Renewable Energy and Electricity Demand

Background

Fossil fuels are the primary energy source for generation of electrical power. Even though they cause air pollution, global warming, and ocean acidification, fossil fuels are used because they can be burned at any time that they are needed. Renewable energy sources like solar power and wind power are much more environmentally friendly, but they are not used so much to generate electrical power because they are only available when the sun is shining and the wind is blowing. It would be more worthwhile to invest in solar power and wind power if we knew they would be most available at the times when electrical demand is greatest.

Question

Electrical demand in California is largest on hot and humid days when people turn on air conditioning. Are solar power and wind power also large on hot and humid days?

Experimental Approach

Students will set up instrumentation on the SIO pier to measure temperature, humidity, wind speed, and solar irradiance for 1-2 weeks. They will then analyze the measurements and determine whether solar irradiance and wind speed are large or small at times when temperature and humidity are high.

Outcome

The students will make a recommendation on whether coastal San Diego would be a good location for renewable energy development to meet peak electrical demand.