

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 (one copy) and electronic formats (MSWord)
2. The information submitted to the DNA in this PIN will remain confidential.
3. Please ensure that all fields are filled in as far as possible to allow for proper consideration of the proposed project. Please indicate if information is not available for any particular item and reasons for the unavailability of information.

Part A: Project Proponent Details

Project Name	Southern African Renewable Energy (SARE) PoA
Date of Submission of PDD	PoA-DD and first CPA-DD submitted: 07/02/2012

Project Developer	
Name	EcoMetrix Africa
Organizational Category	Private Company
Legal Status	Privately held limited liability company
Street Address	43 Peter Place, Bryanston, Johannesburg, South Africa
Postal Address (if different from above)	PO Box 418 Cramerview 2060
Website Address	www.ecometrix.co.za
Main Activities	EcoMetrix Africa is focused on the provision of services and development of projects which result in the mitigation of climate change or assist entities to participate in the low carbon economy.

Summary of Financial Performance in last fiscal year	Company has been operating for a year and has audited revenue of approximately R5 million.
Contact Person(s)	Graham Paul
Telephone	Work: +27(0)11 463 1009 Cell: +27(0)78 152 9191
Fax	011 463 4513
Email Address	graham.paul@ecometrix.co.za
Project Partners 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 organisation)	
Name	African Rainbow Energy (Pty) Ltd
Nature of partner	Private Company
Organizational Category	Private Company
Legal Status (if private company)	Private Company
Street Address	Via della Rotonda 36 Roma 00186 Italy
Postal Address (if different to Street Address)	
Website Address	
Main Activities	Renewable energy project development
Contact Person(s)	Thierry Rault
Telephone	+39 335 1696013
Fax	
Email Address	Thierry.rault@medenergygroup.com
Contractual Arrangements	
Contractual arrangements between various entities involved	Contractual arrangements vary from participant to participant under the programme.

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

Technical Summary of the project	
Objective of the Project	This programme of activities (hereafter referred to as the "PoA") is a programme for the development of renewable energy projects that will supply energy to the national grid within the country of

Technical Summary of the project

concern. The stated objective of this programme is to incentivise broad scale investment in renewable energy technology and reduce dependence on fossil fuels electricity. This will help to reduce the associated CO₂ emissions in Southern Africa by displacing electricity produced by coal or other carbon-intensive fossil fuels through the use of renewable energy (solar, wind, hydro, geothermal, wave and tidal power).

In addition the PoA will contribute to activities aimed at growing and strengthening the renewable energy industry in the Countries. Whilst the countries involved in this PoA are well known to have little or no oil or natural gas reserves, they do have well developed coal reserves and considerably undeveloped, but promising renewable energy resources.

Project Description

A typical CPA will consist of a grid-connected renewable power generation project that is eligible under ACM0002 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” version 12.1.0. Typical CPAs will include power generation by solar, hydro, wind, geothermal, wave, or tidal power technology which will supply power to the grid.

A typical CPA project activity is one of:

- a) installation of a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant);
- b) involves a capacity addition;
- c) involves a retrofit of (an) existing plant(s); or
- d) involves a replacement of (an) existing plant(s). The grid-connected renewable power generation CPA project activity will be developed within the borders of the Countries.

“Southern African Renewable Energy (SARE) Programme - African Rainbow Energy PV CPA” is the first CPA under this PoA. Ecometrix Africa (Pty) Ltd is the coordinating and managing entity (CME) of the PoA. African Rainbow Energy (Pty) Ltd is the CPA implementing entity.

This CPA consists of a single, grid connected installation of a system of solar photovoltaic (PV) panels of approximately 25MW installed capacity on farm UPA 418 near Upington, Northern Cape Province, South Africa (28° 23’ 14” S, 21° 22’ 26” E). There is currently no installation relating to electricity generation of any sort at this site.

The use of solar energy for the production of electricity displaces the baseline production of grid electricity. Currently grid electricity is primarily derived from the combustion of coal in South Africa (section B.3 provides the baseline scenario which is alternative 2: continuation of the current situation - the proposed CPA is not developed and power continues to be supplied solely from the existing grid) and thus the project, using solar photovoltaic systems to generate electrical energy, has a significant effect on reducing GHG emissions related to electricity usage.

