will be technology specific (i.e. either solar or wind power) and will be fixed or non-transferable, commercial plants that can be easily identified with GPS coordinates, which will prevent incidences of double counting. In addition, Standard Bank will have a recordkeeping system which will maintain data relating to each CPA such as project developer details, site addresses, which will be compared against the record of projects under the CDM undergoing validation or those that are registered to further avoid double counting. The management of this system will be relatively simple considering the nature of the programme activities which will limit each CPA to a small number of installations.

Operation and management of the various projects will be at the CPA level and each CPA will have an operation and maintenance manual that determines roles and responsibilities. While the two technologies (wind or solar) differ in the way that they produce electricity, the common eligibility criteria apply because the way that wind and solar power plants feed electricity into grid is similar, as is the environmental legislation pertaining to them.

CPA inclusion and emission reduction purchase agreements
The provisions to ensure that those operating the CPA are aware of, and have agreed that their activity is being subscribed to the PoA, will include the signature of:
- CPA inclusion agreement
- Emission reduction purchase agreement

with each CPA/ project entity.

SECTION D. Duration of PoA
D.1. Start date of PoA

18 November 2011 is the start date of the PoA, as on this date the PoA-DD was first published for the global stakeholder consultation process.

D.2. Length of the PoA

28 years.

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

Environmental Analysis is done at CPA level.

In August 2010 the new National Environmental Management Act ("NEMA") Environmental Impact Assessment ("EIA") regulations[33] came into effect, signalling the start of the official implementation process of a new regime aimed at improving the efficiency and effectiveness of EIAs in South Africa.

The NEMA EIA 2010 regulations and the listing notices thereto replace the NEMA EIA regulations of 2006 and its associated listing notices.

An EIA is a pro-active and systematic process where potential environmental impacts, both positive and negative, associated with certain activities are assessed, investigated and reported. The process assists decision makers in assessing the desirability of certain activities and the conditions which authorisation will be subject to.

Three listing notices[34] have been published in conjunction with the new regulations, whereby depending on the type and scope of the activity, the activity must either be subjected to a Basic Assessment or to the more thorough Scoping and EIA process.

Listing notice one stipulates the activities requiring a basic assessment report. These are typically activities that have the potential to impact negatively on the environment but due to the nature and scale of such activities, these impacts are generally known. Listing notice two identifies the activities requiring both scoping and an Environmental Impact Report these are typically large scale or highly polluting activities and the full range of potential impacts need to be established through a scoping exercise prior to it being assessed. Listing notice three contains activities that will only require an environmental authorisation through a basic assessment process if the activity is undertaken in one of the specified geographical areas indicated in that listing notice.

Standard industry practice indicates that the wind and solar projects under this PoA will fall under listing two, and will require both a Scoping and an Environmental Impact Report. Such decisions will however be made as per the advice of independent environmental assessment practitioners, on a project by project basis. Such EIAs in the Green Power for South Africa will therefore be undertaken at CPA level.

More information on the national EIA law and process is available at
http://www.eiatoolkit.ewt.org.za/process/what.html.

E.2. Analysis of the environmental impacts

To be provided in the CPA-DD.

E.3. Environmental impact assessment

To be provided in the CPA-DD.

SECTION F. Local stakeholder comments

F.1. Solicitation of comments from local stakeholders

[33] http://www.info.gov.za/speech/DynamicAction?pageid=461&sid=11887&tid=13916

[34] http://www.info.gov.za/speech/DynamicAction?pageid=461&sid=11887&tid=13916

Local stakeholder consultation will be done at CPA level due to the size of the proposed installations and because each project is location specific.

F.2. Summary of comments received

Discussed in detail at CPA level.

F.3. Report on consideration of comments received

Discussed in detail at CPA level.

SECTION G. Approval and authorization

The Letter of Approval and Authorisation from the Host Party involved in this PoA was not available at the time of submitting the PoA-DD to the validating DOE.

PART II. Generic component project activity (CPA)

SECTION A. General description of a generic CPA
A.1. Purpose and general description of generic CPAs

The CPAs included in this PoA comprise new wind or solar (PV and CSP) power plants that provide electricity into the national grid.

SECTION B. Application of a baseline and monitoring methodology
B.1. Reference of the approved baseline and monitoring methodology(ies) selected

a. The selected CPA methodology is:
- ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 12.3.0

b. The related tools will include:
- "Tool to calculate the emission factor for an electricity system" Version 02.2.1,
- "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", Version 02.

B.2. Application of methodology(ies)

The CPA [XXX] will meet the requirements set out in the methodology as follows:

- The CPAs included in this PoA comprise new renewable energy technologies (i.e. installation of solar/wind power plant/unit) that supply electricity into the national grid system;

  Yes. [Add justification.]

B.3. Sources and GHGs

As the programme will replace grid electricity, the project boundary will include the physical installation of the wind/solar plants connected to the national grid system in South Africa.

The GHG reduced through CPA [XXX] under this PoA is CO2. The reduction takes place through the avoidance of fossil fuels (predominantly coal) used in the production of electricity to heat water, in the absence of the CPA.

Source		GHGs	Included?	Justification/Explanation
Baseline scenario	Source 1 CO2 emissions from electricity generation in fossil fuel fired power plants that are displaced due to the project activity.	CO_2	Yes	Main emission source
		CH_4	No	Minor emission source
		N_2O	No	Minor emission source
Project scenario	Source 1 For geothermal power plants, fugitive emissions of CH4 and CO2 from non-condensable gases contained in geothermal steam	CO_2	No	Not applicable, as no geothermal power included under this PoA.
		CH_4	No	Not applicable, as no geothermal power included under this PoA.
		N_2O	No	Not applicable, as no geothermal power included under this PoA.
	Source 2 CO_2 emissions from combustion of fossil fuels for electricity generation in solar thermal power plants and geothermal power plants	CO_2	[Yes or No]	[Add justification.]
		CH_4	[No]	As per ACM002. Minor emission source.
		N_2O	[No]	As per ACM002. Minor emission source.
	Source 3 For hydro power plants, emissions of CH_4 from the reservoir	CO_2	No	Not applicable, as no hydro power included under this PoA.
		CH_4	No	Not applicable, as no hydro power included under this PoA.
		N_2O	No	Not applicable, as no hydro power included under this PoA.

B.4. Description of baseline scenario

As per the application of ACM0002, Version 12.3.0, the “Combined tool to identify the baseline scenario and demonstrate additionality” (Version 04.0.0) is used to identify and determine the characteristics of the baseline scenario.

As per the analysis in section A.4.3, the alternative baseline scenario is the development of similar projects (based on technology, size etc.) without application to the CDM and the resultant carbon revenues. As revealed, this scenario is unlikely as even though there are some inventive mechanisms now available in South Africa, carbon revenues are widely considered to be an integral part of increasing the competitive nature of bids submitted in tending for the Department of Energy's IPP tariff.

