

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	De Aar Grid Connected 10 MW Solar Park, South Africa
Date of Submission of PDD	29 February 2012

Project Developer	
Name	Mulilo Renewable Energy Solar PV De Aar (Pty) Ltd
Organizational Category	Private company
Legal Status	Limited company
Street Address	Office 301, Third floor Execujet Business Centre Tower Road Cape Town International Airport 7525 South Africa
Postal Address (if different from above)	P O Box 50 Cape Town International Airport 7525 South Africa

Website Address	www.muliloenergy.com
Main Activities	Development of renewable energy projects
Summary of Financial Performance in last fiscal year	Capital Expenditure phase, pre-award of PPA
Contact Person(s)	Johannes Coetsee (Director)
Telephone	+27 (0)21 934 5278
Fax	+27 (0)21 935 0505
Email Address	johannes@mulilo.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	Blue World Carbon Asset Management (Pty) Ltd
Nature of partner	Carbon consultant
Organizational Category	Private company
Legal Status (if private company)	Limited company
Street Address	Suite 101, Block A 7 West Quay Road V&A Marina Cape Town, 8001 Republic of South Africa
Postal Address (if different to Street Address)	
Website Address	www.blueworldcarbon.com
Main Activities	Blue World Carbon (BWC) is the leading international company that specializes in developing solutions and rendering professional services in the sphere of climate change, greenhouse gas management and energy consulting.
Contact Person(s)	Joost van Lier (Managing Director, South Africa)
Telephone	Work: +27 (0)82 607 1440 Cell: +27 (0)71 609 2276
Fax	+27 (0)86 609 2770
Email Address	joost.van.lier@blueworldcarbon.com
Contractual Arrangements	
Contractual arrangements between various entities involved	The project will be developed by Mulilo Renewable Energy Solar PV De Aar (Pty) Ltd which will afterwards run the solar energy facilities. BWC will act as a carbon consultant to develop all necessary documentation for project approval by the CDM Executive Board and selling GHG emission reductions in the international market.

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

Technical Summary of the project																					
Objective of the Project	The aim of the project is to supply clean electricity to the grid of the Republic of South Africa.																				
Project Description The project development envisages the construction and operation of a solar park with an output capacity of 10 MW near the town of De Aar in the Northern Cape Province of RSA. The solar park will be equipped with several arrays of photovoltaic (PV) panels. It is expected that Trina PV solar panels supplied by Gestamp Solar will be used for this project. The produced electricity will be supplied to the Eskom electricity network.																					
Project Constraints: There are no constraints																					
Technology to be employed	The solar park will be equipped with several arrays of photovoltaic panels. It is expected that Trina PV solar panels supplied by Gestamp Solar will be used for this project. The proposed technology is well-proven and widely used internationally. Nevertheless there are no large solar parks in South Africa so far, only small-scale installations. Corporation Gestamp has over a hundred plants in more than 25 countries throughout Europe, America, Africa, and Asia. Gestamp Solar's expansion is nourished by the Spanish-based parent corporation, Corporation Gestamp, which allows it to continue to successfully carry out new solar energy projects throughout the world. (http://www.gestampsolar.com/en/global)																				
Greenhouse Gases Targeted	The implementation of the project will lead to reduction of greenhouse gas (GHG) emissions from combustion of fossil fuel for electricity generation at grid connected power plants. The principal GHG released during combustion of fossil fuel is CO ₂ . Emissions of CH ₄ and N ₂ O from combustion of fossil fuel are negligibly small as compared with CO ₂ emissions and excluded for simplification.																				
Emission reductions	The project is expected to be registered by the CDM Executive Board on the 1 st of October 2013 (starting date of the crediting period). The total emission reductions at the end of the first 7-year crediting period is expected to be 133 287 tCO ₂ e. <table border="1" data-bbox="560 1369 1367 1885"> <thead> <tr> <th>Years</th> <th>Annual estimation of emission reductions in tonnes of CO₂ e</th> </tr> </thead> <tbody> <tr> <td>2013 (From 1 October to 31 December)</td> <td>4 760</td> </tr> <tr> <td>2014</td> <td>19 041</td> </tr> <tr> <td>2015</td> <td>19 041</td> </tr> <tr> <td>2016</td> <td>19 041</td> </tr> <tr> <td>2017</td> <td>19 041</td> </tr> <tr> <td>2018</td> <td>19 041</td> </tr> <tr> <td>2019</td> <td>19 041</td> </tr> <tr> <td>2020 (From 1 January to 30 September)</td> <td>14 281</td> </tr> <tr> <td>Total estimated reductions (tonnes of CO₂ e)</td> <td>133 287</td> </tr> </tbody> </table>	Years	Annual estimation of emission reductions in tonnes of CO ₂ e	2013 (From 1 October to 31 December)	4 760	2014	19 041	2015	19 041	2016	19 041	2017	19 041	2018	19 041	2019	19 041	2020 (From 1 January to 30 September)	14 281	Total estimated reductions (tonnes of CO₂ e)	133 287
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Technical Summary of the project	
Baseline & Additionality Assessment	<p>The approved simplified baseline and monitoring methodology AMS-I.D. "Grid connected renewable electricity generation" (Version 17) is applicable to the proposed project activity. This methodology is applicable to grid-connected renewable power generation project activities including the construction of a solar park.</p> <p>The additionality is demonstrated according to Attachment A of Appendix B of the "Simplified modalities and procedures for small-scale CDM project activities" (Version 08), reported as Annex 24 to EB 63. According to Attachment A of appendix B solar PV technologies up to 15 MW are automatically defined as additional.</p> <p>[http://cdm.unfccc.int/Reference/Guidclarif/ssc/methSSC_guid05.pdf]</p>
Monitoring	This project will be monitored according to the rules monitoring provided in AMS-I.D. The parameter to be monitored is quantity of net electricity generation supplied by the solar park to the grid of the Republic of South Africa.
Type of project/activities	Energy Supply
a. Energy Supply	Renewable Energy (excluding biomass) The project uses PV solar panels to convert solar radiation into electricity. The produced electricity will be supplied to the grid of the Republic of South Africa.
b. Energy Demand	Not Applicable
c. Industrial Process	Not Applicable
d. Transport	Not Applicable
e. Waste Management	Not Applicable
f. Forestry/ land use	Not Applicable
g. Other	Not Applicable
Project Boundary The project boundary encompasses the physical, geographical site of the renewable generation source.	
Indicate Emissions outside the Project Boundary	Not Applicable

