CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY

Name(s)
Trevor J. Filseth

Project Number
J0109

Project Title
An Improvement on the VAWT Wind Turbine

Abstract

Objectives/Goals
I wanted to improve the performance of the standard Savonius Vertical Axis Wind Turbine (VAWT) by at least 10%.

Methods/Materials
I developed a modified Savonius turbine design which incorporates a movable flap (the #Filseth Flap#!) which sits on top of the standard Savonius blade. The flap is hinged and angled so it opens while the wind blows in one direction and shuts while the wind blows in the other direction. I tested my design against two other designs (the standard Savonius, and the standard Savonius with a cover on the top) at four different distances from a wind source (24, 30, 36, and 42 inches) for both generated voltage (with a DC electric motor and 2 K-ohm resistor), and time taken to reach 60 revolutions (which I later converted into RPM).

Results
The flap design performed well. In the test of voltage, the flap-equipped VAWT exceeded the next best configuration (the VAWT with the covered top) by an average of 24%. In the case of rotation speed, the flap VAWT beat the next best one # again the covered top design # by an average of 21%.

Conclusions/Discussion
My flap design improves the efficiency of the Savonius VAWT by about 20-25%, relative to the next best configuration over a range of different wind intensities.

Summary Statement
In my project, I developed a 20-25% more efficient version of the Savonius wind turbine.

Help Received
My dad helped me with data collection. Also, my mom helped with some of the gluing.