The alternative renewable energy technologies (to wind and PV and CSP solar) applicable to the IPP bid include[35]:

- Solar thermal generation
- Biomass
- Biogas
- Landfill gas
- Small hydro

In reference to the EB 22 Annex 3 decision[36], the Department of Energy's IPP procurement programme is however excluded when identifying alternative scenarios for baseline because this E-type policy (that aims to decrease GHG emissions) was only implemented in 2011, after the adoption by the COP of the CDM M&P (decision 17/CP.7, 11 November 2001).

The following were therefore identified as possible alternatives to the project activities:

Scenario 1: *The proposed project activity undertaken without being registered as a CDM project activity*
In 2003, the South African government approved private-sector participation in the electricity industry and decided that future power generation capacity will be divided between Eskom (70 %) and IPPs (30 %)[37].

Department of Energy's Renewable Energy IPP procurement programme was subsequently developed which will facilitate the development of renewable energy projects in South Africa without registration with the CDM. Prevailing barriers remain in this regard as in order to apply to the IPP bidding programme, significant development costs must be laid out (e.g. positively concluded EIAs; costly grid connection reviews etc.) before the assurance of the receipt of the tariff is received. These can require equity or debt investment which is often problematic as the economic climate in South Africa does not encourage such capital outlays due to the perceived riskiness inherent in renewable energy projects. Significant development costs are therefore often undertaken at risk, before knowing whether or not submissions will receive the IPP programme. For example, prospective bidders are required to pay a non-refundable fee of R15 000 to access the request for proposal ("RFP") documentation, in addition to a bid bond of R100 000 for every megawatt of capacity bid[38].

The Department of Energy's IPP contractual agreements further require that the IPP take on the responsibility of certain risks, many of which are onerous and have potentially large repercussions, especially for smaller plants. Of note are the following requirements identified by an independent, third party technical advisor[39]:

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[35] http://www.ipp-renewables.co.za/

[36] Annex 3. Clarifications on the Consideration of National and/or Sectoral Policies and Circumstances in Baseline Scenarios (Version 02), paragraph 7.

[37] http://www.energy.gov.za/files/electricity_frame.html

[38] http://www.engineeringnews.co.za/article/sa-unveils-the-names-of-first-28-preferred-renewables-bidders-2011-12-07

[39] ARUP Taaibos & Linde PV Projects: Revised Technical Due Diligence, Phase 1 Report, February 2012, page 64-67.

- Damages and liability of unavailable grid – lost benefits

Risks associated with Eskom's performance (e.g. connection delays and network failures) may result in grid unavailability which can lead to reduced revenues. Such losses cannot be passed-on to the operations and maintenance contractor and must be considered in the financial models.

- Timing of connection

A key risk associated with the distribution and transmission connection is associated with the timing of the connection - both in terms of works carried out by the distribution and network owner (likely to be Eskom) and the EPC (engineering, procurement and construction) contractor, and availability of the connection in the case of a premium connections. While the transmission network operator is responsible for any damages caused to the IPP due to delays in achieving connection to a max of 5 % of the connection charge, the cost incurred to the IPP due to the delay of connecting the premium equipment may exceed this limit.

- Connection point

The connection point must be within the boundaries of the IPP and land must be owned and made available for the connection site. Lack of connection point access can endanger the whole permit of the Eskom licence. Land ownership must therefore be ascertained with provisional agreements from an early point in the planning stage.

- Construction risk

The IPP is obligated to commence the generation at the latest 18 months after the commercial operation date. While 18 months construction delay is generally uncommon, with the main risk being supply chain, the Department of Energy's stipulated PPA requires that one day of project delay, beyond last Commercial Operation Date, will reduce the operating period by two days.

These and other risks make the development of renewable energy projects under the DoE IPP programme an intensive process which requires guidance (and remuneration) of various specialists such as legal and engineering consultants.

The evaluation of bids considers the fulfilment or mitigation of the risks and other requirements stipulated in the formal Request for Proposals documentation. However, the financial competitiveness of the respective bids is by far the overwhelming consideration of a successful application because 70 % of the final bidding evaluation is based on the cheapest tariff proposal (and the remaining 30 % is based on performance on economic development obligations).

Investor/financier concerns in this regard often revolve around the unstable regulatory environment, technology barriers and the lack of large scale operational renewable energy facilities in the country compared to the prevailing practice which is the provision of cheaper and more convenient electricity supplies from Eskom. The inclusion therefore of a carbon revenue stream allows bidders to reduce the ultimate electricity selling price, thereby increasing the competitive strength of the respective bids.

Scenario 2: *Continuation of the current situation, not requiring any investment or expenses to maintain the current situation*

The continuation of business-as-usual is the utilisation of electricity generated through the combustion of fossil fuels, largely coal. This is currently the most economically feasible source of electricity (due to plentiful, cheap coal supplies and the economies of scale that Eskom is able to provide) and carries the least risks in terms of barriers surrounding new technologies; skilled support personnel and existing markets and established distribution networks (the majority of which are owned by Eskom).

Scenario 3: *Other plausible and credible alternative scenarios to the project activity scenario, including the common practices in the relevant sector, which deliver outputs or services*

No large-scale renewable energy facilities are currently operational in South Africa. While the IPP procurement will assist in developing this industry, high barriers to entry into this market still prevail making the continuation of the current practice discussed above more attractive as an alternative scenario.

Furthermore Scatec Solar's expertise lies in its ability to provide PV solar energy solutions as opposed to other renewable energy technologies.

Concluding remarks
While the development of large scale renewable energy projects will be driven by the Department of Energy's Renewable Energy IPP procurement programme, projects developers in this regard face a great number of challenges and must tender bids in an environment characterised by intense levels of competition. The provision of an additional revenue stream through the generation and sale of carbon credits will allow project developers to reduce their bid tariff prices, thus increasing their chances of becoming preferred bidders in the programme.

Once the programme has closed (it has a finite limit of five rounds, two of which were complete at the time of writing), South Africa will have to look at other mechanisms to promote the renewables energy. As no subsequent plan is yet in place, the continuation of the prevailing practice, the generation of electricity in South Africa from coal-fired power stations[40] largely owned by the parastal Eskom, is therefore the most likely long term alternative baseline scenario.

The development of such facilities do not face the barriers that renewable energy projects face due to the prevalence of plentiful, cheap coal supplies combined with more competitive development costs for new facility generations as a result of Eskom's large economies of scale. The end result is the generation of electricity at vastly competitive rates compared to the existing and proven renewable energy alternatives.

The common practice of electricity production from coal-fired power stations is thus the most economically and practically viable alternative to the proposed programme activities, and will therefore be used as the baseline for calculating the emission reductions under this PoA.

