



# CALIFORNIA STATE SCIENCE FAIR 2011 PROJECT SUMMARY

<b>Name(s)</b> <b>Alexander D. Cowan</b>	<b>Project Number</b> <b>J0208</b>
<b>Project Title</b> <b>"Sea-ing" Solar: Floating Photovoltaic Electrical Generation System</b>	
<p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b> Is it possible to build an offshore floating barge that supports a series of photovoltaic panels which generate electricity that is carried back to land through insulated wires? Does air temperature have an affect on electrical generation of a solar panel? What are the affects of corrosion on the floating barge over time? My hypothesis is that the offshore, floating photovoltaic barge will successfully float and generate the same amount of electricity as a similarly sized photovoltaic field on land, air temperature will not affect electrical output, and corrosion on the barge will be minimal.</p> <p><b>Methods/Materials</b> Materials: 1. Floating photovoltaic barge, which I will construct; 2. Voltmeter; 3. Pool; 4. Plastic container filled with saltwater; 5. Computer. Methods: 1. Build the floating solar barge. 2. Select dates for testing that will be cold or warm days. 3. Connect wires to Voltmeter. 4. Place in pool and test for a 25 minute period and record the voltage output in 5 minute intervals. 5. Place in salt-water filled container for 3-5 weeks. 6. Every 3 days observe/look for rust/corrosion.</p> <p><b>Results</b> The solar barge successfully kept the solar film afloat and transmitted the electricity back to land through wires connected to a voltmeter. The voltage output was the same in both warm and cool air temperature environments. Temperature does not appear to have an effect on the electrical generation of solar panels. The corrosion test requires a long period of time for solid results#results will be finalized by late April.</p> <p><b>Conclusions/Discussion</b> In conclusion, I learned a great deal about renewable energy, photovoltaic technology, and engineering. After the testing was complete, the results of my project showed that my hypothesis was correct. In addition, the results of my project were promising--the barge kept the solar film afloat and transmitted the electricity back to land. The Floating Photovoltaic Electrical Generation System (FPEGS) is a very effective method of delivering electricity to coastal urban communities because 40% of the world's population lives within 100 kilometers of the ocean. Thirdly, I discovered that solar radiation (watts/square meter) is greater over oceans and coastline than it is over land, which means that solar panels over the ocean are more efficient. Finally, the FPEGS would be a valuable tool for providing power after a natural disaster or other emergency.</p>	
<b>Summary Statement</b> In this project, I built and tested the effectiveness of the Floating Photovoltaic Electrical Generation System (patent pending) in order to create a new method for capturing/delivering solar energy to coastal communities around the world.	
<b>Help Received</b> Father helped me solder wires together. Mother helped me edit my report and display board. Used pool at Sharon Redsun's House.	