Wind Turbines for Developing Worlds

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The purpose of this project was to optimize a vertical axis wind turbine that was capable of charging small electronics, specifically cellphones, in underdeveloped countries. I chose to test the solidity of the NACA 0018 airfoil and a savonius type wind turbine. The wind turbines were all created in AutoCAD 2013 and then 3-D printed. A wind tunnel was designed and constructed that allowed the wind turbines to be compared in constant conditions. I measured the wind turbines power output at different wind speeds using an anemometer and a pulley system. The results show that the savonius type wind turbine had the lower starting torque and the steepest power slope, which made it the best of the tested wind turbine designs. I designed a wind turbine device that is able to charge a set of batteries then charge cellphones. Further research will attempt to optimize the current phone charging device and test different blade designs.

Awards Won: