

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

Project Name	Amakhala Emoyeni Grid Connected 138.6 MW Wind Farm, Phase 1, South Africa ¹
Date of Submission of PDD	11 May 2012

Project Developer	
Name	Amakhala Emoyeni RE Project 1 (Pty) Ltd
Organizational Category	Private company
Legal Status	Privately held company (registration number:2008/015881/07)
Street Address	Green Building 9B Bell Crescent Close Westlake Business Park Cape Town 7945

¹It should be noted that the name of the project in the first version of the PDD was Amakhala Emoyeni Grid Connected 750 MW Wind Farm, Phase 1, South Africa

Postal Address (if different from above)	PO Box 48189 Kommetjie Cape Town 7976
Website Address	www.windlab.com
Main Activities	Development of wind energy projects
Summary of Financial Performance in last fiscal year	The current financial performance of the company is that of all development cost, whether capitalized or not. There have been no revenues to date.
Contact Person(s)	Katherine Degenaar (Project Manager)
Telephone	+27 (0)21 701 1292 +27 (0)73 819 4870
Fax	0800 981 222 (within SA only)
Email Address	katherine.degenaar@windlab.com
Project Partners	
Provide the following Information for all project partners (copy and paste relevant sections of the table if information is to be provided on more than one partner organisation)	
Name	Blue World Carbon Asset Management (Pty) Ltd
Nature of partner	Carbon consultant
Organizational Category	Private company
Legal Status (if private company)	Limited company
Street Address	Suite 101, Block A 7 West Quay Road V&A Marina Cape Town, 8001 Republic of South Africa
Postal Address (if different to Street Address)	
Website Address	www.blueworldcarbon.com
Main Activities	Blue World Carbon (BWC) is the leading international company that specializes in developing solutions and rendering professional services in the sphere of climate change, greenhouse gas management and energy consulting.
Contact Person(s)	Joost van Lier (Managing Director, South Africa)
Telephone	Work: +27 (0)82 607 1440 Cell: +27 (0)71 609 2276
Fax	+27 (0)86 609 2770
Email Address	joost.van.lier@blueworldcarbon.com
Contractual Arrangements	
Contractual arrangements	Windlab Developments South Africa (Pty) Ltd has developed the

between various entities involved	project to date. The owners of the project SPV (Amakhala Emoyeni RE Project 1 (Pty) Ltd) will develop the project and then run the wind farm after construction. Windlab currently owns the project SPV but it may be sold to an equity partner at some time in the future. BWC will act as a carbon consultant to Windlab and/or the project SPV and will develop all necessary documentation for project approval by the CDM Executive Board and selling GHG emission reductions in the international market.
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Part B: Project Overview (Technical Summary, Location and Schedule)

Technical Summary of the project	
Objective of the Project	The aim of the project is to supply clean electricity to the grid of the Republic of South Africa.
<p>Project Description</p> <p>The project envisages the construction and operation of a wind farm with installed capacity of up to 138.6 MW. The wind farm will be comprised of up to 66 wind turbines and the associated infrastructure. The entire project consists of the construction and operation of a wind farm with a total installed capacity of up to 750MW. The project will be developed in separate phases; with each consecutive phase occurring at an estimate of anything between 1 to 2 year intervals after the first successful signing of a power purchase agreement. Phase 1 will be constructed within the boundaries of the given 750 MW farm location.</p> <p>It is anticipated that the turbine supplier and model will be selected for final negotiation of contracts by October 2011 at the latest. Produced electricity will be supplied to the Eskom electricity network.</p>	
<p>Project Constraints:</p> <p>Lack of finance due to missing CDM contribution as well as availability of cranes and technical know-how.</p>	
Technology employed	<p>to be</p> <p>The wind farm consists of multiple wind turbines which are used to capture the kinetic energy of the wind for the purposes of generating electricity. Preferred suppliers have been selected and Engineering, Procurement and Construction (EPC) tenders have been requested. It is anticipated that the turbine supplier and model will be selected for final negotiation of contracts by October 2011 at the latest.</p> <p>The proposed technology is well-proven. The turbines that will be used have been tried and tested on the international market; nevertheless there are no large wind farms in South Africa so far, only small-scale installations.</p> <p>Windlab is an international wind energy development company that was established in Australia in 2003. Globally, Windlab has successfully developed a number of projects including Collgar Wind Farm (206 MW) and Oaklands Hill Wind Farm (67.2MW) in Australia, which have both been developed to financial close under partnership. Other advanced projects that Windlab is developing include Kennedy Wind Farm, Australia (600MW) and Bull Creek Wind Farm, Canada (130MW). With Windlab's proprietary atmospheric modeling capacity, Windlab's staff has assisted with the development of most of the successful other projects in Australia since 1999, at least 10 of which have now reach financial close and are in construction or operation. Windlab has been active in South Africa since 2007 and Windlab Developments South Africa (Pty) Ltd was registered in July 2008.</p>

