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 100.5 MW Wind Farm, South Africa
Date of Submission of PDD	18 November 2011

Project Developer	
Name	Longyuan Mulilo (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	Work: +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 (BWC)
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	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 is being developed by Longyuan Mulilo (Pty) Ltd, a private company established to develop renewable energy projects in the Republic of South Africa. Longyuan Mulilo (Pty) Ltd will establish the SPV called Longyuan Mulilo De Aar which will construct and operate the wind farm. BWC is a carbon consultant which is developing 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)

<table>
<tr><th colspan="2">Technical Summary of the project</th></tr>
<tr><td>Objective of the Project</td><td>The aim of the project is to supply clean electricity to the grid of the Republic of South Africa.</td></tr>
<tr><td colspan="2">Project Description

The proposed project envisages the construction and operation of a wind farm with installed capacity of up to 100.5 MW. The wind farm will be comprised of up to 67 wind turbine generators, and the associated infrastructure. Produced electricity will be supplied to the Eskom electricity network.

The wind turbines capture the kinetic energy of the wind to drive a generator located within the wind turbine where this energy is subsequently converted into electricity. The amount of energy a turbine can harness is dependent on the wind velocity and the length of the rotor blades.</td></tr>
<tr><td colspan="2">Project Constraints

There are no constraints.</td></tr>
<tr><td>Technology to be employed</td><td>The wind energy facilities consist of multiple wind turbines which are used to capture the kinetic energy of the wind for the purposes of generating electricity. Manufacturers and suppliers of the turbines will be specified later.

The proposed technology is well-proven and widely used internationally; nevertheless there are no large wind farms in South Africa so far, only small-scale installations.

The project partner, China Longyuan Power Group, has experience and expertise with proposed technology. By the end of 2009, Longyuan has developed more than 50 wind farms distributed in Asia.</td></tr>
<tr><td>Greenhouse Gases Targeted</td><td>Implementation of the project will lead to reduction of greenhouse gas (GHG) emissions from combustion of fossil fuel for electricity generation at the grid connected power plants. The principal GHG released during combustion of fossil fuel is CO_2. Emissions of CH_4 and N_2O from combustion of fossil fuel are negligibly small as compared with CO_2 emissions and excluded for simplification.</td></tr>
<tr><td>Emission reductions</td><td>The wind farm is expected to be up and running on the 1st of October 2013 (starting date of the crediting period).

The total emission reductions at the end of the 10-year crediting period is expected to be 2 278 920 t CO_2, as indicated in the following table:

<table>
<tr><th>Years</th><th>Volume, t CO_2</th></tr>
<tr><td>2013 (from the 1st of October to 31st of December)</td><td>56 973</td></tr>
<tr><td>2014</td><td>227 892</td></tr>
<tr><td>2015</td><td>227 892</td></tr>
<tr><td>2016</td><td>227 892</td></tr>
<tr><td>2017</td><td>227 892</td></tr>
<tr><td>2018</td><td>227 892</td></tr>
</table>
</td></tr>
</table>

Technical Summary of the project	
	2019: 227 892 2020: 227 892 2021: 227 892 2022: 227 892 2023 (from the 1st of January to the 30st of September): 170 919
Baseline & Additionality Assessment	Approved consolidated baseline and monitoring methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" (Version 12.1.0) is applicable to the project activity. Tool for the demonstration and assessment of additionality" (Version 05.2.1) is used to demonstrate and assess the additionality of the proposed project activity. The main emphasis is made on an investment analysis and a common practice analysis. The project is additional as defined under the Kyoto Protocol because of the following key factors: • The project IRR, based on the preliminary estimation, without the CDM are below than benchmark; • The project is first-of-its-kind in the Republic of South Africa.
Monitoring	Approved consolidated baseline and monitoring methodology ACM0002 "Consolidated baseline methodology for grid-connected electricity generation from renewable sources" will be used for project monitoring. The parameter to be monitored is quantity of net electricity generation supplied by the wind energy facilities to the grid of the Republic of South Africa.
Type of project/activities	Energy Supply
a. Energy Supply	Renewable Energy (excluding biomass). The project is aimed at electricity generation using wind energy. Produced electricity will be supplied to the grid of the Republic of South Africa.
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 spatial extent of the project boundary includes the proposed wind farm and all power plants physically connected to the grid of the Republic of South Africa.	
Indicate Emissions outside the Project Boundary	N/A

Location of the Project	
Province	Northern Cape
Municipality	Emthanjeni Local
Nearest city/large town	The town of De Aar
Brief description of the location of the project site	The project site is located on Farm Re/130, Re/131, 4/130, 3/131, 2/131, 15/180 outside of De Aar. Geographical latitude: 30°48' S. Geographical longitude: 23°52' E.

