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	Indwe Wind Farm (Pty) Ltd
Date of Submission of PDD	01.03.2012

Project Developer	
Name	DNA Wind (Pty) Ltd
Organizational Category	Private Company
Legal Status	Privately held company
Street Address	70c Oxford Rd, Riviera, Johannesburg, Gauteng, 2146, RSA
Postal Address (if different from above)	Same as above
Website Address	www.dnawind.co.za
Main Activities	The DNA Wind is a South African wind development company, with a number of projects in the Eastern Cape, South Africa.
Summary of Financial Performance in last fiscal year	Development company and relies on shareholder inputs for each of its projects.
Contact Person(s)	Mr. Doug Jenman

Telephone	Work: +27 21 685 5411 Cell: +27 82 41 52515
Fax	+27 86 582 1792
Email Address	doug@dnawind.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	n/a
Nature of partner	*n/a*
Organizational Category	*n/a*
Legal Status (if private company)	*n/a*
Street Address	n/a
Postal Address (if different to Street Address)	n/a
Website Address	n/a
Main Activities	*n/a*
Contact Person(s)	n/a
Telephone	n/a
Fax	n/a
Email Address	n/a
Contractual Arrangements	
Contractual arrangements between various entities involved	*n/a*

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

Technical Summary of the project	
Objective of the Project	To build a grid connected wind energy project in South Africa. This project will have a capacity up to 57.5 MW, and will contribute to the critically needed energy expansion in South Africa without further carbon dioxide emissions.

Project Description

The main activity of the project is to replace thermal electrical power in South Africa's coal based energy grid through the generation of clean electricity using proven Wind Turbine Generators. The project will provide much needed Renewable Energy in a coal dominant energy generation mix.

The project will be based in the Eastern Cape province of South Africa and will generate clean energy for the South Africa national grid. This will displace the current exclusive burning of coal used by thermal power plants in the country.

The up to 57.5 MW project will be constructed on a 10 square kilometre plateau, in the Emalahleni municipal region, 10 km north-east of the town of Indwe, along the R56 regional road. The facility would be operated as a single facility and would include the following: up to 25 wind turbine generators, internal access roads, a substation and distribution power lines linking to the existing Eskom transmission network in the vicinity of the proposed facility. The environmental clearance for this project was granted by the Department of Environmental Affairs on 27/06/2011.

Technical Summary of the project	
The project will help ease the current electricity shortage in South Africa. Currently, all power in the Eastern Cape is generated by coal power stations situated in the provinces of Limpopo and Mpumalanga and the Province has limited power generation. A project of this nature will create needed energy generation capability and employment in the region.	
Project Constraints The project is applying for a power purchase agreement through the competitive bidding process in the upcoming second round. Finalising an off-taker agreement is critical to project advancement.	
Technology to be employed	The project will employ established Wind Turbine Generator technology measuring up to a capacity of 57.5 MW, with individual turbines measuring 2MW - 3MW depending on the technology supplier used for the project. The anticipated turbines have been proven internationally to perform well.
Greenhouse Gases Targeted	CO2
Emission reductions	Annually (approximate): 154,833 tons CO2e.
Baseline & Additionality Assessment	The baseline for the project activity will be the continued use of the current coal based electricity from the South African national grid. The project faces many barriers. Additionality is be clearly demonstrated through a financial analysis.
Monitoring	The main parameter to be monitored is the amount of clean electricity that is inputted into the South Africa electricity grid.
Type of project/activities	*Identify which type of activity is involved in this project – and for each, provide brief details*
a. Energy Supply	The project is an energy supply project. It will provide renewable energy, specifically wind-generated energy.
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 is the project power plant and all power plants connected physically to the South African electricity grid.	
Indicate Emissions outside the Project Boundary	n/a

Location of the Project	
Province	Eastern Cape
Municipality	Emalahleni Local Municipality
Nearest city/large town	Indwe
Brief description of the location of the project site	A cluster of up to 25 wind turbines is planned to be constructed over an area of approximately 980 ha, which has primarily been used for agricultural activities. The proposed site is situated in an area approximately 10 km north-east of Indwe, along the R56 regional road. The GPS co-ordinates of the project are: 31°25'55.95"S, 27°28'53.17"E.

Project Schedule/Timetable	
Earliest Project Start Date	June 2012 for financial closure.

Project Schedule/Timetable	
When is the expected first year of CER delivery	2013
Project Lifetime	21 years
Project End Date	2034
Crediting Period	7 years - renewable two times.
Current Status or phase of the project	A Pre - Feasibility study has been completed. Full Feasibility study has been completed on site wind testing. The Environmental Impact Assessment Report has been completed and Environmental clearance granted. Pre Grid connection approvals have been obtained. The Draft Validation Report has been provided by Designated Operating Entity (DOE) Carbon Check. The project is applying under the REBID competitive bidding process for a PPA.
DNA Approval	The project has not previously been submitted to the DNA for an LoA. A letter of no objection (LNO) was provided by the DNA for this project on 04/11/2010.
Approval by other bodies	Environmental Clearance and pre-grid connection approvals have been granted. Validation and application for a PPA is currently underway.