Location of the Project	
Province	Northern Cape
Municipality	Emthanjeni Local Municipality
Nearest city/large town	De Aar
Brief description of the location of the project site	<p>The project activity will be constructed on the Farm 145/2 located approximately 2.5 km north-west of De Aar.</p> <p>Geographical latitude: 30° 37' S.</p> <p>Geographical longitude: 23° 59' E.</p>

Project Schedule/Timetable

Project Schedule/Timetable	
Earliest Project Start Date	1 October 2012 (Start of construction)
When is the expected first year of CER delivery	2014
Project Lifetime	30 years
Project End Date	2043/10/01
Crediting Period	7 year renewable crediting period
Current Status or phase of the project	At the moment, the project conducted the following activities: <ul style="list-style-type: none"> • The Final Environmental Impact Report is completed • Record of Decision has been obtained • The Feasibility Study is completed • The PDD has been drafted by BWC • The project is currently being validated by Carbon Check. • The project has been listed as a preferred bidder under the Independent Power Producer Procurement Program (IPPPP) • Awaiting a PPA from the Department of Energy
DNA Approval	The project has not been previously submitted to the DNA for approval. A Project Identification Note (PIN) was submitted and a letter of no objection was received on 20/12/2010.
Approval by other bodies	The project (or any elements of the project) has not been submitted to any other national, provincial or local government departments or agencies for regulatory or legal approval (excluding EIA process - see Part C).

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. Worldwide expansion of the renewable energy industry points to the sustainable development of the country's economy. The implementation of the proposed project will promote development of PV solar parks in the RSA which in turn will lead to the creation of new job opportunities both during the construction and operation phases. The implementation of solar parks will make a contribution to achieve the objective to reduce South Africa's GHG emissions below the current emissions baseline of around 34% by 2020, and contribute to the 1450 MW solar PV set out in accordance with the capacity allocated to renewable energy generation in IRP 2010-2030 [<http://www.ipp-renewables.co.za/>].

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

Yes. The project will ensure the creation of new job opportunities.

