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	Karoo Renewable Energy Facility (Nobelsfontein Wind Project)
Date of Submission of PDD	12/06/2012

Project Developer	
Name	South African Renewable Green Energy (Pty) Ltd
Organizational Category	Private Company
Legal Status	Limited Company
Street Address	1st Floor, ICR House, Alphen Park, Main Road, Constantia, Cape Town, South Africa. 7848
Postal Address (if different from above)	As above.
Website Address	www.sarge.co.za

Main Activities	South African Renewable Green Energy (Pty) Ltd (hereafter referred to as SARGE) is a renewable energy project developer focusing primarily on the development of medium to large-scale wind and solar photovoltaic (PV) power plants. SARGE has been a leading player in the field of renewable energy development in South Africa for over 5 years.
Summary of Financial Performance in last fiscal year	SARGE's audited financial statements for 15 months to 28 February 2010 include the following key financial indicators: • Assets: R5,166,781 • Revenue: R9,791,120 • Net Income after Tax: R4,586,642
Contact Person(s)	Francois Roux, Chief Executive Officer (CEO)
Telephone	Work: +27(0) 21 794 3140 Cell: +27(0) 76 435 4241
Fax	Fax: +27(0)21 794 3135
Email Address	francois@sarge.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	Standard Bank Plc
Nature of partner	Debt and Carbon Partner
Organizational Category	Private Company
Legal Status (if private company)	Limited Company
Street Address	20 Gresham Street London EC2V 7JE United Kingdom
Postal Address (if different to Street Address)	As above
Website Address	www.standardbank.com
Main Activities	Standard Bank is a leading African banking group focused on emerging markets globally. Standard Bank has a 150-year history in South Africa and operates in 18 countries on the African continent, including South Africa, as well as in other selected emerging markets, providing transactional banking, saving, borrowing, lending, investment, insurance, risk management, wealth management and advisory services.
Contact Person(s)	Geoff Sinclair, Head of Carbon Sales and Trading
Telephone	Work: +44 20 3-145 6-893 Cell: +44 77 696 486 95

Fax	+44 20 3189 6930
Email Address	geoff.sinclair@standardbank.com co2@standardbank.com
Contractual Arrangements	
Contractual arrangements between various entities involved	SARGE and Standard Bank Plc entered into negotiations surrounding the purchase of the certified emissions reductions (CERs) generated by the project and have signed an emissions reductions purchase agreement (ERPA) in this regard.

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

Technical Summary of the project	
Objective of the Project	The objective of the project is to supply renewable energy, generated from wind resources, to the South African national grid, thereby displacing the greenhouse gas (GHG) intensive electricity of the grid.

Project Description

The project involves the construction and operation of a wind power plant with an installed capacity of approximately 400MWe. Based on the wind resource of the project site, the wind power plant is expected to have a capacity factor of 26% generating approximately 872,256 MWh of electricity per annum.

The project will utilize 150 turbines, 41 with a rated output of 1.8 MW and 109 with a rated output of 3MW.Each wind turbine will consist of a steel tower – between 80m and 125m in height - a nacelle (gear box) and three rotor blades with a rotor diameter of between 90m and 100m (ie, each blade ranging from 45m to 55m in length). The project adopts turbine-transformer units and all transformers will be linked to the existing substation. Grid connection will be via onsite 132kV line through to the existing substation. Please refer to Figure 1 below for a simplified process flow diagram.

Technical Summary of the project

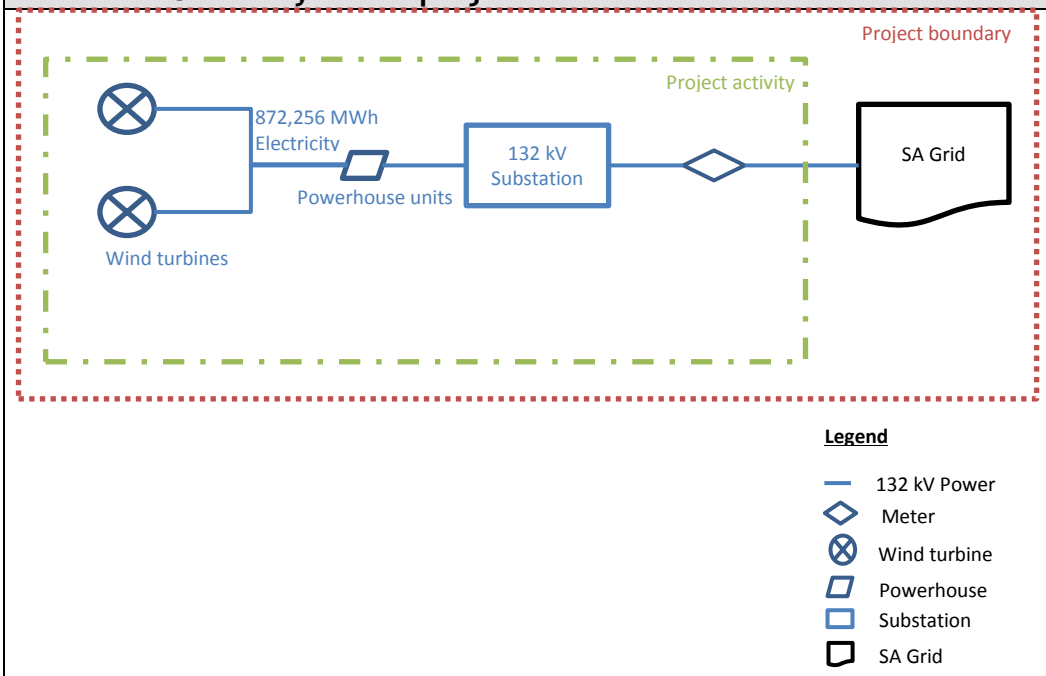

Figure 1: Simplified process flow diagram of the project.

Project Constraints

The project is not expected to encounter any constraints and there are currently no known technical or resource constraints affecting the operation or commissions of the project.

Technology to be employed	The technology employed includes wind turbine consisting of a steel tower – between 80m and 125m in height - a nacelle (gear box) and three rotor blades with a rotor diameter of between 90m and 100m (ie, each blade ranging from 45m to 55m in length). *Is the technology one that has been previously tried and tested in South Africa or internationally? If yes, provide details (1 paragraph)* There are currently only two operational wind power plants in South Africa: the Darling and Klipheuwel farms and the project is therefore expected, as part of the ongoing renewable energy independent power producers procurement programme (REIPPPP), to be one of the first large-scale grid connected wind power plants in South Africa. The project will however make use of engineering, procurement and construction (EPC) contractors with significant international experience in building large-scale grid connected wind power plants. *Have the project operators had any previous experience or expertise with operating the technology?* As above, the project will make use of companies with significant international experience in the operation and maintenance (O&M) of wind power plants and will thus derive significant benefit in this regard.
Greenhouse Gases Targeted	The project will result in the displacement of GHG intensive electricity supplied from the South African national grid and will

Technical Summary of the project	
	therefore target Carbon Dioxide (CO_2) reductions.
Emission reductions	The project is expected to result in GHG emissions reductions of approximately 846,960tCO_2e/yr and have total estimated emissions reductions of approximately 8,469,601tCO_2e over a ten (10) year crediting period.
Baseline & Additionality Assessment	The baseline is the continuation of the status quo (current situation) whereby the equivalent electricity service is provided by the South African national grid. Additionality is assessed and demonstrated using investment analysis. The project is additional since without CDM revenues from the sale of CERs the project is not as economically or financially feasible.
Monitoring	The primary parameter to be monitored is quantity of net electricity supplied to the South African national grid. This will be determined on the basis of electricity meters installed at the project site. These meters will continuously monitor the amount of electricity supplied to the grid, store the data in regular intervals, and will allow the project participants to access the readings remotely. The electricity meters shall be inspected annually and in case of inaccuracies will be recalibrated or replaced accordingly.
Type of project/activities	*Identify which type of activity is involved in this project – and for each, provide brief details*
a. Energy Supply	Renewable energy – the project involves the construction and operation of a wind power plant with an installed capacity of approximately 400MWe.
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 The project boundary includes the project power plant and all power plants physically connected to the South African national grid operated by Eskom for the purposes of determining the baseline and grid emissions factor (GEF). Please refer to Figure 1 above for a diagram delineating the project boundary.	
Indicate Emissions outside the Project Boundary	N/a

Location of the Project	
Province	Western Cape Province
Municipality	West Coast District Municipality
Nearest city/large town	Lutzville
Brief description of the location of the project site	The project site is located on the western coast of South Africa, approximately 6km from the coast and 250km north of Cape Town.

Project Schedule/Timetable	
Earliest Project Start Date	2014/07
When is the expected first year of CER delivery	2015
Project Lifetime	20 years
Project End Date	2035/03
Crediting Period	*Has a crediting period for the project been identified?* Yes – a ten (10) year crediting period has been chosen.
Current Status or phase of the project	The project is currently in the planning phase with a feasibility study report (FSR) completed.
DNA Approval	*Has this project been submitted to the DNA for approval previously?* Other than the Project Identification Note (PIN) that was submitted to the DNA in order to receive the Letter of No Objection (LONO), the project has not been submitted to the DNA for approval previously. *Provide details of any other official response by the DNA regarding this project* The positive LONO was received from the DNA on 22/11/2011.
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.* The project sought a re-zoning application from the local municipality and will be submitted as a potential project under the REIPPPP to the Department of Energy (DoE).

