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

Project Name	Small Scale Grid-connected Solar Power Programme
Date of Submission of PDD	26/03/2012

Project Developer	
Name	Camco Carbon Africa Limited (Ltd).
Organizational Category	Private Company.
Legal Status	Limited company.
Street Address	Green Street Channel House St Helier Jersey JE2 4UH Channel Islands
Postal Address (if different from above)	PO Box 70 Woodlands Office Park Western Service Road Woodmead Johannesburg South Africa 2080
Website Address	www.camcoglobal.com

Main Activities	Camco is engaged in identifying and developing greenhouse gas emission reduction projects and provide carbon and sustainable development consultancy services, including emissions assessment, carbon management and strategy and policy work.
Summary of Financial Performance in last fiscal year	
Contact Person(s)	Mr. Arthur Houston, Managing Director, Camco Carbon Africa Limited (Ltd). Mr Jonathan Curren, Managing Director, Camco South Africa
Telephone	Mr. Arthur Houston Work: +44 7717 326572 Cell: +44 7717 326572 Mr Jonathan Curren Work: +27 (0)11 253 3407 Cell: +27 (0)79 543 1899
Fax	+44 2071216101 +27 (0)11 804 1038
Email Address	Project.Participant.af@camcoglobal.com
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	Merino PV Power Project (Pty) Ltd.
Nature of partner	Solar PV project seeking to be listed under this Programme of Activities (PoA). Merino PV Power Project is the first CPA under this PoA.
Organizational Category	Private Company.
Legal Status (if private company)	Limited company.
Street Address	5 Walnut Road Durban KwaZulu-Natal 4001 Republic of South Africa
Postal Address (if different to Street Address)	P O Box 3619 Durban 4000

Website Address	http://astrumenergy.com/
Main Activities	The project developer's primary business is the development of sustainable energy projects, with the objective to promote sustainable energy in South Africa and beyond.
Contact Person(s)	Ms. Yegis Reddy
Telephone	Work: +27 31 301 6444/5 Cell: +27 83 284 6028
Fax	086 698 0283
Email Address	yegis.reddy@astrumenergy.com
Contractual Arrangements	
Contractual arrangements between various entities involved	Camco Carbon Africa Ltd is the coordinating and managing entity (CME) of the PoA. The role of the CME is to assess and review potential CPAs, and work with the CPA implementing entity – through a contractual agreement – to perform the eligibility assessment, complete the CPA-DD, and submit the CPA to the DOE for inclusion into the PoA. An Emission Reduction Purchase Agreement (ERPA) has been signed between Camco Carbon Africa Ltd and Merino PV Power Project (Pty) Ltd for a share of CERs generated by the CPA. Merino PV Power Project is the first CPA under this PoA. A contractual agreement, in the form of an ERPA, will be prepared by the CME and signed by each CPA implementing entity prior to submission of the CPA-DD to a DOE for inclusion into the PoA, which clearly defines the roles of the CME and CPA implementing entity, as well as the ownership of the carbon credits (CERS).

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

Technical Summary of the project	
Objective of the Project	This PoA aims to encourage the development of small scale grid-connected (less than or equal to 15MW) solar photovoltaic and solar thermal electricity technologies (hereinafter referred to as "solar power"). This programme will encourage co-benefits in creating jobs for each CPA included under the PoA while delivering sustainable development benefits through the deployment of low carbon power supplies. Small scale grid-connected solar power projects offer the ability to exploit smaller pockets of solar energy resources that have less of a potentially negative impact on the local environment (such as smaller areas of land taken up by solar arrays). Small scale projects attract capital flows from smaller developers looking for opportunities to enter the market, which helps to create and sustain local businesses and employment.
Project Description This PoA aims to encourage the development of small scale grid-connected solar power projects.	

Technical Summary of the project

Small scale projects do not offer the same economies of scale that larger scale projects benefit from, nor do they necessarily benefit from any enhanced resource availability compared to large scale projects employing the same technologies. The economics of small scale grid-connected solar power remains challenging and this PoA aims to provide, through the CDM, an additional financial flow to assist in mitigating the real and perceived risks of investing in small scale grid-connected solar power, and help to attract new and increased investment flows into small scale grid-connected solar power technologies.

