

Hope Beach

Wind Farm

Project Information Note (PIN)



Executive Summary

The Hope Beach Wind Farm is a renewable energy investment opportunity to support the Low Carbon Development Strategy (LCDS.gov.gy) trust has been adopted by Guyana and to diversify the energy mix. The Farm is designed with an installed capacity of 25 MW to harness the energy of the North East Trade winds that are experienced along the South American coast. The Guyana Windfarms Inc. is a private company that has negotiated joint venture agreements with NuPlanet, DELTA N.V. and Gamesa, to develop the farm.

The Hope Beach Wind Farm (HBWF) will be the first of its kind in Guyana and will supply 10% of the energy needed for the Demerara Interconnected System (DIS) of the Guyana Power & Light (GPL). GPL is the national utility and is eager to purchase power for its customers due to its power deficit and lack of reserve capacity. GPL uses heavy fuel oil and diesel generation to produce 90MW. The Demerara demand is approximately 160 MW and is met by most industrial users resorting to self generation. There is also poor reliability of supply and high unit cost. Hence the wind farm is poised to provide a long term supply of green power for a growing energy demand as the urban centres are expanding with new housing developments being constructed in Demerara. The farm is also 24 km from the power distribution centre.

The Hope Beach Wind Farm is designed with 10 x 2.5 MW Goldwind turbines mounted 80 m in a straight line. The projected annual production is 82 GWh to generate revenue of US\$9.84 million per annum. The investment cost is US\$31.5 million. The wind turbines will be installed at a rate of US\$1,160 per KW or US\$29.0 M.

Additionally, the environmental benefits include reduction of 54,680 tons of Carbon Dioxide emissions, 277 tons of Nitrogen Oxide and 870 tons of Sulphur Dioxide per

The project is a turnkey project and the farm can be constructed and commissioned within six months. A 69 KV transmission line has been proposed during the grid stability study done by KEMA and will be constructed to send Power to the GPL Sophia System Control Centre by Guyana Windfarm Inc. This is subjected to change as the power utility company Guyana Power & Light Inc. has plans for a Demerara Berbice Interconnect 69kV line which passes within 2km of the windfarm site

The HBWF will also derive revenue from the sale of carbon credits as these markets emerge. The financial model was built for 15 year project period. The internal rate of return is 15.4%, net present value is US\$11.7M. The simple payback is 6 years, return on equity is 22.93 %.

The Directors of Guyana Windfarm Inc are please to share this investment opportunity with you for the development of green business in our world to stem climate change and to diversify the energy mix in Guyana.

