



**CALIFORNIA STATE SCIENCE FAIR
2010 PROJECT SUMMARY**

Name(s) Ethan D. Maahs	Project Number J1119
Project Title H2O, H2O Everywhere, Let's Have a Drink: The Study of Different Clean Energy Sources to Desalinate Ocean Water	
Abstract	
Objectives/Goals The objective of this project was to determine the most efficient clean energy source to desalinate water.	
Methods/Materials Procedure 1. Run the battery down until the alarm on the power inverter alarms. 2. Charge the battery with solar panel or wind turbine and record the time to charge the battery. 3. Measure 800 cc of ocean water and put it in the tea kettle. 4. Set hot plate temperature to 200 degrees C. 5. Allow hot plate to run until power inverter alarms and collect the distilled water. Record the time the hot plate ran. 6. Measure and record the amount of water collected using the graduated cylinder. 7. Repeat steps 1-6 with the same hotplate temperature and run time for two more samples. 8. Repeat steps 1-7 at 250 degrees C. 9. Repeat steps 1-7 at 300 degrees C. Fresnel Lens Procedure 1. Measure 800 cc of ocean water and put it in the tea kettle with the distiller connected. 2. Place the distiller and Fresnel lens in direct sunlight and focus it on the tea kettle 3. Record the temperature of the water at five minute intervals. 4. Adjust the Fresnel lens to maintain focus on the tea kettle. 5. Collect the water for 3 hours 6. Measure the amount of water collected 7. Repeat steps 1-6 for two more data samples. 8. Measure 550 cc of ocean water and place it in the canister. 9. Place the distiller and Fresnel lens in direct sunlight and focus it on the canister 10. Record the temperature of the water at five minute intervals. 11. Adjust the Fresnel lens to maintain focus on the tea kettle. 12. Collect the water for 3 hours 13. Measure the amount of water collected 14. Repeat steps 8-13 for two more data samples. Calculations 1. Calculate the number of cc's of water collected per hour based on the amount of time required to charge the battery for the solar panel and wind turbine and based on the amount of time the water was collected for the fresnel lens.	
Results The fresnel lens on average produced 35.0 cc's of water per hour. The wind turbine produced on average 25.6 cc's of water per hour of charge time with a hot plate temperature of 250 degrees C. The solar panel on average produced 1.7 cc's of water per hour of charge time with teh hot plate temperature of 250 degrees C.	
Conclusions/Discussion My hypothesis was disproved because the Fresnel lens was the most efficient, the wind turbine was the second most efficient, and the solar panel was by far the least efficient.	
Summary Statement To determine the most efficient clean energy source at desalinating ocean water	
Help Received USGI Medical allowed me to use a hot plate. My dad helped me build some of the apparatus and My mom and sister helped with my display board.	