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's contribution to national economic development is two-fold:
1. South Africa faces an energy crisis due to an aging electrical generation infrastructure combined with a growing population and growing economy. The project can add clean power into the grid in a time effective manner, to negate potential power cuts and loss of productivity in the South African economy while waiting for the completion of new thermal plants. The project is also an opportunity for South Africa to further the establishment of a wind industry, encompassing component manufacturing, maintenance and related services.

2. The project is situated in the poorest province in South Africa – Eastern Cape province. Numerous jobs will be created in the project as described in the section below (Construction Phase – up to 150 jobs; Operations – 15-30 jobs created).

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

The project will provide a transfer of skills as local engineers and technicians are trained to manage the operations and maintenance of the wind energy facility over the first five years. This will also provide an excellent example of sustainable economic development within the renewable energy sector in South Africa. Employment creation will not be confined to the project infrastructure alone; for example, the project will also provide local employment through opportunities such as the establishment of a security company around its operations. The project will stimulate universities and other educational institutions to develop programs focusing on renewable energy and wind power. A bursary, mentorship and training program will train and use local engineers and ensure that 95% of the operating staff are from the area within 5 years. The trained engineers and personnel will be equipped and experienced to take part in future renewable energy projects

as the wind energy industry grows in South Africa. Furthermore, the project will, in part, directly employ 30 skilled engineers and technicians to contribute to the local economy through the purchase of housing, goods and services. A community trust will be set up with local ownership in the final project. This trust fund will focus on education and training, and primary health care in the rural area in which the wind farm is situated.

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

South Africa is currently the 11th largest emitter of CO_2 in the world and this is largely a result of the coal dependent electricity generation sector. The South African government has set a target of reducing dependence on coal through the 2002 White Paper (by the Department of Minerals and Energy) that sets a target of 10,000GWh of renewable energy produced in South Africa prior to 2013. The Indwe Wind Farm (Pty) Ltd. will help South Africa to meet this 2013 renewable energy target.

The Indwe Wind Farm (Pty) Ltd. will add to the current energy infrastructure without further degrading the air quality of the county, depleting the limited water resources, or cause local biodiversity degradation and water pollution through the mining of coal.

A full Environmental Impact Assessment has been performed by independent consultants in which no "environmental fatal flaws were identified to be associated with the proposed wind energy facility". This assessment included a full stakeholder consultation and provided recommendations for mitigating any negative impacts that might be implemented throughout all phases of the project. Environmental Clearance was provided by the Department of Environmental Affairs.

i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be avoided, are minimised and remedied	The disturbance of ecosystems and loss of biological diversity is anticipated to be low after mitigation steps. Direct impacts include the loss of natural vegetation in development footprints, including direct loss in natural vegetation in areas that will be disturbed by heavy machinery, laydown areas, etc. In addition, impact on avifauna is anticipated to be low as monitoring will be completed and any necessary mitigation measures will be implemented.
ii) That **pollution and degradation of the environment** are avoided, or where they cannot be altogether avoided, are minimised and remedied	The project is committed to remediating any degradation of the environment, particularly with regard to transport of the turbines on public infrastructure (roads) and pastoral farmland where the turbines are sited.
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 proposed project has a low potential for disturbances of any heritage landscapes, archaeological material or sites that constitute the nation's cultural heritage.
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	All waste resulting from the projects construction and operation will be avoided when possible or minimised. All relevant project equipment, including turbines & hub will be recycled during the decommissioning phase.
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 proposed project does not utilise or exploit, on a consequential level, any non-renewable resources.
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 project will utilise the renewable resource of wind to generate power. The project is designed to benefit all shareholders, including land owner, local community, project developer, investors, and the South African general public in an equitable manner.
vii) That **a risk averse and cautious approach** is applied, which takes into account the limits of current knowledge	The project has adopted a cautious approach based on extensive wind data, technological capabilities of available turbine technology, transmission access & capability and transport infrastructure

about the consequences of decisions and actions	capacity.
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	All negative impacts on the environment and people's environmental rights have been taken into account and are anticipated to be minimal. Any resultant negative impacts - particularly during the construction and operational phase - will be remediated to the fullest extent possible in all cases.
Other comments **Please provide any other comments on how this project contributes to sustainable development in South Africa** The project aims is to produce clean energy for the South African grid, contributing to the sustainable development objectives and goals of South Africa. In addition to the beneficial environmental impacts of the project, specific efforts are made to further social and economically beneficial impacts to the local community and South Africa overall.	

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)	South Africa's current energy mix emits 0.27kg/MWh of particulate, leading to poor air quality. Also, 1.35 litres of water is used for the production of 1kwh of electricity. Water shortages are a key issue in semi-arid South Africa and are likely to be a key resource constraint with the current population. This proposed wind farm project does not include these detrimental impacts to generate the nation's power. The possible impacts of the project are low noise and medium visual impact on the natural setting once operational.
	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 proposed project does not anticipate any adverse impact community access to natural resources as the project site is on private property. The proposed wind facility requires negligible water usage during operation and will result in a significant water savings per kilowatt produced in South Africa. This is of critical importance due to the current water stress in South Africa. With regard to other minerals and non-renewable natural resources, the primary usage will be during the construction phase in the concrete foundations to support the turbine towers. However usage is not anticipated to have a negative impact on the efficiency of resource utilisation.
	Impacts on biodiversity and ecosystems	• Changes in local or regional biodiversity arising from the project	Biodiversity changes arising from the project will include the loss of natural vegetation in development footprints, and direct loss in natural vegetation in areas that will be disturbed by heavy machinery such as laydown areas and others. In addition, a low impact on avifauna is anticipated. The concern is, during operation, avifauna could collide with turbine blades. Mitigation measures will be implemented to ensure the least possible change in local and regional biodiversity.

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 increase foreign direct investment to South Africa as equity investors being sought are, in part, from international investors. This could have a minimal affect on foreign exchange requirements but impact will be minimal. The project will positively benefit economic activity in the area largely through income generation and job creation (anticipated jobs include - Construction Phase – up to 150 jobs; Operations – 15-30 jobs). Lastly, the project is applying for the South African REFIT so it will not increase the overall cost of grid power in South Africa.
	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 be utilise turbine technology transferred/sourced from outside South Africa (procurement for the turbines is currently underway). The project will require local skill development for construction and continual operation and maintenance of the wind turbines. As the wind industry is in its infancy in South Africa, the project has significant potential to serve as a demonstration for further replication and lessons learned for future development.

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 strongly aligned with and supports national government objectives and the renewable energy target through the provision of up to 57.5 MW's of clean energy. The project is also in line with local and provincial goals of economic development for the area. Benefits will primarily be derived through employment opportunities. In addition, the project is setting up a community trust with ownership to focus on supporting education and training in the local area and to contribute to basic services in the area. The project does will not result in any 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	The project will create employment and business opportunities in the local community during its construction (estimate up to 150 jobs during construction) and operational phases (estimate between 15-30 jobs during operational phase). Other job opportunities will be in required services such as security. The project will provide a bursary; mentorship and training program to ensure a targeted 95% of operating staff are from the area within 5 years. Downstream manufacturing jobs will be created as the wind industry grows in South Africa. A community trust is to be set up with ownership in the final project. This trust fund will focus on education and training, and primary health care in the rural area in which the wind farm is situated. Also, CDM revenues will benefit BEE funds.

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 is specifically designed to ensure a fair distribution of project benefits for project stakeholders, including the landowners, the local community, project developers and investors. Specifically, the project entity will establish a local trust fund to ensure wider benefit sharing from the project in the local community. This is in addition to increasing low employment opportunities directly related to the construction and operational phases.

Part D: Finance

Project Costs	
Development Costs (R's)	108 million ZAR which includes all pre feasibility, feasibility and engineering design.
Installed Costs (R's)	738 million ZAR
Other Costs (R's)	257 million ZAR (including DSRA, underwriting fees, etc.)
Total Project Costs (R's)	1,103 million ZAR (Total Cost assumes 57.5 MW project)
Sources of Finance	
Equity	*Name of Organisation(s) and amount (R's) contributed by each* 331 million ZAR A number of leading equity funds have been contacted and are committed to this project.
Debt (long term)	772 million ZAR Debt providers have been identified from previous infrastructure projects and negotiations for financing are underway. Banks being spoken to include: Nedbank, Standard Bank, Rand Merchant Bank, FMO, Industrial Development Corporation, Development Bank of South Africa
Debt (short term)	None
Amount not identified (R's)	N/A
Total CDM Contribution sought	Assumed to be approximately €1,548330 per annum (using €10 CER price) at full operation although this is dependent on the carbon market situation post 2012. Revenue will be received 6 months in arrears to allow for the audit process.
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)	To be determined – no ERPA signed to date *Price? (R's) tbd* *Price? (R's)* tbd *Price? (R's)* tbd
Indicate the **projected Internal Rate of Return** for the project with and without CER revenues.	10 Euro assumed CER price: Without CER revenue: projected 11.59% With CER revenue: projected 16.29%
Constraints on tradability of carbon credits	*None identified*
Preliminary discussions with potential purchasers	*No serious discussions to date*