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

sustainable development?	
<p>The Environmental Impact Assessment (EIA) of the proposed project was carried out in accordance with the South African legislation by DJ Environmental Consultants (DJEC). The draft Environmental Impact Report (EIR) was published for public review and comment over a period of 40 days from 22 October 2010. Hereafter the EIR was submitted to the Department of Environmental Affairs (DEA) in December 2010 for a decision. On 29 August 2011 the Record of Decision (ROD) was obtained and Environmental Authorisation was granted.</p>	
<p>i) That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be avoided, are minimised and remedied</p>	<p>The vegetation type located on the proposed site is not regarded as threatened on a national basis, and is very widespread within the Nama Karoo. It was concluded that the site does not present significant or important constraints to the proposed development with regard to botanical sensitivity.</p> <p>The avifaunal study indicated that the development area does not support any important bird populations, and the proposed PV facility is likely to have no significant, long-term impact on the local avifauna.</p> <p>Based on the findings of all the credible specialists who undertook their respective specialist studies, it was concluded that there are no negative impacts that cannot be adequately mitigated. All mitigatory measures and recommendations are outlined in the EIR.</p>
<p>ii) That pollution and degradation of the environment are avoided, or where they cannot be altogether avoided, are minimised and remedied</p>	<p>The project implementation will not lead to pollution and degradation of the environment. The combustion of fossil fuels (mostly coal) at the Eskom power stations and hereby emissions of the harmful substances into the atmosphere, such as flue ash, oxides of sulphur and nitrogen will be reduced due to the project implementation.</p>
<p>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</p>	<p>The Heritage Impact Assessment indicated that the site has low heritage significance. The visual impact of the proposed development has been assessed as moderate-high and with time will reduce to moderate. The proposed site is preferred above all alternatives with the regard to visual impact. By choosing the proposed site above alternative sites identified in the EIR, the visual impact has been mitigated as far as possible.</p>
<p>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</p>	<p>The project implementation will not lead to any changes in waste management.</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>There are no non-renewable resources to be used in this project.</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>The proposed project does not affect the depletion of renewable resources. Solar energy is an inexhaustible source of the renewable energy.</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>The project implementation will only be started when the project developer has completed a full financial and technical evaluation. The technology to be applied has been tested and proven overseas and carries no negative consequences.</p>
<p>vii) That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be</p>	<p>The project implementation will lead to mitigation of the negative environmental impact. The combustion of fossil fuels (mostly coal) at the Eskom power stations and hereby emissions of the harmful substances into the atmosphere, such as flue ash, oxides of sulphur and nitrogen will be</p>

altogether prevented, are minimised and remedied	reduced due to the project implementation. As part of the EIR a public participation process was undertaken to ensure that all stakeholder's rights and environmental rights are taken into account during development of this project.
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Other comments

South Africa is anticipating another shortage of electricity supply due to the higher than anticipated economic growth combined with a number of technical factors such as overloaded electricity lines. The country is blessed with an abundance of fossil fuels, but the use of these resources in power production is becoming increasingly difficult as international pressure mounts against countries that do not comply with strict sustainable environmental policies. Solar parks do not only meet environmental requirements, but also provide a much needed additional source of electricity. In addition, the implementation of solar parks makes a contribution to achievement of the goal to generate 10 000 GWh of electricity from renewable energy by 2013.

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 project implementation will positively impact the air quality due to reduction of combustion of fossil fuels (mostly coal) at the grid-connected power plants. The project will not have an impact on water pollution and solid waste. The construction phase will have an impact on sensitive receptors (i.e. nearby residents). It is accepted that the visual impact of the proposed development will be moderate-high and with time reduce to moderate.</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 major impact on the natural resources is the loss of arable land due to the construction of arrays of photovoltaic panels and associated infrastructure. The total area of the project site is approximately 17 ha. The project implementation will lead to reduction of fossil fuel consumption (mostly coal) at grid-connected power plants.</p>
	Impacts on biodiversity and ecosystems	<ul style="list-style-type: none"> • Changes in local or regional biodiversity arising from the project 	<p>Changes to local or regional biodiversity arising from the project are minimal. No fatal flaws were identified in the Environmental Impact Assessment, and therefore the project obtained environmental authorisation.</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>The project will have an impact on foreign exchange requirements as the main technological equipment of the solar park such as solar panels can only be sourced from foreign suppliers. There will be some increase in skilled labour requirements to operate the solar park. There is a possibility that new manufacturing capacities will be generated in the Republic of South Africa to accommodate the growing demand of solar panels. The project implementation will not affect the electricity price since the solar parks are not able to compete with coal-fired power plants because of the higher cost price of electricity generation. The sale of carbon credits generated by the project will result in increased foreign direct investment.</p>
	Appropriate technology transfer	<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>There will be some increase in skilled labour requirements to operate the new technology. The project will demonstrate power production from solar energy in South Africa. Similar projects can be deployed in other regions of the country.</p>

