



**CALIFORNIA STATE SCIENCE FAIR
2004 PROJECT SUMMARY**

| | |
|--|---------------------------------------|
| Name(s) Alex M. Koppel | Project Number J0818 |
| Project Title In Hot Water | |
| Abstract Objectives/Goals Is it practical to build a solar water heater that would contribute energy to a home at lower cost than buying energy from the power grid? Methods/Materials I built a solar water heater with a length of tubing within a wooden frame and covered with Plexiglas. This heater was connected to a water reservoir which contained a small electric pump. Over several days I measured the increase in temperature of the water as the heater sat in the sun. I then calculated the heat generated, and compared it to the cost of purchasing the same amount of energy from Pacific Gas & Electric. Results Even in January, I was able to generate a gain of around 50 Watts of heat per hour. The cost of the solar heater was less expensive than buying the same power from PG & E over a 1 1/2 year period. Conclusions/Discussion It is straightforward to build a solar water heater that contributes energy to a home, at less cost than purchasing the power from the electric power utility, with a payback period under two years. It would be straightforward to build a larger heater that is of practical use and could be connected to a home. | |
| Summary Statement My project demonstrated that it is straightforward to build a solar water heater for a home. | |
| Help Received My father helped me build the apparatus, and gave me advice on how to compare the cost of my heater with the cost of purchasing electric power. | |