



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

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Project Title Wind Turbines: Vertical vs. Horizontal: Watts Up with That?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals Wind turbines horizontal vs vertical. Watts up with that! I was interested in learning about alternative energy when I came across two different types of wind turbines, horizontal and vertical. I wondered which style would produce the most energy. After some research my hypothesis would be that the horizontal turbine would produce more energy, due to its more commonly used design.</p> <p>Methods/Materials For my experiment, I built a horizontal wind turbine and a vertical wind turbine with the same size motors. Each turbine is calculated at the optimum size to produce the maximum amount of energy for each identical motor. I used an Anemometer to measure the wind speeds of 15 kilometers, 20 kilometers and 25 kilometers. I repeated the experiment five times.</p> <p>Results The wind speed at 15 kilometers showed the horizontal turbine produced an average of 1.41 volts. The vertical turbine produced an average of 1.14 volts. At 20 kilometers the horizontal turbine produces an average of 1.47 volts and the vertical turbine produced an average of 2.1 volts. At 25 kilometers the horizontal turbine produced an average of 1.66 volts. The vertical turbine produced an average of 2.71 volts. The overall averages for the horizontal was 1.51 volts and the vertical 1.98 volts.</p> <p>Conclusions/Discussion I learned from my data the horizontal turbine produced energy more consistent in varying wind speeds; however, the vertical's data showed that it consistently produced more energy in higher wind speeds.</p>	
Summary Statement In comparing the vertical and horizontal wind turbines, I discovered that the vertical produced the most energy on average and preformed best in high wind speeds; however, the horizontal preformed more consistent in different wind speeds.	
Help Received I built the wind turbines from a kit from picoturbine international by myself. I conducted and designed the experiment by myself and used my dad and my teacher Mrs. Salazar for any questions I had.	