DESIGN OF SOLAR POWER PLANT WITH MIRROR REFLECTORS AND POWER MONITORING BASED ON INTERNET OF THINGS

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ABSTRACT

The electrical energy that can be generated by solar panels or photovoltaic (PV) is greatly influenced by external factors such as the intensity of solar irradiation, environmental temperature and the movement of the tilt angle of the PV installation. The intensity of solar irradiation on the earth's surface always changes in value along with the movement of the sun in the sky from sunrise to sunset. The research discusses power monitoring using solar power plant (PLTS) with mirror reflectors to obtain maximum solar irradiation intensity throughout the day. The use of reflectors in this research aims to increase diffuse irradiance and shorten the distance traveled by the solar tracker so that it is more energy efficient. The solar tracker is designed to move automatically following the position of the sun by updating the angle of the solar tracker according to the sun hour angle periodically once every hour. Determining the angle of the solar tracker is controlled and can be monitored for the power produced by the ESP 8266. For accurate current and voltage readings, the PZEM-017 sensor is used.
The results of the field experiment showed that the average output power produced by Monocrystalline PLTS without using a reflector during the 3 days of testing was 29.34 Watts and the average output power of monocrystalline PLTS using a reflector was 29.67 watts. For current without a reflector, the average current is 1.95 A, while using a reflector, the average voltage is 2.03 A. And the average voltage obtained for Monocrystalline PLTS without a reflector is an average voltage of 12.553 volts. Meanwhile, to use a reflector the average voltage is 12.84 volts.

Keywords: *Renewable Energy, PLTS, Solar tracker, Reflector, PZEM-017*