CPA-[XXX] will be applied in accordance with ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 12.3.0; the "Combined tool to identify the baseline scenario and demonstrate additionality", Version 04.0.0 as well as the "Tool for the demonstration and assessment of additionality" Version 06.0.0 where appropriate.

Each CPA-DD shall present the key parameters for the baseline determination for that specific CPA under section B.5.1 of the respective design documents. The key parameters to be considered are:

Parameter	**Unit**
Technology	-
Installed Capacity	MW
Total Annual Energy Output	MWh
Capacity Factor	%
Annual Energy Output	MWh/annum
Project electricity consumption	MWh/annum
Net electricity feed into grid	MWh/annum

[40] Department of Energy: South African Energy Synopsys 2010.

[Additional information specific to the particular technology and project may also be included in the CPA-DD to provide a holistic overview of the parameters and clarity on the project outputs.]

B.5. Demonstration of eligibility for a generic CPA

No.	Criteria	Eligibility
1	All installation shall take place within the geographical boundaries of South Africa and shall be connected to the national grid electricity system.	Yes. The proposed site is located near to the town of [name] in the [province name] in South Africa.
2	Conditions that avoid double counting of emission reductions like unique identifications of plants and end-user locations.	Yes. CPA-XX has unique GPS coordinates and the CPA implementer complies with the procedure established by the CME as specified in PoA-DD Section C Part I to avoid double accounting.
3	New wind or solar (PV and CSP) power plants that provide electricity into the national grid are eligible (i.e. no retrofits or capacity additions are included).	Yes. This programme activity is a new [wind and/or solar] plant which will generate [number] MW of electricity which will be fed into the national grid.
4	The starting date of the CPA shall be earliest date at which the project implementation begins, which shall be determined based on the first signed major contract related to the CPA. The CPA starting date needs to be after 18 November 2011.	Yes. [Add justification.]
5	The CPA to be included in this PoA shall meet the applicability requirements of the CDM methodology "ACM0002: Baseline methodology for grid-connected electricity generation from renewable sources" Version 12.3.0.	Yes. This programme activity will generate [number] MW of electricity from [solar and/or wind] technology which will be fed into the national grid.
6	The CPA to be included in this PoA shall assess additionality against one or more of the barriers listed in the "Tool for the demonstration and assessment of additionality" (Version 06.0.0) as well as the "Combined tool to identify the baseline scenario and demonstrate additionality", Version 04.0.0 as per section B.5, and leakage rules as per section B.6.1 of the CPA document.	Yes. This programme activity meets the additionality and leakage requirements as proven in the sections D.4 and D.6.1 of the CPA-DD.
7	The local stakeholder consultation (LSC) shall take place in CPA level and shall follow the EIA requirements. In case an EIA is not required for the specific CPA a separate LSC process shall take place. This process shall identify the key stakeholder and affected parties, which shall be informed in the most suitable way (e.g. public announcement via newspaper and/or personal invites, presentation and/or project summary and a minimum of 2 weeks commenting period from the	Yes. The local stakeholder process and Environmental Impact Assessment have been undertaken in the CPA level, in line with the relevant legislation.

	announcement/ invite.	
8	Wind or solar power plants must obtain the relevant environmental approvals in accordance with the National Environmental Management Act ("NEMA") Environmental Impact Assessment ("EIA") regulations.	Yes. [Status of the Environmental Authorisation].
9	No CPAs under this programme will receive funding from Annex I parties.	Yes. CPA-XX is not publicly funded by an Annex I party.
10	Where applicable, target group (e.g. domestic/ commercial/industrial, rural/urban, grid connected/off-grid) and distribution mechanisms (e.g. direct installation).	N/a. CPA-XX is a commercial renewable energy facility connected to the national grid system.
11	Where applicable, the conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys.	N/a. No sampling is applied under this PoA, and all CPAs/ projects are monitored individually according the requirements of the methodology ACM0002.
12	Where applicable, the conditions that ensure that every CPA in aggregate meets the small-scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the CPA.	N/a. CPA-XX applies the large scale methodology ACM0002 and will therefore not be eligible for small scale or microscale threshold criteria.
13	Where applicable, the requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories.	N/a. CPA-XX applies the large scale methodology ACM0002 and will therefore not be eligible for inclusion as a bundle of projects under the small scale or microscale project categories.
14	All power plants shall have a lifetime in excess of 10 years.	Yes. The lifetime of the project is over 10 years. Please see section A.8.2.
15	Each CPA must be approved by the coordinating entity and DOE prior to its incorporation into the PoA.	Yes. The DOE will approve the programme activity prior to incorporation into the PoA.

The PoA faces financial and technical barriers discussed above as well as barriers due investor perceptions of risk related to the lack of such common practices in the country.

[Select the chosen tool for the demonstration and assessment of additionality below and delete the other options.]

"Tool for the demonstration and assessment of additionality" (Version 06.0.0)	**Barrier**	**Criteria**
Sub-steps 2b (Option II) and 2c	Financial Analysis: Investment comparison analysis	A cash flow model with and without CERs shall be provided in the CPA-DD making comparison between IRR, NPV or electricity price, whichever is relevant to that specific CPA.
Sub-steps 2b (Option III) and 2c	Financial Analysis: Benchmark analysis	A cash flow model comparing the project IRR to the selected relevant benchmark IRR shall be provided for the relevant CPA.
Step 3	Barrier Analysis:	Comprehensive argumentation shall be provided in the

	Investment barriers	CPA-DD.
Step 3	Barrier Analysis: Technological Barrier	Comprehensive argumentation shall be provided in the CPA-DD.
Step 3	Barrier Analysis: Prevailing Practice	Comprehensive argumentation shall be provided in the CPA-DD.

All CPAs will be applied in accordance with ACM0002: "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Version 12.3.0; the "Combined tool to identify the baseline scenario and demonstrate additionality", Version 04.0.0 as well as the "Tool for the demonstration and assessment of additionality" Version 06.0.0 where appropriate.

As the identification of alternative activities, general PoA barriers and common practice analyses (Step 4) are discussed in detail in Section B (Part I) above, the following discusses the barriers and financial analyses at the CPA level.

STEP 2: INVESTMENT ANALYSIS

As per the "Combined tool to identify the baseline scenario and demonstrate additionality", Version 04.0.0, the objective of Step 3 is to compare the financial attractiveness of the alternative scenarios (from Step 1) remaining after the barrier analysis by conducting an investment analysis. The analysis therefore includes scenarios 1, 2, and 3 discussed above.