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Hope Beach

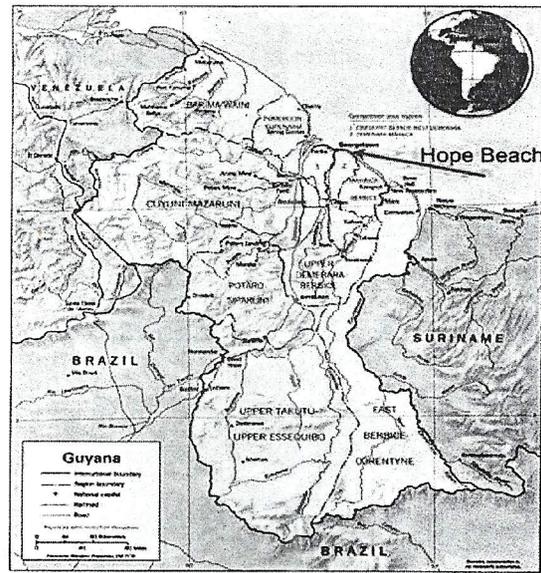
Wind Farm

DESCRIPTION

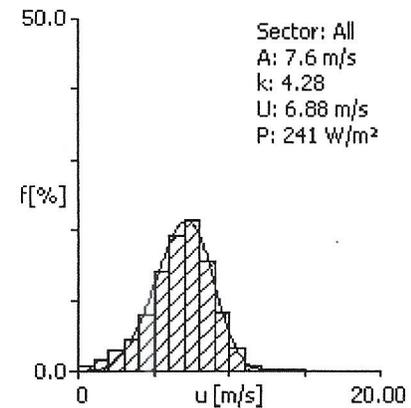
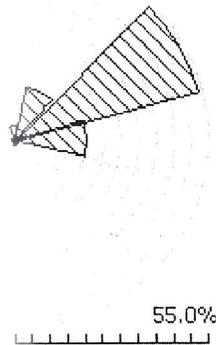
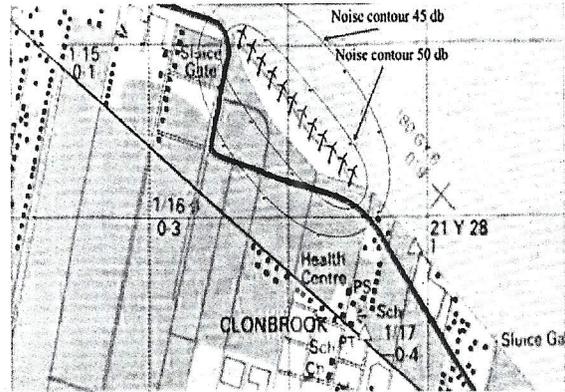
The wind farm will consist of 10 wind turbines of 2.5 MW on 80 m towers (Goldwind).

The turbines will be spread out over a length of approximately 1,75 km (1.09 mi). Each turbine occupies a space of $\pm 200 \text{ m}^2$, therefore the actual area occupied by the various units and the control building/metering station and stock yard on the site will be in the order of 1800 m^2 .

On the site itself the project entails the construction of concrete foundation pads for each tower. These foundations will be piled to the bearing layers at approximately 30m depth. Because the turbines are situated on the sea ward side of the sea defence wall the concrete foundation pads will be made extra high to avoid flooding of the tower bases in extreme tide conditions. The sides of the foundation pads will be strengthened against erosion by backfilling with broken rock. Alongside the turbine row, an access road will be constructed on a strengthened base of crushed rock. From the main road leading from Georgetown an access road to the wind farm with a