Technical Summary of the project																						
Greenhouse Targeted	Gases	Implementation of the project will lead to reduction of greenhouse gas (GHG) emissions from combustion of fossil fuel for electricity generation at the grid connected power plants. The principal GHG released during combustion of fossil fuel is CO ₂ . Emissions of CH ₄ and N ₂ O from combustion of fossil fuel are negligibly small as compared with CO ₂ emissions and excluded for simplification.																				
Emission reductions		<p>The project is expected to be registered by the CDM Executive Board on the 1st of July 2015 (starting date of the crediting period). The total emission reductions at the end of the first 7-year crediting period is expected to be 369 563 tCO₂.</p> <table border="1"> <thead> <tr> <th>Years</th> <th>Annual estimation of emission reductions in tonnes of CO₂ e</th> </tr> </thead> <tbody> <tr> <td>2015 (From 01/07/2015 to 31/12/2015)</td> <td>184 782</td> </tr> <tr> <td>2016</td> <td>369 563</td> </tr> <tr> <td>2017</td> <td>369 563</td> </tr> <tr> <td>2018</td> <td>369 563</td> </tr> <tr> <td>2019</td> <td>369 563</td> </tr> <tr> <td>2020</td> <td>369 563</td> </tr> <tr> <td>2021</td> <td>369 563</td> </tr> <tr> <td>2022 (From 01/01/2022 to 30/06/2022)</td> <td>184 781</td> </tr> <tr> <td>Total estimated reductions (tonnes of CO₂ e)</td> <td>2 586 941</td> </tr> </tbody> </table>	Years	Annual estimation of emission reductions in tonnes of CO ₂ e	2015 (From 01/07/2015 to 31/12/2015)	184 782	2016	369 563	2017	369 563	2018	369 563	2019	369 563	2020	369 563	2021	369 563	2022 (From 01/01/2022 to 30/06/2022)	184 781	Total estimated reductions (tonnes of CO₂ e)	2 586 941
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Baseline & Additionality Assessment		<p>Approved consolidated baseline and monitoring methodology ACM0002: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” will be used to identify and develop the baseline. This methodology is applicable to grid-connected renewable power generation project activities including construction of wind farms.</p> <p>Additionality of the project activity will be demonstrated using the latest version of the “Tool for the demonstration and assessment of additionality” agreed by the CDM Executive Board. The main emphasis will be made on an investment analysis and a common practice analysis. The project is additional as defined under the Kyoto Protocol because of the following key factors:</p> <ul style="list-style-type: none"> • The economic parameters of the project (IRR), based on the preliminary estimation, without the CDM are unacceptably low; • The project is not a common practice in the Republic of South Africa. 																				
Monitoring		<p>Approved consolidated baseline and monitoring methodology ACM0002: “Consolidated baseline methodology for grid-connected electricity generation from renewable sources” will be used for project monitoring.</p> <p>The parameter to be monitored is quantity of net electricity generation supplied by the wind farm to the grid of the Republic of South Africa.</p>																				

Technical Summary of the project	
Type of project/activities	Energy Supply
a. Energy Supply	Renewable Energy (excluding biomass) The project is aimed at electricity generation using wind energy. Produced electricity will be supplied to the grid of the Republic of South Africa.
b. Energy Demand	Not Applicable
c. Industrial Process	Not Applicable
d. Transport	Not Applicable
e. Waste Management	Not Applicable
f. Forestry/ land use	Not Applicable
g. Other	Not Applicable
Project Boundary The project boundary includes the proposed wind farm and the grid of the Republic of South Africa.	
Indicate Emissions outside the Project Boundary	Not Applicable

Location of the Project	
Province	Eastern Cape
Municipality	Blue Crane Route Local Municipality
Nearest city/large town	Bedford
Brief description of the location of the project site	The project is located on the following farms/portions: Portion 0 of Farm 206, Portion 5 of Farm 149 (Great Knoffel Fonteyn), Portion 0 of Farm 242, Portion 0 of Farm 205 (Kop Leegte), Portion1 of Farm 222, Portion 0 of Farm 222, Portion 0 of Farm 168 (Stompstaart Fontein), Portion 0 of Farm 259, Portion 1 (RE) of Farm 187 (Klein Knoffel Fonteyn). Geographical latitude: 32° 50'27.29"S. Geographical longitude: : 26° 0'37.11"E.

