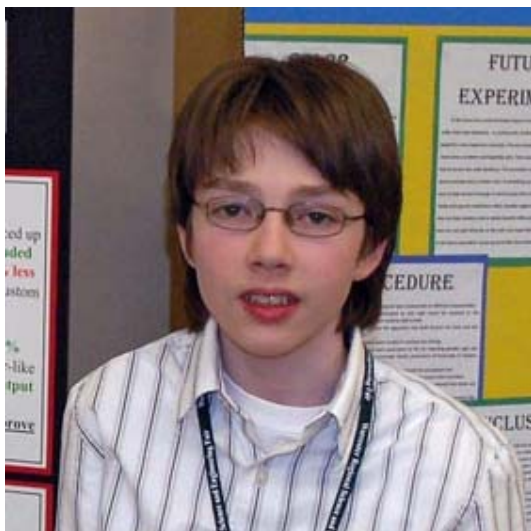




MASSACHUSETTS CLEAN TECHNOLOGY AWARDS

A Program from The Foresight Project Inc

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Region II: Central MA
Project Recognition

Scott Todd,
Framingham High School

*"Increasing Wind Turbine
Efficiency"*

My name is Scott Todd and I am a freshman at Framingham High School in Framingham, Massachusetts. I love math and science as well as technology classes. For the past 3 years I have been doing Destination Imagination and last year my team competed in the Global Finals in Knoxville, Tennessee after advancing from the regional and then state levels. I am in my school's chess club; enjoy playing ultimate Frisbee, computer games, and hiking.

I enjoy traveling and have been fortunate enough to explore the Galapagos Islands and Andes Mountains in Ecuador, as well as England, Italy, France, Belize, Honduras, and many of our wonderful states.

MY PROJECT:

Wind energy is beginning to be increasingly important as an alternative to fossil fuel as an energy source. With this, now many new designs are being tested to see how they affect the efficiency of different wind turbine configurations, including shrouded and mixer/ejector wind turbines. [These techniques are similar to the ones used on airplanes, where the shroud (which encircles the wind turbine) directs more of the air flow into the turbine.]

I wanted to see if more energy could be extracted from the wind with these techniques compared to standard wind turbines. I mounted shrouded, mixer/ejector, and un-shrouded wind turbines on the roof of a car and recorded the voltage produced across various resistive loads as the car was driven at 30 MPH. I found that some wind turbines produced up to 20% more power when shrouded; my custom wind turbine made up to 43% more power inside a simple shroud, but it made 31% less power inside a mixer/ejector, although this could be attributed to airfoil inaccuracies. It is clear that this is an interesting area for further research.