

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

<b>Project Name</b>	Dorper Wind Farm (Pty) Ltd
<b>Date of Submission of PDD</b>	February 27, 2012

Project Developer	
<b>Name</b>	Dorper Wind Development (Pty) Ltd (a Rainmaker Energy Company)
<b>Organizational Category</b>	Private Company
<b>Legal Status</b>	Privately held company
<b>Street Address</b>	70c Oxford Road, Riviera, Johannesburg 2193, South Africa
<b>Postal Address (if different from above)</b>	Same as above
<b>Website Address</b>	<a href="http://www.rainmakerenergy.co.za">www.rainmakerenergy.co.za</a>
<b>Main Activities</b>	Dorper Wind Development (Pty) Ltd, a Rainmaker Energy company is a privately owned, independent power company, with offices in Johannesburg and Cape Town. The company develops, owns and operates sustainable, conventional and renewable energy generation projects.
<b>Summary of Financial Performance in last fiscal year</b>	Development company and does not have revenue but relies on shareholder inputs for each of its projects.

<b>Contact Person(s)</b>	Mr. Doug Jenman
<b>Telephone</b>	Work: +27 21 685 5411 Cell: +27 82 4152515
<b>Fax</b>	+27 86 582 1792
<b>Email Address</b>	doug@rainmakerenergy.co.za
<b>Project Partners</b>	
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)	
<b>Name</b>	Sumitomo Corporation
<b>Nature of partner</b>	Project Investor
<b>Organizational Category</b>	Private Company
<b>Legal Status (if private company)</b>	Corporation
<b>Street Address</b>	Harumi Triton Square, 8-11, 1 chome, Harumi, Office Tower Y, Tokyo, 104-8610, Japan
<b>Postal Address (if different to Street Address)</b>	Same as above
<b>Website Address</b>	<a href="http://www.sumitomocorp.co.jp/english/">www.sumitomocorp.co.jp/english/</a>
<b>Main Activities</b>	Engage in multifaceted business activities benefitting from an integrated corporate strength, selling a variety of domestic products and services, conducting import/ export and trilateral business transactions, providing domestic and international business investment, and participating in numerous other profitable activities facilitated by a global network in various industrial sectors around the world.
<b>Contact Person(s)</b>	Ms. Kato Ruiko
<b>Telephone</b>	Work: +81 3 5166 4618 Cell: +81 3 5166 3160
<b>Fax</b>	+27 86 582 1792
<b>Email Address</b>	<a href="mailto:cdm-project@sumitomocorp.co.jp">cdm-project@sumitomocorp.co.jp</a>
<b>Contractual Arrangements</b>	
<b>Contractual arrangements between various entities involved</b>	Sumitomo Corporation is an investor in the project and will manage the sale of all CERs generated from the project.

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

<b>Technical Summary of the project</b>	
<b>Objective of the Project</b>	To build a grid connected wind energy project in South Africa. This Phase project will result in a total project up to 550 MW and contribute to the necessary energy expansion that is critically needed within South Africa without further CO2 emissions.
<b>Project Description</b>	
The main activity of the project is to replace thermal electrical power in South Africa's coal biased energy grid through the generation of clean electricity using proven wind turbine generators. South Africa has not yet developed a renewable energy market.	
The project will be based in the Eastern Cape province of South Africa and will produce approximately 1,595,000 MWh of energy annually. This will displace the current exclusive burning of coal used by	

<b>Technical Summary of the project</b>	
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thermal power plants in the country.

The total 550 MW wind energy facility will be constructed on a 180 square kilometer plateau, in the Inkwanca municipality. The facility will be located in a sparsely populated area made up of very large landholdings and will have minimal visual disturbance to any of those settlements.

There is no need for the construction of transmission lines as there is a 400KV and a 132KV line on site. The site is connected to the port by two main roads. Also, the low visual impact gives the project ecological credibility. However this and other ecological impacts are outlined in the Environmental Impact Assessment Report for the project activity, which was completed in 2010.

The project will help ease the current electricity shortage in South Africa, as well as providing much needed Renewable Energy in a coal dominant energy generation mix.

<b>Project Constraints</b>	
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The project applied for Phase I of the competitive bid process and was successful. Finalising an off-taker agreement is critical to project advancement for all anticipated 550 MW.