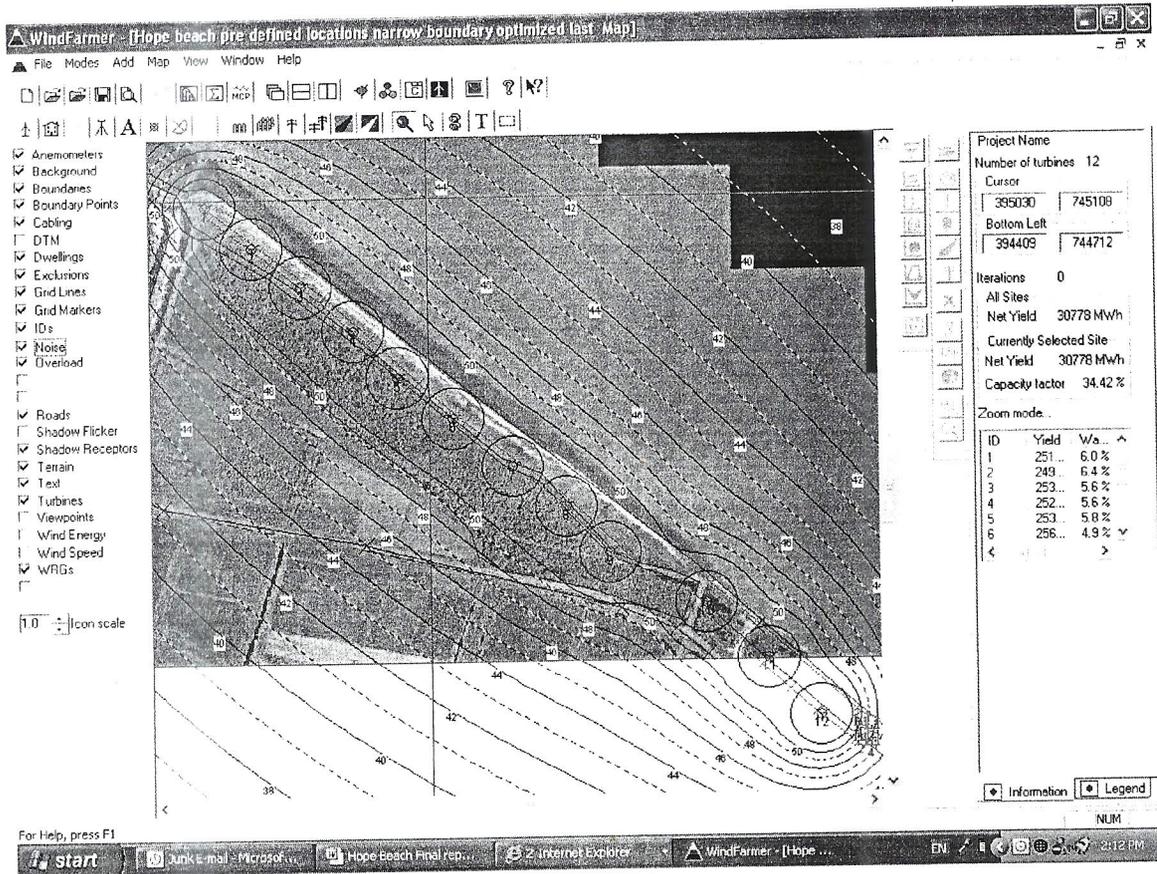
length of approximately 150 m will be constructed. It is envisaged that a control building housing the plant control systems and operational staff will be built on the site with a stockyard and spares stockroom. Next to this unit it is envisaged that a medium/high voltage transformer station will be built with the metering equipment signifying where the high-voltage evacuation line starts to the 69 kV sub-station at Sophia, 24 km away in Georgetown. At Sophia the wind farm will be interconnected to the national electricity grid at the large GPL sub-station situated there. The wind farm delivery point however will be at the wind farm where it connects to the 69 kV line. The metering equipment will be situated here as well. Park internal electrics will typically consist of a small inter-turbine grid feeding into the park step-up transformer and metering station, from where the power is evacuated to the Sophia sub-station.



Wind direction at Hope Beach

Speed distribution at Hope Beach

Details from the lay-out optimization of Hope Beach Wind farm



PROJECT FACT SHEET

Location:	Hope Beach, Guyana, South America
Lay-out:	Straight line
Wind Speed (at hub height):	7,6 m/s
Weibull parameters:	a = 8,45 k = 5,2
Turbine Choice:	2.5 MW Goldwind
Number of Turbines:	10
Tower Height:	80 m
Estimated Annual Production:	82 GWh/year
Annual environmental benefits:	CO ₂ reductions: 54,680 tons NO _x reductions: 277 tons SO ₂ reductions: 870 tons
Total Project Investment:	US\$ 31.5. million

PROJECT OWNERSHIP STRUCTURE

At the moment the only owner of the project is Guyana Windfarms Incorporated (GWI). This Special Purpose Company (SPC) was established under the laws of Guyana and has its principal office at 78 Garnett Street, Lamaha Gardens, Georgetown, Guyana.

100% of the shares of Guyana Windfarms Incorporated are reserved for transfer to an approved Equity Provider and/or investor.

