

Clean Development Mechanism South Africa  
Designated National Authority



energy

Department:  
Energy  
**REPUBLIC OF SOUTH AFRICA**

Private Bag X 19 , Acardia ,Pretoria, 0007, Tel:012-444 4116, Fax: 012 444 4501  
Private Bag X9111, Cape Town, 8000, Tel: 021-469 6412, Fax: 021-465 5980

## 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>	TWE Golden Valley Wind Power Project
<b>Date of Submission of PDD</b>	23 June 2010

Project Developer	
<b>Name</b>	Terra Wind Energy - Golden Valley (Pty) Limited
<b>Organizational Category</b>	Private Company
<b>Legal Status</b>	Limited company
<b>Street Address</b>	Building 1, Leslie Ave East, Design Quarter District, Fourways, South Africa.
<b>Postal Address (if different from above)</b>	P.O. Box 69408, Bryanston, Gauteng 2021, South Africa
<b>Website Address</b>	The project does not have a separate website.
<b>Main Activities</b>	Terra Wind Energy - Golden Valley (Pty) Limited is a Special Purpose Vehicle that has been specifically set up for the development and implementation of the project activity.

	Therefore, the main activity of Terra Wind Energy - Golden Valley (Pty) Limited is the development and implementation of a wind power project in South Africa.
<b>Summary of Financial Performance in last fiscal year</b>	<i>The company has only entered into agreements to further the development of the project. No assets and liabilities other than those in relation to the development were created</i>
<b>Contact Person(s)</b>	Uri Epstein
<b>Telephone</b>	Work: +27 (0) 11 3674600
<b>Fax</b>	+27 (0) 11 367 4601
<b>Email Address</b>	<a href="mailto:info@biothermenergy.com">info@biothermenergy.com</a> <a href="mailto:uepstein@biothermenergy.com">uepstein@biothermenergy.com</a>
<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>	BioTherm Energy
<b>Nature of partner</b>	BioTherm Energy is the principal owner of Terra Wind Energy - Golden Valley (Pty) Limited and lead developer.
<b>Organizational Category</b>	Private company
<b>Legal Status (if private company)</b>	Limited Company
<b>Street Address</b>	Building 1, Leslie Ave East, Design Quarter District, Fourways, South Africa.
<b>Postal Address (if different to Street Address)</b>	P.O. Box 69408, Bryanston, Gauteng 2021, South Africa
<b>Website Address</b>	<a href="http://www.biothermenergy.com">www.biothermenergy.com</a>
<b>Main Activities</b>	BioThermEnergy (Pty) Limited (BTE) is a renewable energy developer based in South Africa. As one of South Africa's first independent power producer (IPP), BTE has embarked on delivering clean, renewable energy to South Africa with a series of wind and solar farms in the Eastern, Western and Northern Cape provinces. As at its establishment in 2003, BTE business was initially focused on developing waste gas and heat cogeneration projects. BTE boasts the commissioning of a 4.2 megawatt biogas project at the PetroSA refinery in Mossel Bay, Eastern Cape, which was the first non-recourse project-financed independent power producer transaction completed in South Africa.
<b>Contact Person(s)</b>	Name: Uri Epstein
<b>Telephone</b>	Work: +27 (0) 11 3674600

Fax	+27 (0) 11 367 4601
Email Address	<a href="mailto:info@biothermenergy.com">info@biothermenergy.com</a> <a href="mailto:uepstein@biothermenergy.com">uepstein@biothermenergy.com</a>
<b>Contractual Arrangements</b>	
Contractual arrangements between various entities involved	BioTherm Energy is the principal owner of the TWE Golden Valley Wind Power Project and therefore also the owner of the future CERs. Currently, BioTherm Energy is the only project participant and acts as the CDM sole focal point.

