

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	CDM Africa Wind and Solar Programme of Activities for South Africa
Date of Submission of PDD	5 April 2012

Project Developer	
Name	PoA Africa Wind/Solar (Pty) Ltd, a subsidiary of CDM Africa Climate Solutions (Pty) Ltd
Organizational Category	Select most applicable: Private Company
Legal Status	Private company
Street Address	83 Mackay Blairgowrie Randburg
Postal Address (if different from above)	C/o Imbewu 59 Dudley Avenue Rosebank Johannesburg Gauteng

Website Address	N/a
Main Activities	<i>Acting as a Co-ordinating and Managing Entity for the CDM Africa Wind and Solar Programme of Activities for South Africa</i>
Summary of Financial Performance in last fiscal year	<i>N/a new entity erected specifically for this purpose</i>
Contact Person(s)	Ms Marilize Stoltz
Telephone	Work: 011 214 0660 Cell:082 7463364
Fax	N/a
Email Address	marilize@cdmafrica.com
Project Partners	
Provide the following Information for all project partners (copy and paste relevant sections of the table if information is to be provided on more than one partner organisation)	
Name	N/a - no project partners. CPA's will join the PoA on a contractual basis
Nature of partner	
Organizational Category	
Legal Status (if private company)	
Street Address	
Postal Address (if different to Street Address)	
Website Address	
Main Activities	
Contact Person(s)	
Telephone	
Fax	
Email Address	
Contractual Arrangements	

Contractual arrangements between various entities involved	
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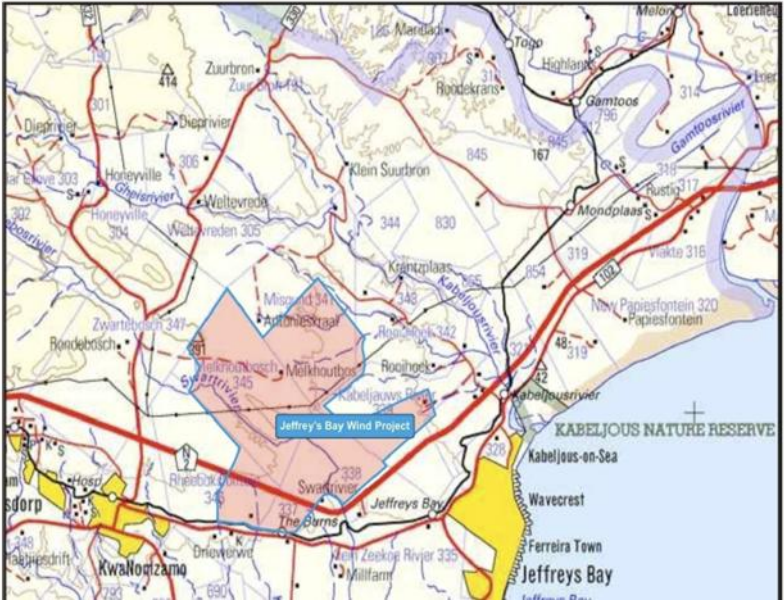
Part B: Project Overview (Technical Summary, Location and Schedule)

Technical Summary of the project	
Objective of the Project	<p>The objective of the CDM Africa Wind and Solar Programme of Activities for South Africa is to develop a multi-track platform for overcoming regulatory, institutional, financial and structural hurdles for the roll-out of wind and solar power in South Africa by providing access to carbon finance</p>
<p>South Africa has approximately 45,000 MW of installed capacity for power generation, out of which the contribution of renewable energy sources is negligible. As of October 2011 the installed capacity for grid connected power generation from solar is 0% and for wind is less than 0.023%. This is typically due to high costs associated with implementing the renewable energy power plants in South Africa and the fact that the country has traditionally had a state sponsored utility monopolising the electricity supply industry.</p> <p>The coordinating & managing entity “PoA Africa Wind/Solar (Pty) Ltd has initiated the proposed “CDM Africa Wind and Solar Programme of Activities for South Africa” to promote the development and implementation of wind and solar projects, with the objective to contribution towards increased generation of renewable energy in South Africa.</p> <p>The programme of activities (hereafter referred to as “the PoA”) is a programme for the installation of wind and solar projects generating electricity into the national grid across South Africa. Both PV and solar thermal technologies are included in the PoA. Each CDM programme activity (CPA) will be implemented in geographically distinct area within South Africa. The PoA and the inclusion of each CPA will be managed by a managing/coordinating entity (CME), PoA Africa Wind/Solar (Pty) Ltd.</p> <p>The following renewable energy technologies can be implemented under the PoA:</p> <ul style="list-style-type: none"> - Wind Power - Solar Power 	
<p>Project Constraints</p> <p>The biggest project constraint is the fungibility of the CER’s into the EU ETS. If the project is registered in time to be eligible into the EU ETS (before the end of 2012), the carbon revenue will be significant and will enable future projects. If not the impact will be smaller and some projects may not reach feasibility.</p>	
Technology to be employed	Grid connected wind, solar PV and solar Thermal
Greenhouse Gases Targeted	CO2 produced in generating electricity for the national grid
Emission reductions	The total amount of CER’s will depend on the number of CPA’s that