Project Schedule/Timetable	
Earliest Project Start Date	2012/06 (start of construction) 2013/10 (commissioning)
When is the expected first year of CER delivery	2014
Project Lifetime	20 years
Project End Date	2033/09
Crediting Period	10 year crediting period has been identified for the project.
Current Status or phase of the project	The Environmental Impact Report (EIR) was submitted to the Department of Environmental Affairs for an approval. Record of Decision (RoD) was received. The Project Design Document (PDD) was made by BWC. The Draft Validation Report (DVR) was issued by Carbon Check Pty (Ltd).
DNA Approval	The PIN was submitted to the DNA for approval on the 26th of November 2010. The letter of no objection was issued.
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. Implementation of the proposed project will promote development of the wind farms in the Republic of South Africa which in turn will lead to the creation of new job opportunities both during the construction and operation phases. It is worthwhile to say that the implementation of wind farms 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.	
2. Social: Does the project contribute to social development in South Africa? Yes. The project will ensure the creation of 147 new job opportunities (130 jobs during the construction phase and 17 jobs during the operation phase).	
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	The construction of the wind energy facilities and the associated disturbance of the vegetation may impact on the ecology, flora and fauna of the project site. Each turbine, with the underground base and the crane lifting pad. The total wind farm is spread over an area of 350 hectares, with the required spacing between turbines. The detailed EIR has been initiated to assess potential impacts of the project on terrestrial animals and birds. The proposed project activity has no significant impact on the environment, as the wind power is one of the cleanest sources of renewable energy, with no associated emissions and waste products.
ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are minimised and remedied	The project implementation will not lead to pollution and degradation of the environment. 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.
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	The wind farm is spread over an area of 350 hectares. The establishment of the wind turbines and the associated infrastructure may impact on the aesthetic quality of the landscape during the construction and operational phases. Disturbance to or destruction of heritage sites will be avoided.
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	The project implementation will not lead to any changes in waste management.
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	There are no non-renewable resources to be used in this project.
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.	The proposed project does not affect on the depletion of renewable resources. Wind energy is an inexhaustible source of the renewable energy.
vii) That **a risk averse and cautious approach** is applied, which takes	Commercial wind farms are operational for over 20 years. Operational risks are well known and will be mitigated.

into account the limits of current knowledge about the consequences of decisions and actions	
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 implementation will lead to mitigation of the negative environmental impact. 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.
Other comments **Please provide any other comments on how this project contributes to sustainable development in South Africa** 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 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. Wind farms not only meet environmental requirements, but also provide a much needed additional source of electricity. In addition, implementation of wind farms makes a contribution to achievement of 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	• 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 project implementation will positively impact on air quality due to reduction of combustion of fossil fuels (mostly coal) at the grid-connected power plants. The project will not impact on water pollution and solid waste. Construction phase as well as the rotation of wind turbine blades during operational phase may impact on sensitive receptors (i.e. nearby residents). Due to their height, wind turbines have the potential to have a visual impact on the surrounds and on sensitive visual receptors. The noise from construction machines has some impact on the surrounding area during the construction phase, which will only have a localized effect and is not expected to increase the ambient noise levels in nearest towns. During the operation phase the cumulative contribution of the wind turbines and the transformer substation on the noise environment at the communities around the site will be within acceptable levels.
	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 major impact on the natural resources is the loss of arable land due to the construction of the turbines and associated infrastructure. Most of the current cultivation or grazing practices will still be possible between the structures.
	Impacts on biodiversity and ecosystems	• Changes in local or regional biodiversity arising from the project	Reptiles may be forced out of their underground shelters during the construction phase. Birds and bats may be impacted through collision with the blades of the wind turbines as well as collision with the associated power line during the operational phase.

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 will impact on foreign exchange requirements as the main technological equipment of the wind farm such as wind turbines can only be sourced from overseas suppliers. The contribution to the local economic activities (micro economic) will be in form of employment and direct investment. The cost of energy is determined by the IRP (Integrated Resources Plan) decided on by NERSA (National Energy Regulator of South Africa) and DOE (Department of Energy). This project will increase the availability of energy on the national grid. Sale of carbon credits generated by the project will result in increased foreign direct investment.
	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	There will be some increase in skilled labour requirements to operate the new technology. The project will demonstrate potential of power production from wind energy in South Africa. Similar projects can be deployed in other regions of the country.

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)	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. At the same time the project implementation leads to the insignificant loss of arable land. It is worthwhile to say that the implementation of wind farms 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.
	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	It is expected that impact on employment levels and skills development opportunities will be positive. The potential negative social impacts are linked to the impact on local road surfaces associated with the transport of heavy components and the impact on local communities and current farming activities 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. Precise impacts cannot be determined until the feasibility phase is completed.

Indicators in Support of the Project Approval Criteria			
Category		**Indicator**	**Comment**
General	General Project Acceptability	• Are the distributions of project benefits deemed to be reasonable and fair?	The distribution of the project benefits is deemed to be reasonable and fair because they contribute to technological development of the country, improvement of the environmental situation and increase of the employment level.

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)	About ZAR 1 590 million
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)	In case of a contract to purchase for a period of 10 years expected price of CER is 100÷150 ZAR/tCO_2
Indicate the **projected Internal Rate of Return** for the project with and without CER revenues.	Not available
Constraints on tradability of carbon credits	No constraints as yet
Preliminary discussions with potential purchasers	Preliminary discussions have not taken place.