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

<b>Technical Summary of the project</b>	
Objective of the Project	The purpose of the TWE Golden Valley Wind Power Project is the construction of a 147.6 MW wind power plant in the Eastern Cape Province of South Africa.
<p><b>Project Description</b>  <i>Present a brief description of the project (approximately ½ page A4)</i>  <i>Identify the main processes and activities involved in the project. A flow diagram showing the processes/materials and/or products involved may be used to complement the description (over and above the ½ page A4).</i></p> <p>The wind park will consist of 82 Vestas V100-1.8 MW turbines. It is estimated that the project activity will supply 509,303 MWh of clean electricity to the South African national electricity grid per year resulting in a net load factor of 39.39%.</p> <p>The project will inject the energy generated into the South African national grid at the Point of Utility Connection at a voltage level of 400 KV.</p> <p>A main and back-up metering system will be installed as part of the project in line with the metering code and NRS 057 code.</p> <p>The project activity will achieve CO2 emission reductions by replacing electricity generated by fossil fuel powered plants connected to the national grid.</p> <p>The project is intending to submit a bid under the third bid submission in October 2012. Financial close is expected in July 2013 after which construction will start in July or August. The plant is then expected to be commissioned in July 2015.</p>	
<p><b>Project Constraints</b>  Are there any constraints affecting project operations or commissioning? <i>(Brief description: 1 paragraph or less)</i> <i>Note: these may be due to energy supply, infrastructure, other resources etc.</i></p> <p>Key constraints for the development of the project, include regulatory uncertainty and changes as well as higher project development costs as compared to other parts of the world. This makes the financial returns on the project less attractive and therefore the project is seeking CDM accreditation.</p>	

## Technical Summary of the project

Technology to be employed

*Describe in less than 5 lines.  
Is the technology one that has been previously tried and tested in South Africa or internationally? If yes, provide details (1 paragraph)*

*Have the project operators had any previous experience or expertise with operating the technology?  
If yes - provide brief details (1-2 lines)*

Based on onsite wind measurements and analysis the Vestas V100 1.8 MW wind turbine generator was selected as the most appropriate turbine technology. The turbine has a nominal capacity of 1.8 MW. A total of 82 wind turbine generators (WTGs) will be installed. Further details regarding the technical specifications of the Vestas V100-1.8 MW are given in the table below.

Technical specifications of wind turbine technology

Parameter	Value
Manufacturer	Vestas Wind Systems A/S
Rotor diameter	100 m
Area swept	7.850 m <sup>2</sup>
Number of blades	3
Hub height	80 m
Cut-in wind speed	3 m/s
Cut-out wind speed	20 m/s
Rotor speed range	9.3-16.6 rpm
Nominal output	1.8 MW

BioTherm Energy has experience with the development of wind power projects in South Africa and currently has 10 projects under development.

Greenhouse Gases Targeted

*Identify which greenhouse gas(es) this project will target.*

*Note: CDM projects must result in a reduction of one of the following greenhouse gases: CO<sub>2</sub>/ CH<sub>4</sub>/N<sub>2</sub>O/HFCs/PCFs/SF<sub>6</sub>*

The project is targeting the reduction of CO<sub>2</sub> emissions from fossil fuel power plants that are supplying electricity to the national grid.

Emission reductions

*Indicate the expected emission reductions that will occur due to the project.*

*Note: please provide annual and total emission reductions in tonnes CO<sub>2</sub> equivalent*

The annual and total emission reduction for the first crediting period are given in the table below

Year	Baseline emissions (t CO <sub>2</sub> e)	Project emissions (t CO <sub>2</sub> e)	Leakage (t CO <sub>2</sub> e)	Emission reductions (t CO <sub>2</sub> e)
Year 1	481,997	0	0	481,997