As the CPA project activity replaces existing grid-connected renewable power plant/unit(s) at the project site, the following step-wise procedure is used to identify the baseline scenario:

Step 0: Demonstration whether the proposed project activity is the First-of-its-kind
This step is optional. If it is not applied it shall be considered that the proposed project activity is not the First-of-its-kind. This step serves for the demonstration of additionality by means of the First-of-its-kind approach.

For the measures listed in the definitions section above, a proposed project activity is the First-of-its-kind in the applicable geographical area if:

a. The project is the first in the applicable geographical area that applies a technology that is different from all other technologies that are able to deliver the same output and that have started commercial operation in the applicable geographical area before the start date of the project; and
b. Project participants selected a crediting period for the project activity that is "a maximum of 10 years with no option of renewal.

Outcome of Step 0:

- Conclusion I: The proposed project activity is the First-of-its-kind.
- Conclusion II: The proposed project activity is not the First-of-its-kind.

In both cases, proceed to Step 1.

Step 1: Identify realistic and credible alternative baseline scenarios for power generation

Apply Step 1 of the "Combined tool to identify the baseline scenario and demonstrate additionality" Version 04.0.0. The options considered should include:

- P1: The project activity not implemented as a CDM project;

- P2: The continuation of the current situation, i.e. to use all power generation equipment that was already in use prior to the implementation of the project activity and undertaking business as usual maintenance. The additional power generated under the project would be generated in existing and new grid-connected power plants in the electricity system; and
- P3: All other plausible and credible alternatives to the project activity that provide an increase in the power generated at the site, which are technically feasible to implement. This includes, inter alia, different levels of replacement and/or retrofit at the power plant/unit(s). Only alternatives available to project participants should be taken into account.

Step 2: Barrier analysis
Apply Step 2 of the "Combined tool to identify the baseline scenario and demonstrate additionality".

Step 3: Investment analysis.
If this option is used, apply the following:

- Apply an investment comparison analysis, as per Step 3 of the "Combined tool to identify the baseline scenario and demonstrate additionality", if more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P3;
- Apply a benchmark analysis, as per Step 2b of the "Tool for the demonstration and assessment of additionality", if more than one alternative is remaining after Step 2 and if the remaining alternatives include scenarios P1 and P2.

Investment comparison analysis
In case of Option II (investment comparison), economic indicators such as IRR, NPV or electricity sales price (with and without carbon revenues) will be compared.

[The comparison analysis is particularly relevant in the South African environment where it is likely that all or most of the CPAs will submit bids for the Department of Energy's IPP tariff discussed previously.] The inclusion of carbon revenues allows project developers to reduce their electricity selling prices, thereby making the respective bids more competitive and increasing their chances of being awarded the IPP tariff.

The analyses in all cases will be based on parameters that are standard in the market, considering the specific characteristics of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer. In the particular case where the project activity can only be implemented by the project participant, the specific financial/economic situation of the company undertaking the project activity could be considered.

Benchmark analysis
The post-tax return on equity has been identified as the financial indicator most suitable to benchmark for the project type and decision-making context because this is a common criteria used by funders to compare various investment opportunities. [The relevant benchmark should however be selected at each CPA level.]

The Guidelines on the Assessment of Investment Analysis (Version 05) provides a real equity return benchmark for South Africa 10.9%.

While this may be applied in some instances, investigations reveal that common practice in South Africa is higher, reflecting the risk premium required by private investors in South Africa to participate in local projects.

Examples of local benchmark equity IRR values		
	Organisation	**Real equity IRR**
1	NERSA[41]	17%
2	Exxaro[42]	17%
3	Lereko Metier[43]	15-20%
4	Association for Savings and Investment SA[44]	18%
5	SAPVIA[45]	20%

The average of these benchmarks is thus 17.9%. The NERSA benchmark of 17% taken from the NERSA consultation document (March 2011) is particularly relevant. Based on extensive research into renewable energy projects in South Africa, this RoE benchmark is one of the criteria for eligibility to the proposed feed-in tariff programme.

Unfortunately after years of deliberation and consultation the programme was scrapped in August 2011 and replaced by the IPP procurement process, based on the request for proposals published in July 2011. Potential applicants to this programme must therefore present their renewable energy projects and bid on the basis of the lowest tariff required to ensure that their projects are feasible.

The CPAs under this programme will however likely apply for the competitive bidding process because the individual projects are unlikely to provide renewable electricity at competitive rates without a subsidy. The CER revenues will therefore allow the individual projects to bid on lower tariff rates, making them more competitive and marketable.

In addition, the real equity return rate of 20% proposed by SAPVIA (the South African Photovoltaic Industry Association) and the 15%-20% rate provided by Lereko Metier (specific to the Solafrica CSP [concentrated solar power] company) support the argument. Typically higher returns are clearly required for investor security in allocating funds to renewable energy projects in the South African context.

In further support of additionality, renewable energy projects are not common practice in South Africa. There is no commercial solar power generation and at present there are only three small, functional wind installations in the country, which all are pilot or national demonstration project.

[The choice of relevant benchmark shall be done at the CPA level. Sensitivity analyses will also be undertaken at the level of individual CPAs.

The Tool advises that if after the sensitivity analysis (sub-step 2d) it is concluded that the proposed CDM project activity is unlikely to be the most financially/economically attractive (as per Step 2c paragraph 11a of the Tool) or is unlikely to be financially/economically attractive (as per Step 2c paragraph 11b of the Tool), then the analysis can immediately proceed to Step 4 (Common practice analysis).]

Concluding remarks

The financial analyses above support the argument that CPA [XXX] is indeed additional. The CER revenue is required to make the projects competitive in terms of application to the IPP procurement process.

[41] NERSA Consultation Paper: Review of Renewable Energy Feed - In Tariffs, March 2011, page 22.

[42] Exxaro Group interim financial results, 30 June 2011, page 24.

[43] Lereko Metier CSP finance presentation September 2010, page 12.

[44] ASISA CIS stats 30 June 2011

[45] SAPVIA NERSA REFIT Public Consultation March 2011, page 3.

The analyses have therefore been undertaken as per the guidelines in the additionality tool[46], notably:

- Estimates of the required returns have been based on bankers' views and private equity investors/funds' required return on comparable projects
- The financial analyses are based on parameters that are standard in the market

STEP 3: BARRIER ANALYSIS

The barriers for individual CPAs are identical to the PoA and are discussed in detail in Section B (Part 1). The most likely scenario in the absence of the CPA is the continuation of business-as-usual scenarios (predominantly the generation of electricity from coal-fired power stations) because these are the cheaper, most easily accessible sources of energy in South Africa. In the absence of the CPA, fossil fuels would continue to be used for the generation of energy as these scenarios do not face the same challenges that renewable energy projects do.

