



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Hiro D. Sparks</b>	<b>Project Number</b> <b>S0222</b>
<b>Project Title</b> <b>Recycling the Heat Energy Lost from a Common Light Bulb</b>	
<b>Abstract</b> <b>Objectives/Goals</b> I hope to build a housing for a 150 watt halogen light bulb, that will use the concepts of thermosiphoning to recycle the heat energy lost from a light bulb and transform it into the kinetic energy of a spinning a turbine. The system will release zero emissions and require no more energy then it takes to light a halogen light bulb normally, and it will not sacrifice any of the light given off by the bulb. <b>Methods/Materials</b> I accomplished this by wrapping 4 feet of 300 psi rated copper tubing around a light bulb, and attaching two 250 psi rated, quarter turn valves on either end of the tubing. I then ran acetone, a volatile liquid, through this coiling, and when it boiled due to the heat from the light bulb, I used the pressure gained to turn a turbine. I re-tested at different exposure times and temperatures, and observed the effects made on the turbine. <b>Results</b> After 1 minute of exposing the acetone to 65.6 degrees C it turned the turbine at 1 RPS, after 3 minutes it turned the turbine 1.5 times. After 5 minutes it turned it at 2 RPS and after 10 minutes of exposure it turned it at 3 RPS. There were very similar results for exposure at 66.6 degrees C. Tests at 67.0 degrees C were my most successful. After 1 minute it turned more than 1 RPS, after 3 minutes it turned at about 2 RPS, and after both 5 and 10 minutes it turned at 3 RPS. It took 15 minutes and 40 seconds for the coils to reach the boiling point of acetone: 56.5 degrees C. <b>Conclusions/Discussion</b> The 15 minutes it takes for the light bulb to heat up is a reasonable amount of time, considering the average person does leave their lights on for more than 15 minutes. Although these results were below my expectations, they still act as a proof of the concept that light bulbs# heat energy can be harnessed and transferred into kinetic energy.	
<b>Summary Statement</b> I have built a housing for a 150 watt halogen light bulb, that uses the concepts of thermosiphoning to recycle the heat energy lost from a light bulb and transform it into the kinetic energy of a spinning a turbine.	
<b>Help Received</b> This project was performed entirely in my home or at my school.	