## Technical Summary of the project

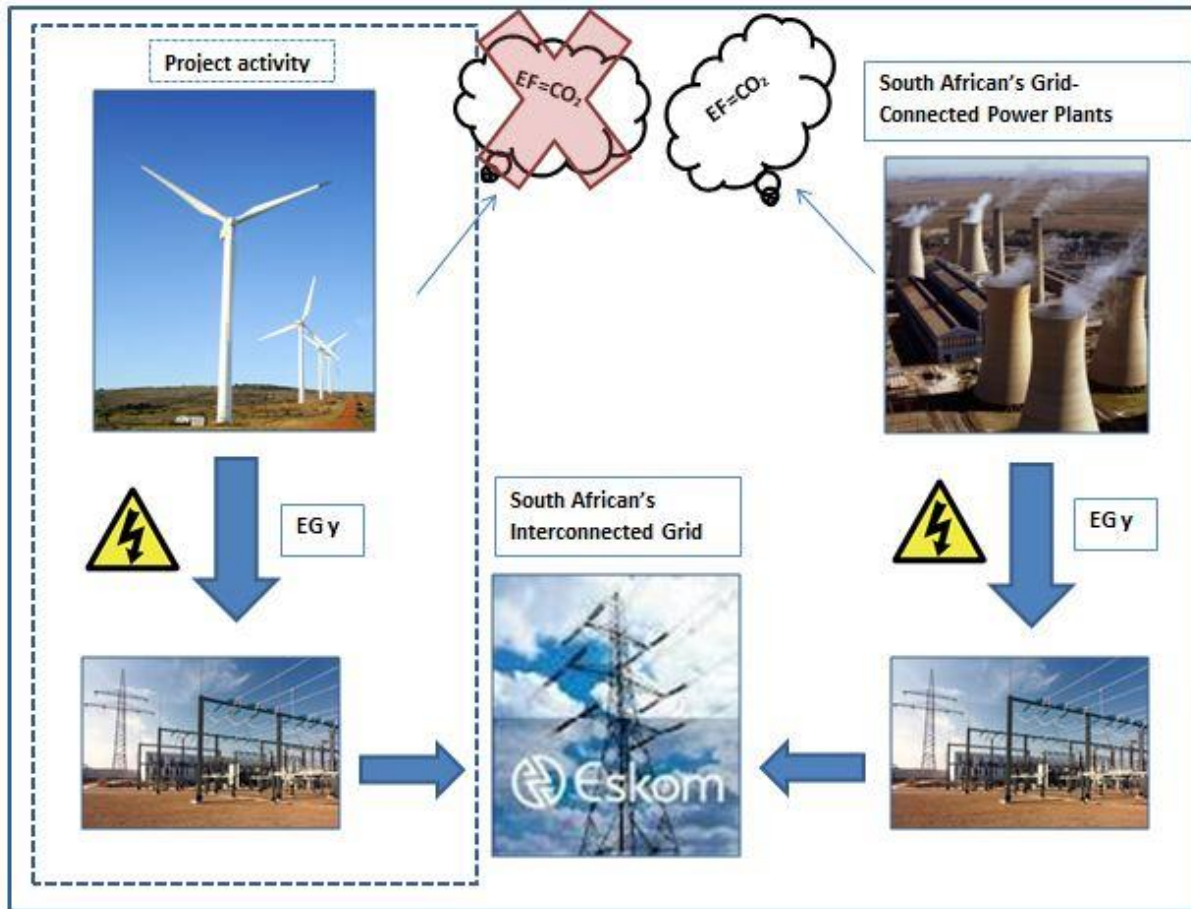
	Year 2	481,997	0	0	481,997
	Year 3	481,997	0	0	481,997
	Year 4	481,997	0	0	481,997
	Year 5	481,997	0	0	481,997
	Year 6	481,997	0	0	481,997
	Year 7	481,997	0	0	481,997
	<b>Total</b>	<b>3,373,982</b>	<b>0</b>	<b>0</b>	<b>3,373,982</b>
	<b>Total number of crediting years</b>	7			
	<b>Annual average over the crediting period</b>	481,997	0	0	481,997
<b>Baseline &amp; Additionality Assessment</b>	<p><i>Provide an indication of the baseline and additionality approach to be used, with a brief explanation of why the project is additional as defined under the Kyoto Protocol.</i></p> <p><b>Baseline</b></p> <p>In the case of renewable energy projects, the baseline is provided by approved and consolidated baseline methodology ACM0002:</p> <p>“Electricity delivered to the grid by the project activity would have otherwise been generated by the operation of grid-connected power plants and by the addition of new generation sources, as reflected in the combined margin (CM) calculations described in the “Tool to calculate the emission factor for an electricity system.”</p> <p>In South Africa, approximately 85% of the electricity delivered to the grid is generated by coal-fired power plants. This leads to a relatively high grid emission factor of over 0.9 tCO<sub>2</sub>/MWh</p> <p><b>Additionality assessment</b></p> <p>The project is applying investment analysis to demonstrate additionality. The benchmark used is the post-tax Weighted Average Cost of Capital (WACC). Based on the calculation of the project IRR, it appears that, without the revenue from the CERs, the IRR would be below the benchmark and therefore it is concluded that the project would not be financially viable without the future revenue from the CERs.</p>				
<b>Monitoring</b>	<p><i>Describe the parameters that will be used as performance indicators that will be monitored to verify that emissions reductions are taking place.</i></p> <p><i>Note: parameters may include emissions output, energy production, energy sales, environmental impacts etc.</i></p> <p>For the purpose of calculating the emission reductions, the project will fix the grid emission factor ex ante. Therefore, the project will only monitor the future electricity generation by the project activity.</p>				