Project Schedule/Timetable	
Earliest Project Start Date	1 December 2012 (Start of construction)
When is the expected first year of CER delivery	2016
Project Lifetime	25 years
Project End Date	2040/11/30
Crediting Period	7 year renewable crediting period
Current Status or phase of the project	At the moment, the project conducted the following activities: <ul style="list-style-type: none"> The Final Environmental Impact Report is completed

Project Schedule/Timetable	
	<ul style="list-style-type: none"> Record of Decision has been obtained The Feasibility Study is completed The PDD has been drafted by BWC The project is currently being validated by Carbon Check. The project was submitted in the second bidding round under the Independent Power Producer Procurement Program (IPPPP)
DNA Approval	The project has not been previously submitted to the DNA for approval. A Project Identification Note (PIN) was submitted and a letter of no objection was received on 25/11/2011.
Approval by other bodies	The project (or any elements of the project) has not been submitted to any other national, provincial or local government departments or agencies for regulatory or legal approval (excluding EIA process - see Part C).

Part C: Performance Against the DNA's Sustainable Development Criteria

South Africa has identified the following sustainable development criteria and indicators against which each CDM project will be assessed. Please provide your interpretation of how this project will address each of these **criteria and indicators** where they are relevant to the project. If the space provided is not sufficient please append additional information as required.

NOTE: For all indicators which are of relevance to the project show how the performance of the project against these indicators can be objectively monitored and measured on an ongoing basis.

1. Economic: Does the project contribute to national economic development?

Yes. Worldwide expansion of the renewable energy industry points to the sustainable development of the country's economy. The implementation of the proposed project will promote development of wind farms in the RSA which in turn will lead to the creation of new job opportunities both during the construction and operation phases. The implementation of wind farms will make a contribution to achieve the objective to reduce South Africa's GHG emissions below the current emissions baseline of around 34% by 2020, and contribute to the 1850 MW onshore wind set out in accordance with the capacity allocated to renewable energy generation in IRP 2010-2030 [<http://www.ipp-renewables.co.za/>].

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

Yes. Although not all employees would be from the Bedford area, the project would implement a 'locals first' employment policy.

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

The Environmental Impact Assessment (EIA) of the proposed project was carried out in accordance with the South African legislation by DJ Environmental Consultants (DJEC). The draft Environmental Impact Report (EIR) was published for public review and comment over a period of 29 days from 18 October 2010. Hereafter the EIR was submitted to the Department of Environmental Affairs (DEA) in November 2010 for a decision. On 02 September 2011 the Record of Decision (ROD) was obtained and Environmental Authorisation was granted.

i) That the **disturbance of ecosystems and loss of biological diversity** are avoided, or where they cannot be avoided, are minimised and remedied

Mitigation plans for potential disturbances will be implemented as identified by environmental specialists. The construction of the wind farm and the associated disturbance of the vegetation will have a moderate to low impact on the ecology, flora, fauna and avifauna of the project site with the implementation of mitigation strategies. The total wind farm is spread over an area of 273 km². Environmental Authorization was issued 2

	September 2011.
ii) That pollution and degradation of the environment are avoided, or where they cannot be altogether avoided, are minimised and remedied	The project implementation will not lead to pollution and degradation of the environment. Combustion of fossil fuels (mostly coal) at the Eskom power stations and hereby emissions of the harmful substances into the atmosphere, such as flue ash, oxides of sulphur and nitrogen will be reduced due to the project implementation.
iii) That the disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied	The wind farm is spread over an area of 273 km ² , of which only 1.5% will form the actual wind farm. The establishment of the wind turbines and the associated infrastructure may impact on the aesthetic quality of the landscape during the construction and operational phases. Recommended mitigation plans by environmental specialists will be implemented in order to reduce the potential disturbance or destruction on heritage resources from medium to a more acceptable moderate-low significance.
iv) That waste is avoided , or where it cannot be altogether avoided, minimised and reused or recycled where possible and otherwise disposed of in a responsible manner	The project will produce minimal waste and such waste will be disposed of in a responsible manner. Such waste would be limited during operation phase to the minor waste from the site office and maintenance such as fluid changes. Fluids will be disposed of and/or recycled according to applicable standards and responsible practices.
v) That the use and exploitation of non-renewable resources is responsible and equitable , and takes into account the consequences of the depletion of the resource	There are negligible non-renewable resources to be used in this project.
vi) That the development, use and exploitation of renewable resources is responsible and equitable , and takes into account the consequences of the depletion of the resource.	The proposed project does not effect on the depletion of renewable resources. Wind energy is an inexhaustible source of the renewable energy.
vii) That a risk averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions	Commercial wind farms are operational for over 25 years. Operational risks are well known and will be mitigated.
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	Mitigation plans for potential disturbances will be implemented as identified by environmental specialists. Combustion of fossil fuels (mostly coal) at the Eskom power stations and hereby emissions of the harmful substances into the atmosphere, such as flue ash, oxides of sulphur and nitrogen will be reduced due to the project implementation.
Other comments	
South Africa is anticipating another shortage of electricity supply due to the higher than anticipated economic growth combined with a number of technical factors such as overloaded lines. The country is blessed with an abundance of fossil fuels, but the use of these resources in power production is becoming increasingly difficult as international pressure mounts against countries that do not comply with strict sustainable environmental policies. Wind farms not only meet environmental requirements, but also provide a much needed additional source of electricity. Further, they do this with a fraction of the water requirements of existing dominant forms of energy production.	

