

**Technical Review Form
GFO-16-310
EPIC Wind Energy Research Solicitation**

Applicant Name:	Wind Harvest International	Proposal Number:	7
Project Title:	Researching and developing the potential of VAWTs to double capacities of California's wind resource regions while preventing harm to birds – Phase I		
Reviewer Name:	Jocelyn Brown-Saracino		

Proposal Strengths and Weaknesses

Proposal Strengths:

Overall, the proposal lays out a logical sequence of modeling and testing VAWTs.

The proposal to measure the environmental performance of the system is a strength, since data regarding environmental performance of alternate turbine designs is lacking.

Proposal Weaknesses:

The proposal supports, in part, the testing and installation of VAWTs. While a proposal for certification has been submitted for the VAWT design in question, it has yet to be received. To date no VAWT has received certification in the US due to technical challenges associated with their performance (energy production on average lower than predicted and also due to issues associated with reliability and maintenance). I do not recommend providing funding for VAWT turbine installation until after certification has been obtained.

The proposal suggests that VAWTs might be used as an understory below HAWTs and suggests that the primary driver for the height of HAWTs is that near-ground wind is too turbulent. Wind resource is much greater at height and this calls into question the resource potential for VAWTs deployed in this fashion.

The proposal implies that VAWTs will be safer for birds. To date there is no evidence to back up this claim. While the proposal seeks to test this hypothesis, their plan lacks sufficient detail around the following:

- 1) Adequate reference or control to determine what levels of bird mortality are acceptable at a given site.
- 2) The proposal states that if birds are being harmed by the VAWTs and the deterrent system in testing does not work, the team will reduce the RPM of the system from 66 to 10. More information is needed on predicted power loss from such a proposed mitigation option and at first blush, it seems like this would not be an effective solution from the perspective of energy production. Further, there's no evidence to suggest lower RPMs would result in lower bird mortality. Commercial-scale HAWTs spin at very low RPMs and bird and bat mortality still results from such interactions.
- 3) There's a lack of information regarding the frequency or magnitude of bird mortality that would result in various mitigation options, including turbine decommissioning. There's also no information regarding species of birds of concern for such thresholds (e.g., threshold for all bird mortality vs. a threshold for specific protected species?).

The proposal aims to test the DTBird system using drones. Note: DOE is already funding such work at other locations and thus these efforts may be redundant of funded activities.

Additionally, while the proposal states that the DTBird system as undergone validation of its detection capabilities, those validation efforts found that the system was likely to trigger the dissuasion signal more often than warranted and thus increase the risk of habituation to the signal. Further, the actual effectiveness of the system at reducing bird mortality at wind farms has not been validated.

Other Observations:

The use of the DTBird system and drones as part of its testing may require take permits from FWS. These can be lengthy to obtain and thus may affect project timeline.

Full resumes appear to be missing.

Recommendation

Recommendation:

Do not fund.

Funding Recommendation: In your best judgment, when all factors are taken into consideration, how would you rate the overall technical feasibility of the project? (double click on boxes to activate menu)

- Excellent Very Good Good Fair Poor