
FloDesign Wind Turbine
there's change in the wind
Avian Safety Validation Project
Presentation to Altamont Pass
Scientific Review Committee (SRC)
Oakland, CA
July 21, 2011
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Presentation Overview

1. FloDesign Wind Turbine Corp. overview
2. Description of MEWT (Mixer Ejector Wind Turbine) expected performance and environmental advantages
3. Basis for FDWT's working hypothesis that MEWTs will be more avian-friendly than earlier-generation technologies
4. Proposed plan for avian safety test and request for input
5. Q&A and discussion of next steps

FloDesign Wind Turbine: Corporate Profile

- Manufacturer of high-efficiency wind turbine technologies
  - Founded in 2007
  - Headquartered in Waltham, MA
  - ±70 employees worldwide
- Strong IP position (200+ patent applications, with 19 awarded)
- >$50M of funding to date includes prestigious awards:
  - 2008 – MIT CEEP & ICE Winner
  - 2009 – USDOE arpa·e $8.3 million award
  - 2010 – Mass CEC financing package, $3 million
- Blue chip private investors (>$40M):
  - Kleiner Perkins Caufield & Byers
  - Vantage Point Capital Partners
  - Goldman Sachs
  - Technology Ventures

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MEWT: A New Application of Well-Proven Technology

Aerospace applications for noise/IR suppression, enhanced thrust, fuel economy (1970s-80s)

First (1kW) in-field MEWT prototype (Dec 2009)

First (100kW) commercial-scale MEWT prototype (May 2011)

Avian Safety: A Major Potential Advantage of MEWTs

- FDWT conducted an exhaustive review of literature on avian impacts of wind power (Aug-Sept 2010)
- This review sought to identify all major causes of bird fatalities from wind turbine operations
- Based on this review, FDWT believes it is reasonable to assert that MEWTs will sharply reduce bird kills because of intrinsic design features of shrouded turbines, e.g.,
  - 70% smaller rotor swept area vs. comparably-rated HAWTs
  - Shrouds will prevent inadvertent entry from above, below, sides
  - Lower height places MEWTs below most avian flight paths
- FDWT's belief , at this stage, is based on intuition and logic. Absent empirical evidence (which requires a field demonstration), it is advanced as a working hypothesis, not a verified claim

From Intuition to Hypothesis to Proof Test

- After forming this hypothesis, FDWT has engaged with key stakeholders in CA and nationally to introduce MEWT technology and listen to reactions/concerns (Nov 2010 – May 2011)
- FDWT's goal has been to form a robust plan for testing the avian friendliness of its compact, shrouded turbine design
- With enXco/FDWT has now identified a prospective host and site for a ten-turbine project/study in the APWRA
- If this attribute can be proven, FDWT believes such a study could speed acceptance of MEWTs as a new choice for repowering and for future growth of clean energy (esp. for sites that cannot be served by conventional utility-scale turbines)

Outline of Plan for Avian Safety Project/Study

- FDWT is prepared to support a ten-turbine deployment in APWRA for the purpose of a scientifically rigorous study of avian impacts compared to existing legacy turbines
- Thirty turbine sites would be selected on the basis of high scores on the SRC's Hazardous Rating Scale
- Turbine sites would be grouped into ten groups of three based on key site characteristics (e.g., position in string, adjacency to canyons, other significant terrain/topographical features)
- One turbine in each group to be swapped for a FDWT turbine
- All 30 turbines to be monitored for avian collisions intensively (e.g., 2x weekly) for a predetermined period (e.g., 1 year)
- Study governance, funding, contractor issues TBD in consultation with SRC and other stakeholders/participants

Next Steps and Request for Input

- Conceptual Study Design: FDWT has consulted with avian safety stakeholders (ENGOs, govt agencies, experts) for input but has not contracted for any paid work
- Proposal Development: FDWT is prepared to engage Dr. Shawn Smallwood (who has provided study design advice informally) to prepare a detailed study proposal to the SRC (assembly of baseline data beginning in 2011; first MEWTs installed in 3Q/4Q 2012)
- Study Governance: FDWT seeks an independent study administrator (SRC? NREL? ICF?) to select and oversee the Principal Investigator
- Study Funding: FDWT will provide up to $250k to support study costs, and will seek opportunities for cost-sharing with outside sources (both private and government, e.g., PIER, USDOE)

Thank You!
Q&A

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