<b>Technical Summary of the project</b>	
	<p>The grid emission factor is currently estimated at 0.95 tCO<sub>2</sub>/MWh. This figure might increase slightly before the end of validation due to comments from the DOE.</p> <p>Monitoring of electricity generation will take place using main and back up metering systems. The installation and operation of the metering systems will be carried out in line with national regulations and standards.</p>
<b>Type of project/activities</b>	<i>Identify which type of activity is involved in this project - and for each, provide brief details</i>
a. Energy Supply	<p><i>Select if applicable: Renewable Energy (excluding biomass)/ Biomass/ Cogeneration/ Improving energy efficiency by replacing existing equipment/minimization of transport and distribution/ fuel switch/ other</i></p> <p><i>Provide details (1-2 lines)</i></p> <p>The project activity involves the construction of a wind power plant at a site where no renewable power plant existed prior to the implementation of the project activity. The project will supply electricity to the South African national grid.</p>
b. Energy Demand	<p><i>Select if applicable: Replacement of existing 'household equipment'/ improvement of energy efficiency of existing production equipment/ other</i></p> <p><i>Provide details (1-2 lines)</i></p> <p><i>n/a</i></p>
c. Industrial Process	<p><i>Provide details (1-2 lines)</i></p> <p><i>n/a</i></p>
d. Transport	<p><i>Select if applicable: More efficient engines for transport/ modal shift/ fuel switch/ other</i></p> <p><i>Provide details (1-2 lines)</i></p> <p><i>n/a</i></p>
e. Waste Management	<p><i>Select if applicable: Capture of landfill methane emissions/ utilization of waste and waste water emissions/ other</i></p> <p><i>Provide details (1-2 lines)</i></p> <p><i>n/a</i></p>
f. Forestry/ land use	<p><i>Provide details (1-2 lines)</i></p> <p><i>n/a</i></p>
g. Other	<p><i>Provide details (1-2 lines)</i></p> <p><i>n/a</i></p>
<p><b>Project Boundary</b>  <i>Define the Project Boundary (Approximately 1 paragraph)</i>  <i>Note: a project boundary refers to all emissions which are under the control or directly affected by</i></p>	

## Technical Summary of the project

the project activity. Such a boundary can encompass equipment, processes and process flows.

In line with the applied methodology, ACM0002, the spatial project boundary encompasses the project power plant and all the grid connected power plants in South Africa. The figure below provides a flow chart of the equipment and systems, emissions sources and gases included in the project boundary as well as the monitoring variables in the project boundary:



Indicate Emissions outside the Project Boundary

*Note: Significant and measurable net emissions of GHG that are attributable to the project outside of the project boundary*

Main emissions outside the project boundary are emissions from the transport of the turbines to the project site. However, these emissions are not measurable and also insignificant according to the consolidated and approved baseline methodology ACM0002.

