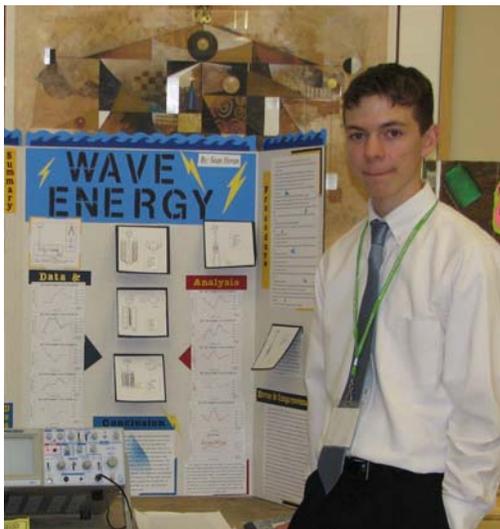




2009

MASSACHUSETTS CLEAN TECHNOLOGY AWARDS

A Program from The Foresight Project Inc; www.theforesightproject.org



Region II: Central MA

Sean Horan, Shrewsbury High School,
Shrewsbury

"Wave Energy"

My name is Sean Horan; I am a sophomore at Shrewsbury High School. This is my first year at a Regional Science Fair. I am very active in and out of school: I play trombone in the band and I participate in sports all three seasons. I play soccer in the fall and I run varsity track in the winter and spring, all at Shrewsbury High School. Piano is also one of my interests.

I live with my mother, father and sister. Along with that I also have two pets, a cat and dog. I like to spend time with my friends playing basketball, soccer and football, and running.

My Project:

There is an increased need for solutions to today's environmental crisis. People are constantly using energy in ways that are harming the environment and using up all of the Earth's resources. I wanted to see if there was a way to generate electricity using the resources already available to us. Natural resources are beginning to be used, but the two largest sources, solar and wind, depend upon ever-changing weather. I decided to create a device that harnessed the vertical movements of the oceans waves to produce electricity. The concept of wave power is fairly new; I based my idea on a concept from a company located in England, using the vertical movements of the ocean's waves to power a generator and create electricity.

This project involved much trial and error - I went through five designs before arriving at the final design. This consists of a buoy placed on top of the water surface, which is attached to a wooden dowel. A rectangular magnet is attached to this dowel; as the dowel bobs up and down from the movement of the waves it moves the magnet through a coil of copper wire, coiled around the outside of a thin cardboard cylinder. All of this is sealed and under the surface of the water except for the buoy and part of the wooden dowel.

In a typical generator, an electric wire is rotated through a magnetic field. The interaction between the magnetic field and the electrons in the wire causes electricity to flow. This same interaction can be

used in reverse, and this is the principle behind the power created by my design: the current and electricity is created when a changing magnetic field runs through a stationary electrical wire. The bobbing magnet through the wire coil creates a current. I then read this current from an oscilloscope. I put every design I made into a small wave tank that I created for the project, and tested to see how many volts were being produced. My final design produced on average 40 to 50 millivolts. This is not a large amount but it proves that the concept is feasible and the idea can be used to create electricity.

For the future, I would like to be back at the fair next year with better results. I plan to make a larger scale model than my model which is held in a fish tank, and hope to produce larger amounts of electricity.