



**CALIFORNIA STATE SCIENCE FAIR
2008 PROJECT SUMMARY**

Name(s) Khajag Bornazyan	Project Number J0902
Project Title Energy Trap	
Abstract Objectives/Goals Can I collect and store solar energy for our future needs? I hypothesized that if I create a vertical salinity gradient layer in a body of water in a solar-pond like environment, isolated with fresh water from the top, the density increasing with the depth and expose to the lamplight, then, as the surface exposure time progresses, the temperature of the bottom high density layer will increase and exceed the temperature of the top layer by collecting and storing thermal energy. Methods/Materials I studied two cases, a vertical salinity gradient and no salinity gradient (the control), both created in a 15 cm tall container. Each case was tested in three different trials. In both cases the container was exposed to halogen lamplight. In each case the temperatures of the bottom and top layers were measured as a function of the light exposure time. The average differences in temperature between the bottom and top were calculated and the results were compared between the two cases. Results Based on my experiments, I observed that in the salinity gradient case, after about 30 hours of exposure to the lamplight, the temperature of the bottom layer exceeded the top by about 6 °C. In the no salinity gradient case, during the same time period, the bottom did not exceed the top. Conclusions/Discussion I concluded that in the vertical salinity gradient case the thermal energy was trapped in the bottom high-density layer, since there was no convection in the middle, the isolating gradient layer. In the no salinity gradient case, the bottom layer could not trap the energy, because the entire environment was convective. The data fully supported my hypothesis. My findings agreed with the information found in the literature. I have learned that the solar renewable energy source can be effectively collected and stored in the solar pond-like conditions, and used for our future daily needs.	
Summary Statement By creating salinity gradient layer in a body of water in a solar pond-like environment, I have shown that a renewable energy, such as solar, could be collected and stored in the bottom high-density layer for our future needs.	
Help Received Father helped me to choose the topic and with transportation to obtain necessary materials and literature. Mother helped me with the display board.	