Technical Summary of the project	
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	join the PoA. The CER's in the first CPA are approximately 400,000 per year for ten years. The total emissions reductions that will emanate from South Africa's Integrated Resource Plan as it relates to wind and solar energy until 2030 are in the order of 20 - 25 million tonnes per annum once the full complement is in operation
Baseline & Additionality Assessment	<p>The CDM methodologies applied to this project are "Consolidated baseline methodology for grid-connected electricity generation from renewable sources", Reference: ACM0002, Version 10, EB 47.</p> <p>The methodology also refers to the latest approved versions of:</p> <ul style="list-style-type: none"> • "Tool to calculate the emission factor for an electricity system", Version 01.1, EB 35 • "Tool for the demonstration and assessment of additionality", Version 05.2, EB 39 • "Combined tool to identify the baseline scenario and demonstrate additionality", Version 02.2, EB 28 • "Tool to calculate project or leakage CO2 emissions from fossil fuel combustion", Version 02, EB 41 • "Guidelines for the reporting and validation of plant load factors". <p>The baseline scenario is a "business as usual" scenario, where no project activity is undertaken.</p> <p>The first CPA will use the first-of-kind argumentation in accordance with version 6 of the additionality tool.</p>
Monitoring	Electricity production will be monitored in order to determine the emissions reductions as against the baseline of electricity production by the grid
Type of project/activities	
a. Energy Supply	<i>Renewable Energy - solar PV and solar Thermal and wind power</i>
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	Define the Project Boundary (Approximately 1 paragraph)
	The PoA chooses a geographical boundary being South Africa - all CPA's must thus be within South Africa.
	At CPA level the boundary is the national grid.
Indicate Emissions outside the Project Boundary	N/a

Location of the Project	
Province	South Africa for the PoA. The first CPA is in the Eastern Cape
Municipality	PoA - N/a

	First CPA - Blue Crane Route Local Municipality
Nearest city/large town	Jeffreys Bay 
Brief description of the location of the project site	Rural land near Jeffreys Bay, Eastern Cape

Project Schedule/Timetable	
Earliest Project Start Date	June 2012
When is the expected first year of CER delivery	2014
Project Lifetime	Technically 20 years
Project End Date	June 2033
Crediting Period	Ten years fixed for all CPA's in the PoA - the PoA itself has a 28 year lifetime
Current Status or phase of the project	The project has been shortlisted in phase one of the Department of Energy's REIPPP initiative and is approaching financial close
DNA Approval	No but a PIN was submitted in Q4 of 2011
Approval by other bodies	For PoA - n/a. For first CPA an application to conduct the EIA process was submitted to the National Department of Environmental Affairs (DEA) in Pretoria on 13 November 2009. The application was accepted and the project moved into the scoping phase. The Final

Project Schedule/Timetable

Scoping Report and Plan of Study was submitted to DEA and notice to proceed to the EIA phase was received on 30 June 2010. Record of decision was received.

The project is approaching financial close.

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 PoA will create a framework to leverage carbon finance for the up to 25 million tonnes a year of emissions reductions that South African renewables projects under the Integrated Resource Plan will create per annum in the period leading up to 2030. South Africa's chosen low carbon energy path would be supported to the maximum extent possible by leveraging international carbon finance, so ensuring that electricity costs are kept as low as possible for the consumer and for business. The proportion of the potential benefits harnessed will depend on the number of CPA's joining the PoA. There will be significant benefits in job creation, localisation, and social upliftment as required by the Department of Energy's Renewable Energy Independent Power Procurement Programme ("REIPPP") rules. Again the ultimate quantum of benefits will depend on the number of CPA's joining the PoA. The projects in the PoA will displace coal-dominated¹ power generation in South Africa with renewable power, thereby reducing the carbon intensity of the South African national electricity grid. It will furthermore avoid the emissions of other pollutants from the coal fired power stations and save significant water resources that are typically associated with coal fired power generation>

