Optimizing the Utilization of Wind Energy with an Alternative Engineering Design: A Horizontal Dual Motor Turbine, Phase II

Lunt, Caid

Wind energy has great potential to reduce our dependence on traditional energy resources. Wind is a clean source of energy that has fewer environmental impacts than traditional energy sources. It's estimated that if 20% of the world's power came from wind by 2030, it would cut CO2 emissions by 825 million metric tons yearly. This project addressed the continued development of an efficient turbine that can be used in commercial and residential communities. Phase II examined the use of a horizontal dual motor turbine to harness wind energy for production of voltage when used in field tests. The new design criteria included; production of voltage and amperage in field testing, commercial size and materials, addition of a gear ratio, and the replacement of high output motor in place of generators. Four measures were used in the design criteria; voltage and amperage generation from intermittent wind, the ability to withstand a wide range of wind speeds, wind speed to voltage generation ratio, and gear ratio to maximize motor output. The data indicated that the turbine is viable and will perform in intermittent mild canyon winds generating on average 2.8 V and 39.2 mA. The data also suggests that the turbine can produce voltage in varied wind speeds ranging from 80 -206 V in a controlled wind tunnel. By improving current wind technologies we will have the capacity to reduce our dependency on traditional energy sources and produce clean and inexpensive energy that will result in a more sustainable world.

Awards Won: