



CALIFORNIA SCIENCE & ENGINEERING FAIR 2019 PROJECT SUMMARY

Name(s) Lillian Lawrenz	Project Number J0209
Project Title Temperature: The Impact on Windmill Power Output	
<p style="text-align: center;">Abstract</p> <p>Objectives Measure the electrical power output of a wind-driven generator at various temperatures. Compare the power output of the generator at the same windspeed for various temperatures.</p> <p>Methods Wind-driven generator, digital multimeter, handheld anemometer, weather app on a smartphone, and spreadsheet. At various temperature and windspeed combinations, measure the voltage and amperage output of a wind-driven generator. Use a spreadsheet to analyze and plot the data to interpret the results.</p> <p>Results Plotting the power output (milliWatts) versus windspeed (meters / second) and grouping similar temperatures shows that a generator will produce more power in a cooler temperature compared to a warmer temperature at the same windspeed.</p> <p>Conclusions Cooler weather will produce more power. For example, a 16 degree cooler temperature can produce over twice the power output for the same windspeed. Capturing the most possible clean energy from the wind is important in planning new wind farms and new communities. The size, location, and typical weather will all influence the future use of wind farms.</p>	
Summary Statement I found that wind mills will generate more power in cooler temperatures compared to warmer temperatures.	
Help Received I built the test equipment and conducted the experiment myself with some help from my dad.	