CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY

Name(s)
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Project Number
J0913

Project Title
Using Water as a Coolant to Increase Solar Panel Efficiency

Abstract

Objectives/Goals

Fossil fuels are burning out at a rapid rate. An alternative, abundant resource needs to be found for human usage. Heating homes is a large energy consumer. Recently solar panels have become a resource to meet such needs. However, solar panels have had their share of problems. Particularly, overheating when exposed to too much sunlight. In addition, when the temperature becomes too hot, solar panels generate a lot less energy than when they are cool.

Statement of the Problem: Solar panels often overheat, and thus become less efficient. Cooling solar panels down seems to be a necessary function. This experiment was conducted to determine if water could be used as a coolant to keep solar panels from overheating. Does water help the efficiency of solar panels?

Hypothesis: Flowing water over the surface of a solar panel will cool down the panel enough to make it generate more energy and allow it to work more efficiently.

Methods/Materials

Using two, small, model solar panels, one as a control and the other as a test for water as a coolant, several readings were taken at scheduled times of the day measuring the difference in energy efficiency of each panel. Both solar panels were placed on Styrofoam bases and set into a water filled tub. The angle, height, and direction of both panels were identical. However, Solar Panel A, the water coolant experiment model, had rubber tubing attached to it. Using a fish tank pump, water was pumped from the tub through the rubber tubing so that a fan of water sprayed continuously over the panel surface throughout the day.

Results

As a result, data readings showed higher energy efficiency from Model A, the water cooled, experimental model, indicating that water may act as a viable coolant for solar panels. Using water as a coolant to run over the surface of solar panels, increases the energy output.

Conclusions/Discussion

Using water as a coolant on a solar panel cools it down enough to cause it to generate more energy than one without water. While the sun was not covered by any clouds and was directly overhead, the solar panel with water cooling it generated more energy than the one without water. A water coolant system for solar panels may help the solar panels to cool and increase energy output during clear, sunny days and when the sun is at more of a direct angle above the solar panels.

Summary Statement

Flowing water over the surface of a solar panel will cool down the panel enough to make it generate more energy and allow it to work more efficiently.

Help Received

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