CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY

Name(s)

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Project Number

35389

Project Title

Charging a Smartphone Using Its Own Heat Source

Abstract

Objectives/Goals

My objective of my project was to try see if you could charge a smartphone using its own heat that it emits. My hypothesis was: If I can capture enough heat from a smartphone and convert it efficiently into electricity, then I can power a smartphone using its own heat without any batteries or kinetic energy. My project focuses on renewable energy and utilizing heat as a source of electricity without.

Methods/Materials

My experimental design would use a iPhone, a TEG module, a heat sink, an adjustable voltage step- up circuit, and a travel adapter charger. Before we begin, it is essential to know that a TEG module produces electricity when one side is heated and the other side is cooled. The larger the temperature differential on the TEG module, the more electricity is produced. A heat sink cools something hot. A voltage step- up circuit steps up the input voltage to a higher output voltage. How my experimental design works is you attach a TEG module to the back of a smartphone. The heat of the smartphone produced and the heat sink on the other side of the TEG module makes electricity. But since the electricity is not sufficient to charge a smartphone, you would hook up the TEG module to the adjustable voltage step- up circuit to increase the voltage. With high enough voltage and current to charge a smartphone, you would then attach a port to the step- up circuit. You then plug in the travel adapter into the port and the smartphone to charge the smartphone. So essentially, you are charging a smartphone using its own heat.

Results

I was not able to successfully accomplish the goal of my project because of insufficient voltage needed to be able to step up the voltage. To further explain, you need a certain input voltage for a step- up circuit to work but I was not able to achieve that voltage limit because the temperature differential was not high enough. But once I get enough voltage for the step- up circuit to work, my project will work.

Conclusions/Discussion

I was not able to achieve my objective but I am confident that this project will work. This project expands our knowledge of renewable energy because the research from my project might be beneficial to other people working on the subject of alternate energy. I hope that this project inspires others to look into alternate energy because the field of alternate energy is a unexplored, promising potential for other ways of obtaining energy.

Summary Statement

My project essentially focuses on renewable energy by taking the heat of a smartphone and converting it to electricity to charge the phone.

Help Received

Preliminary