Guyana Windfarms Incorporated is registered in Guyana under :

Guyana Companies Registration Number 5577

FINANCIAL SUMMARY

All the assumptions are conservative in order to keep the risks down. In the table below, the main assumptions are presented:

ITEM	DESCRIPTION
Power Sale Tariff	10.5 US\$ cent/kWh
Interest rate for commercial loan	10%
Loan Term for the project	10 years
Inflation	4 %
Repayment method	Annuity
Tax holiday	10 years
Electricity price increase	2.5 %
Discount rate	8 %
Erosion fund	2000 US\$/metre (total of 2.8 US\$ million)
CDM price of the CER's	5.75 €/Ton CO ₂

Land lease costs:

Year 1-2: \$ 375 / year (confirmed)

Year 3: \$ 400 / year (confirmed)

Year 4-20: \$ 500

1. The Power Sale Tariff was worked out from the other financial indicators. The goal was to achieve an interesting return by keeping a low tariff and a Debt Service Coverage Ratio higher than 1.25.
2. The interest rate and the loan term were benchmarked from other similar projects in the region and they are considered to be the standard for these kinds of projects.
3. During last years the inflation in Guyana was around 4%; therefore the same inflation was considered for the upcoming years.
4. After several meetings with the Chief Executive Officer of the Guyana Office of Investment (GO-INVEST) Mr. Geoffrey Da Silva, it was agreed that the project was categorized as "Pioneering Investment" under the special incentives to investments mechanism in Guyana which gives the project a 10 year tax holiday (please refer to the official GO-INVEST web site http://www.goinvest.gov.gy/incentives_special.html for further details about taxation issues).
5. As it can be seen in the table above, a fund for the eventuality of future erosion of the site was included. This fund consists of 2000 US\$/metre of upgraded coast-line and in total amounts to US\$ 2,8 million to be spent in year 10 if required.
6. The CDM price was considered using the current prices as baseline.

The Clean Development Mechanism (CDM) is a mechanism of the Kyoto Protocol. This mechanism defined in Article 12 of the Kyoto Protocol provides the signing developed countries listed in Annex I of the Protocol to implement project activities that reduce emissions in non-Annex I countries (developing countries) in return for certified emission reductions (CERs). The CERs generated by such project activities can be used by Annex I countries to help meet their emissions targets under the Kyoto Protocol. Article 12 also stresses that such projects are to assist the developing country host Parties in achieving sustainable development and in contributing to the ultimate objective of the Convention (Clean Development Mechanism web site http://unfccc.int/kyoto_mechanisms/cdm/items/2718.php).



A certified emission reduction is just a registered document that validates and certifies the reduction of emissions that a certain project produces. These emission reductions can, afterwards, be sold to Annex I countries.

In order to quantify the amount of carbon emissions reduced, the project has to be compared with a baseline.

A country baseline is a result of a weighted average of the emissions of a country's fuel mix used for generation purposes. In this sense, the "dirtier" the fuels used for generation in a country the higher the amount of reductions obtained by using clean energies (such as wind) and the higher the income from the sale of these certificates.

The income for the present project was calculated by using an assumed baseline; the following table presents the assumed baseline for Hope Beach:

Avoided emissions	Avoided emissions per kWh [grams/kWh]
CO ₂	966
NO _x	4,6
SO ₂	14

These figures were estimated for Guyana based on existing plant and age. Because currently no CDM-project as yet has been done in Guyana a calculated baseline for the country does not exist and we have assumed the above baseline.

In comparison; in China these are approximately 35% higher and in The Netherlands approx. 58% lower. The estimation was obtained from a report from the Netherlands Economic Institute for a similar calculation for the Dabanchang Wind farm in Xinjiang, China.



Using all the previous assumptions, the financial model was built. The following table presents the results of the analysis.

