CALIFORNIA STATE SCIENCE FAIR
2011 PROJECT SUMMARY

Name(s)
Kate B. Danker

Project Number
31632

Project Title
The Power of Wind: A Wind Powered Electric Car

Abstract

Objectives/Goals
My objective is to discover if wind energy obtained from small wind turbines attached to an electric car can provide enough power to charge the battery of the car while driving.

Methods/Materials
Using an anemometer, I tested the wind velocity at eight different locations around a car driving at a steady rate. With my recorded data, I used the equation P=1/2pAV^3, to calculate the amount of power available at each wind velocity. I compared the total power available from eight small wind turbines to the power an electric car#s battery uses in driving.

Results
From my calculations, I found that eight small wind turbines can provide a substantial amount of power. For example, eight wind turbines with a diameter of four inches, driving at an average speed of 55 miles per hour, can provide 339.23 Watts of power, compared to the 240 Watt hour that the Nissan Leaf has.

Conclusions/Discussion
I cannot accurately state that the wind turbines can provide enough wind energy to power an electric car#s battery endlessly, because there are many factors that come into play. I did not calculate the drag created by the wind turbines, which would alter my results, because I did not have the resources. To obtain more specific results, I will need to test the actual electric car that will be powered by the wind turbines, and run physical tests with different wind turbines to find which material and shape of turbine is most effective and creates the least amount of drag. My calculations show general results that provide encouragement for further work.

Summary Statement
My project is on powering an electric car's battery with wind turbines.

Help Received
Father helped with experiment by driving; Father's work friend lent anemometer; Father helped operate Microsoft Excel