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
Environmental	Impact on local environmental quality	<ul style="list-style-type: none"> • Impact of the project on air quality • Impact of the project on water pollution • Impact of the project on the generation or disposal of solid waste • Any other positive or negative environmental impacts of the project (such as impacts on noise, safety, visual impacts, or traffic) <p>The project implementation will positively impact on air quality due to reduction of combustion of fossil fuels (mostly coal) at the grid-connected power plants. The project will not impact on water pollution and solid waste. Construction phase may impact on sensitive receptors (i.e. nearby residents). The placement of the facility and its associated infrastructure will have a visual impact on the natural scenic resources and rural character of this region. The visual index map clearly indicates the core area of potentially high visual impact within a 5 km radius of the proposed facility. The construction of the power lines and substations will generally have a medium to low impacts on the ecology of the study area. The substations and associated power lines are not expected to create a major negative visual disturbance as this smaller scale infrastructure will be dominated by the much taller wind turbines and thus blend in with the facility.</p>
	Change in usage of natural resources	<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>A potential impact on the natural resources is loss of grazing land due to the construction of the turbines and associated infrastructure, however this can be shown to be insignificant. Permanently affected areas comprise the proposed turbine footprints (350 foundation areas of 20 m x 20 m in extent), access roads (to be rehabilitated to 4 m in width), three substations footprint (up to 200 m x 250 m in extent) and a maintenance facility (~400m²). This amounts to only 1.5% of the total ~273m² area which will form part of the total wind energy facility. Current grazing practices will still be possible between the structures.</p>
	Impacts on biodiversity and ecosystems	<ul style="list-style-type: none"> • Changes in local or regional biodiversity arising from the project <p>Avifauna may be impacted through collision with the blades of the wind turbines during the operational phase. Due to the size of the project, through mitigation, impact of the avifauna can be reduced to a moderate significance. The development area also does not impinge significantly on any bird fly-ways or unique landscape features. The full study of the impact on the ecology of the surrounding environment is discussed in the Environmental Impact Assessment Report.</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 project will be financed with local and overseas capitals. The foreign exchange requirements and risks will be hedged within the overseas investor's portfolio.</p> <p>The contribution to the local economic activities (micro economic) will be in form of employment and direct investment.</p> <p>The cost of energy is determined by the IRP (Integrated Resources Plan) decided on by NERSA (National Energy Regulator of South Africa) and DOE (Department of Energy). This project will increase the availability of energy on the national grid.</p> <p>Part of the required capital cost will be covered by FDI (Foreign Direct Investment). This will foster the overall influx of capital.</p>
	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>Some of the equipment used and the skills to implement those will be imported from overseas. This will help to grow the South African skill base.</p> <p>The skill transfer will especially concentrate on local employees in the engineering and maintenance sectors.</p> <p>There is a high potential for demonstration and replication due to South Africa being in an early development phase of renewable energy projects.</p>

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
<p align="center">Social</p>	<p 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) 	<p>Expansion of the renewable energy industry in the province points to the sustainable development of the region and the whole country. The project implementation promotes development of the county energy system and creates new job opportunities in the region. The project partakes in the national bidding scheme for RSA’s Renewable Energy Feed-In Tariffs. At the same time the project does not negatively affect any local industries as implemented on unused deteriorated agricultural land.</p> <p>The implementation of wind farms will make a contribution to achieve the objective to reduce South Africa’s GHG emissions below the current emissions baseline of around 34% by 2020, and contribute to the 1850 MW onshore wind set out in accordance with the capacity allocated to renewable energy generation in IRP 2010-2030 [http://www.ipp-renewables.co.za/].</p>

