THE ELECTRICAL POWER PRODUCED BY A VERTICAL AXIS WIND TURBINE

INTAN NAZIRAH BINTI ROSLAN

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ABSTRACT

THE ELECTRICAL POWER PRODUCED BY A VERTICAL AXIS WIND TURBINE

This project was a study about a relationship of the speed of wind for the vertical axis wind turbine with voltage output, power output and its current output as their result. The study was using a GES-200 Wind Energy Trainer machine of a vertical axis wind turbine equipment. A vertical axis wind turbine (VAWT) has a perpendicular axis to the wind and vertical to the ground. The shaft rotor of the wind turbine was vertical and the main component that is generator in (GES-28002) was located below the blades. VAWTs can capture winds from any direction, they do not depend on the direction of the wind thus it can produce the power easily. The study featured of a speed of wind variable and the design of the vertical axis wind turbine itself. Next, the GES-200 Wind Energy Trainer was used for characterise the voltage and current characteristic curve that has been obtained by using wind speed and the wind generators. By using the machine, the power produced has been calculated from the voltage output and current output produced. The apparatus used in the study was, wind energy baseplate (GES-28001) wind generator (blower), vertical axis wind turbine (GES-28002), anemometer (GES-28004) for the speed of wind measurement, wind energy module (GES-23001) for voltmeter and ammeter reader and lastly was a power supply. As the result, it was found that at the highest wind speed in Malaysia was 2.1 ms^{-1}, the voltage output was 0.15 volts, the power output was 0.0318 watt and for the current output was 212.0 mA. Next for the lowest speed was 1.6 ms^{-1} thus resulting in 0.12 Volts as the voltage, 0.01109 watt as the power output and 92.40 mA as current output. Furthermore, this project also used a meteorology data of the wind speed data in Malaysia from 2012 to 2013 as wind based for analysed and evaluated the measured of the wind data. Recommendation was made to further study and improved the performance of the vertical axis wind turbine.