The first CPA project, once operational, will produce 400,000 Megawatt hours of green electricity per year - enough to power thousands of South African homes. The first CPA is located close to the towns of Humansdorp and Jeffreys Bay in the Eastern Cape of South Africa, and these towns will act as a ready source of local labour during construction of the proposed facility. Given the location of the proposed facility the majority of permanent staff is likely to reside in these two towns. In terms of accommodation options, a percentage of the permanent employees may purchase a house in one of these two towns, while others may decide to rent. Both options would represent a positive economic benefit for the region. In addition, a percentage of the monthly wage bill earned by permanent staff would also be spent in the regional and local economy. This will benefit local businesses in towns. The benefits to the local economy will extend over the 20-year operational lifespan of the project.

Approximately 190 jobs of one year duration would be associated with the entire construction phase with the majority of jobs in the low and medium skill sectors as expected².

With regard to direct employment during operations, it is expected that approximately 10 direct employment opportunities would be created by the project equally spread across skill levels.

¹ http://www.eskom.co.za/live/content.php?Item_ID=28 and http://www.geni.org/globalenergy/library/energy-issues/south_africa/index_chart.html

² Final EIA Report, page xi, August 2010

	Number of workers				Duration of employment
	Highly skilled	Medium skilled	Low skilled	Total	
Construction component					
-Civils and Building	7	34	85	126	10 - 14 months
-Installation of machinery and equip	3	17	43	63	10 - 14 months
Total	10	51	128	189	

Once established, the operation of the facility would result in direct and indirect economic opportunities. These would stem from expenditure on operations including expenditure on employees that would not otherwise have occurred particularly in the local area. Estimates of operational costs and where operational good and services would be sourced from are indicative at this stage. It is anticipated that roughly R60 million would be spent annually on operations. As with construction a high percentage (roughly 70%) of this would initially be imported given the limited availability particularly of highly skilled engineers. It is hoped that after 5 years or so, local skills will have been built up to the required level and maintenance engineering companies will have been established so that the importation of these services will no longer be necessary. Aside from engineering services, all other operational costs would entail purchases of goods and services mostly from the local area and/or region resulting in an ongoing investment injection.

With regard to direct employment during operations, the Table outlines what should be expected. In keeping with the relatively low maintenance and high technology nature of the facility, it is expected that approximately 10 direct employment opportunities would be created by the project equally spread across skill levels. Although high skill positions will probably have to initially be filled by imported technicians, medium and low skill positions will offer opportunities for locals and those from the region.

	Number of employees			
	Highly skilled	Medium skilled	Low skilled	Total
Operational jobs once fully operational	3	4	3	10

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

It is submitted that the project will make a positive contribution to social development in a number of ways:

- The job creation and skills development described above will have a positive social impact;
- About ZAR 4 million per annum will be invested into the Jeffreys Bay community, inter alia by supporting the Joshua project, the Kouga community radio station, supporting the surfing foundation for underprivileged children, and/or supporting emerging farmers.

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.

NOTE: The questions below are for the greater part answered with respect to the first CPA as it is not possible to provide a generic answer that will apply to all CPA's

in the PoA. Each CPA will need to carry out such environmental investigations as may be required by law

<p>i) That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be avoided, are minimised and remedied</p>	<p>No fatal flaws, or negative impacts of high significance that would necessitate substantial redesign or termination of the project, were identified during the EIA process provided that the recommended management actions are implemented affectively. In summary, the overall predicted impact of the wind turbines is low to medium. The impact on the visual character of the area had been identified as being the most significant, with the overall significance (with mitigation), for each of the nine specialist studies, as follows:</p> <ul style="list-style-type: none"> ● Impacts on landscape ecology: Low ● Impacts on fauna and flora: Low ● Impacts on birds: Low ● Impacts on bats: Low to Moderate ● Impacts on archaeology: None ● Impacts on palaeontology: None <p>A summary of impacts, as evaluated, is provided in the final EIA Report (DEA Ref No: 12/12/20/1718). All impacts were determined as low or medium and mitigation measures were suggested where applicable.</p>
<p>ii) That pollution and degradation of the environment are avoided, or where they cannot be altogether avoided, are minimised and remedied</p>	<p>Impacts were assessed separately for wind turbines, substations and workshops and alternative power lines. A summary of impacts, as evaluated, is provided in Table 5.1 of the final EIA Report (DEA Ref No: 12/12/20/1718). All impacts were determined as low or medium and mitigation measures were suggested where applicable.</p> <p>No pollution or degradation of the environment is foreseen.</p>
<p>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</p>	<p>Due to the fact that the site is further than five kilometers from the coast, shell middens were not expected to be found this far from the beach (Binneman 1996, 2001, 2005). It appears that there was little cultural activity on the site in the past.</p> <p>It is thus unlikely that any valuable archaeological or historical material would be located during development, but sites (possibly shell middens) and material may be exposed after the top soil is removed.</p> <p>The wind farm site, apart from the presence of a few Middle Stone Age stone tools, appears to be of low archaeological sensitivity. It is also highly unlikely that any archaeological heritage remains of any value will be found in situ. The area is also situated more than five kilometres from the coast (the maximum distance shell middens are expected to be found inland); and no such features have been observed.</p> <p>In the unlikely event that any concentrations of archaeological material are uncovered during construction they should be reported immediately to the nearest archaeologist and/or the South African Heritage Resources Agency. If these materials are to be removed a permit has to be obtained from SAHRA.</p>

<p>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</p>	<p>The draft EMP (Appendix P in the EIA report) includes procedures for managing and storing waste on site.</p> <p>Solid waste from the site during the operational phase of the project is foreseen to be minimum. Any waste products (e.g. oil) will be disposed of in accordance with relevant waste management legislation.</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>Wind power consumes no non-renewable fuel for continuing operation.</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>Wind power is the conversion of wind energy into a useful form, such as electricity, using wind turbines. The use of wind for electricity generation is a non-consumptive use of a natural resource, and therefore does not deplete the resource. The electricity generated will be exported to the national grid from where it will be distributed to all South Africans for consumption.</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>Adherence to the conditions of the Environmental Authorisation for the project, as well as those contained in the Environmental Management Programme, will ensure that a risk averse and cautious approach is adopted. This will be enhanced further by the use of established and internationally-recognised technologies, control systems and procedures.</p>
<p>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</p>	<p>The CPA will be implemented in such a manner that any potential social negative impacts will be anticipated and prevented wherever possible. The environmental assessment process includes the relevant social and environment impacts in its assessment and mitigation measures are recommended where applicable. Interested and Affected Parties (I&APs) participated in the stakeholder process and were given the opportunity to learn about the project, raise questions, and provide input into the project at the planning stage.</p>
<p>Other comments</p> <p>South Africa has announced that it is embarking on a low carbon energy future including significant renewables. In order to be sustainable this initiative should ensure as far as possible that the electricity consumer/tax payer is not affected by the installation of renewable energy rather than dirtier but cheaper energy sources. Carbon revenue will ensure that the transition to renewables is funded as much as possible from international sources. The PoA will not only make it easier for projects to access carbon revenue but will also (if registered in time) ensure that participating projects/CPA's will have access to selling CER's into the EU ETS, thus maximizing carbon revenue.</p>	

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Environmental	<p style="text-align: center;">Impact on local environmental quality</p>	<ul style="list-style-type: none"> • The use of renewable energy for power generation will avoid the emission of air pollutants such as Suspended Particulate Matter (SPM), Sulphur Dioxide (SO₂) and Nitrogen Oxides (NO_x) thereby improving the surrounding air quality. • The CPA project will not impact on water and will not cause any water pollution. • The CPA project will not result in significant disposal of solid waste. • Visual impacts: if mitigation measures are adhered to as described in the Environmental impact assessment, the impact is predicted to be of moderate significance. • Noise impacts: The wind turbines are the key source of noise impacts during the operation of the wind farm. These effects are unlikely to affect the residents adversely as the distance between the turbines and the nearest communities will permit noise attenuation and the sound power level from the turbines is low. The opinion of the noise specialist is that the impact of low frequency noise and infra sound will be negligible
	<p style="text-align: center;">Change in usage of natural resources</p>	<ul style="list-style-type: none"> • 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 <p>The project is to make use of a renewable resource as a fuel being wind. As such, no effect on community access to natural resources will take place. The project activity will reduce the use of finite fossil fuel resources by substituting coal-derived grid electricity with renewable energy. The project will in no way negatively impact on the surrounding community's access to natural resources.</p> <p>Additionally, the project will have no impacts on any non-renewable resources at local level.</p> <p>On a wider national level, the project will have a positive impact on non-renewable resources by replacing fossil-fuel based power from the national grid. This will reduce in particular coal and water consumption and improve the efficiency of resource utilization overall.</p>

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
	Impacts on biodiversity and ecosystems	<ul style="list-style-type: none">• Changes in local or regional biodiversity arising from the project <p>The project will have no negative impacts on local or regional biodiversity. The environmental assessment addressed the environment impacts including those on biodiversity in its assessment and mitigation measures are recommended where applicable.</p>

