

Katherine Younglove
Using Mirrors to Increase the Power Obtained by Solar PV Cells

This project was conducted to see if using mirrors to reflect light onto a solar PV cell would increase the electrical energy obtained by the solar cell. If I arrange mirrors to reflect sunlight onto a solar PV cell then the solar cell will generate a greater amount of electricity than without the mirrors and the additional electricity is generated at a lower cost than if it were generated by additional solar cells.

My experiment consisted of measuring electric energy produced by solar cells using 4 different setups. Setups #1, 2, & 3 used the same wooden frame with mirrors added for setups 2 & 3. Setup 1 was measuring the amount of energy generated by a solar cell without mirrors. My experiment compares the energy produced by setups 2, 3, & 4, which all use mirrors, against setup 1. The measurement for a single setup took the following steps: 1) Position setup facing south, 2) place solar module in setup and connect load resistor, 3) measure voltage across load resistor, and 4) record voltage on a data sheet. Repeat with setups 2, 3, and 4.

In this set of experiments I have conclusively shown that the power obtained from solar PV cells can be substantially increased by arranging the solar cells between properly positioned mirrors thus proving my hypothesis. Analysis of the cost of materials shows that extra solar power can be generated more cost effectively using a combination of mirrors and solar modules than just solar modules alone.