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Wind-Driven Power Generation System

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Wind-Driven Power Generation System

A comprehensive analysis of a green energy system
alternative to non-renewable resource power generation



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ECET/CPET 491 – Fall 2007

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Monday December 3rd, 2007

ABSTRACT

A wind-driven power generation system is needed to reduce production of green house gases and help compensate for increasing energy prices and fossil fuel consumption. Much information has been gathered from test data to formulate hypotheses for various concepts for the project. Research has proven that, for this project, wind energy is the most feasible and economic choice among environmentally friendly power generation alternatives. Existing designs for the electrical and mechanical components of similar projects have been compared, and those that best fit the budget and requirements for this project served as the foundation for the project. The generator stands atop a 20 foot tall steel pole with 3.5 foot long fiberglass propeller blades. The AC motor and propeller assembly are attached to a furling mechanism that protects the assembly in high winds exceeding 30 miles per hour. The 3-phase AC power produced by the generator is rectified to 12VDC to charge 3 car batteries connected in parallel. The battery power is then inverted to 120VAC (single phase) @ 60Hz. The control/ logger circuit regulates the power so that once the batteries reach 12.5 volts, power cannot be drawn from the batteries until they reach 13.5 volts. Additionally, it measures and displays volts, amps, watts, and motor rpm, in real time.

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