CALIFORNIA STATE SCIENCE FAIR
2007 PROJECT SUMMARY

Name(s)
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Project Number
J0802

Project Title
Efficiency of a Photovoltaic Cell: High vs. Low Temperature

Abstract

Objectives/Goals
The objective of my project is to test how does the power output of a photo voltaic cell is effected by change in temperature. My hypothesis is that, higher the temperature lower the power output.

Methods/Materials
I used two photo voltaic cells of similar specifications. I connected both the cells to two different monitoring devices that record volt and ampere at various temperatures. I then placed two lamps at the same height from each cell. I heated the ambient temperature of one cell and cooled the ambient temperature of the other cell in the same volume of air by placing the cells in an enclosure. I then recorded the vols and ampere of each cell at different temperatures.

Results
The photo voltaic cell in the cooler ambient produced higher power output than the photo voltaic cell in the higher ambient temperature.

Conclusions/Discussion
The results proved my hypothesis correct. I believe it is a result of better conductivity produced through the silicon in the photo voltaic cell. The cooler temperature of the leads carrying the current from the cell also had a positive effect on the output of the cell.

To keep the photo voltaic cells cooler on the roof of a house, a rubber tubing system carrying water may be installed under the cells. The warm water can then be channeled to a water heater to reduce the cost of heating.

Summary Statement
My project is designed to test the efficiency of a Photo Voltaic Cell at various temperatures.

Help Received
Peter Agarwal, my dad helped buying the material and assembling the project. Ed Murdoch of Anaheim Public Utility provided suggestions to keep the integrity of the test results.