<b>Technology to be employed</b>	It is anticipated that Phase I of the project will employ established wind turbine generator technology measuring 100MW, with individual turbines measuring 2MW - 3MW (depending on the technology supplier used for the project).
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<b>Greenhouse Gases Targeted</b>	CO2
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<b>Emission reductions</b>	Phase I – anticipated 100 MW: Annually post 2012 (approximate): 290,000 tons CO2e At project completion – full 550MW: 1,010,698 tons CO2e (annual)
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<b>Baseline &amp; Additionality Assessment</b>	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 clearly demonstrated through a financial analysis.
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<b>Monitoring</b>	The main parameter to be monitored is the amount of clean electricity that is contributed to the South Africa electricity grid.
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<b>Type of project/activities</b>	<i>Identify which type of activity is involved in this project - and for each, provide brief details</i>
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a. Energy Supply	The project is an energy supply project type. It will provide renewable energy, specifically wind generated energy.
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b. Energy Demand	N/A
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c. Industrial Process	N/A
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d. Transport	N/A
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e. Waste Management	N/A
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f. Forestry/ land use	N/A
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g. Other	N/A
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<b>Project Boundary</b>	
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Define the Project Boundary (Approximately 1 paragraph)

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
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<b>Location of the Project</b>	
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<b>Province</b>	Eastern Cape
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<b>Municipality</b>	Inkwanca Local Municipality
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<b>Nearest city/large town</b>	Molteno
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<b>Brief description of the location of the project site</b>	The project will be constructed over an area of approximately 13,200 ha (132km <sup>2</sup> ) that is primarily used for agricultural activities. The proposed site is situated approximately 2 km south of Molteno and approximately 10 km north-west of the town of Sterkstroom. The site
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	is proposed across 9 farms situated between R56 and the R397 National roads. The GPS co-ordinates of the project are: 31°28'40.23"S, 26°26'58.40"E
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Project Schedule/Timetable	
Earliest Project Start Date	June 2012
When is the expected first year of CER delivery	2013
Project Lifetime	21 Years
Project End Date	December 2034
Crediting Period	7 years - renewable two times
Current Status or phase of the project	Project Status to date: <ol style="list-style-type: none"> <li>1. Pre - Feasibility study completed.</li> <li>2. Full Feasibility study including on site wind testing in progress since August 2009.</li> <li>3. Full Environmental Authorisation approved by South African Department of Environmental Affairs</li> <li>4. Pre Grid connection approvals obtained</li> <li>5. Awarded 97 MW for Dorper under competitive bidding process in Phase 1.</li> </ol>
DNA Approval	This is the first time the LoA has been request to the DNA. Prior Consideration was submitted to CDM EB and South African DNA in 2010. PIN was submitted to the South African DNA and Letter of No Objection provided on 04/11/2010.
Approval by other bodies	Pre-grid connection approvals have been obtained. The Environmental Impact Assessment Report has been completed. All necessary approvals have been processed.

## 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.

### 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 a novel 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 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<sub>2</sub> 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), which set a target of 10,000GWh of renewable energy produced in South Africa prior to 2013. The Dorper Wind Farm (Pty) Ltd. will help South Africa to meet this 2013 renewable energy target and the IRP.

The Dorper 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 with a full Environmental Authorisation given by Department of Environmental Affairs. 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.

<p>i) That the <b>disturbance of ecosystems and loss of biological diversity</b> are avoided, or where they cannot be avoided, are minimised and remedied</p>	<p>The disturbance of ecosystems and loss of biological diversity is anticipated to be minimal and all recommended remediation steps from the EIA process are being incorporated into the project implementation. Direct impacts include loss of natural vegetation and soil erosion in development footprints, and direct loss in natural vegetation in areas that will be disturbed by heavy machinery such as laydown areas. However the geology of the project area has been deemed generally favorable towards the proposed project layout. In addition, the avifauna is expected to be affected but the project is expected to have a low impact with appropriate monitoring and mitigation measures.</p>
<p>ii) That <b>pollution and degradation of the environment</b> are avoided, or where they cannot be altogether avoided, are minimised and remedied</p>	<p>Minimal pollution and degradation are anticipated from the construction and operation of the project. However, the project is committed to remediating any degradation of the environment, particularly with regard to the transportation of the wind turbines on public infrastructure (roads) and pastoral farmland on which they will be situated.</p>
<p>iii) That the <b>disturbance of landscapes and sites that constitute the nation's cultural heritage</b> is avoided, or where it cannot be altogether avoided, is minimised and remedied</p>	<p>The proposed project has a low potential for disturbances of any heritage landscapes, archaeological material or sites that constitute the nation's cultural heritage.</p>
<p>iv) That <b>waste is avoided</b>, or where it cannot be altogether avoided,</p>	<p>All waste resulting from the projects construction and operation will be minimised or avoided where possible. All relevant project</p>

