CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

J0220

Project Title

Does the Color of Light and the Temperature of Solar Panels Improve the Efficiency?

Abstract

Objectives/Goals

The purpose of this experiment is to find out if solar panels are more efficient at a certain temperature, when a certain color of light is shined on it, or when fluorescent colors are shined on it. When something is fluorescent it absorbs UV light and emits it as a light with a longer wavelength.This would be very useful because the best solar panels can only absorb 20% of the sun#s energy. Moreover, they are very expensive to build, so improving them would help make them worth more, and we would be able to produce more clean energy.

Methods/Materials

I did two experiments. The first experiment would test which temperature solar panels have the highest amount of electricity at. I changed the temperature by putting dry ice, wet ice, and blowing hot air (with a hair dryer) at the solar panel with a hair dryer. Then I measured voltage and amperage with a multimeter. My second experiment would test if different colors of light, and fluorescent colors affected it. I put a colored sheet at the bottom of the box, reflected light off of it and on to the panel, measured voltage and amperes and then went on to the next color.

Results

In my temperature experiment, the solar panel produced electricity in the cold than when it was warm. Amazingly, my solar panel produce 373% more energy in extreme cold temperatures (-56 degrees at 1.332 micro watts) than in warm temperature (60 degrees at 0.3563 micro watts). The different colors also changed the watts of the solar panel. The yellow was at 0.722 micro watts while the blue was 0.389 micro watts. Fluorescent yellow worked very well for the solar panel, surprisingly a few nanowatts better than the white. Fluorescent yellow was at 0.811 micro watts and white was at 0.771 micro watts.

Conclusions/Discussion

From my experiment, I can conclude that solar panels are more efficient in the cold, and in fluorescent light. A way to improve them would be to have a water cooling system, where the solar panel pumps the cool water over itself and into the house. A see- through fluorescent coating might also help boost the electricity production of a solar panel up.

Summary Statement

My project is testing if the color of light and the temperature of solar panels improve the efficiency.

Help Received

My dad helped expand on idea, gave suggestions, helped wire my board, and supplied my materials.