

Developing an Optimal Novel Unconventional Wind Turbine

Shahid, Farid

The world is currently dependent on fossil fuels (which are damaging to the environment) for energy. To solve this problem, renewable resources must be used and be made more efficient so that they may compete with fossil fuels economically. The objective of this project was to develop an unconventional wind turbine to exceed the performance of a conventional wind turbine. Making noticeable modifications to the typical conventional blade design (three-blade, horizontal axis, upwind turbine) is one way to reach the objective. The unconventional turbines used in this experiment include: a doubled pronged turbine (with a 1.5 cm pronged-shaped tip), a deep double pronged turbine (with a 4 cm pronged-shaped tip), and a gradient tube turbine (with sloped tubes to decrease the volume available for the wind to flow through). The conventional turbine (three trapezoidal blades) was the control group in the experiment. The peak voltage was measured and recorded for each of the turbines as they rotated when placed in front of a spinning box fan. In the end, both double pronged turbines exceeded the performance of the conventional turbine.

Awards Won:

Arconic Foundation: Sustainable Urban Design, Third Award \$1,000