## Location of the Project

Province	Eastern Cape
Municipality	Blue Crane Route Local Municipality
Nearest city/large town	Cookhouse

<b>Brief description of the location of the project site</b>	<p><i>No more than 3-5 lines</i></p> <p>The project is situated 15 km Southeast of Cookhouse in the Eastern Cape province, South Africa. The site belongs to the Bedford Magisterial District. It is bordered on the west by the Great Fish River and the national road R335 from Cradock to Port Elizabeth, and on the northern side by the Cookhouse-Bedford gravel road that passes near the major Eskom Poseidon substation</p>
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<b>Project Schedule/Timetable</b>	
<b>Earliest Project Start Date</b>	16/05/2012
<b>When is the expected first year of CER delivery</b>	2015
<b>Project Lifetime</b>	20 years
<b>Project End Date</b>	<p><i>Year/month</i></p> <p>2035/07</p>
<b>Crediting Period</b>	<p><i>Has a crediting period for the project been identified? If yes - which option has been selected (10 years or X times 7 years, with reassessment of baseline for each 7 year renewal?)</i></p> <p>7 years, renewable crediting period</p>
<b>Current Status or phase of the project</b>	<p><i>Select most applicable: Under discussion/ planning/preparation/construction or other actions already commenced/ Other (explain)</i></p> <p><i>Please provide brief details (1-2 lines)</i></p> <p>The project is currently preparing for round 3 bid submission.</p>
<b>DNA Approval</b>	<p><i>Has this project been submitted to the DNA for approval previously?</i></p> <p><i>If yes - provide date of last submission and brief details of the response from the DNA (1 paragraph)</i></p> <p><i>Provide details of any other official response by the DNA regarding this project</i></p> <p>This project has not been submitted previously to the DNA for approval prior to this submission.</p>
<b>Approval by other bodies</b>	<p><i>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)</i></p>

## Project Schedule/Timetable

- see Part C). If so - provide brief details.

Civil Aviation Authority approval dated 26- Feb 2010

## 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?

Please give details (1 paragraph)

For an economy to develop, energy is needed. The Integrated Resource Plan 2010-2030, published by the Department of Energy (DOE) and the National Energy Regulator of South Africa (NERSA), predicts that by 2030 the power generation capacity of South Africa will double to 89,532MW to meet the rising energy demand. It is expected that wind energy technologies will constitute 10.3% of the future capacity, i.e. approximately 9,200 MW. The proposed project will assist the country to meet its generation requirements.

The project will monitor electricity generation throughout the lifetime of the project. Therefore, this indicator can be objectively monitored and measured on an ongoing basis.

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

Please give details (1 paragraph)

The project will meet all the requirements for economic development as set out in Volume 5 of the Request for Qualification and Proposals for New Generation Capacity under the IPP Procurement Programme in terms of job creation, local content, ownership, management control, preferential procurement, enterprise development and socio-economic development contributions.

Volume 5 of the Request for Qualifications provides quantitative targets for the different elements of the economic development programme. Therefore, the elements can be objectively monitored and measured on an ongoing basis.

### 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

(1 paragraph)

In line with the Environmental Management Plan, the project will carry out a number of mitigation activities to avoid, minimize and/or remedy the disturbance of ecosystems and loss of biological diversity. The measures include:

- Keeping the removal of vegetation to a minimum (it should be noted that the wind farm will be constructed in an area where the vegetation is already quite degraded due to