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
<p align="center">Social</p>	<p align="center">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>Expansion of the renewable energy industry in the province points to the sustainable development of the region and the whole country. The project implementation promotes development of the county energy system and creates new job opportunities in the region. The project partakes in the national bidding scheme for RSA's Renewable Energy Feed-In Tariffs. At the same time the project does not negatively affect any local industries as implemented on unused deteriorated agricultural land.</p> <p>The implementation of solar parks will make a contribution to achieve the objective of reducing South Africa's GHG emissions below the current emissions baseline of around 34% by 2020. This project will also contribute to the 1450 MW new solar PV set out in accordance with the capacity allocated to renewable energy generation in IRP 2010-2030 [http://www.ipp-renewables.co.za/].</p>

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
	<p 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>It is expected that 120 jobs will be created during the construction phase and 25 jobs during the operation phase. The potential negative social impact is linked to the impact on local communities associated with the presence of construction workers on the site. Impact on community social structures, social heritage and provision of social amenities are not expected to be negative. The Heritage Impact Assessment indicated that the site has low heritage significance. No fatal flaws were identified and the project was granted Environmental Authorisation by means of a Record of Decision.</p>

Indicators in Support of the Project Approval Criteria

	Category	Indicator	Comment
General	General Project Acceptability	<ul style="list-style-type: none"> • Are the distribution of project benefits deemed to be reasonable and fair? 	The distribution of the project benefits is deemed to be reasonable. It contributes to technological development of the country, creates jobs in the RSA and contributes to combat climate change by reducing GHGs. The revenue from carbon credits is vital because renewable technologies require higher capital investment compared to fossil fuel powered plants.

Part D: Finance

Project Costs																							
Development Costs (R's)																							
Installed Costs (R's)																							
Other Costs (R's)																							
Total Project Costs (R's)	R 334.8 million ¹																						
Sources of Finance																							
Equity	Not applicable																						
Debt (long term)	R 334.8 million																						
Debt (short term)	Not applicable																						
Amount not identified (R's)	Not applicable																						
Total CDM Contribution sought	<p>Due to the fast approaching end of the Kyoto commitment period the CDM revenue has become risky to investors. The estimated price of CERs is therefore difficult to estimate accurately.</p> <p>Expected CER's for this project over the first 7 year commitment period:</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Million Rand from sale of CDM revenue (assuming R100/CER)</th> </tr> </thead> <tbody> <tr> <td>2013 (from 1 October to 31 December)</td> <td>0.48</td> </tr> <tr> <td>2014</td> <td>1.90</td> </tr> <tr> <td>2015</td> <td>1.90</td> </tr> <tr> <td>2016</td> <td>1.90</td> </tr> <tr> <td>2017</td> <td>1.90</td> </tr> <tr> <td>2018</td> <td>1.90</td> </tr> <tr> <td>2019</td> <td>1.90</td> </tr> <tr> <td>2020 (From 1 January to 30 September)</td> <td>1.43</td> </tr> <tr> <td>Average</td> <td>1.90</td> </tr> <tr> <td>Total</td> <td>13.33</td> </tr> </tbody> </table>	Year	Million Rand from sale of CDM revenue (assuming R100/CER)	2013 (from 1 October to 31 December)	0.48	2014	1.90	2015	1.90	2016	1.90	2017	1.90	2018	1.90	2019	1.90	2020 (From 1 January to 30 September)	1.43	Average	1.90	Total	13.33
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Expected Price of CER in case of a contract to purchase for: A period of 7 years	<p>R 100 (Assumed CER value at the start of the project activity.)</p> <p>A 7 year renewable crediting period was chosen for the project. The project may be renewed twice, and the total crediting period may not be more than 21 years.</p>																						
Indicate the projected	Not available at this stage.																						

¹ This is the latest information from project developers.

Internal Rate of Return for the project with and without CER revenues.	
Constraints on tradability of carbon credits	There are no constraints yet. It is anticipated that there may be constraints with the tradability of carbon credits post 2012.
Preliminary discussions with potential purchasers	Preliminary discussions have not taken place. The discussions will commence upon registration of the project by the EB.