Summary of the barriers discussed:

1. **Investment barriers**
   - ***Capital Availability***

   Returns on investment for renewable energy projects in South Africa are typically low, particularly on a perceived risk-adjusted basis, in comparison with the alternative uses of this available capital. The financial projections for the proposed projects suggest that, even under optimistic assumptions, the cost to generate electricity will be higher than the average cost of electricity from the national provider (Eskom).

   - ***Risk Perceptions***

   The unstable nature of the regulatory environment in South Africa makes debt and equity funding of the proposed project extremely difficult. Furthermore the technological barriers and lack of prevailing practice summarised below further contribute to levels of investor conservatism, especially as the proposed project activities will require capital expenditure that would not be required in the continuation of the baseline scenarios.

2. **Technological barriers**

   The risk of technological failure in [wind/solar] plants in South Africa is significantly greater than for other dominant technologies for electricity generation (coal-fired power stations) that are comparable in energy output, because coal-fired technologies are well established in South Africa with an extensive support industry of technical personnel that has been developed over the years.

   Furthermore developers of renewable energy projects, particularly those relating to [wind/solar], are constrained by the geographical locations selected (i.e. must be proven to be high concentrations of wind and solar radiation respectively) making the substitution of alternative renewable energy technologies very difficult or even unfeasible.

3. **Lack of prevailing practice**

   There are only few operational small scale renewable energy projects in South Africa. The development of CPA [XXX] will be one of the first of its kind in South Africa. The lack of legislation requiring the full or partial use of electricity from renewable sources has contributes to the lack of prevailing practice in this regard and attests to the additionality of the project activity.

[46] EB 39: Tool for the demonstration and assessment of additionality (Version 05.2)

Alleviating the investment barriers:
Carbon-revenues will lower the financial risks associated with the programme activities and will therefore assist in overcoming the identified investment barriers. In addition this added revenue line will likely make CPA [XXX]'s application for the IPP procurement bidding tariff more attractive than those that are not supplemented by this additional income (i.e. projects with carbon-revenues will be able to decrease their final electrical selling price accordingly).

Alleviating the technological barriers:
The technological barriers are linked to the operators of the technology. The additional revenue can also be used to cover the costs associated with the training of staff required to operate the specialised equipment so that skills can be developed or transferred.

Alleviating the lack of prevailing practice barriers:
The development of CPA [XXX] will begin to break down barriers related to such uncommon practices. The additional carbon credit revenues will further make the project attractive to investors despite the inherent risks.

Concluding remarks
The broad analysis above establishes that the most likely alternative scenario in the absence of the CPA is the continuation of business-as-usual – i.e. the use of fossil based fuels for energy use. The previous analyses show that without the CPA framework, renewable energy projects in South Africa face specific barriers which the continuation of the current practice does not face.

The only other alternative scenario possible is the autonomous development of renewable energy projects by industry. Such autonomous measures are however subject to a variety of barriers which include access to finance, prevailing practices and lack of knowledge, making it unlikely that such parties will take up such measures on a scale comparable to that which may be achieved through the establishment of the proposed CPA.

[The proposed project activity is therefore additional, as demonstrated by the barrier analyses. CPAs under the Green Power for South Africa PoA is able to overcome such barriers by creating a consolidated carbon finance platform providing technology, information, services and access to capital, discussed in Step 3 above.]

STEP 4: COMMON PRACTICE ANALYSIS

Unless the proposed activity in the PoA is demonstrated to be first-of-its kind, the common practice analysis will be undertaken to determine the extent to which the proposed project type (e.g. technology or practice) has already diffused in the relevant sector and region in South Africa.

Sub-step 4a: Analyse other activities similar to the proposed project activity

The Tool for the Demonstration and Assessment of Additionality, Version 06.0.0, defines similar activities as those activities (i.e. technologies or practices) that are of similar scale, take place in a comparable environment, inter alia, with respect to the regulatory framework and are undertaken in the relevant geographical area.

There are various mechanisms aimed at facilitating the development of such projects such as the Department of Energy's IPP procurement programme and the Renewable Energy Market Transformation[47] ("REMT"). The former is an example of a financial-incentive mechanism that was

[47] http://www.remtproject.org/

initiated in April 2008 by the Department of Energy, in partnership with the Development Bank of South Africa and the World Bank acting as implementing agencies for the Global Environment Facility.

Even so, there are currently no large-scale wind or solar plants operating in South Africa.

Sub-step 4b: Discuss any similar Options that are occurring

There are a few small-scale or pilot projects of similar technologies in operation in South Africa that are worth noting:

Solar

- The 60 kW Cape Solar Plant[48] that powers the Aquila Private Game Reserve in the Western Cape was launched in 2010 by Germany's Concentrix Solar.
- 7kW PV facility in Copperton, Karoo[49] installed by Mulilo Renewable Energy (MRE) and its Chinese Shareholder Yingli Green Energy in April 2010 is producing 10MWh/yr power.

Wind

- The Darling Wind Farm[50] has an installed capacity of 5.2 MW and is a national demonstration project funded in part by the state entity, CEF (Pty) Ltd and with help of official development aid from the Danish Government ;
- Eskom's test site at Klipheuwel[51] has a theoretical installed capacity of 3.2 MW. Three small wind turbines have been erected at this experimental wind energy farm so that Eskom can demonstrate and assess their different mechanical and electrical performances;
- Belgian developer Electrawinds[52] installed a single 1.8 MW turbine at the Coega industrial development zone as a public relations exercise ahead of the FIFA World Cup in South Africa in 2010, ahead of a large proposed commercial development which has yet to be completed.

The measurement for the determination of whether a project activity is common practice or not is subsequently undertaken as per paragraph 47 of the Tool for the Demonstration and Assessment of Additionality, Version 06.0.0:

- *Step 1: Calculate applicable output range as +/-50% of the design output or capacity of the proposed project activity*

Table 1: Output Range

Output range	MWp
CPA-[XXX] total output capacity	Xx
+50%	Xx
-50%	Xx

- *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 and projects activities undergoing validation shall not be included in this step*

48 http://www.southafrica.info/business/investing/concentrix-080910.htm

49 http://www.engineeringnews.co.za/article/big-scale-up-plans-for-grid-connected-karoo-microsolar-plant-2010-05-28

50 http://www.darlingwindfarm.co.za

51 http://www.eskom.co.za/content/RW_0002KliphWindfRev5~2.pdf

52 http://www.electrawinds.be/electrawinds_powered_by_nature-electrawinds_artikels.asp?artikelID=11521&taal=en

As discussed in Sub-step 4b above, while there are a few small-scale or pilot projects of similar technologies in operation in South Africa there is not a single large scale facility in operation that is within the output range discussed in the step 1 above.

Therefore Nall = 0.

- *Step 3: Within plants identified in Step 2, identify those that apply technologies different that the technology applied in the proposed project activity. Note their number Ndiff.*

  As discussed in Sub-step 4b and the step above, there is not a single large scale renewable energy facility in operation that is within the output range discussed in the step above.

  Therefore Ndiff = 0.

- *Step 4: Calculate factor F=1-Ndiff/Nall representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity. The proposed project activity is a common practice within a sector in the applicable geographical area if both the following conditions are fulfilled:*

  (a) the factor F is greater than 0.2, and
  (b) Nall-Ndiff is greater than 3.

  As discussed in steps 2 and 3 above: Nall = 0 and Ndiff = 0. There is not a single large scale renewable energy facility in operation that is within the output range discussed in step 1 above. CPA-[XXX] is therefore clearly not common practice in the South African context.

Concluding remarks
The evidence of few small-scale solar projects and the total lack of large-scale facilities in this regard, point to the conclusion that the development of renewable energy projects continue to face large barriers in South Africa, proving the additional nature of the proposed CPA-[XXX] under this programme. The factors behind the slow growth of the renewables industry in South Africa can largely be attributed to the unstable regulatory environment which has imposed major barriers to the development of independent power producers, as well as the high capital outlays required during project development.

The barriers remain high, even with the introduction of the IPP procurement process, largely due to the high development costs which must be undertaken at risk before applying to the programme. Investor/financier risk-perceptions are not likely to be allayed by these requirements unless other financial mechanisms (such as the inclusion of carbon revenues) can be included which will increase the competitive nature of the respective bid applications (by reducing the final electricity selling price). This being said, there are currently no large scale renewable energy facilities in operation that are within a comparable output or capacity range to CPA-[XXX].

It is clear that the business-as-usual scenarios, generation of electricity from coal-fired power stations, do not face the barriers that renewable energy projects face due to the prevalence of plentiful, cheap coal supplies combined with more competitive development costs for new coal-fired facilities as a result of Eskom's large economies of scale. The end result is the generation of electricity at vastly competitive rates compared to the renewable energy alternatives.

The additionality argument of CPA-[XXX] project activities is thus affirmed as the common practice of electricity production from coal-fired power stations is clearly the most economically and practically

viable alternative to the proposed activity. Eskom's generation of electricity from coal-fired facilities will therefore be used as the baseline for calculating the emission reductions in this CPA. All activities under the CPA will thus feed electricity into the national grid system and will therefore displace electricity created by the combustion of fossil fuels.

B.6. Estimation of emission reductions of a generic CPA
B.6.1. Explanation of methodological choices

Baseline emissions
Baseline emissions include only CO_2 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 will be calculated as follows:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$$

Where:

BE_y	=	Baseline emissions in year *y* (tCO_2/yr)
$EG_{PJ,y}$	=	Quantity of net electricity generation that is poroduced and fed into the grid as a result of the implementation of the CDM project activity in year *y* (MWh/yr)
$EF_{grid,CM,y}$	=	Combined margin CO_2 emission factor for grid connected power generation in year *y* (tCO_2/MWh)

$EG_{PJ,y}$ for Greenfield renewable energy power plants is calculated as follows;

$$EG_{PJ,y} = EG_{facility,y}$$

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 CDM project activity 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)

$EF_{grid,CM,y}$ is calculated using the "Tool to calculate the emission factor for an electricity system" as follows:

In South Africa, Eskom dominates the electricity supply market and only a few municipal and private generators exist. Public information on the Eskom power plants exists until 2008, and the private generators' information is available only partly until 2005. It is considered acceptable that Eskom represents the electricity production industry in South Africa, as it produces over 96 % of electricity in South Africa. Only less than 4 % comes from private and municipal generators.[53]

In South Africa the grid system is a nationwide grid system, and the fuel consumption as well as net electricity generation data is available for all Eskom systems. The calculation has been provided in Grid Factor Calculation of the PoA-DD. The power plant data has been obtained from the Eskom website and the data for most recent years (2007/8, 2008/9, 2009/10) has been applied, available under:
http://www.eskom.co.za/c/article/236/cdm-calculations/

[53] Electricity supply statistics of South Africa, 2005 (the latest one), page 6, 14. Available under: http://www.nersa.org.za/documents/ArchivedESSDocuments.aspx

The grid system is part of the national grid system, and fuel consumption as well as net electricity generation data is available for all Eskom systems. However, as per the data provided by Eskom, only coal power plants are have been producing electricity in the last 5 years and hence it is assumed that coal forms part of low-cost/must-run resources, and hence average OM has been selected as suitable calculation method (step 4 d, option A, equation 1 and option 1A equation 2 of the tool are applied). The operating margin has been calculated *ex-ante* based on 3-year generation-weighted average on the most recent publicly available data.

The build margin is calculated based on 20 % generation capacity including grid connected CDM projects as well as plants older than 10 years, as the generation capacity of plants built within the last 10 years is marginal (< 1 %). The option 1 and equation 12 are applied.

The combined margin is calculated based on weighted average (step 6, option), applying the values given for wind and solar power generation (: wOM = 0.75 and wBM = 0.25) owing to their intermittent and non-dispatchable nature.

The detailed calculation is presented in Grid Factor Calculation of the PoA-DD.

Project emissions
For most of the renewable power generation CPA project activities, $PE_y = 0$. However, some CPAs may involve project emissions due to fossil fuel consumption:

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

Where:

$\mathbf{PE_y}$	=	Project emissions in year *y* (tCO_2e/yr)
$\mathbf{PE_{ff,y}}$	=	Project emissions from fossil fuel consumption in year *y* (tCO_2/yr)
	=	

These emissions shall be calculated as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion".

CO_2 emissions from fossil fuel combustion in process *j* are calculated based on the quantity of fuels combusted and the CO_2 emission coefficient of those fuels, as follows:

$$PE_{FC,j,y} = \sum FC_{i,j,y} \times COEF_{,i,y}$$

Where:

$\mathbf{PE_{FC,j,y}}$	=	Are the CO_2 emissions from fossil fuel combustion in process *j* during the year *y* (tCO_2/yr)
$\mathbf{FC_{i,j,y}}$	=	Is the quantity of fuel type *i* combusted in process *j* during the year *y* (mass of volume unit/yr)
$\mathbf{COEF_{i,y}}$	=	Is the CO_2 emission coefficient of fuel type *i* in year *y* (tCO_2/mass or volume unit)
i	=	Are the fuel types combusted in process *j* during the year *y*

The CO_2 emission coefficient $COEF_{jy}$ can be calculated using one of the following two options, depending on the availability of data on the fossil fuel type *i*, as follows:

Option A:

The CO_2 emission coefficient $COEF_{i,y}$ is calculated based on the chemical composition of the fossil fuel type *i*, using the following approach:

If $FC_{i,j,y}$ is measured in a mass unit: $\mathbf{COEF_{i,y} = w_{c,i,y} * 44/12}$ **(2)**
If $FC_{i,j,y}$ is measured in a volume unit: $\mathbf{COEF_{i,y} = w_{c,i,y} * \rho_{i,y} * 44/12}$ **(3)**

Where:

$\mathbf{COEF_{i,y}}$	=	Is the CO_2 emission coefficient of fuel type *i* (tCO_2/mass or volume unit)
wc,i,y	=	Is the weighted average mass fraction of carbon in fuel type *i* in year *y*
ρi,y	=	Is the weighted average density of fuel type *i* in year *y* (mass unit/volume unit of the fuel).
i	=	Are the fuel types combusted in process *j* during the year *y*

Option B:
The CO_2 emission coefficient $COEF_{i,y}$ is calculated based on net calorific value and CO_2 emission factor of the fuel type *i*, as follows:

$$\mathbf{COEF_{i,y} = NCV_{i,y} * EF_{CO2,I,y}} \quad \mathbf{(4)}$$

Where:

$\mathbf{COEF_{i,y}}$	=	Is the CO_2 emission coefficient of fuel type *i* in year *y* (tCO_2/mass or volume unit)
$\mathbf{NCV_{i,y}}$	=	Is the weighted average net calorific value of the fuel type *i* in year *y* (GJ/mass or volume unit)
$\mathbf{EF_{CO2,I,y}}$	=	Is the weighted average CO_2 emission factor of fuel type *i* in year *y* (tCO_2/GJ)
i	=	Are the fuel types combusted in process *j* during the year *y*

Each CPA will document which option has been applied, if relevant.

Leakage
There are no relevant leakage emissions and hence leakage is not considered.

Emission reductions are calculated as follows:
$ER_y = BE_y - PE_y$

Where:

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

B.6.2. Data and parameters that are to be reported ex-ante
Baseline emissions:

Data / Parameter	$EF_{grid,CM,y}$
Unit	tCO_2/MWh
Description	Combined margin CO2 emission factor for grid connected power generation in year y
Source of data	Calculated using the "Tool to calculate the emission factor for an electricity system".
Value(s) applied	0.9721 tCO2/MWh
Choice of data or Measurement methods and procedures	Based on the guidance of the methodology ACM002 and the relevant power plant data provided by Eskom, available at: http://www.eskom.co.za/content/calculationTable.htm.
Purpose of data	Calculation of baseline emissions.
Additional comment	Please see the Grid Factor Calculation documentfor detail calculation. The Grid Factor Calculation document provides fuel use ($FC_{i,y}$) and net electricity generation ($EG_{m,y}$) and CO_2 emission ($EF_{CO2,i,y}$) data for each power plant in each year.

Data / Parameter	NCVi,y
Unit	MJ/t
Description	Net calorific value (energy content) of fossil fuel type *i* in year *y*.
Source of data	Eskom annual report and plant data.
Value(s) applied	Bituminous coal: 19 095 MJ/t Kerosene: 42 400 MJ/t
Choice of data or Measurement methods and procedures	The tool allows the use of plant specific/ national data.
Purpose of data	Calculation of project emissions.
Additional comment	

Data / Parameter	$EF_{CO2,m,i,y}$
Unit	tCO_2/MJ
Description	CO2 emission factor of fossil fuel type *i* used in power unit *m* in year *y*.
Source of data	IPCC 2006 Guideline.
Value(s) applied	Bituminous coal: 89.5 t CO_2/MJ Kerosene: 70.8 t CO_2/MJ
Choice of data or Measurement methods and procedures	The tool allows the use of IPCC default values.
Purpose of data	Calculation of project emissions.
Additional comment	

B.6.3. Ex-ante calculations of emission reductions

The baseline emissions will be calculated as follows:

$$BE_y = EG_{PJ,y} * EF_{grid,CM,y}$$

Where:

BE_y = [add value] tCO_2/yr)

$EG_{PJ,y}$ = [add value] (MWh/yr)

$EF_{grid,CM,y}$ = 0.9721 (tCO_2/MWh)

$EG_{PJ,y}$ for Greenfield renewable energy power plants is calculated as follows;

$$EG_{PJ,y} = EG_{facility,y}$$

Where:

$EG_{PJ,y}$ = [add value] (MWh/yr)

$EG_{facility,y}$ = [add value] (MWh/yr)

Project emissions

For most of the renewable power generation CPA project activities, $PE_y = 0$. However, some CPAs may involve project emissions due to fossil fuel consumption:

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

Where:

PE_y = [add value] (tCO_2e/yr)

$PE_{ff,y}$ = [add value] (tCO_2/yr)

These emissions shall be calculated as per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion", as follows:

$$PE_{FC,j,y} = \sum FC_{i,j,y} \text{ x } COEF_{,i,y}$$

Where:

$PE_{FC,j,y}$ = (tCO_2/yr)
$FC_{i,j,y}$ = (mass of volume unit/yr)

$COEF_{i,y}$ = (tCO_2/mass or volume unit)
i =

The CO_2 emission coefficient $COEF_{jy}$ can be calculated using one of the following two options, depending on the availability of data on the fossil fuel type *i*, as follows:

Option A:

If $FC_{i,j,y}$ is measured in a mass unit: **$COEF_{i,y} = w_{c,i,y} * 44/12$ (2)**
If $FC_{i,j,y}$ is measured in a volume unit: **$COEF_{i,y} = w_{c,i,y} * \rho_{i,y} * 44/12$ (3)**

Where:
$COEF_{i,y}$ = [add value] (tCO_2/mass or volume unit)
$w_{c,i,y}$ = [add value] (t)
$\rho_{i,y}$ = [add value] (t/volume unit of the fuel).
i = Fuel types combusted in process *j* during the year *y*

Option B:
The CO_2 emission coefficient $COEF_{i,y}$ is calculated based on net calorific value and CO_2 emission factor of the fuel type *i*, as follows:

$$COEF_{i,y} = NCV_{i,y} * EF_{CO2,I,y} \quad (4)$$

Where:
$COEF_{i,y}$ = [add value] (tCO_2/mass or volume unit)
$NCV_{i,y}$ = [add value] (GJ/mass or volume unit)
$EF_{CO2,I,y}$ = [add value] (tCO_2/GJ)
i = Fuel types combusted in process *j* during the year *y*

Each CPA will document which option has been applied, if relevant.

Leakage
There are no relevant leakage emissions and hence leakage is not considered.

Emission reductions are calculated as follows:
$ER_y = BE_y - PE_y$

Where:
ER_y = [add value] (t CO_2/y)
BE_y = [add value] (t CO_2/y)
PE_y = [add value] (t CO_2/y)

B.7. Application of the monitoring methodology and description of the monitoring plan
B.7.1. Data and parameters to be monitored by each generic CPA

Data / Parameter	$EG_{facility,y}$
Unit	MWh
Description	Quantity of net electricity generation supplied by the project plant/unit to the grid in year *y*.
Source of data	Electricity meter at project activity site.
Value(s) applied	To be stipulated by in the CPA-DD.
Measurement methods and procedures	Direct, physical measurements as recorded by metering equipment (electricity meter).
Monitoring frequency	Continuous measurement and at least monthly recording.
QA/QC procedures	Cross check measurement results with records for sold electricity.
Purpose of data	Calculation of baseline emissions.
Additional comments	

Data / Parameter	$PE_{FF,y}$
Unit	tCO_2
Description	Project emissions from fossil fuel consumption in year y.
Source of data	Measured at project site.
Value(s) applied	To be stipulated by the CPA, if relevant.
Measurement methods and procedures	As per the "Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion". Calculated based on onsite measurements and supplier information.
Monitoring frequency	-
QA/QC procedures	
Purpose of data	Calculation of project emissions.
Additional comments	Please note that this is applicable only to those CPAs that have onsite fossil fuel power generation. This scenario is expected to be rather rare, as most plants use typically electricity produced by the plant.

Data / Parameter	EGimported,y
Unit	MWh/y
Description	Quantity of electricity imported into the power plant/ used by the power plant and supplied by the grid in year *y*.
Source of data	Electricity meter at project site.
Value(s) applied	-
Measurement methods and procedures	Direct, physical measurements as recorded by metering equipment (electricity meter).
Monitoring frequency	Continuous measurement and at least monthly recording.
QA/QC procedures	Cross check measurement results with records for sold electricity.
Purpose of data	Calculation of baseline emissions.
Additional comments	Please note that this is applicable only to those CPAs that use electricity from the grid to cover internal electricity need. This scenario is expected to be rather rare, as most plants use typically electricity produced by the plant.

B.7.2. Description of the monitoring plan for a generic CPA

CPA [XXX] will be verified in a transparent system that ensures that no double accounting occurs and that the status of verification can be determined at any time. All CPAs under the Green Power for South Africa Programme will be large, commercial plants that can be easily identified with GPS coordinates, which will prevent incidences of double counting.

Management structure and responsibilities
The CME will implement a monitoring protocol that allows the Designated Operational Entity ("DOE") to verify CPAs [XXX]. All parameters included in B.7.1 will be monitored by the implementing entity of the CPA. The main parameter for the PoA is the measure of net electricity supplied to the grid and assuring the correct operation and maintenance of the measuring equipment.

Data collection
The CME will establish and maintain a database for CPA [XXX] wherein the following data will be recorded:

- Name of the CPA;
- Name of the implementing entity of the CPA;
- Contact details of the implementing entity including contact person, address, telephone and email address;
- Type of renewable energy technology (solar PV, CSP or wind);
- Installed capacity and other relevant technical specifications of each CPA;
- Location of the CPA (GPS coordinates of the power house for example);
- Verification status and monitoring reports of each CPA.

Monitoring will be carried in CPA [XXX]. The CME will provide guidance to the CPA implementing entity on how the monitoring should be conducted and collected with regards to emission reduction calculations. The start and end dates of each monitoring period for the CPA, together with the emission reductions attributable to that monitoring period, will be recorded in the database.

Data recording
For CPA [XXX], all parameters included in B.7.1 will be monitored by the implementing entity of the CPA and recorded electronically. The CPA owners will provide data on monitored parameters included in section B.7.1 to the CME. The CME will document and store all data related to parameters included in section B.7.1 provided by CPA implementing entities in an electronic database, while primary data will be stored by the CPA implementing entity.

Data calibration
This will be done by respecting the calibration frequency as per the manufacturer's requirements. The CME will store all the data in an electronic database, and the data shall be kept for two year after the crediting period. Primary data will be stored by the implementing entities.

Data reporting
The CME will in responsible for the preparation of the Monitoring Reports and communication with the DOE during verification activities. The Monitoring Report will compile all required monitoring information in order to allow the DOE to verify the emission reductions for each monitoring period of each individual CPA. The Monitoring Report will unambiguously set out the data on emission reductions generation by CPA [XXX] during the monitoring period, consistently with the requirements of this PoA-DD and the corresponding CPA-DD. Record keeping procedures undertaken by the CME will ensure that the data attributed to a monitoring period can be clearly attributed to an individual CPA and will furthermore prevent double counting of emission reduction data.

Data archiving
The CME will be responsible for the management of records and data associated with CPA [XXX] and all records will be stored for a period of two years after the end of the relevant crediting period.

Data quality control
Quality control and quality assurance must be integrated in a CPA Monitoring Plan/Manual, which determines clear roles and responsibilities in CPA [XXX], including data collecting and recording, maintenance and calibration of the electricity meters, accuracy etc.

Training and monitoring personnel
The CME will ensure that all persons that participate in the monitoring process will be suitably qualified and trained in the operation and maintenance of the CPA project activity. These persons will also receive training on the application of the monitoring plan.

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Appendix 1: Contact information on entity/individual responsible for the PoA

Organization	Standard Bank Plc
Street/P.O. Box	20 Gresham Street
Building	
City	London
State/Region	
Postcode	EC2V 7JE
Country	United Kingdom
Telephone	+44 20 3145 6890
Fax	+44 20 3189 6930
E-mail	co2@standardbank.com
Website	www.standardbank.com
Contact person	Geoff Sinclair
Title	Head of Carbon Sales & Trading
Salutation	Mr.
Last name	Sinclair
Middle name	
First name	Geoff
Department	Energy Trading and Marketing
Mobile	+44 7769 648 695
Direct fax	+44 20 3189 6930
Direct tel.	+44 20 3145 6893
Personal e-mail	geoff.sinclair@standardbank.com

Organization	The Standard Bank of South Africa Limited
Street/P.O. Box	3 Simmonds Street / PO Box 58088
Building	
City	Marshalltown, Johannesburg / Newville
State/Region	
Postcode	2114
Country	South Africa
Telephone	+44 20 3145 6890
Fax	+44 20 3189 6930
E-mail	co2@standardbank.com
Website	www.standardbank.com
Contact person	
Title	
Salutation	Mr.
Last name	Sinclair
Middle name	
First name	Geoff
Department	
Mobile	
Direct fax	
Direct tel.	
Personal e-mail	

Appendix 2: Affirmation regarding public funding

The CPAs under the Green Power for South Africa Programme have not received any Official Development Aid from Annex I Countries.

Appendix 3: Application of methodology(ies)

Not applicable.

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

Not applicable.

Appendix 5: Further background information on the monitoring plan

Not applicable.

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History of the document

Version	Date	Nature of revision(s)
02.0	EB 66 13 March 2012	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	EB33, Annex 41 27 July 2007	Initial adoption.
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