

# Abstract

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**Piezoelectric materials** are perhaps the most interesting materials ever. Also used in sensor and actuator applications, they are materials which release voltage when mechanical stress is applied onto them, or move when voltage is applied onto them. Piezoelectric materials have been used to harvest energy for a long time, but with the introduction of piezoceramics, energy harvesting using piezoelectric panels has gotten much, much easier and promising. This project explores the possibility of building a piezoelectric-wind-harvesting apparatus, and comparing this technology to the traditional modern urban wind turbine (HAWT).

To make the wind turbine, one must make a nacelle to hold the motor and hub together on a tower of some sort (5 feet preferred). Once the motor and hub are connected, one must then make propellers to connect to the hub so the turbine can produce electricity.

To make the piezoelectric panel, one must make an apparatus that give a vibration or an oscillating force on the piezoceramic. I made a sort of T-shaped design with 'flaps' on the horizontal arms so when wind blows into them, the flaps put pressure onto the piezoceramic, which generates electricity.

In conclusion to my experiment, my hypothesis almost agreed with the results. I concluded that although vibro-wind panels are less efficient than traditional wind turbines, they can still be used in certain ideal situations, such as a rooftop, or a flat side of a building. All in all, my project was an overall success.