Project Constraints

No constraints to project development.

Technical Summary of the project

Technology to be employed

A typical CPA project activity is one of:

- a) installation of a new power plant at a site where no renewable power plant was operated prior to the implementation of the project activity (greenfield plant);
- b) involves a capacity addition;
- c) involves a retrofit of (an) existing plant(s); or
- d) involves a replacement of (an) existing plant(s). The grid-connected renewable power generation CPA project activity will be developed within the borders of the Countries.

A grid-connected renewable power generation CPA may be one technology of either a:

- hydro power plant/unit (either with a run-of-river reservoir or an accumulation reservoir),
- wind power plant/unit,
- geothermal power plant/unit,
- solar power plant/unit,
- wave power plant/unit; or
- tidal power plant/unit.

A CPA under this PoA may be a single plant or a cluster of such plants employing the same technology undertaken by the same project developer.

The Programme will initially involve the following technologies:

- Different types of photovoltaic ‘solar’ panels that generate electrical power by converting solar radiation into electricity via a panel composed of a number of cells containing a photovoltaic material. The panels are placed in direct sunlight and may be complemented with a battery pack to store electricity for use after dark;
- Solar thermal plants, i.e. concentrated solar thermal, that use solar energy to produce high temperatures in a working fluid which is used to produce electricity usually through a steam turbine;
- Hydro power plants which use the potential energy stored in water reservoirs or the natural course of rivers, to produce electricity;
- Wind turbine farms which use wind energy converted via a large wind turbine into electrical energy which is supplied to the grid;
- Geothermal energy plants which use the heat available in subterranean locations to heat a working fluid which is then used to produce electricity usually by way of a steam turbine.

This first CPA consists of a single, grid connected installation of a system of solar photovoltaic (PV) panels of approximately 25MW installed capacity on farm UPA 418 near Upington, Northern Cape Province, South Africa (28° 23’ 14” S, 21° 22’ 26” E).

Greenhouse Gases Targeted

Technical Summary of the project	
	CO2: Carbon dioxide
Emission reductions	For Southern African Renewable Energy (SARE) Programme - African Rainbow Energy PV CPA - estimated 366,012 tCO2 over the 7 year crediting period (ave: 52,287 tCO2 per year). The emission reduction for each CPA will vary considerably depending on the nature of that CPA.
Baseline & Additionality Assessment	<p>The methodology used in this CPA is ACM0002 - Consolidated baseline methodology for grid-connected electricity generation from renewable sources - v12.1.0, EB58. The use of solar energy for the production of electricity displaces the baseline production of grid electricity. Currently grid electricity is primarily derived from the combustion of coal in South Africa. The CPA-DD provides the baseline scenario which is: the continuation of the current situation - the proposed CPA is not developed and power continues to be supplied solely from the existing grid.</p> <p>The methodology stipulates the use of the Tool for the demonstration and assessment of additionality v06.0.0, EB65, Annex21. Additionality is demonstrated using benchmark analysis. The CPA-DD contains the conclusion that the project developer has a more financially attractive, and economically reasonable, alternative of investing in the equity market. Therefore the African Rainbow Energy PV CPA is additional and would not have occurred without registration as a CDM project (i.e. a CPA within this PoA).</p>
Monitoring	The PoA-DD and CPA-DD contain details of the monitoring plans as well as details of the parameters that will be monitored - as per the methodology.
Type of project/activities	<i>Identify which type of activity is involved in this project - and for each, provide brief details</i>
a. Energy Supply	Each CPA shall provide clean source (renewable) energy.
b. Energy Demand	<i>n/a</i>
c. Industrial Process	<i>n/a</i>
d. Transport	<i>n/a</i>
e. Waste Management	<i>n/a</i>
f. Forestry/ land use	<i>n/a</i>
g. Other	<i>n/a</i>
Project Boundary	
The PoA is located within the following Southern African countries: Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe. This CPA is located with the geographical boundary of South Africa, which is a host country to the PoA. The region chosen for this CPA is not the entire host country of South Africa - this CPA (and every CPA registered within the large scale SARE Programme) will be one grid connected renewable energy installation.	