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
<p align="center">Social equity and poverty alleviation</p>	<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>The construction of this project will create jobs in the rural areas close to the wind farm. The civil engineering (construction of roads etc.) required to construct the wind farm will produce job opportunities and transfer of skills to an otherwise underprivileged rural areas. After construction of the wind farm a service team based in the regional surrounding will be responsible for maintenance and security of the wind farm.</p> <p>The overall impact of the construction and the finished wind farm on site will potentially be insignificant.</p> <p>It is estimated that for the development of the entire project (up to 750 MW), approximately 220-220 full-time employees would be required for construction. The breakdown of skilled, semi-skilled and low-skilled employees would be 25%, 35% and 40% respectively. The operations period would employ up to approximately 90 full-time employees (for a 25-year period). Although not all employees would be from the Bedford area the project would implement a ‘locals first’ employment policy.</p> <p>The above mentioned figures are based on the development of the entire project. The development of Phase 1 of up to 140 MW would likely employ up to approximately 47 people during construction and 19 people during operations.</p> <p>Over and above the wind farm construction, there will also be job creation in the logistics sector, social sector, infrastructure etc. as well as other industries that will benefit from generation of electricity example demand for production of locally manufactured components.</p>

Indicators in Support of the Project Approval Criteria

Category	Indicator	Comment
General	<ul style="list-style-type: none">• Are the distribution of project benefits deemed to be reasonable and fair?	The distribution of the project benefits is deemed to be reasonable and fair because they contribute to technological development of the country, improvement of the environmental situation and increase of the employment level.

Part D: Finance

Project Costs																							
Development Costs (R's)																							
Installed Costs (R's)																							
Other Costs (R's)																							
Total Project Costs (R's)	R 2 281.1 million ²																						
Sources of Finance																							
Equity	Not applicable																						
Debt (long term)	Not applicable																						
Debt (short term)	Not applicable																						
Amount not identified (R's)	R 2 281.1 million																						
Total CDM Contribution sought	<p>Due to the fast approaching end of the Kyoto commitment period the CDM revenue has become risky to investors. The estimated price of CERs is therefore difficult to estimate accurately.</p> <p>Expected CER's for this project over the first 7 year commitment period:</p> <table border="1"> <thead> <tr> <th>Year</th> <th>Million Rand from sale of CDM revenue (assuming R50/CER)</th> </tr> </thead> <tbody> <tr> <td>2015 (From 1/07/2015 to 31/07/2015)</td> <td>9.2</td> </tr> <tr> <td>2016</td> <td>18.5</td> </tr> <tr> <td>2017</td> <td>18.5</td> </tr> <tr> <td>2018</td> <td>18.5</td> </tr> <tr> <td>2019</td> <td>18.5</td> </tr> <tr> <td>2020</td> <td>18.5</td> </tr> <tr> <td>2021</td> <td>18.5</td> </tr> <tr> <td>2022 (From 01/01/2022 to 30/06/2022)</td> <td>9.2</td> </tr> <tr> <td>Average</td> <td>18.5</td> </tr> <tr> <td>Total</td> <td>129.4</td> </tr> </tbody> </table>	Year	Million Rand from sale of CDM revenue (assuming R50/CER)	2015 (From 1/07/2015 to 31/07/2015)	9.2	2016	18.5	2017	18.5	2018	18.5	2019	18.5	2020	18.5	2021	18.5	2022 (From 01/01/2022 to 30/06/2022)	9.2	Average	18.5	Total	129.4
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Average	18.5																						
Total	129.4																						
Expected Price of CER in case of a contract to purchase for: A period of 7 years	<p>R 50 (Assumed CER value at the start of the project activity.)</p> <p>A 7 year renewable crediting period was chosen for the project. The project may be renewed twice, and the total crediting period may not be more than 21 years.</p>																						
Indicate the projected Internal Rate of Return for the project with and	Not available at this stage.																						

² The total project cost was calculated from \$315.7 million and the exchange rate values for the last 6 months of 2011 (9th May - 8th November), www.resbank.co.za.

without CER revenues.	
Constraints on tradability of carbon credits	There are no constraints yet. It is anticipated that there may be constraints with the tradability of carbon credits post 2012.
Preliminary discussions with potential purchasers	Preliminary discussions have not taken place. The discussions will commence upon registration of the project by the EB.