ITEM	DESCRIPTION
Project period	15 years
Debt / equity ratio	70 / 30%
IRR project (before finance costs and taxes)	15,4%
Net Present Value (8%, 15 years)	\$ 11,765,979.00
Return on Equity	22.93 %
Simple Pay back period	6 years
DSCR (10 years)	1,72
Total project investment	\$ 34,48 Million
Debt (70%)	\$ 22.05 Million
Equity (30%)	\$ 9,45 Million
Assumed sale tariff	\$ 120 / MWh

It should be noted that the project company (Guyana Windfarms Inc) will enjoy at least a 10 year tax holiday. Furthermore exemptions on import duties are also possible on the hardware. Because the project is "tax-free" the benefit of the depreciation on assets cannot be utilized in Guyana. For this reason it would be interesting for a foreign investor or lender to consider an optimal fiscal construction such as a cross-border lease whereby the assets can be depreciated

against profits in the domicile of the investor while revenues from the project are tax-free from Guyana. Furthermore Guyana has double taxation treaties with most countries allowing the investor to benefit fully from the tax incentives in Guyana. By applying a fiscal structure whereby these maximum benefits are gained, the Return on Equity can be increased to well above 20%

RISKS ASSESSMENT

Projects of this nature involve some risks for their development and operation. Apart from these, some specific risks of this project were assessed in order to give comfort to private investors, to secure the loan and to reach financial closure.

Three main areas of risk were identified, namely: financial, technical and operational.

In the following tables, these three areas of risk are discussed. In each area the sources of risk are presented and the ways of mitigating them are included.

It is envisaged that by following the proposed mitigation solutions, no major risks will be involved anymore giving the investors enough security and comfort.

Financial Risks

Risk	Solution
Payment default on the Power Purchase Agreement	Hard guarantees (Escrow Account) from the Client (GPL) Standby Letter of Credit
Change in prices <ul style="list-style-type: none"> Investment Operational 	Assume worst-case prices for investment, keep tight budget on construction, long term O&M contract with Operator (Gamesa)
Substantial drop of the oil prices whereby energy prices in Guyana become cheap.	<input type="checkbox"/> Highly unlikely. <input type="checkbox"/> Robust long term PPA contract with GPL ensuring financial feasibility of the project.
Debt Finance <ul style="list-style-type: none"> Assumed interests Assumed fin. costs 	Assume a realistic interest rate and financing costs. Involve a respected and renowned banking institution.
Inflation Exchange Rate Fluctuations	Assume realistic inflation rates US Dollar based Power Purchase Agreement.
Tax Amendments	Get written guarantees from the Government of Guyana regarding tax exemptions and credits.
Delay in Private Investment	Only start project once all Private Capital has been subscribed. Involve a respected financial institution to manage the Private Offering.

Technical Risks

Risk	Solution
Future possible erosion of Hope Beach	<input type="checkbox"/> Robust design of the infrastructure <input type="checkbox"/> Make financial allowance for counter measures if required in the future [from 2015]. <input type="checkbox"/> Place the turbines as far back as possible on the beach area. <input type="checkbox"/> Follow Royal Haskoning's
Product failure	Hard guarantees from suppliers. Experienced Maintenance company (Gamesa) Insurance against calamities
Low wind yield Change in wind regime	<input type="checkbox"/> Natural phenomena, compensates with high wind yield years. Assume conservative values production calculations. Ensure Debt Service Cover sufficient from year 1.
Losses	<input type="checkbox"/> Hard guarantees from suppliers Good design

Operational Risks

Risk	Solution
Machine failure, breakdowns or operational losses.	Service and maintenance in compliance with manufacturer specifications Operations and Maintenance (O&M) contract with experienced operator for first two years (Gamesa) Insurance against machine failure or breakage
Lack of wind farm operation experience in Guyana	Train local personnel by manufacturer (Gamesa) Maintenance management by Gamesa for the first two years with an option to extend to five years with strong input from an experienced maintenance engineer from Gamesa to train a local team to maintain the plant. The windfarm will also be monitored by Gamesa's global SCADA that will provide alerts for predictive maintenance.