Technical Summary of the project

Indicate Emissions outside the Project Boundary	n/a
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Location of the Project

Province	The PoA is located within the following Southern African countries: Botswana, Lesotho, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe. This CPA is located with the geographical boundary of South Africa, which is a host country to the PoA. The region chosen for this CPA is not the entire host country of South Africa - this CPA (and every CPA registered within the large scale SARE Programme) will be one grid connected renewable energy installation.
Municipality	
Nearest city/large town	Upington
Brief description of the location of the project site	This CPA consists of a single, grid connected installation of a system of solar photovoltaic (PV) panels of approximately 25MW installed capacity on farm UPA 418 near Upington, Northern Cape Province, South Africa (28° 23' 14" S, 21° 22' 26" E).

Project Schedule/Timetable

Earliest Project Start Date	September 2012 (Date of registration of the PoA)
When is the expected first year of CER delivery	2013
Project Lifetime	28 years
Project End Date	PoA end date is 2040
Crediting Period	3x7
Current Status or phase of the project	The project activity is currently in development.
DNA Approval	This project has not previously been submitted to the DNA for approval.
Approval by other bodies	The project has not been submitted to any government departments for regulatory approval.

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?

This CPA contributes to sustainable development in South Africa through development and investment in renewable energy technology and assisting South Africa meet its renewable energy target of 10,000GWh renewable energy contribution to energy consumption by 2013 and in doing so reduce dependence on fossil fuel based electricity. This CPA contributes to national social and economic development as the project will create employment opportunities at the project site. During the peak construction phase it is envisaged that there would be 300 individuals employed with at least 150 of these being local. During operation (0-30 years) there will be a requirement for 11 employment positions (3 technicians, 6 assistants, and 2 security personnel). Foreign direct investment will also occur through the implementing entity's international sister-company. Furthermore, the project contributes to the renewable energy development in South Africa and helps to alleviate the potential energy scarcity crisis in South Africa.

Broad scale investment in renewable energy technology has not taken place as is evident by the limited number of commercial renewable energy projects in South Africa, and hence the limited amount of electricity that is produced using renewable energy. Investment in the host country will allow for the growth and strengthening of these renewable energy industries. This will include the transfer of renewable energy technologies and associated knowledge and experience.

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

This CPA contributes to sustainable development in South Africa through development and investment in renewable energy technology and assisting South Africa meet its renewable energy target of 10,000GWh renewable energy contribution to energy consumption by 2013 and in doing so reduce dependence on fossil fuel based electricity. This CPA contributes to national social and economic development as the project will create employment opportunities at the project site. During the peak construction phase it is envisaged that there would be 300 individuals employed with at least 150 of these being local. During operation (0-30 years) there will be a requirement for 11 employment positions (3 technicians, 6 assistants, and 2 security personnel). Foreign direct investment will also occur through the implementing entity's international sister-company. Furthermore, the project contributes to the renewable energy development in South Africa and helps to alleviate the potential energy scarcity crisis in South Africa.

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

Please provide brief comment for each of these below.

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

Negligible - see the details of the EIA report as provided in the CPA-DD - The final EIA report states that there are no impacts of high significance that can be associated with the PV facility. Further, the majority of identified impacts are restricted to the site itself and can be mitigated to the site itself and all identified impacts can be mitigated to acceptable levels.

ii) That pollution and degradation of the environment are avoided, or where they cannot be altogether avoided, are minimised and remedied

Negligible - see the details of the EIA report as provided in the CPA-DD - The final EIA report states that there are no impacts of high significance that can be associated with the PV facility. Further, the majority of identified impacts are restricted to the site itself and can be mitigated to the site itself and all identified impacts can be mitigated to acceptable levels.

iii) That the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied	n/a
iv) That waste is avoided , or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner	Negligible - see the details of the EIA report as provided in the CPA-DD - The final EIA report states that there are no impacts of high significance that can be associated with the PV facility. Further, the majority of identified impacts are restricted to the site itself and can be mitigated to the site itself and all identified impacts can be mitigated to acceptable levels.
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	n/a
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.	Renewable resources are used in a responsible and equitable way. See the details of the EIA report as provided in the CPA-DD - The final EIA report states that there are no impacts of high significance that can be associated with the PV facility. Further, the majority of identified impacts are restricted to the site itself and can be mitigated to the site itself and all identified impacts can be mitigated to acceptable levels.
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	Negligible - see the details of the EIA report as provided in the CPA-DD - The final EIA report states that there are no impacts of high significance that can be associated with the PV facility. Further, the majority of identified impacts are restricted to the site itself and can be mitigated to the site itself and all identified impacts can be mitigated to acceptable levels.
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	The project will adopt a risk averse and cautious approach, including the risk assessment on health, safety and environment as per the rules and regulations of the CDM.
Other comments Please provide any other comments on how this project contributes to sustainable development in South Africa (optional)	

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment	
Environmental	Impact on local environmental quality	<ul style="list-style-type: none"> • Impact of the project on air quality • Impact of the project on water pollution • Impact of the project on the generation or disposal of solid waste • Any other positive or negative environmental impacts of the project (such as impacts on noise, safety, visual impacts, or traffic) 	<p>The final EIA report states that there are no impacts of high significance that can be associated with the PV facility. Further, the majority of identified impacts are restricted to the site itself and can be mitigated to the site itself and all identified impacts can be mitigated to acceptable levels.</p> <p>The final EIA report also speaks of the positive implications of establishing a solar energy facility on the identified site. The details of the EIA are provided in the CPA-DD.</p>
	Change in usage of natural resources	<ul style="list-style-type: none"> • Impact of the project on community access to natural resources • Impact of the project on the sustainability of use of water, minerals or other non renewable natural resources • Impact of the project on the efficiency of resource utilisation 	<p>The final EIA report states that there are no impacts of high significance that can be associated with the PV facility. Further, the majority of identified impacts are restricted to the site itself and can be mitigated to the site itself and all identified impacts can be mitigated to acceptable levels.</p> <p>The final EIA report also speaks of the positive implications of establishing a solar energy facility on the identified site. The details of the EIA are provided in the CPA-DD.</p>
	Impacts on biodiversity and ecosystems	<ul style="list-style-type: none"> • Changes in local or regional biodiversity arising from the project 	<p>Negligible. See the details of the EIA report as provided in the CPA-DD - The final EIA report states that there are no impacts of high significance that can be associated with the PV facility. Further, the majority of identified impacts are restricted to the site itself and can be mitigated to the site itself and all identified impacts can be mitigated to acceptable levels.</p>

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Economic	Economic impacts	<ul style="list-style-type: none"> • Impact of the project on foreign exchange requirements • Impact of the project on existing economic activity in the area • Impact of the project on the cost of energy • Impact of the project on foreign direct investment <p>This CPA contributes to sustainable development in South Africa through development and investment in renewable energy technology and assisting South Africa meet its renewable energy target of 10,000GWh renewable energy contribution to energy consumption by 2013 and in doing so reduce dependence on fossil fuel based electricity. This CPA contributes to national social and economic development as the project will create employment opportunities at the project site. During the peak construction phase it is envisaged that there would be 300 individuals employed with at least 150 of these being local. During operation (0-30 years) there will be a requirement for 11 employment positions (3 technicians, 6 assistants, and 2 security personnel). Foreign direct investment will also occur through the implementing entity's international sister-company. Furthermore, the project contributes to the renewable energy development in South Africa and helps to alleviate the potential energy scarcity crisis in South Africa.</p>

Indicators in Support of the Project Approval Criteria		
Category	Indicator	Comment
	<p>Appropriate technology transfer</p> <ul style="list-style-type: none"> • Positive or negative implications for the transfer of technology to South Africa arising from the project • Impacts of the project on local skills development • Demonstration and replication potential of the project 	<p>This CPA contributes to national social and economic development as the project will create employment opportunities at the project site. During the peak construction phase it is envisaged that there would be 300 individuals employed with at least 150 of these being local. During operation (0-30 years) there will be a requirement for 11 employment positions (3 technicians, 6 assistants, and 2 security personnel). Foreign direct investment will also occur through the implementing entity's international sister-company. Furthermore, the project contributes to the renewable energy development in South Africa and helps to alleviate the potential energy scarcity crisis in South Africa.</p> <p>Broad scale investment in renewable energy technology has not taken place as is evident by the limited number of commercial renewable energy projects in South Africa, and hence the limited amount of electricity that is produced using renewable energy. Investment in the host country will allow for the growth and strengthening of these renewable energy industries. This will include the transfer of renewable energy technologies and associated knowledge and experience which will allow for the replication of these projects in the future.</p>

Indicators in Support of the Project Approval Criteria		
Category	Indicator	Comment

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Social	<p>Alignment with national provincial and local development priorities</p> <ul style="list-style-type: none"> • How the project is aligned with provincial and national government objectives • How the project is aligned with local developmental objectives • Impact of the project on the provision of, or access to, basic services to the area • Impact of the project on the relocation of communities if applicable • Contribution of the project to a any specific sectoral objectives (for example, renewable energy targets) 	<p>The project complies with Government policy:</p> <ul style="list-style-type: none"> • Promotion of CDM; • Improvement of environmental quality; • Reduction on reliance of fossil fuels and aiding the country meet renewable energy targets; • Enhancing economic development and job creation; • Greenhouse gas reduction. <p>No relocation of communities will take place.</p> <p>The project will assist in addressing the energy scarcity within the Southern African nations.</p>

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"> • 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) • Impact of the project on community social structures • Impact of the project on social heritage • Impact of the project on the provision of social amenities to the community in which the project is situated • Contribution of the project to the development of previously underdeveloped areas or specially designated development nodes 	<p>This CPA contributes to sustainable development in South Africa through development and investment in renewable energy technology and assisting South Africa meet its renewable energy target of 10,000GWh renewable energy contribution to energy consumption by 2013 and in doing so reduce dependence on fossil fuel based electricity. This CPA contributes to national social and economic development as the project will create employment opportunities at the project site. During the peak construction phase it is envisaged that there would be 300 individuals employed with at least 150 of these being local. During operation (0-30 years) there will be a requirement for 11 employment positions (3 technicians, 6 assistants, and 2 security personnel). Foreign direct investment will also occur through the implementing entity's international sister-company. Furthermore, the project contributes to the renewable energy development in South Africa and helps to alleviate the potential energy scarcity crisis in South Africa.</p> <p>Broad scale investment in renewable energy technology has not taken place as is evident by the limited number of commercial renewable energy projects in South Africa, and hence the limited amount of electricity that is produced using renewable energy. Investment in the host country will allow for the growth and strengthening of these renewable energy industries. This will include the transfer of renewable energy technologies and associated knowledge and experience.</p>

Indicators in Support of the Project Approval Criteria

Category	Indicator	Indicator	Comment
General	General Project Acceptability	<ul style="list-style-type: none"> • Are the distribution of project benefits deemed to be reasonable and fair? 	<p>The project will benefit the Sothern African community through the provision of renewable energy, and the creation of jobs. Furthermore, it will contribute towards to sustainable economic and global emission reductions. The international experts involved on the project development will contribute to knowhow transfer into South Africa.</p>

Part D: Finance

Project Costs	
Development Costs (R's)	See total project cost below
Installed Costs (R's)	Not available.
Other Costs (R's)	Not available.
Total Project Costs (R's)	Total Construction Cost: R-612,983,167 Average O&M Cost: R-19,570,190
Sources of Finance	
Equity	20%
Debt (long term)	80%
Debt (short term)	n/a
Amount not identified (R's)	n/a
Total CDM Contribution sought	The project Southern African Renewable Energy (SARE) Programme - African Rainbow Energy PV CPA is estimated to produce 366,012 tCO2 over the 7 year crediting period (ave: 52,287 tCO2 per year).
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)	There is currently no purchase agreement signed with anyone. Expected price of CERs is 10 Euro/tCO2.
Indicate the projected Internal Rate of Return for the project with and without CER revenues.	n/a
Constraints on tradability of carbon cred	n/a
Preliminary discussions with potential purchasers	No ERPA has been signed at this time