minimised and reused or recycled where possible and otherwise disposed of in a responsible manner	equipment, including turbines & hub will be fully recycled during the decommissioning phase of the project.
v) That the <b>use and exploitation of non-renewable resources is responsible and equitable</b> , and takes into account the consequences of the depletion of the resource	The proposed project does not utilise or exploit any non-renewable resources on a consequential level.
vi) That the <b>development, use and exploitation of renewable resources is responsible and equitable</b> , and takes into account the consequences of the depletion of the resource.	The project will only utilise the renewable resource of wind to generate power for the national grid. 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 <b>risk averse and cautious approach</b> is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions	Project development is using a cautious approach based on extensive wind data, technological capabilities of available turbine technology, environmental sensitivities, transmission access & capability and transport infrastructure capacity.
vii) That <b>negative impacts on the environment and on people's environmental rights</b> be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied	All possible negative impacts on the environment and people's environmental rights have been taken into account and are anticipated to be minimal. Any resulting negative impact, particularly during the construction and operational phase will be remediated to the fullest extent possible in all cases.
<b>Other comments</b> Please provide any other comments on how this project contributes to sustainable development in South Africa The project will contribute to South Africa's national renewable energy target. The additional benefits to the local economy through the development of a "Green Economy" will significantly contribute to the sustainable development of the local region and South Africa as a whole.	

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment	
<b>Environmental</b>	Impact on local environmental quality	<ul style="list-style-type: none"> <li>• Impact of the project on air quality</li> <li>• Impact of the project on water pollution</li> <li>• Impact of the project on the generation or disposal of solid waste</li> <li>• Any other positive or negative environmental impacts of the project (such as impacts on noise, safety, visual impacts, or traffic)</li> </ul>	<p style="color: green;">Please comment on the impact of the project on local environmental quality. Comment specifically on the indicators of relevance which are given here. (1 paragraph)</p> <p>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.</p>
	Change in usage of natural resources	<ul style="list-style-type: none"> <li>• Impact of the project on community access to natural resources</li> <li>• Impact of the project on the sustainability of use of water, minerals or other non renewable natural resources</li> <li>• Impact of the project on the efficiency of resource utilisation</li> </ul>	<p style="color: green;">Please comment on the impact of the project on the usage of natural resources. Comment specifically on the indicators of relevance which are given here. (1 paragraph)</p> <p>The project's location is on private property (9 continuous farms) and will not affect community access to natural resources. The wind facility requires negligible water usage during operation and will result in significant water savings per kilowatt produced. This is of critical importance given that South Africa is a water-stressed country. Other minerals and non-renewable natural resources will primarily be used 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.</p>
	Impacts on biodiversity and ecosystems	<ul style="list-style-type: none"> <li>• Changes in local or regional biodiversity arising from the project</li> </ul>	<p style="color: green;">Please comment on the impact of the project on biodiversity and ecosystems. Comment specifically on the indicators of relevance which are given here. (1 paragraph)</p> <p>Biodiversity changes arising from the project could include soil erosion, loss of natural vegetation in development footprints, and direct loss in natural vegetation in areas that will be disturbed by heavy machinery such as lay down areas. Avifauna could be impacted by disturbance and displacement during project construction and operation. The Environmental Impact Assessment report determined that construction of the Dorper Wind Farm (Pty) Ltd. does not result in whole-scale disturbance to the site, concluding that no environmental fatal flaws were identified to be associated with the project.</p>

Indicators in Support of the Project Approval Criteria		
Category	Indicator	Comment
Economic	Economic impacts	<ul style="list-style-type: none"> <li>Impact of the project on foreign exchange requirements</li> <li>Impact of the project on existing economic activity in the area</li> <li>Impact of the project on the cost of energy</li> <li>Impact of the project on foreign direct investment</li> </ul> <p>Please comment on the economic impacts of the project. Comment specifically on the indicators of relevance which are given here. (1 paragraph)</p> <p>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. The project will positively benefit economic activity in the area, directly and indirectly creating income and jobs. Lastly, the project will continue to apply for the competitive bidding IPP process(or alternatively a competitive bid process) so it will not increase the overall cost of grid power in South Africa.</p>
	Appropriate technology transfer	<ul style="list-style-type: none"> <li>Positive or negative implications for the transfer of technology to South Africa arising from the project</li> <li>Impacts of the project on local skills development</li> <li>Demonstration and replication potential of the project</li> </ul> <p>Please comment on the impacts of the project on appropriate technology transfer. Comment specifically on the indicators of relevance which are given here. (1 paragraph)</p> <p>The project will utilise turbine technology transferred/sourced from outside of South Africa (procurement for the turbines is currently underway). The project will require local skill development for construction and continual maintenance of the wind turbines. As the wind industry is in its infancy in South Africa, the project will have significant potential to serve as a demonstration for further replication and lessons learnt for future developments.</p>