	<p>invasive species).</p> <ul style="list-style-type: none"> <li>• Rehabilitation and revegetation</li> <li>• Monitoring of the site for potential invasive species.</li> </ul> <p>In the specific case of birds and bats, the project activity will take a number of measures to minimize the number bird collisions and fatalities. These include:</p> <ul style="list-style-type: none"> <li>• Siting of the wind turbines away from high sensitivity areas.</li> <li>• Use of intermittent lighting</li> <li>• Monitoring of fatalities for the duration of the project activity</li> <li>• Broadcast of ultrasound to deter bats.</li> </ul>
<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><i>(1 paragraph)</i></p> <p>According to the National Environmental Management Act, No. 107 of 1998, pollution can be defined as, “Any change in the environment caused by (i) substances; (ii) radioactive or other waves; or (iii) noise, odours, dust or heat emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future”</p> <p>In line with the Environmental Impact Assessment Report, hazardous waste such as bitumen, oils, oily rags, paint tins, etc. usually associated with the construction phase of the project shall be disposed of at a DEA approved hazardous waste landfill site. Special care will be taken to avoid spillage of hazardous waste from entering the ground or contaminating water.</p> <p>In terms of noise, the Environmental Management Plan contains detailed provisions for the reduction of noise during the construction phase. During the operation of the wind farm, the project shall ensure that the turbine infrastructure is maintained such that noise levels in identified noise sensitive areas will not exceed the legally acceptable level of 45 dB for affected communities or households.</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><i>(1 paragraph)</i></p> <p>The project will have a visual impact and the natural landscape. In order to limit the impact, the project has been sited away from protected areas.</p> <p>The heritage specialist assessment has concluded that implementing the proposed project will result in no impacts to heritage, apart from those impacts caused by natural forces such as erosion.</p>
<p>iv) That <b>waste is avoided</b>, or where</p>	<p><i>(1 paragraph)</i></p>

<p>it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner</p>	<p>The environmental Impact Assessment report recommends that as far as possible, maintenance of machinery and vehicles on site should be avoided. Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery will be collected in a holding tank and returned to the supplier. Water and oil will be separated in an oil trap. Oils collected in this manner, will be retained in a safe holding tank and removed from site by a specialist oil recycling company for disposal at approved waste disposal sites for toxic/hazardous materials. Oil collected by a mobile servicing unit will be stored in the service unit's sludge tank and discharged into the safe holding tank for collection by the specialist oil recycling company. The Contractor will ensure that an emergency preparedness plan is in place for implementation in the case of a spill or substances which can be harmful to an individual or the receiving environment. All used filter materials will be stored in a secure bin for disposal off site. Hazardous waste will not be stored or stockpiled in any area other than that designated on the construction site layout.</p> <p>Any contaminated soil during the construction will be removed and replaced. Soils contaminated by oils and lubricants will be collected and disposed of at a facility designated by the local authority to accept contaminated materials. Washing of vehicles on the construction site will not be permitted as this is likely to result in release of hydrocarbon-contaminated wash water into the environment.</p> <p>The above precautions clearly indicate that waste is avoided and where it cannot be avoided it will be reduced, reused or recycled or disposed of in a responsible manner.</p>
<p>v) That the use and exploitation of non-renewable resources is responsible and equitable, and takes into account the consequences of the depletion of the resource</p>	<p><i>(1 paragraph)</i></p> <p>The project does not involve the extraction of a non renewable resource. However, in case of such activity, consultation with an Environmental Control Officer (ECO) will be carried out to ensure that consequences of depletion are taken into account.</p>
<p>vi) That the development, use and exploitation of renewable resources is responsible and equitable, and takes into account the consequences of the depletion of the resource.</p>	<p><i>(1 paragraph)</i></p> <p>The project activity involves the exploitation of wind energy which cannot be depleted as a result of exploitation but is subject to variation from environmental conditions.</p>
<p>vii) That a risk averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions</p>	<p><i>(1 paragraph)</i></p> <p>The project takes a risk averse and cautious approach which is exemplified by the continued monitoring of the impacts of the project on the surroundings during operations. For instance, in the case of birds and bats, this will help in increasing the understanding of the impacts of wind power projects on birds and bats in South Africa and possibly help design better mitigation measures.</p> <p>The project will also put in place an appropriate environmental management structure, including the appointment of an</p>

	<p>Environmental Control Officer who will be responsible for ensuring that the provisions in the Environmental Management Plan are adhered to.</p>
<p>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</p>	<p><i>(1 paragraph)</i></p> <p>The project has carried out a detailed Environmental Impact Assessment in line with the requirements under the National Environmental Management Act (Act No. 107 of 1998) (NEMA) and other environmental regulations. As part of the process, seven specialist studies were carried out. The assessments were intended to anticipate potential negative impacts and design mitigation measures to prevent, minimize and/or remedy the potential impacts.</p>
<p><b>Other comments</b> Please provide any other comments on how this project contributes to sustainable development in South Africa (optional)</p>	

