CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY

Name(s)
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Project Number
36870

Project Title
Solar: Cell vs. Mirror

Abstract

Objectives/Goals
This project was created to attempt to qualify and quantify the benefits and drawbacks of two different methods for converting solar power to electricity.

Methods/Materials
Power was measured using by:
1. Measuring current and voltage generated by a solar cell and calculating power generated over a certain amount of time, then,
2. Calculating the amount of power, created by the reflection of a parabolic mirror, required to heat a measured amount of water from an initial temperature to a final temperature over a certain amount of time.
The tests using the two setups were measured simultaneously.

Results
The results showed that the weather impacted the generation of power with the two methods. A clear day, with no wind, allow the mirror setup to create more power. A breeze and/or cloudy day allowed the solar cell to create more power.

Conclusions/Discussion
This experiment showed that the solar cell power generation was probably more consistent over time compared with the solar mirrors. If an environment was found where the wind was calm and there were few clouds, the mirrors could be more efficient than the solar cell. The one obstacle for me was to determine what costs would be for a large volume/production for each setup. I do know that the large scale power generation by mirrors is much more elaborate, including melting salt, which may reduce the variation in power generation using mirrors.

Summary Statement
I compared 2 basic solar power generation methods in an effort to determine which method was more efficient and why.

Help Received
I used store bought mirror and cells as apparatus, and used an assistant to help record the data. I had to research online how to convert water temperature change over time to power.