#35 – DESIGN OF OSCILLATING WIND POWER

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• Project Synopsis: Traditional wind turbines cannot be sited in many locations, such as much of the California coast and population centers, due to citizen concerns about aesthetics, bird kills, and noise. A new kind of wind generator with a very different mechanism may circumvent such barriers and allow wind power to be installed in many locations where traditional turbines are not allowed. This project will work with a local inventor and another in Seattle, WA to optimize the design's power output, cost, and aesthetics. This includes building and testing prototypes from small-scale to full-size, as well as modeling in software. If engineering and cost appear promising, students can also propose a business plan for production of the devices.

- Expected Project Outcomes:
  - Model expected energy output.
  - Build small- to medium-scale prototypes of device (perhaps even full-size).
  - Test prototypes, on campus and/or on site in Marin County.
  - Calculate structural strength requirements for safety.
  - Calculate costs and likely return on investment from energy production.

- Technical Challenges: Calculating likely power output, structural strength requirements, and costs. Optimizing cost effective balance of energy generation, equipment, siting and construction costs, and visually acceptable design. Building and testing small- to medium-scale prototypes (possibly a full-scale prototype), either at Berkeley or in Marin County. A large west Marin private property is the available demonstration site.

- Project Background: Traditional wind turbines cannot be sited in many locations, such as much of the California coast, due to citizen concerns about aesthetics, bird kills, and noise. A new kind of wind generator has been proposed, with a very different working mechanism and aesthetic. It may circumvent policy / opinion barriers and allow wind power to be installed in many locations where traditional turbines are not allowed.

- Tools and Equipment Provided:
  - Standard CAD tools available to all UCB students.
  - Standard CFD software available to all UCB students.
  - Standard machine shop access available to all UCB ME students.
  - Wind tunnel (limited access).

• Project Objective/Deliverable: Improve engineering feasibility, aesthetics, and likely cost-effectiveness of a new wind generator design. Build and test prototypes of the wind generator, and model with CFD

software. Talk with the community near the test site to design for their concerns and obtain their acceptance.

• Ideal Team Size: 3-5 people

• Skill Set Needed: Matlab, LabView, or other datalogging. CFD optional. Experience in physical prototyping of mechanisms, calculating stress/strain of mechanisms. Experience in electric motors and power generation.

• Additional Uploaded Documents: http://faludidesign.com/TEMP/Fung/OWP/