Indicators in Support of the Project Approval Criteria		
Category	Indicator	Comment
Social	Alignment with national provincial and local development priorities	<ul style="list-style-type: none"> <li>How the project is aligned with provincial and national government objectives</li> <li>How the project is aligned with local developmental objectives</li> <li>Impact of the project on the provision of, or access to, basic services to the area</li> <li>Impact of the project on the relocation of communities if applicable</li> <li>Contribution of the project to a any specific sectoral objectives (for example, renewable energy targets)</li> </ul> <p>Please comment on how the project is aligned with national, provincial and local development priorities. Comment specifically the indicators of relevance to the project which are given here. (1 paragraph)</p> <p>Phase I of the project is strongly aligned with and supports national government objectives and the renewable energy target through the provision of up to 100 MW's of clean energy. The overall project (550 MW) is also in line with local and provincial goals of economic development for the area. Benefits will primarily be derived through employment opportunities (up to 600 jobs during construction phase and up to 75 during operational phase).</p> <p>In addition, the project intends to set 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.</p>

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
	<p style="text-align: center;">Social equity and poverty alleviation</p> <ul style="list-style-type: none"> <li>• 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)</li> <li>• Impact of the project on community social structures</li> <li>• Impact of the project on social heritage</li> <li>• Impact of the project on the provision of social amenities to the community in which the project is situated</li> <li>• Contribution of the project to the development of previously underdeveloped areas or specially designated development nodes</li> </ul>	<p style="color: green;">Please comment on the impact of the project on social equity and poverty alleviation. Comment specifically on the indicators of relevance which are given here. (1 paragraph)</p> <p>The project will create employment and business opportunities in the local community during its construction (up to 600) and operational (up to 75) phases. Other job opportunities will be in required services such as security. The project will also 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.</p>

**Indicators in Support of the Project Approval Criteria**

Category	Indicator	Comment
<p align="center"><b>General</b></p>	<p>General Project Acceptability</p> <ul style="list-style-type: none"> <li>• Are the distribution of project benefits deemed to be reasonable and fair?</li> </ul>	<p>Please comment on whether the benefits occurring from the project due to the contribution of the CDM are reasonable and fair. (1 paragraph)</p> <p>The project includes a fair distribution of project benefits for project stakeholders, including the land owners, the local community, project developers and investors. Of particular note, 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 local employment opportunities directly related to the construction (up to 600 jobs) and operational (up to 75 jobs) phases.</p>

## Part D: Finance

Project Costs	
Development Costs (R's )	110 Million ZAR
Installed Costs (R's)	9,086 Million ZAR
Other Costs (R's)	2,536 Million ZAR (including DSRA, underwriting fees, etc.)
<b>Total Project Costs (R's)</b>	<b>11,732 Million ZAR</b>
Sources of Finance	
Equity	3,520 Million ZAR A number of leading equity funds have been contacted and are committed to this project. Debt providers have been identified from previous infrastructure projects.
Debt (long term)	8,212 Million ZAR 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	TBD Without income from CDM, the investment cost and the operating and maintenance expenses will be too costly to proceed with the implementation of the project.
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)	TBD <i>Price? (R's) n/a</i> <i>Price? (R's) n/a</i> <i>Price? (R's) n/a</i>
Indicate the projected Internal Rate of Return for the project with and without CER revenues.	Assumed CER price 10 Euros Projected project IRR without CERs: 12.58%  Projected project IRR with CERs: 16.31%
Constraints on tradability of carbon credits	<i>Have any commercial arrangements been made that may impact the tradability of the carbon emission reductions? If yes, please define.</i>  No commercial arrangements have been made that could impact the tradability of the CERs.
Preliminary discussions with potential purchasers	No formal discussions have taken place regarding the CER purchase to date.