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?

The project will directly boost the nascent South African wind industry and indirectly boost complementary industries such as construction and engineering and therefore support job creation through increased gross domestic product (GDP) contributions. The project 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.

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

The project provides sustainable job creation supporting the growth of the green economy within South Africa. Specifically, in the context of South Africa this project will contribute towards job creation as outlined in the Green Economy Accord's "Commitment Three: Rollout of Renewable Energy". Approximately 1000 job opportunities will be created for the construction phase of the project and 10 long term jobs will be created for the operating of the project throughout the 20 year life of the project.

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	*Disturbance of ecosystems and loss of biological diversity are negligible for the project given that wind power plants have relatively small area and land requirements that do not exclude other land uses such as natural vegetation and or agricultural activities.*
ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are minimised and remedied	*The risk of pollution and degradation of the environment is negligible and exists mainly due to the construction of the project.*
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	*Disturbance of landscapes and sites that constitute the nation's cultural heritage are negligible for project.*
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	*There is no appreciable waste component to the project. As above, most of the waste generation is associated with the construction of the project and is accordingly mitigated in the project's environmental management plan (EMP).*
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	*The use and exploitation of non-renewable resources is negligible as a result of project. Although, since the project is a renewable energy project, it displaces electricity produced from non-renewable resources and contributes to slowing the depletion of non-renewable resources.*
vi) That the **development, use and exploitation of renewable resources is responsible and equitable**, and takes	*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 and the*

into account the consequences of the depletion of the resource.	*electricity produced from the project and use and exploitation of wind is supplied to the national grid. The grid supplies electricity to all South Africans and therefore the use of this renewable resource is equitable. Moreover, by displacing power currently produced from carbon intensive process (coal-fired) and therefore its use is responsible.*
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	*The development of the project 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, are applied when considering the environmental impacts of project.*
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	*Negative impacts on the environment and on people's environmental rights are negligible for the project.*

Other comments

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

The project makes important and noteworthy contributions to the sustainable development of South Africa. 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 project. Thirdly, the power produced from the project 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 project will result in significant GHG emissions reductions by displacing GHG intensive, fossil fuel based electricity from the grid.

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 project will attract capital flows 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 the project on the local environment are negligible and no effects on air, water or waste are noted from historic implementation of wind 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	The project utilises renewable natural resources as opposed to non-renewable fossil fuel resources. The project will have no impact on community access to natural resources. The project 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 the project.

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	The project should not impact foreign exchange requirements. Positive impacts should be seen for economic activity in the vicinity of the project, particularly in rural areas where economic activity can be limited. Wind 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 project 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	The project will utilize technologies from around the world, thus positively impacting technology transfer for South Africa. The project development and operation will increase the demand for project specific skills on a local level, thus positively impacting local skills development and job creation. The project and wind power technologies in general are designed to be readily replicated and will provide an important demonstration of the technology capabilities in South Africa.

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)	The project 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 project is expected to have a positive impact on access to basic services through the increased economic activity at a local level associated with project activities by increasing local economic growth, creating jobs and empowering people with a greater and more diversified skills base. Also, the project does not have an impact on the relocation of communities.
	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	The project will deliver increased employment levels and associated social benefits locally and for South Africa. The project will create approximately 1000 shorter term job opportunities and 10 long term jobs for the construction and operation of the wind power plant. The project 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 project 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?	The project will deliver benefits to South Africa throughout the renewable energy supply chain from the early stages of R&D/feasibility studies through to construction, operation and maintenance of wind power project development. There will be direct job creation as a result of the project and South Africa will benefit from a cleaner energy mix as a result of the project.

Part D: Finance

Project Costs	
Development Costs (R's)	*N/a*
Installed Costs (R's)	*N/a*
Other Costs (R's)	*N/a*
Total Project Costs (R's)	*Approximately ZAR 7,204,000,000*
Sources of Finance	
Equity	*N/a*
Debt (long term)	*N/a*
Debt (short term)	*N/a*
Amount not identified (R's)	*N/a*
Total CDM Contribution sought	*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)	*N/a*
Indicate the **projected Internal Rate of Return** for the project with and without CER revenues.	*IRR without CER Revenues: 5.39%* *IRR with CER Revenues: 7.29%*
Constraints on tradability of carbon credits	*SARGE and Standard Bank have entered into an ERPA for the purchase of the CERs. This is however not considered to be a constraint on the tradability of the carbon credits.*
Preliminary discussions with potential purchasers	*SARGE and Standard Bank have entered into an ERPA for the purchase of the CERs.*