Although the technologies may differ, the objective and outcome is the same for all small scale grid-connected solar power projects under this PoA: The development of economically viable low carbon electrical generation capacity, which delivers power to the national/region grid that would have otherwise have been generated by the operation of existing grid-connected power plants and by the addition of new generation sources to the grid.
Renewable energy is widely considered as an important contribution to sustainable development in Africa. Benefits to sustainable development include that:

- The energy is intrinsically sustainable [i.e. allows natural processes to continue] and without fossil-carbon emissions.
- Additional electricity supply from renewable energy projects to national grids in African countries allows for expansion of grids to new regions where grid connections are not in place, thus increasing access to power to otherwise non- accessed populations.
- Renewable power projects allow for increased power production without the pollution and other environmental impacts (such as transport of fossil fuels) that are typical for a conventional power plant.
- The development of renewable power projects also provides job creation during the construction and operation of the facilities.

Project Constraints
There are currently no known technical or resource constraints affecting the operation or commissions of this Project activity.

Technology to be employed	The PoA is a programme to encourage the development of grid-connected solar photovoltaic and solar thermal electricity technologies in project sizes of a total installed capacity of less than or equal to 15MW. It is envisioned that this would include: • Solar photovoltaic: refers to a technology which uses a device (usually a solar panel) to produce free electrons when exposed to light, resulting in the production of an electric current. • Concentrated solar thermal power (CSP) technologies: Concentrated solar thermal power systems use mirrors or lenses to concentrate a large area of sunlight, or solar thermal energy on to a small area to generate heat, which drives a heat engine (usually a steam turbine) connected to an electrical power generator. *Is the technology one that has been previously tried and tested in South Africa or internationally? If yes, provide details (1 paragraph)* Both Solar PV and CSP technologies have been tried and tested internationally at a great many locations. The PoA will allow for the greater uptake of solar power technologies in South Africa,

Technical Summary of the project	
	along with the added sustainable development benefits such as job creation and low carbon development. *Have the project operators had any previous experience or expertise with operating the technology?* If yes – provide brief details (1-2 lines) All equipment suppliers, installers and operators will be experienced with respect to the technology in use.
Greenhouse Gases Targeted	CO_2
Emission reductions	The Merino PV Power Project is the first CPA under this PoA and is expected to result in annual emission reductions of 11,149tCO_2e per year and a total of 111,490tCO_2e over the ten year crediting period of the CPA. Emission reductions for subsequent CPAs included in this PoA will be calculated in accordance with the methodology described in the PoA-DD and included in the CPA-DD.
Baseline & Additionality Assessment	*Provide an indication of the baseline and additionality approach to be used, with a brief explanation of why the project is additional as defined under the Kyoto Protocol.* The baseline scenario is that the electricity delivered to the grid as a result of each CPA project activity would have otherwise been generated by the operation of grid-connected power plants and/or by the addition of new generation sources to the grid. As per UNFCCC guidance (Annex 24, EB 63 Attachment A of Appendix B version 08.) project types that are explicitly listed in the positive list of grid-connected renewable electricity generation technologies in are automatically defined as additional without further documentation of barriers. Solar technologies up to 15MW of installed capacity are included in the positive list and are there for defined as additional.
Monitoring	The key parameter that will be monitored to verify that emissions reductions are taking place will be quantity of net electricity generation supplied to the grid in each year of the project activity. Other parameters which will be constantly monitored include the any fossil fuels used on site for the project activity operation. Additionally, emission reductions will be verified for each CPA independently. Details of the monitoring plan for each individual CPA will be described at the CPA level in the CPA-DD and each CPA monitoring plan will outline the procedures for monitoring and recording of all relevant parameters. Monitoring data will be submitted to the CME periodically and stored in a safe electronic database. All raw monitoring data will be recorded and stored by the respective CPA implementing entities. The electronic database will enable the CME to track the status of verification for each CPA and ensure no double counting occurs.
Type of project/activities	*Identify which type of activity is involved in this project - and for*

Technical Summary of the project	
	each, provide brief details
a. Energy Supply	*Renewable Energy (excluding biomass)* Grid-connected solar photovoltaic and solar thermal electricity technologies (solar power technologies).
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
Project Boundary Define the Project Boundary (Approximately 1 paragraph) The spatial extent of the project boundary for each CPA includes the project power plant and all power plants connected physically to the electricity system that the CPA project power plant is connected to.	
Indicate Emissions outside the Project Boundary	N/A

Location of the Project	
Province	The first CPA of this PoA is located in: Free State province.
Municipality	Dihlabeng Local Municipality.
Nearest city/large town	Bethlehem.
Brief description of the location of the project site	Approximately 16km south of the town of Bethlehem, in the Free State province of the Republic of South Africa.

Project Schedule/Timetable	
Earliest Project Start Date	The earliest possible start date for first CPA of this PoA is : *2013/June*
When is the expected first year of CER delivery	*2014*
Project Lifetime	The first CPA of this PoA is expected to have a project lifetime of 20 years.
Project End Date	The end date for first CPA of this PoA is : *2033/June*
Crediting Period	The crediting period of this PoA is 27 years. The crediting period for the first CPA of this PoA is 10 years (subsequent CPAs included in this PoA will identify the crediting period in their respective CPA-DDs).
Current Status or phase of the	The first CPA is currently in the planning phase, with construction

Project Schedule/Timetable	
project	expected to commence in June 2013
DNA Approval	*Has this project been submitted to the DNA for approval previously?* No.
Approval by other bodies	*Has this project (or any elements of the project) been submitted to any other national, provincial or local government departments or agencies for regulatory or legal approval (excluding EIA process – see Part C). If so – provide brief details.* No.

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?

Please give details (1 paragraph)

This PoA encourages the development of solar power technologies which will directly boost the South African solar industry and indirectly boost complementary industries such as construction and engineering and therefore support job creation through increased gross domestic product (GDP) contributions. The PoA project activities (CPAs) will provide reliable power to the South African grid and increase the capacity and security of supply of the grid which should impact positively on national economic development. Furthermore, with the potential to expand the PoA to include numerous countries throughout the Southern African Development Community (SADC), the PoA also has the potential to contribute towards positive and sustainable regional economic growth.

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

Please give details (1 paragraph)

The development of renewable power projects under this PoA provides sustainable job creation supporting the growth of the green economy within South Africa and the region. Specifically, in the context of South Africa this PoA will contribute towards job creation as outlined in the Green Economy Accord's "Commitment Three: Rollout of Renewable Energy". 60 job opportunities will be created for the construction phase of the first CPA of this PoA and 5-7 long term jobs will be created for the operating of the project throughout the 20 year life of the project. Future CPAs included under this PoA are expected to be in line with the job creation figures for the first CPA.

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. **The environmental impacts for the Merino P Power Project have been assessed in accordance with the relevant environmental impact assessment (EIA) regulations for South Africa, namely the National Environmental Management Act: Act No. 107 of 1998 and its relevant notices and regulations and therefore conforms to the Act's principles of sustainable development.** **Furthermore, subsequent CPAs added under this PoA, will also conform to the respective laws and requirements for EIAs in South Africa and in the host country of each CPA. While different countries may have different requirements and regulations for EIAs for solar power projects, environmental impacts and sustainable development criteria will be described at the CPA level in the CPA-DD.**	
i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be avoided, are minimised and remedied	*(1 paragraph)* **Disturbance of ecosystems and loss of biological diversity** are negligible for *project activity technologies*.
ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are minimised and remedied	*(1 paragraph)* No **pollution and degradation of the environment** occurs as a result of project activity technologies.
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	*(1 paragraph*) **Disturbance of landscapes and sites that constitute the nation's cultural heritage** are negligible for *project activity technologies*.
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	*(1 paragraph)* No additional **waste** occurs as a result of *project activity technologies*.
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	*(1 paragraph)* The **use and exploitation of non-renewable resources** is negligible as a result of *project activity technologies*.
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.	*(1 paragraph)* The **development, use and exploitation of renewable resources** is responsible and equitable and contributes towards economic development and job creation. Depletion of the resource is negligible for the *project activity technologies*.
vii) That **a risk averse and cautious**	*(1 paragraph)*

approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions	The development of project activity technologies will ensure the highest quality equipment, skills and materials are used. Furthermore, the precautionary principle, in the form of a **risk averse and cautious approach**, will be applied when considering the environmental impacts of *project activity technologies*.
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	*(1 paragraph)* **Negative impacts on the environment and on people's environmental rights** are negligible for *project activity technologies*.

Other comments
Please provide any other comments on how this project contributes to sustainable development in South Africa (optional)

This PoA makes important and noteworthy contributions to the sustainable development of South Africa and the region. Firstly, the rollout of renewable energy technologies adds major economic benefits to the local, national and regional economy through the improved and boosted value add achieved and job creation.

Secondly, by employing the highest quality equipment, skills and materials, resource efficiency is considerably enhanced through the PoA. Thirdly, the power produced from the first CPA and subsequent CPAs, will help reduce the burden on the currently strained South African electricity reserve margin, and support wider energy sector investment and energy security objectives. Also, the PoA will result in significant GHG emissions reductions by displacing GHG intensive, fossil fuel based electricity from the grid to which CPAs are attached.

The growth of energy supplies in South Africa and the region is considered critical to future economic development in the country and regionally, and will require large-scale investment in new generation capacity. The PoA will attract capital flows from smaller developers looking for opportunities to enter the renewable energy market, which helps to create and sustain local businesses and employment.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Environmental	Impact on local environmental quality	• 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)	The impacts of project activity implementation on the local environment are negligible and no effects on air, water or waste are noted from historic implementation of solar power technologies.
	Change in usage of natural resources	• 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	This PoA encourages the use of renewable natural resources as opposed to non-renewable fossil fuel resources. The PoA will have no impact on community access to natural resources. The PoA will have positive impacts on the sustainability of use of water, minerals or other non-renewable natural resources and on the efficiency of resource utilisation in general (particularly non-renewable fossil fuel resources).
	Impacts on biodiversity and ecosystems	• Changes in local or regional biodiversity arising from the project	Disturbance of ecosystems and loss of biological diversity are negligible for project activity technologies.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Economic	Economic impacts	• 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	Please comment on the economic impacts of the project. Comment specifically on the indicators of relevance which are given here. (1 paragraph) PoA project activities should not impact foreign exchange requirements. Positive impacts should be seen for economic activity in the vicinity of project activities, particularly in rural areas where economic activity can be limited. Solar power technologies provide reliable low cost electricity from a renewable resource increasing energy access and reducing energy poverty. Foreign Direct Investment should be increased by the improved prospects provided by the CDM status of the activities covered under this PoA which will be supported by carbon finance from the CDM.
	Appropriate technology transfer	• 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	Please comment on the impacts of the project on appropriate technology transfer. Comment specifically on the indicators of relevance which are given here. (1 paragraph) The PoA will encourage the development of solar projects utilizing technologies from around the world, thus positively impacting technology transfer for South Africa and the region. The PoA project activity development and operation will increase the demand for project activity specific skills on a local level, thus positively impacting local skills development and job creation. The PoA and solar power technologies in general are designed to be readily replicated and will provide an important demonstration of the technology capabilities in South Africa and the region.

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

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
Social	Alignment with national provincial and local development priorities	• 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)	Please comment on how the project is aligned with national, provincial and local development priorities. Comment specifically the indicators of relevance to the project which are given here. (1 paragraph) This PoA is aligned with national government objectives to deliver a transformed and sustainable energy sector and improving the energy mix and amount of clean energy sources, thus contributing to renewable energy targets. The PoA project activities are expected to have a positive impact on access to basic services through the increased economic activity at a local level associated with project activities. Also, project activities under this PoA are not expected to have an impact on the relocation of communities.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
	Social equity and poverty alleviation	• 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	Please comment on the impact of the project on social equity and poverty alleviation. Comment specifically on the indicators of relevance which are given here. (1 paragraph) This PoA will deliver increased employment levels and associated social benefits for South Africa and regionally. The first CPA of this PoA will create 60 shorter term job opportunities and 5-7 long term jobs for the construction and operation of the solar power plant respectively. This PoA will have negligible impact on other social structures, social heritage etc. Improved economic activity at the local level is expected to have a positive impact on the provision of social amenities for the surrounding communities. Moreover, the PoA allows for the expansion of national/regional grids brining renewable and reliable energy access to previously underdeveloped areas or specially designated development nodes.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
General	General Project Acceptability	• Are the distribution of project benefits deemed to be reasonable and fair?	Please comment on whether the benefits occurring from the project due to the contribution of the CDM are reasonable and fair. (1 paragraph) This PoA will deliver benefits to South Africa and the region throughout the renewable energy supply chain from the early stages of R&D/feasibility studies through to construction, operation and maintenance of solar power project development. There will be direct job creation as a result of project activities and South Africa and the region will benefit from a cleaner energy mix as a result of this PoA.

Part D: Finance

Project Costs	
Development Costs (R's)	The total development costs are not known at this time for the specific potential CPA's under this PoA.
Installed Costs (R's)	The total installed costs are not known at this time for the specific potential CPA's under this PoA.
Other Costs (R's)	The total other costs are not known at this time for the specific potential CPA's under this PoA.
Total Project Costs (R's)	The total project costs are not known at this time for the specific potential CPA's under this PoA.
Sources of Finance	
Equity	*Name of Organisation(s) and amount (R's) contributed by each* CPA's under this PoA will be funded by individual CPA owners through a combination of debt and equity.
Debt (long term)	*Name of organization(s) and amount (R's) for each* CPA's under this PoA will be funded by individual CPA owners through a combination of debt and equity.
Debt (short term)	N*ame of organization(s) and amount (R's) for each* CPA's under this PoA will be funded by individual CPA owners through a combination of debt and equity. The providers of debt are not known at this time for the specific potential CPA's under this PoA.
Amount not identified (R's)	*Amount (R's) and a brief summary of the needs and any outstanding issues* *(1 paragraph or less)* N/A
Total CDM Contribution sought	*Amount (R's) and a brief summary of the needs and any outstanding issues* *(1 paragraph or less)* The total CDM contribution sought is not known at this time for the specific potential CPA's under this PoA.
Expected Price of CER in case of a contract to purchase for: A period of 7 years A period of 10 years	N/A

A period of 14 years (2x7 years)	
Indicate the **projected Internal Rate of Return** for the project with and without CER revenues.	*Note: Please indicate assumed price of CER as used in your calculation* The projected Internal Rate of Return (IRR) is not known at this time for the specific potential CPA's under this PoA. The assumed price of CERs is therefore also not known at this time.
Constraints on tradability of carbon credits	*Have any commercial arrangements been made that may impact the tradability of the carbon emission reductions? If yes, please define.Note. Examples would be subjection to a mortgage, government tax etc.* As stated previously, a contractual agreement, in the form of an ERPA, will be prepared by the CME and signed by each CPA implementing entity prior to submission of the CPA-DD to a DOE for inclusion into the PoA, which clearly defines the roles of the CME and CPA implementing entity, as well as the ownership of the carbon credits (CERS). Thus, there is not expected to be any impact to the tradability of the carbon emission reductions.
Preliminary discussions with potential purchasers	*Have you had any preliminary discussions with any potential purchasers of the carbon credits (CERs)* *If yes, please give brief details.* No. Preliminary discussions with potential purchasers of the carbon credits (CERS) have not commenced.