Unforeseen high running costs	Robust O&M contract with Gameas Guarantees of equipment Insurance on equipment Strict budget control by Gameas under the Build operate Transfer (BOT) arrangement.
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STATUS OF THE PROJECT

- The project development is for all intents and purposes completed and has been executed by a reputable developer (DELTA Caribbean, www.delta-caribbean.com) who forms part of a Netherlands utility (DELTA NV). All that remains to be done is the final engineering. Delta Caribbean NV has since rolled up operations in the Caribbean.

 - A fixed offer to supply the turbines has been made by Gamesa Eólica. Gamesa is a reputable Spanish supplier of wind turbines and is currently the second largest supplier in the world. According to a recent press release Gamesa intends to become the largest supplier of wind turbines in the world. The Gamesa Group had a gross turnover of € 1,745 billion in 2004 with a net profit of € 226 million.
- 
Gamesa Eólica
- The project meets Govt of Guyana criteria and is fully supported by the Govt. of Guyana. All licences, approvals and permissions have been approved and granted.
 - An environmental impact study has been finished and is approved by the Environmental Protection Agency (EPA). Also the Environmental Management Plan is drawn up and approved by EPA.
 - The following contracts / permits are in the progress of being obtained or negotiated:
 - a. Independent Power Producer (IPP) license, this is a formality as the Prime Minister's Office is the Issuing Agency. The Prime Minister and the President of Guyana, Mr. Jagdeo, have both personally indicated that the IPP license will be granted. A conditional (temporary license) has been applied for until the PPA (which is an appendix to the License application) has been finalized.
 - b. Power Purchase Agreement (PPA). Negotiations with GPL are ongoing. The technical issues have been solved, only the tariff is still outstanding. A final offer has been made to GPL in November 2008. The end-negotiations on the tariff are expected to be finished in the fourth quarter of 2010. The proposed tariff is US\$0.105 per KWh.
 - c. Letter of No Objection for the export of the CER's (Certified Emission Reductions). This license has been verbally approved by the Designated National Authority (DNA) of Guyana, Hydromet, the LONO is expected shortly.
 - Financial Closure.
 - a. An investment Memo has been finalized. This will be presented to banks and investment groups and other facilitatory services to obtain the financing.
 - b. NuPlanet is currently finalizing the bankable document for the debt finance.

2. Carbon Component.

- a. At present a provisional estimate of the CER price of € 5,75 has been used in the financial models.
- b. The LONO has been applied for from the Guyanese DNA.
- c. The following steps in the CDM-Executive Board Registration still need to be done:

Item	Duration
1. Start Up (site visit, initial costs, project assessment)	2 weeks
2. ERPA	1 month
3. PDD	2 months
3. Suitable Methodology exists for project	1 month
4. Host Country Approval	5th month
5. CDM Exec Board approval	6th month
6. Certification	8 weeks after submission

- d. It is expected that the carbon registration component will take 7-9 months and should be started a.s.a.p.
- e. If the Registration process is started in the fourth quarter of 2010 it can be expected that the registration process will be finalized by the third - fourth quarter of 2011 allowing CER's to be produced in line with the commissioning of the project which is expected to be towards the end of 2011.

CONSULTANTS (2003 - 2008)

Delta Caribbean

DELTA Caribbean is a Netherlands Antillean company established in Willemstad, Curaçao. The company as a subsidiary of DELTA NV with a staff of about consists of a staff complement of 9 persons of which 3 are wind farm operating and maintenance personnel, all stationed in Curaçao. DELTA Caribbean has as its core business the development, implementation, operation and maintenance of wind farms in the Caribbean Region.

www.delta-caribbean.com

www.delta.nl

NuPlanet BV

NuPlanet is a Dutch and South African company specializing in the development and implementation of clean energy projects ranging from wind farms and hydro power plants to CDM projects. NuPlanet acted as advisor to Corobrik in the identification and structuring of the CDM project and was responsible to managing the entire CDM process.

www.nuplanet.nl

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Issued : 8th September 2010