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Environmental	Impact on local environmental quality	<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>The project activity is the construction of a wind farm. Therefore, it has no impact on air quality.</p> <p>The project will only have limited impact on water resources. The impact of the project on water pollution will be kept to minimal through avoidance of leakage involving oil and washing of equipment and machinery.</p> <p>The project will produce some solid waste during the construction phase. Solid waste shall be stored in a designated area within the site area in covered, tip proof drums for collection and disposal. Disposal of solid waste shall be at a DEA licensed landfill site, or at a site approved by DEA in the event that an existing operating landfill site is not within reasonable distance from the site. No waste shall be burned.</p> <p>Noise will mostly occur during the construction phase. The Environmental Management Plan describes detailed measures to limit noise impacts during construction. During the operation phase, the impact of noise will be limited through careful siting and proper maintenance of the wind turbines.</p> <p>The visual impact of a wind farm will be high for residents and surrounding farms, most of whom are participants in the project. However, the siting of the wind farm has been selected in such a way to reduce the impact on scenic viewpoints and protected areas.</p> <p>Other potential environmental impacts including traffic, safety, etc. will mostly occur during the construction phase. Appropriate mitigation measures are described in the Environmental Management Plan.</p>

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
	Change in usage of natural resources	<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> <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>The project will have no impact on community access to natural resources.</p> <p>The project will have no impact on sustainability of use of water, minerals or other non renewable natural resources.</p> <p>The project will increase the efficiency of wind resource utilization as a way of generating clean energy.</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>The wind farm is expected to have some negative impact on avifauna and bats. Specialist studies were carried out to assess the impacts and propose appropriate mitigation measures, which are also included in the Environmental Management Plan. Apart from birds and bats, the project is expected to only have a moderate impact on biodiversity and ecosystems and most impacts can be mitigated through the implementation of appropriate mitigation measures.</p>

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

Category	Indicator	Comment
Economic	Economic impacts	<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 have no impact on foreign exchange requirements</p> <p>The existing economic activities in the area are manufacturing, agriculture and tourism. Through the delivery of electricity, the project will have a positive impact on mostly the manufacturing sector. Some negative impacts can be expected on the tourism sector due to the visual impact of a large wind farm on the natural landscape.</p> <p>The impact of the project on the cost of energy will be negligible due to the small size of the project as compared to the total installed capacity of the national grid.</p> <p>The total investment cost for the project is estimated at 3 billion ZAR part of which will be financed through foreign direct investment.</p>
	Appropriate technology transfer	<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>Implementation of the project activity will have a positive impact on the transfer of wind energy technology to South Africa, as well as know-how skills for local workers. The transfer of technology and know-how will be directly replicable to other future wind energy projects. Transfer of environmentally safe and sound technology will take place through the introduction of state-of-the-art wind turbine technology. Transfer of know-how will take place through the training of local engineers and other technical staff by the Operations and Maintenance contractor with the support of the turbine manufacturer. The turbine manufactures as well as assuring performance standards for the wind farm will also provide oversight of the maintenance and operation of the turbines during its lifetime. This is also in line with the economic development requirements under Volume 5 of the Request for Qualifications and Proposals for New Generation Capacity under the IPP Procurement Programme.</p>

