



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2018 PROJECT SUMMARY**

Name(s) Talha Mala	Project Number J0211
Project Title Gone with the Wind: The Effect of a Wind Turbine's RPM on the Amount of Energy Produced	
Abstract Objectives/Goals The objective of my project is to explore the amount of electricity generated by a wind turbine as an alternative form of energy and to examine the effect of the number of revolutions per minute (RPM) on the voltage output. I hypothesized that as the number of RPMs increases the amount of electricity generated (as measured in volts) would also increase. Methods/Materials I used a 27-volt motor, a glue gun, a soldering iron, a utility knife, a propeller, a bulb, wires, a PVC pipe, a hammer, a drill, a voltmeter, and spray paint. I used an electric fan to produce wind. I assembled the wind turbine, and I used a lightweight string affixed to the shaft of the wind turbine and a stopwatch to measure the number of revolutions per minute at every speed of the fan. I then used the voltmeter to measure the voltage output at every variation of fan speed. Results As the speed of the fan increased and more "wind" was generated, the number of RPMs of the wind turbine also increased. The greater the RPMs of the wind turbine, the greater the voltage output was as measured by the voltmeter. Please see table for quantitative results. Conclusions/Discussion I repeated my experiment 5 times per fan speed. This resulted in a total of 15 trials for my study. My results supported my hypothesis and suggested that there is a strong correlation between the amount of voltage produced and the number of revolutions per minute of a wind turbine. As reducing our carbon footprint becomes a more pressing issue and we are shifting away from the use of fossil fuels, the scope of my study is important to understanding the dynamics of a wind turbine and improving the efficiency of it. Wind energy is a clean and sustainable energy -- meaning that it is renewable and non-polluting.	
Summary Statement My project examines wind energy as an alternative form of energy and how the amount of voltage generated is dependent on the number of revolutions per minute of a wind turbine.	
Help Received I designed my experiment and model by myself. However, my dad helped me cut the wood and drill a hole in the PVC pipe.	