



2009

## MASSACHUSETTS CLEAN TECHNOLOGY AWARDS

A Program from The Foresight Project Inc; [www.theforesightproject.org](http://www.theforesightproject.org)



Region III, Southwestern MA  
CleanTech Award:

Matthew Wezowicz, Tauton High  
School, Tauton

*“Solar Energy, Collecting the  
Most Free Power”*

### ABOUT ME:

Matthew Wezowicz is a 17 year-old junior at Taunton High School in Taunton, MA. He is the eldest of two children. Throughout his high school career he has been involved in the math team, Academic Decathlon, National Honor Society, and as a member of the stage crew. He enjoys drawing and 3D modeling. Matthew hopes to study architecture in college and picked this science fair project because it is a field that can be integrated into green architecture.

### MY PROJECT:

*The purpose of this project was to determine the best arrangement of fixed solar cells that collects the most power with the goal of improving the collection and hence viability of solar power. Different arrangements of fixed solar panels were tested, based on some of the currently used commercial arrangements: as a grid, a 180-degree arc, a triangle, and a trapezoid. It was hypothesized that a 180-degree arc design would be best because it allows at least one solar cell to be facing the sun at all times.*

Today's solar energy systems usually incorporate motorized tracking systems to produce more energy as they pivot and follow the sun's path, thus consuming power in order to maximize the production of power. Fixed panel systems have less energy potential than these tracking systems because less of the light hits directly. However they are cheaper and easier to maintain because there are fewer moving parts. My goal was to determine if there was a configuration that would increase the collection without active tracking of the sun.

The cells were tested under controlled conditions using a simulated sun that accurately replicated its path over the course of the day at a specific point on the Earth's surface. Voltage and amperage were measured at five separate points along the simulated sun's path and used to calculate the wattage. The results indicate that the most common fixed panel arrangement, a simple grid, is the best for collecting solar energy because that arrangement produced the highest average wattage over the course of the simulated day.