

Clean Development Mechanism South Africa  
Designated National Authority



energy

Department:  
Energy  
**REPUBLIC OF SOUTH AFRICA**

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## Project Design Document (PDD)

Project reference number (office)	
Date received (office use only)	

### NOTES ON COMPLETING THIS PROJECT DESIGN DOCUMENT

1. Please provide this PDD in both hard-copy

### Part A: Project Proponent Details

<b>Project Name</b>	PoA Name: Small Scale Renewable Energy Carbon Programme (SRECP). CPA Name: Toitdale Concentrated Photovoltaic Project (CPA-001).
<b>Date of Submission of PDD</b>	13/03/2012

Project Developer	
<b>Name</b>	Carbon Africa (CME for the Program of Activities)
<b>Organizational Category</b>	Private Company
<b>Legal Status</b>	Limited Company
<b>Street Address</b>	-
<b>Postal Address (if different from above)</b>	P.O. Box 14938- 00800, Nairobi, Kenya.
<b>Website Address</b>	<a href="http://www.carbonafrica.co.ke">www.carbonafrica.co.ke</a>
<b>Main Activities</b>	Carbon Africa Ltd. is a carbon asset development and carbon

	transaction management company headquartered in Nairobi, Kenya with offices and representation in Mozambique, Uganda and Zimbabwe. It assists clients in Sub-Saharan Africa to generate and commercialize high quality carbon credits from projects that reduce or remove greenhouse gas emissions.
Summary of Financial Performance in last fiscal year	500,000 USD
Contact Person(s)	Mr. Adriaan Tas
Telephone	Work:+254 731 851 754 Cell:+254 726 385 657
Fax	-
Email Address	<a href="mailto:adriaan@carbonafrica.co.ke">adriaan@carbonafrica.co.ke</a>
<b>Project Partners</b> Provide the following Information for all project partners (copy and paste relevant sections of the table if information is to be provided on more than one partner organization)	
Name	Climate Corporation Emissions Trading GmbH
Nature of partner	Project Participant  Climate Corporation provides financial support on the development of the PoA's CDM activities.
Organizational Category	Private Company.
Legal Status (if private company)	Limited Liability Company.
Street Address	Guntramsdorfer Street 103 (SOL4 Center), Moedling (2340), Austria
Postal Address (if different to Street Address)	-
Website Address	<a href="http://climatecorp.eu">http://climatecorp.eu</a>
Main Activities	Climate Corporation offers EUA and CER spot trading services both on environmental exchanges as well as via OTC partners. Climate Corporation specifically supports project owners with the development of CDM projects, starting from the feasibility study to PDD development all the way to registration of the projects with the CDM EB of the UNFCCC as well as ongoing monitoring with the aim of maximizing the issuance rate of CER from the projects.
Contact Person(s)	Michael Novoszad
Telephone	+43 2236 8002 7000
Fax	+43 2236 8002 7099
Email Address	<a href="mailto:mn@climatecorp.com">mn@climatecorp.com</a>
<b>Project Partners</b> Provide the following Information for all project partners (copy and paste relevant sections of the table if information is to be provided on more than one partner organization)	
Name	Toitdale Solar Energy (Pty) Ltd

Nature of partner	Toitdale Solar Energy (Pty) Ltd is the entity responsible for the development of the Toitdale Concentrated Photovoltaic Project (CPA-001).
Organizational Category	Private Company.
Legal Status (if private company)	Limited Company.
Street Address	3 Eglin Road, Sunninghill PO Box 2505 Sunninghill West, 2072, South Africa
Postal Address (if different to Street Address)	-
Website Address	n/a
Main Activities	Toitdale Solar Energy (Pty) Limited is a project company specifically set up for the development and implementation of the proposed project activity.  Currently, Toitdale Solar Energy (Pty) Limited is 100% owned by Terra Solar Energy, a sister company of Terra Power Solutions.
Contact Person(s)	Howard Ramsden
Telephone	+27 (0)11 234 1603
Fax	-
Email Address	<a href="mailto:Howard.ramsden@terrapower.co.za">Howard.ramsden@terrapower.co.za</a>
<b>Contractual Arrangements</b>	
Contractual arrangements between various entities involved	Carbon Africa Ltd. will act as the Coordinating/Managing Entity. Climate Corporation Emissions Trading GmbH will act as the project participant to the Programme of Activities Toitdale Solar Energy (Pty) Ltd is the entity responsible for the development of the Toitdale Concentrated Photovoltaic Project (CPA-001). To this effect an agreement has been made between Carbon Africa and the CPA implementer.

## Part B: Project Overview (Technical Summary, Location and Schedule)

<b>Technical Summary of the project</b>	
Objective of the Project	The purpose of the Small Scale Renewable Energy Carbon Programme - SRECP (hereafter referred as the PoA) is to support the development and implementation of small-scale renewable energy projects in South Africa in order to displace grid-connected, fossil fuel based electricity generation, thereby reducing greenhouse gas (GHG) emissions.
<b>Project Description</b>	
<p>The CPAs under the PoA will be located in South Africa and will use grid-connected renewable energy technologies to generate electricity. Renewable energy technologies and measures to be employed by a typical SSC-CPA in this PoA will include solar photovoltaic, wind and hydro (either with a run-of-river reservoir or an accumulation reservoir). Installed capacities of individual SSC-CPAs will be below or equal to 15 MW.</p> <p>The renewable energy generation units will either supply electricity to a national or regional grid, or to an identified consumer facility via national/regional grid through a contractual arrangement such as</p>	

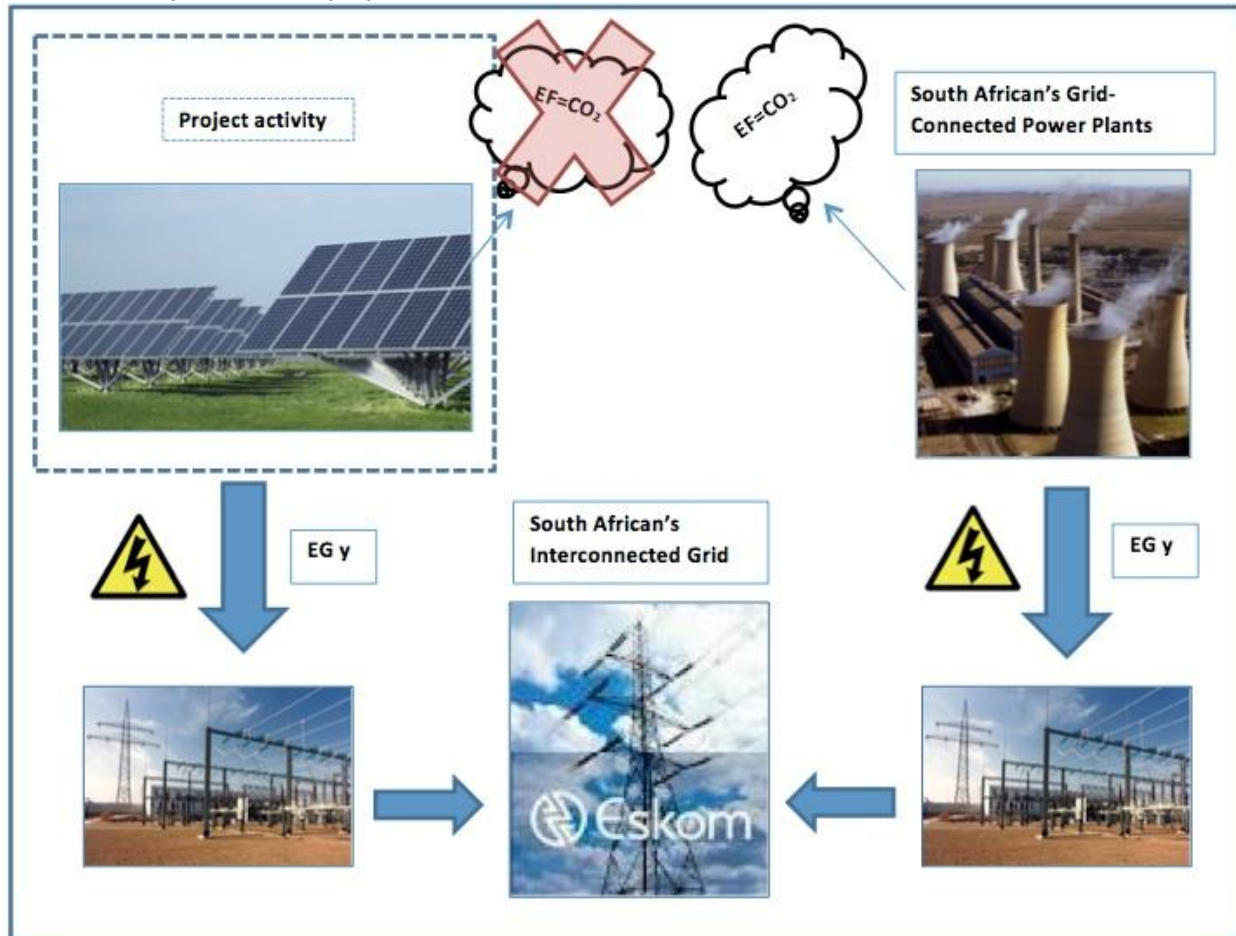
## Technical Summary of the project

wheeling.

The implementation of SSC-CPAs under the PoA will involve the installation of a new power plant at a site where there was no renewable energy power plant operating prior to the implementation of the CPA (greenfield plant). Capacity additions, retrofits and replacement of existing plants are not included in the PoA.

The Toitdale Concentrated Photovoltaic Project is the first CPA under this PoA (SRECP) which seeks to promote grid-connected renewable energy projects in South Africa. It will involve the installation of a 9.52 MW concentrated photovoltaic power plant which will consist of 140 units each with an AC capacity of (+/-5%) of 68 KW at PT. The Toitdale proposed Project is located approximately 4 km north-west of Noupport, Northern Cape Province, South Africa. This project is expected to generate approximately 25,006 MWh annually resulting in annual emission reductions of 24,228tCO<sub>2</sub> per year during the first crediting period.

The flow diagram below highlights the main activity involved in the implementation of the Toitdale concentrated photovoltaic project, the first CPA under this PoA.



## Project Constraints

Small-scale, renewable energy projects with an installed capacity of smaller than or equal to 15 MW face considerable barriers, including lack of finance and high cost of capital i.e. financial barriers and institutional barriers. This is especially relevant for Independent Power Producers (IPPs).

## Technical Summary of the project

<p><b>Technology to be employed</b></p>	<p>SSC-CPAs under this PoA will use renewable energy technologies to generate electricity. Renewable energy technologies and measures to be employed by a typical SSC-CPA will include hydro, wind and solar photovoltaic (PV).</p> <p>Installed capacities of individual SSC-CPAs will be below or equal to 15 MW. The renewable energy generation units will either supply electricity to a national or regional grid, or to an identified consumer facility via national/regional grid through a contractual arrangement such as wheeling.</p> <p>The Toitdale concentrated photovoltaic project, the first CPA in this PoA, will use concentrated solar PV technology and supply this energy to the South African grid.</p> <p><i>Is the technology one that has been previously tried and tested in South Africa or internationally? If yes, provide details (1 paragraph)</i></p> <p>Some of the technology types under this programme have been implemented in South Africa while most of them have been implemented internationally, mostly in Europe, the US and China. However in South Africa, projects using renewable energy technology for grid connected electricity generation only represent less 1.5% of the total installed capacity. Hydro is practically the only technology deployed in this category, together with two small wind energy projects of 3.2 MW and 5.2 MW that constitute 0.02% of the total installed capacity.</p> <p>No other projects of such magnitude and using concentrated solar photovoltaic technology currently exist in South Africa. However, solar PV panels for household applications are widely used in South Africa. Concentrated solar photovoltaic projects such as Toitdale concentrated photovoltaic project are being widely developed all around the world, mainly Europe, US, and China.</p> <p><i>Have the project operators had any previous experience or expertise with operating the technology? If yes - provide brief details (1-2 lines)</i></p> <p>Toitdale Solar Energy (Pty) Ltd through Terra Power Solutions (TPS) has had previous experience in the formulation of a number of renewable energy projects. The company has a number of renewable energy projects in the pipeline including wind and solar powered projects.</p>
<p><b>Greenhouse Gases Targeted</b></p>	<p>The project will result in CO<sub>2</sub> emissions reductions from electricity generation in fossil fuel fired power plants that will be displaced due to project activity.</p>
<p><b>Emission reductions</b></p>	<p>Annual emission reductions for the Toitdale concentrated PV Project are estimated to be 24,228tCO<sub>2</sub> per year.</p> <p>Total emission reductions for the same project during the first</p>

## Technical Summary of the project

	<p>crediting period are estimated to be 169,596 tCO<sub>2</sub>e.</p> <p>Emission reductions for the PoA will depend on the number of CPAs that will be included in the programme and so cannot be determined at this point.</p>							
<p><b>Baseline &amp; Additionality Assessment</b></p>	<p><u>Baseline</u></p> <p>In accordance with simplified baseline and monitoring methodology AMS-I.D (version 17) <i>Grid connected renewable electricity generation</i>, the baseline scenario is:</p> <p><i>“The electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources into the grid”.</i></p> <p>In South Africa, approximately 85% of the electricity delivered to the grid is generated by coal-fired power plants. This leads to a relatively high grid emission factor of over 0.95 tCO<sub>2</sub>e/MWh</p> <p><u>Additionality</u></p> <p>The additionality for the PoA is demonstrated by establishing that each SSC-CPA is additional through eligibility criteria using either the <i>Attachment A to Appendix B</i> (EB 63 Annex 24 version 08) or <i>Guidelines for demonstrating additionality of microscale project activities</i> (EB 63 Annex 23 version 03). These documents provide various approaches that can be used for small scale projects including:</p> <table border="1"> <tr> <td>Option A</td> <td>Micro-scale additionality</td> <td> <p>Applicable if the project has</p> <ul style="list-style-type: none"> <li>(1) A capacity of less than 5 MW and</li> <li>(2) The project is located in a LDC/SID country</li> </ul> <p>Or</p> <p>The project activity employs specific renewable energy technologies/measures recommended by the host country designated national authority (DNA) and approved by the Board to be additional in the host country.</p> </td> </tr> <tr> <td>Option B 1</td> <td>Investment barrier</td> <td> <p>In this case, the project will have to carry out an investment analysis to show that a financially more viable project would have resulted in higher emissions.</p> </td> </tr> </table>		Option A	Micro-scale additionality	<p>Applicable if the project has</p> <ul style="list-style-type: none"> <li>(1) A capacity of less than 5 MW and</li> <li>(2) The project is located in a LDC/SID country</li> </ul> <p>Or</p> <p>The project activity employs specific renewable energy technologies/measures recommended by the host country designated national authority (DNA) and approved by the Board to be additional in the host country.</p>	Option B 1	Investment barrier	<p>In this case, the project will have to carry out an investment analysis to show that a financially more viable project would have resulted in higher emissions.</p>
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Option B 1	Investment barrier	<p>In this case, the project will have to carry out an investment analysis to show that a financially more viable project would have resulted in higher emissions.</p>						

## Technical Summary of the project

	Option B2	Access to capital barrier	This is done to show that the project activity could not access appropriate capital without consideration of the CDM revenues.
	Option B3	Barriers due to prevailing practice	This assessment should show that prevailing practice would have led to implementation of a technology with higher emissions.
	Option C	First of its kind additionality	This is applicable if the project is the first in the applicable geographical area that applies a technology that is different from any other technologies able to deliver the same output and that have started commercial operation in the applicable geographical area before the start date of the project.
	Option D	Automatic additionality	This applies in case the project activity involves a technology, which is on the positive list of grid-connected renewable electricity generation technologies defined in the Attachment A of Appendix B. These technologies include solar technologies (photo voltaic and solar thermal electricity generation), off-shore wind technology and marine technologies (wave and tidal)
	<p>The Toitdale concentrated PV Project, the first CPA in this PoA, uses concentrated solar PV technology. Solar PV technology is on the positive list of grid-connected renewable electricity generation technologies as specified in version 08 of Attachment A of Appendix B (EB 63 Annex 24 version 08) and as described in option D above hence the project is automatically additional.</p>		
<p><b>Monitoring</b></p>	<p>Since the PoA will entail projects that will supply power to the South African grid system, or to identified consumer facilities via national/regional grid through a contractual arrangement such as wheeling, the key parameter that will be monitored is the <i>electricity generated and supplied to the grid operator</i> (<math>EG_{BL,y}</math>). Metering of this parameter will be conducted with calibrated measurement equipment according to relevant industry standards and following guidance from the NRS 057 standard provided by the National Energy Regulator of South Africa. This metering equipment will be installed at the point of connection with ESKOM.</p> <p>Project activities using hydro technologies will monitor and keep</p>		

## Technical Summary of the project

	<p>records of the following additional parameters:</p> <table border="1"> <thead> <tr> <th>Parameter</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>TEG<sub>y</sub></td> <td>Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y (<i>applicable for hydro projects that have reservoirs</i>)</td> </tr> <tr> <td>CAP<sub>PJ</sub></td> <td>Installed capacity of the hydro power plant after the implementation of the project activity (<i>applicable for hydro projects that have reservoirs</i>)</td> </tr> <tr> <td>A<sub>PJ</sub></td> <td>Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full (<i>applicable for hydro projects that have reservoirs</i>)</td> </tr> </tbody> </table> <p>For the Toitdale concentrated PV Project, the only parameter that will require monitoring is the <i>electricity generated and supplied to the grid operator</i> (EG<sub>BL,y</sub>).</p>	Parameter	Description	TEG <sub>y</sub>	Total electricity produced by the project activity, including the electricity supplied to the grid and the electricity supplied to internal loads, in year y ( <i>applicable for hydro projects that have reservoirs</i> )	CAP <sub>PJ</sub>	Installed capacity of the hydro power plant after the implementation of the project activity ( <i>applicable for hydro projects that have reservoirs</i> )	A <sub>PJ</sub>	Area of the single or multiple reservoirs measured in the surface of the water, after the implementation of the project activity, when the reservoir is full ( <i>applicable for hydro projects that have reservoirs</i> )
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<b>Type of project/activities</b>									
a. Energy Supply	Applicable. The program of activities will incorporate renewable energy project activities that will involve the generation of electricity from hydro, wind, and solar photovoltaic (PV). This electricity will be supplied to the national grid system.								
b. Energy Demand	N/A								
c. Industrial Process	N/A								
d. Transport	N/A								
e. Waste Management	N/A								
f. Forestry/ land use	N/A								
g. Other	N/A								
<b>Project Boundary</b>	<p>This program of activities employs the approved baseline and monitoring methodology AMS-I.D (Version 17) that states that the project boundary includes the project power plant and all power plants connected physically to the electricity system that the CDM project power plant is connected to. The flow diagram provided in part B above best illustrates the equipment and extent of the project boundary for the Toitdale concentrated PV project an example of a CPA in this PoA.</p> <p>The greenhouse gas emission source included in the project boundary is CO<sub>2</sub> emissions from electricity generation in fossil fuel fired power plants that are displaced due to project activity. This constitutes the baseline emissions. Project emissions vary depending on the type of technology employed.</p> <p>For the specific case of the Toitdale concentrated PV Project, the emission source will be the baseline CO<sub>2</sub> emissions from electricity generation in fossil fuel fired power plants that are displaced due to project activity.</p>								
Indicate Emissions outside the Project Boundary	N/A								

**Location of the Project** (The PoA will cover the Republic South Africa and possibly other regions globally. However the CPA (Toitdale concentrated PV project) will cover the Republic of South Africa. Below is the description of the location of the Toitdale concentrated PV Project - the CPA1)

<b>Province</b>	Northern Cape
<b>Municipality</b>	Umsobomvu Local Municipality Noupoort
<b>Nearest city/large town</b>	Noupoort

**Brief description of the location of the project site**  
 The Toitdale Concentrated Photovoltaic Project is located approximately 4 km north-west of Noupoort, Northern Cape Province, South Africa. The coordinates and boundaries of the project area are given below:

	Latitude	Longitude
Toitdale - Northwest	31° 9'17.45"S	24° 54'47.80"E
Toitdale - Northeast	31° 9'17.48"S	24° 55'16.40"E
Toitdale - Southwest	31° 9'40.31"S	24° 54'47.78"E
Toitdale - Southeast	31° 9'40.31"S	24° 55'16.40"E



**Project Schedule/Timetable**

<b>Earliest Project Start Date</b>	<i>[For the CPA-DD- Toitdale concentrated PV Project]</i>
	2012/12

<b>Project Schedule/Timetable</b>	
When is the expected first year of CER delivery	2014
Project Lifetime	<p><i>[For the PoA]</i></p> <p>28 years</p> <p><i>[For the CPA -Toitdale concentratedPV Project]</i></p> <p>25 Years</p>
Project End Date	<p><i>[For the PoA]</i></p> <p>2040/12</p> <p><i>[For the CPA - Toitdale concentratedPV Project]</i></p> <p>2038/06</p>
Crediting Period	<p><b><i>Has a crediting period for the project been identified?</i></b></p> <p><i>[For the CPA - Toitdale concentrated PV Project]</i></p> <p>Yes</p> <p><b><i>If yes - which option has been selected</i></b></p> <p><i>[For the CPA-DD- Toitdale concentrated PV Project]</i></p> <p>7-year renewable crediting period that will be three times renewed following guidelines provided in the <i>CDM Mechanism Project Standard</i> paragraph 161 (EB 65 Annex 5)</p>
Current Status or phase of the project	Toitdale is in preparation stage, and will apply for preferred bidder in the next bidding rounds.
DNA Approval	<p><b><i>Has this project been submitted to the DNA for approval previously?</i></b></p> <p>No</p> <p><b><i>If yes - provide date of last submission and brief details of the response from the DNA (1 paragraph)</i></b></p> <p>N/A</p> <p><b><i>Provide details of any other official response by the DNA regarding this project</i></b></p> <p>N/A</p>
Approval by other bodies	Civil Aviation Authority: 16 February 2012 Water use permit: 26 January 2012

## Project Schedule/Timetable

Cabling road crossing: 18 April 2012

## Part C: Performance Against the DNA's Sustainable Development Criteria

South Africa has identified the following sustainable development criteria and indicators against which each CDM project will be assessed. Please provide your interpretation of how this project will address each of these **criteria and indicators** where they are relevant to the project. If the space provided is not sufficient please append additional information as required.

**NOTE:** For all indicators which are of relevance to the project show how the performance of the project against these indicators can be objectively monitored and measured on an ongoing basis.

### 1. Economic: Does the project contribute to national economic development?

Yes. The project i.e. the Programme of Activities, is expected to contribute to national economic development. The programme will support the development and implementation of small-scale renewable energy projects in South Africa. These projects will contribute to South Africa's fiscal revenues through payment of taxes, and are also expected to attract foreign direct investment. The project will also lead to technology transfer and improvement of skill in South Africa on the development, construction, operation and maintenance renewable energy power plants. This skill can be replicable for similar projects. Toitdale Concentrated Solar PV project purposes to implement a concentrated photovoltaic power plant in South Africa that will provide electricity to the South African national grid. For an economy to develop, energy is needed. The Integrated Resource Plan 2010-2030, published by the Department of Energy (DOE) and the National Energy Regulator of South Africa (NERSA), predicts that by 2030 the power generation capacity of South Africa will double to 89,532MW to meet the rising energy demand. It is expected that solar photovoltaic energy technologies will constitute 9.4% of the future capacity, i.e. approximately 8,400 MW. The proposed project will assist the country to meet its generation requirements.

### 2. Social: Does the project contribute to social development in South Africa?

Yes. The project i.e. the Programme of Activities, is expected to contribute to social development. The small-scale renewable energy projects in South Africa under this program will support the national policy goal of achieving 10% penetration for wind and solar PV technologies as a share of total installed capacity in 2020, and 20% in 2030. The project is also expected to provide local employment opportunities during the construction and operation phase of CPAs under the PoA, as well as provide transfer of technological know how and transfer of technology to South Africa since it will involve the development of various renewable energy projects. The programme implementation is expected to result in stable electricity supply in South Africa.

As a project, Toitdale Concentrated Solar PV project will meet all the requirements for economic development as set out in Volume 5 of the Request for Qualification and Proposals for New Generation Capacity under the IPP Procurement Programme in terms of job creation, local content, ownership, management control, preferential procurement, enterprise development and socio-economic development contributions. Volume 5 of the Request for Qualifications provides quantitative targets for the different elements of the economic development programme. Therefore, the elements can be objectively monitored and measured on an ongoing basis.

### 3. Environmental: Does the project conform to the National Environmental Management Act principles of sustainable development?

Yes. The project conforms to the National Environmental Management Act principles of sustainable development as shown below.

i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be

All projects under this PoA will comply with appropriate regulations applicable to the environment including the National Environmental Management Act (NEMA) Environmental Impact Assessment regulations

<p>avoided, are minimised and remedied</p>	<p>wherein is specified the type of projects that require an EIA assessment, either a basic assessment or scoping report. It is expected that the EIA process will address the issue of the specific CPA's possible effect (if any) on ecosystems and biological diversity.</p> <p>According to the Basic assessment report submitted to the Department of Environmental Affairs of South Africa, the Toitdale Concentrated Photovoltaic Project is located in an area whose vegetation type is quite extensive and whose animal species are listed as least concern therefore they have widespread species and stable populations. The basic report also points out that due to the small scale nature of this project, impacts to the populations of the few listed species is likely to be small. The project's EMP also provides a list of mitigation measures that may be taken to minimize the impacts on and loss of vegetation that may occur during the construction phase of the project activity.</p>
<p>ii) That <b>pollution and degradation of the environment</b> are avoided, or where they cannot be altogether avoided, are minimised and remedied</p>	<p>As indicated above, all projects under this PoA will comply with the appropriate regulations applicable to the environment including the National Environmental Management Act (NEMA) Environmental Impact Assessment regulations wherein is specified the type of projects that require an EIA assessment, either a basic assessment or scoping report. Therefore it is expected that the EIA process will address the issue of any possible pollution and degradation of the environment as a result of the specific CPA's under the PoA and provide mitigation in form of an Environmental Management Programme (EMP).</p> <p>The Toitdale Concentrated Photovoltaic project has carried out a Basic Assessment and has put together a proper EMP which highlights the mitigation measures that will be put into effect in order to minimize possible pollution that would occur during the construction and operation phase of the project specific CPA's. The South African Department of Environmental Affairs has approved these and issued a ROD.</p>
<p>iii) That the <b>disturbance of landscapes and sites that constitute the nation's cultural heritage</b> is avoided, or where it cannot be altogether avoided, is minimised and remedied</p>	<p>All projects under this PoA will comply with the appropriate regulations applicable to the environment including the National Environmental Management Act (NEMA) Environmental Impact Assessment regulations wherein is specified the type of projects that require an EIA assessment, either a basic assessment or scoping report. Therefore it is expected that the EIA process will address the issue of disturbance of landscapes and sites that constitute the nation's cultural heritage for each CPA to be included in the PoA.</p> <p>According to the Basic Assessment report prepared for the Toitdale Concentrated Photovoltaic Project, an archaeological impact assessment study was carried out that concluded that the area is considered to have low cultural significance. Furthermore, mitigation measures in the event that such heritage objects are discovered in the area have been described in the EMP.</p>
<p>iv) That <b>waste is avoided</b>, or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner</p>	<p>As described above the specific CPA's that will constitute the programme of activities will comply with the National Environmental Management Act (NEMA) Environmental Impact Assessment regulations wherein is specified the type of projects that require an EIA assessment, either a basic assessment or scoping report. The issue of waste avoidance and disposal will therefore be addressed as part of the EIA process for the specific CPAs.</p> <p>According to the Basic Assessment report prepared for the Toitdale Concentrated Photovoltaic Project, reputable waste disposal companies will be used to dispose the construction wastes that will be produced no liquid effluent other than sewage will be produced. More details on the waste avoidance and management procedures are outlined in the EMP.</p>

<p>v) That the use and exploitation of non-renewable resources is responsible and equitable, and takes into account the consequences of the depletion of the resource</p>	<p>The PoA will include CPA's implementing electricity generating projects such from hydro, wind, and solar photovoltaic (PV). These are considered renewable energy projects and as such there will be no exploitation of non-renewable resources.</p> <p>The Toitdale Concentrated Photovoltaic Project will involve the implementation of a 10 MW concentrated solar PV power plant therefore will not result in exploitation of non-renewable resources.</p>
<p>vi) That the development, use and exploitation of renewable resources is responsible and equitable, and takes into account the consequences of the depletion of the resource.</p>	<p>Individual CPAs will ensure that the development, use and exploitation of renewable resources is responsible and equitable, and takes into account the consequences of the depletion of the resource. The</p> <p>Toitdale Concentrated Solar PV project activity involves the exploitation of energy from the sun which cannot be depleted as a result of exploitation but is subject to variation in insolation.</p>
<p>vii) That a risk averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions</p>	<p>All projects under this PoA will comply with appropriate regulations applicable to the environment including the National Environmental Management Act (NEMA) Environmental Impact Assessment regulations wherein is specified the type of projects that require an EIA assessment, either a basic assessment or scoping report.</p> <p>It is expected that the EIA process will address the underlined issue. This approach was applied in the EIA process for the Toitdale Concentrated PV project.</p>
<p>vii) That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied</p>	<p>The specific CPA's that will constitute the programme of activities will comply with the National Environmental Management Act (NEMA) Environmental Impact Assessment regulations wherein is specified the type of projects that require an EIA assessment, either a basic assessment or scoping report. The EIA process will ensure that negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.</p> <p>This was applied in the Basic Assessment conducted for the Toitdale Concentrated PV Project.</p>
<p><b>Other comments</b>  Please provide any other comments on how this project contributes to sustainable development in South Africa (<i>optional</i>)</p> <p>No additional comments.</p>	

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Environmental	Impact on local environmental quality	<p>Individual CPAs involve the construction and implementation of different renewable technologies. Therefore, the impact of the local environmental quality will also be different.</p> <ul style="list-style-type: none"> <li>• Air quality: All the projects under this Programme of Activities are expected to result in an improvement of the air quality since they will result in a reduction of CO2 emissions from electricity generation in fossil fuel fired power plants that will be displaced as a result of the implementation of the projects. The emission reductions will be monitored as required under the CDM. Toitdale will have a positive impact for that same reason.</li> <li>• Water pollution: According to the Toitdale Concentrated PV project Basic Assessment report, the project is expected to have minimal negative impacts on water resources. The project will use water to clean the CPV panels once every 3 months. The project is expected to have minimal if no effects on water in terms of pollution. Pollution due to run off has also been taken into consideration and control measures for flooding will be put in place accordingly. These have been detailed in the EMP where it is mentioned that a water management plan will be developed as part of the EMP.</li> <li>• Waste: The Basic Assessment report for the Toitdale Concentrated Photovoltaic Project indicates that the project will not produce any wastes during its operational stage. The project will produce some solid waste during the construction phase. Solid waste shall be stored in a designated area within the site area in covered, tip proof drums for collection and disposal. Disposal of solid waste shall be at a DEA licensed landfill site, or at a site approved by DEA in the event that an existing operating landfill site is not within reasonable distance from the site. No waste shall be burned.</li> <li>• Visual Impact: The project's visual impact is expected to be predominantly low. Although the trackers that will contain the photovoltaic modules will be seen from the surrounding areas, there is no specific scenery constraints.</li> </ul>

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
	<p style="text-align: center;">Change in usage of natural resources</p>	<ul style="list-style-type: none"> <li>• Impact of the project on community access to natural resources</li> <li>• Impact of the project on the sustainability of use of water, minerals or other non renewable natural resources</li> <li>• Impact of the project on the efficiency of resource utilisation</li> </ul> <p>It should be noted that Individual CPAs will have different impacts on the change in usage of natural resources which will be addressed through the EIA process.</p>
	<p style="text-align: center;">Impacts on biodiversity and ecosystems</p>	<ul style="list-style-type: none"> <li>• Changes in local or regional biodiversity arising from the project</li> </ul> <p>Impact on biodiversity: The Toitdale concentrated PV project that forms the first CPA in the project is expected to have minimal impacts on the areas biodiversity as was concluded in the Basic Assessment report.</p> <p>It should be noted that Individual CPAs will have different impacts on the change in usage of natural resources which will be addressed through the EIA process.</p>

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Economic	Economic impacts	<ul style="list-style-type: none"> <li>• Impact of the project on foreign exchange requirements</li> <li>• Impact of the project on existing economic activity in the area</li> <li>• Impact of the project on the cost of energy</li> <li>• Impact of the project on foreign direct investment</li> </ul> <p style="margin-top: 20px;">• Impact on foreign exchange: Toitdale will employ solar energy in order to generate electricity that will result in reduction of CO2 emissions resulting in tradable certified emission reductions. These are expected to attract foreign direct investment and so aid the country to meet its foreign exchange requirements. In most cases, projects will increase the foreign direct investment in South Africa as the equity partners may be in some cases, foreign companies willing to invest in South Africa. Therefore, the project will have a positive impact.</p> <p>• Impact on the existing economic activities: Cattle farming is the predominant economic activity on the project area, and after construction it will still be possible to develop that activity, so there is no impact.</p> <p>• Impact on cost of energy: Toitdale Concentrated Solar PV project is expected to result in the stabilisation of the cost of electricity on the longer term since they will result in an increase in the electricity capacity of the South African grid system.</p> <p>• Impact on foreign direct investment: The total investment cost for Toitdale Concentrated Solar PV project is estimated 277 500 000 ZAR part of which will be financed through foreign direct investment.</p> <p style="margin-top: 20px;">  It should be noted that Individual CPAs will have different impacts on the change in usage of natural resources which will be addressed through the EIA process.</p>

**Indicators in Support of the Project Approval Criteria**

Category	Indicator	Comment
Appropriate technology transfer	<ul style="list-style-type: none"> <li>• Positive or negative implications for the transfer of technology to South Africa arising from the project</li> <li>• Impacts of the project on local skills development</li> <li>• Demonstration and replication potential of the project</li> </ul>	<ul style="list-style-type: none"> <li>• Implementation of the Toitdale wind power project will have a positive impact on the transfer of concentrated solar photovoltaic energy technology to South Africa, as well as know-how skills for local workers. The transfer of technology and know-how will be directly replicable to other future wind energy projects. Transfer of environmentally safe and sound technology will take place through the introduction of state-of-the-art concentrated solar photovoltaic technology. Transfer of know-how will take place through the training of local engineers and other technical staff by the Operations and Maintenance contractor with the support of the module manufacturer. The module manufactures as well as assuring performance standards for the solar power plant will also provide oversight of the maintenance and operation of the modules during its lifetime. This is also in line with the economic development requirements under Volume 5 of the Request for Qualifications and Proposals for New Generation Capacity under the IPP Procurement Programme.</li> <li>• Demonstration and replication potential: It is expected that the implementation of these renewable energy projects will facilitate the future replication of those projects in the South Africa and in the neighboring countries, since once the skills and expertise is built in South Africa, it will be easier for other projects to come.</li> </ul> <p>I It should be noted that Individual CPAs will have different impacts on the change in usage of natural resources which will be addressed through the EIA process.</p>

**Indicators in Support of the Project Approval Criteria**

Category	Indicator	Comment
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## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Social	<p style="text-align: center;">Alignment with national provincial and local development priorities</p> <ul style="list-style-type: none"> <li>• How the project is aligned with provincial and national government objectives</li> <li>• How the project is aligned with local developmental objectives</li> <li>• Impact of the project on the provision of, or access to, basic services to the area</li> <li>• Impact of the project on the relocation of communities if applicable</li> <li>• Contribution of the project to a any specific sectorial objectives (for example, renewable energy targets)</li> </ul>	<p>Individual CPAs will employ different renewable technologies hence their alignment with the national provincial and local development priorities will also be different. To that effect, the mentioned priorities will be demonstrated at the CPA level.</p> <ul style="list-style-type: none"> <li>• Alignment with provincial and national objectives: Toitdale Concentrated Solar PV project is aligned with the White Paper on the Energy Policy for South Africa (Energy White Paper) which aims to create energy security by diversifying energy supply and energy carriers and sets out the policy principles, goals and objectives to achieve, “An energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation”</li> <li>• Alignment with local objectives: Toitdale project is aligned with the following local developmental objectives of uplifting the local community via funding from the project as well as job creation.</li> <li>• Impact on access to basic services to the area: Toitdale project will still allow the same access to the basic services that the area has been providing until now, so there is no impact to be accounted.</li> <li>• Impact on relocation of communities: Toitdale project will not result in relocation of communities, therefore there is no negative impact.</li> <li>• Contribution to sectorial objectives: Toitdale project will contribute to the Department of Energy’s target of having 9.4% of the future installed capacity in 2030 be based on solar photovoltaic energy.</li> </ul>

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
<p style="text-align: center;">Social equity and poverty alleviation</p>	<ul style="list-style-type: none"> <li>• Impact of the project on employment levels? (specify the number of jobs created/lost; the duration of time employed, distribution of employment opportunities, types of employment, categories of employment changes in terms of skill levels and gender and racial equity)</li> <li>• Impact of the project on community social structures</li> <li>• Impact of the project on social heritage</li> <li>• Impact of the project on the provision of social amenities to the community in which the project is situated</li> <li>• Contribution of the project to the development of previously underdeveloped areas or specially designated development nodes</li> </ul>	<p>Individual CPAs will have different social, equity and poverty alleviation levels owing to the fact that they would employ different technologies in addition to their capacities also being different. As such, the individual CPAs will have different impacts on employment levels, social heritage, provision of social amenities and contribution to development of previously underdeveloped regions.</p> <ul style="list-style-type: none"> <li>• Impact on employment levels: Toitdale Concentrated PV project reports in its Basic Assessment report that a number of jobs will be created mostly in the project construction phase that may take approximately 6 months. Approximately 50 new employment opportunities will be created in the development phase of the project activity. The same assessment report indicates that 2 new permanent jobs will be created by the project. The EMP of the same project provides mitigation measures to ensure that local labor is employed and are provided with capacity building and skills training.</li> <li>• Impact on community social structures: Toitdale Concentrated Solar PV project will have no impact on community social structures.</li> <li>• Impact on social heritage: Toitdale Concentrated Solar PV project will have no impact on social heritage.</li> <li>• Impact on the provision of social amenities to the community: Toitdale Concentrated Solar PV project will implement a socio-economic development plan in line with the economic development requirements under the Request for Qualification and Proposal for New Generation Capacity under the IPP Procurement Programme. The socio-economic development plan will be based on the needs that will have been identified in the surrounding communities (e.g. health, educations, etc.). Similarly, the project will implement an enterprise development plan in the project area supporting local enterprises.</li> <li>• Toitdale solar project will have no impact on underdeveloped areas.</li> </ul>

### Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
General	General Project Acceptability <ul style="list-style-type: none"><li>• Are the distribution of project benefits deemed to be reasonable and fair?</li></ul>	As part of the IPP Procurement Programme, the Department of Energy has formulated specific economic development targets which need to be met by the projects. The economic development targets focus on job creation, local content, fostering rural development, etc. In complying with the targets, Toitdale Concentrated Solar PV project will ensure that the distribution of the benefits from it will be reasonable and fair.

## Part D: Finance

<b>Project Costs</b>	
Development Costs (R's )	R 7 500 000
Installed Costs (R's)	R 312 000 000
Other Costs (R's)	R 12 000 000
<b>Total Project Costs (R's)</b>	<b>R 331 000 000</b>
<b>Sources of Finance</b>	
Equity	R 82 875 000
Debt (long term)	R 248 250 000
Debt (short term)	R 2 000 000
Amount not identified (R's)	
<b>Total CDM Contribution sought</b>	n/a
Expected Price of CER in case of a contract to purchase for: A period of 7 years A period of 10 years A period of 14 years (2x7 years)	The crediting period per CPA is defined as 7 years however the pricing is subject to negotiation between the CPA and the CME. Current pricing is 3.57 Euro but it is anticipated that 6-8 Euros is achievable in the short to medium term.
Indicate the <b>projected Internal Rate of Return</b> for the project with and without CER revenues.	<i>12.5% with out CC</i> <i>14.5% with CC</i>
<b>Constraints on tradability of carbon credits</b>	None, but subject to legislation, current and future
<b>Preliminary discussions with potential purchasers</b>	No discussions have taken place with potential CER off takers.