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

Category	Indicator	Comment
Social	Alignment with national provincial and local development priorities	<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>The project is aligned with the White Paper on the Energy Policy for South Africa (Energy White Paper) which aims to create energy security by diversifying energy supply and energy carriers and sets out the policy principles, goals and objectives to achieve, “An energy economy in which modern renewable energy increases its share of energy consumed and provides affordable access to energy throughout South Africa, thus contributing to sustainable development and environmental conservation”</p> <p>The project is aligned with the following local developmental objectives:  The project will meet the minimum guidelines suggested by the Department of Energy, Department of Trade &amp; Industry, Department of Treasury and Department of Environmental Affairs, which currently require that, at a minimum, local content equal 40% of the project costs.</p> <p>The project will have the following impact on the provision of, or access to, basic services in the area:  The only potential positive impact of the project to basic services will be the improvement of public roads, as may be needed for the transportation of the project components to site. There will be no negative impacts to the provision and access to basic services in the area</p> <p>The project will not result in relocation of communities.</p> <p>The project will contribute to the Department of Energy’s target of having 10.3% of the future installed capacity in 2030 be based on wind energy.</p>
		<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>

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Social equity and poverty alleviation	<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 is expected to create the following jobs,</p> <ul style="list-style-type: none"> <li>• Total jobs created: 730 man hours made up as follows                             <ul style="list-style-type: none"> <li>○ RSA Based citizens: 460 man hours</li> <li>○ RSA Based Black Citizens: 350 man hours</li> <li>○ Skilled employees: 550 man hours</li> <li>○ RSA Based Skilled Black Citizens: 270 man hours</li> <li>○ Citizens form Local Communities: 100 man hours</li> </ul> </li> </ul> <p>The project will have no impact on community social structures.</p> <p>The project will have no impact on social heritage.</p> <p>The project will implement a socio-economic development plan in line with the economic development requirements under the Request for Qualification and Proposal for New Generation Capacity under the IPP Procurement Programme. The socio-economic development plan will be based on the needs that will have been identified in the surrounding communities (e.g. health, educations, etc.). Similarly, the project will implement an enterprise development plan in the project area supporting local enterprises.</p> <p>The project will contribute to the development of previously underdeveloped areas or specially designated development nodes as follows: The Project is located in an area that has previously only been utilized for agricultural purposes and that will now see modern equipment and the training required for operating it be brought in.</p>

## Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
General	General Project Acceptability <ul style="list-style-type: none"> <li>• Are the distribution of project benefits deemed to be reasonable and fair?</li> </ul>	<p style="color: green;">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>As part of the IPP Procurement Programme, the Department of Energy has formulated specific economic development targets which need to be met by the projects. The economic development targets focus on job creation, local content, fostering rural development, etc. In complying with the targets, the project will ensure that the distribution of the benefits from the project will be reasonable and fair.</p>

## Part D: Finance

Project Costs	
Development Costs (R's )	30 million ZAR
Installed Costs (R's)	2,2 billion ZAR
Other Costs (R's)	970 million ZAR
Total Project Costs (R's)	3.2 billion ZAR
Sources of Finance	
Equity	<i>BioTherm: ZAR0.5 billion Local community trust (via DFI funding): ZAR 40 million</i>
Debt (long term)	<i>ABSA and Nedbank:ZAR2.4 billion</i>
Debt (short term)	N/A
Amount not identified (R's)	<i>Other equity investors to be identified: ZAR280 million. As per the RFP requirements the local shareholders must hold a minimum of 40% equity in the project. We have yet to identify the party/ies that will hold the remaining 35% equity in the project company.</i>
Total CDM Contribution sought	<i>Amount (R's) and a brief summary of the needs and any outstanding issues (1 paragraph or less)</i>  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)	15 EUR/CER
Indicate the projected Internal Rate of Return for the project	<i>Note: Please indicate assumed price of CER as used in your</i>

with and without CER revenues.	<p><i>calculation</i></p> <p>Without CERs: 9.02%  With CERs : 11.59% (CER price of 15 EUR)</p>
<b>Constraints on tradability of carbon credits</b>	<p><i>Have any commercial arrangements been made that may impact the tradability of the carbon emission reductions? If yes, please define. Note. Examples would be subjection to a mortgage, government tax etc.</i></p> <p>No commercial arrangements have been made that impact the tradability of the CERs.</p>
<b>Preliminary discussions with potential purchasers</b>	<p><i>Have you had any preliminary discussions with any potential purchasers of the carbon credits (CERs) If yes, please give brief details.</i></p> <p>No discussions have taken place with potential CER off takers.</p>