

Wind Harvest International  
Davis, California, 95616  
c/o Dr. Ariana Marshall  
Caribbean Sustainability Collective Inc.  
#11 Clermont Terrace South  
St. Michael, Barbados  
May 18, 2018

Re: Comments on “Renewable Energy Supplier Agreement on Distributed Generators >500kW”

Dear Fair Trading Commission/Barbados Light and Power,

We write you based on our wind technology research and development over the past twenty-years in the U.S. and over the past four years in the Caribbean. We continue to focus on locally relevant research and development to pilot adaptations to established wind technology through the development of vertical axis wind turbines. [Wind Harvest International](#) is going through the process of certifying its’ 100-140kW vertical axis wind turbine arrays for the worldwide market. We are working with Dr. Ariana Marshall and the Caribbean Sustainability Collective to collect wind data and find potential sites for demonstration projects which we want to install in Barbados in 2019. It is our perspective that our turbines will create a significant partnership to achieve the island’s renewable energy goals because our Harvester VAWTs have the following attributes:

- The VAWTs were designed with our patent to optimize the [coupled vortex effect](#) which means that they optimize the use of land space while also being compatible within the understory of larger HAWTS – [Reference VAWTS with HAWTS](#).
- The top of their blades can be between 18 to 22m above ground level, which is a substantial improvement to the 40+m tip height of a typical 100kW horizontal axis wind turbine.
- They use the Northern Power System’s direct driver generator and power converters which can source or sink [45 KVAR of reactive power instantaneously](#), whether the wind is blowing or not. This component could be useful to improving the power quality in Barbados.
- A two - turbine, 100kW array will have less than 50 square meters of concrete surface area. Therefore, it can be installed in sugar cane and other agricultural fields with crop growth/harvesting possible directly below the rotors minimizing the use of land, especially compared to how much land would be covered with a 100kW solar panel project.

- VAWTs with their lower blade tip speeds and vertically aligned drive train are quieter than HAWTs allowing their installation closer to homes and businesses.
- The short height of the VAWTs allow them to be placed much closer to property lines if the 1.5x height to property line setback is required.
- The VAWTs can be transported to the site on the heavy-duty transport equipment which already exists in Barbados and can be installed with a small, truck-mounted crane, which means that unpaved roads can be used to transport, install, repair and maintain the turbines.
- Some of the windiest sites on Barbados will have problems installing large HAWTs because of their road access and view shed issues while many 100kW VAWT arrays can easily be installed in these prime locations.

For these reasons, we are enthusiastic about bringing our wind energy technology to Barbados. We appreciate that the remaining unknown, critical factor to our project is finally being addressed, the Power Purchase Agreement. We were relieved to see that the most recent draft proposed by BREA changes the absolute language in section 3.0 Performance Security against the use of any technology that hadn't been in operation for three years. This clause would have locked out our turbines until 2022 and would have stopped solar pv developers from utilizing the improved components that will enter the market during that time.

No one wants to buy older equipment when new, proven more efficient or less expensive options are available. We encourage you to make section 3.0 more flexible by allowing technologies that use UL listed and IEC certified components to qualify for a PPA without having to go through special processes or long time wait periods. Those are not easy milestones for any energy technology to achieve.

We are also pleased to see the “98%-102% Energy Production Requirement” in section 5.2(b) and 5.3(c) expanded to 95%-105%. But even that is too restrictive of a parameter for wind technology given the following factors:

- a. Weather conditions change from year-to-year and could easily result in 6-10+% lower or higher wind speeds than the historic average, which is what a wind project developer will use to predict their project performance.
- b. Climate change is increasing ocean temperatures and is this is estimated to decrease the difference in night to day time temperatures, which could result in lower average annual wind speeds. However, the changing wind speeds which occur due to changing rainfall patterns and potentially more intense hurricanes could also bring periods of higher/stronger wind speeds to meet the renewable energy needs of islands pre/post hurricane impact.

- c. Determining accurately the next day's wind speeds is still as much an art of informed intuition as it is a science. This is especially true for small project owners that won't have access to the sophisticated weather models that are available but costly.

For these reasons, we encourage you to reduce your penalties or widen the parameters in Section 5.2(b), 5.3(c) and 8.1(d)&(e) for wind turbine project requirements to predict wind speeds and related project energy output.

This should also result in a lower Performance Security capital outlay, which will help with project finances. Once a renewable technology has been operating with a 95% operational uptime, then all or part of the performance security should be returned to the company.

We also encourage you to expand section 8.1(f) to provide information back to the wind energy producers on the wind speed predictions at other locations around the island to allow all producers to develop more accurate forecasting capabilities.

We believe that Barbados can more quickly achieve its' goal of 100% renewable energy if it makes the above changes. We hope that you develop a PPA that rapidly stimulates the growth of small (<500kW) distributed projects that can help with the economy and reduce the costs for importing fuel for diesel generation.

Sincerely,



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