Indicators in Support of the Project Approval Criteria		
Category	Indicator	Comment
Economic	Economic impacts	<ul style="list-style-type: none"> • 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 <p>The PoA will leverage Direct Foreign Investment into renewable energy infrastructure through carbon finance</p> <ul style="list-style-type: none"> · In the first CPA, owing to the additional employment opportunities created from the implementation of the project, employees from the Jeffreys Bay project and surrounding areas will benefit from the increased spending power. · The PoA will lower the cost to the SA consumer/fiscus of buying renewable energy under the REIPPP ·
	Appropriate technology transfer	<ul style="list-style-type: none"> • 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 <p>Significant benefits exist in the transfer of state-of-the-art technology to South Africa (Siemens wind turbines and associated infrastructure).</p> <p>It is believed that lessons learnt and systems developed during its implementation will be highly replicable in other potential projects throughout the country. As such it will have significantly high demonstration potential.</p>

Indicators in Support of the Project Approval Criteria		
Category	Indicator	Comment

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Social	<p style="text-align: center;">Alignment with national provincial and local development priorities</p> <ul style="list-style-type: none"> • 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) 	<ul style="list-style-type: none"> • Firstly, South African Government has recognised the country's high level of renewable energy potential and in terms of the IRP 2010 presently has in place targets of about 17,000 MW of wind and solar power installed by 2030. • The Renewable Energy Independent Power Procurement Programme (REIPPP) launched by the DOE envisions procuring the above in a manner that ensures value for money for South Africa • If CPA's have the benefit of carbon revenue they will be able to bid lower prices into the REIPPP, to the ultimate benefit of the country. • At CPA level the first CPA will contribute towards the provincial economy; create sustainable employment opportunities; enhance profitability; ensure sustainable development and poverty eradication - in line with both ASGI-SA and the Provincial Growth and Development Strategy (PGDS). • At a regional and local scale the concept of a wind farm is broadly supported in economic planning documents. With regard to specific spatial planning, the wind farm site is situated outside the short and medium term urban edge of Humansdorp and Jeffrey's Bay implying a good alignment with the spatial planning of the area. • There will be no impact in terms of relocation of communities.

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Social equity and poverty alleviation	<ul style="list-style-type: none"> • 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 	<p>Roughly 190 jobs of one year’s duration, of which approximately 88 will be allocated to local people and 98 to people from the rest of Eastern Cape, would be associated with the entire construction phase with the majority of jobs in the low and medium skill sectors. With regard to direct employment during operations, it is expected that approximately 10 direct employment opportunities would be created by the project evenly spread across skill levels.</p> <p>The project is likely to contribute to healthy community structures through the contributions to the community radio station, surfing lessons for underprivileged children and/or the support of emerging farmers.</p> <p>The project will not impact on social heritage.</p> <p>The project will enhance the development of the Municipal region and surrounding areas.</p>

Indicators in Support of the Project Approval Criteria

Category	Indicator	Indicator	Comment
<p align="center">General</p>	<p>General Project Acceptability</p>	<ul style="list-style-type: none"> • Are the distribution of project benefits deemed to be reasonable and fair? 	<p>The Department of Energy’s REIPPP initiative has extensive terms and conditions aimed specifically at ensuring that renewable energy projects provide sufficient benefits for people on local level in a manner that ensures that the distribution of project benefits are reasonable and fair. The carbon revenue stream through the PoA will facilitate these projects and so leverage the exact benefits that the Department of Energy envisions. At present all CPA’s considering joining the PoA are looking at the REIPPP initiative to make their projects work and the REIPPP rules are thus implied in the PoA.</p>

Part D: Finance

Project Costs	
Development Costs (R's)	ZAR 60 million
Installed Costs (R's)	ZAR 2,04 billion
Other Costs (R's)	N/a
Total Project Costs (R's)	ZAR 2.1 billion
Sources of Finance	
Equity	Mainstream Renewable Power; Thebe Investment Corporation, potentially other equity providers
Debt (long term)	75%
Debt (short term)	N/a
Amount not identified (R's)	N/a
Total CDM Contribution sought	<i>A barrier analysis is chosen in the PDD. The project is first of kind as defined by Version 6 of the Additionality Tool</i>
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)	The term can only be 10 years in terms of PoAS rules - CER price of 6 - 8 euro is achievable if Kyoto is extended
Indicate the projected Internal Rate of Return for the project with and without CER revenues.	N/a the project is using first of kind (barrier) additionality analysis
Constraints on tradability of carbon credits	None
Preliminary discussions with	No

potential purchasers	
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