

ABSTRACT

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Title : Analysis of the Effect of Shading on Solar Panel Energy Characteristics for the Internet Of Things-Based Aren Nira Collection Monitoring System

Recently, there has been a prototype technology to monitor the harvesting process of palm sap collected in the bumbung. The existing prototype has two main problems, firstly the system does not detect the cessation of sap dripping and secondly the problem of energy sources for prototypes that still depend on PLN electricity. The purpose of this research focuses on providing energy for the IoT-based palm sap monitoring system using solar panels, as well as analysing the use of energy consumption by the system. However, in the field conditions, the solar panel used may be affected by shading produced by the palm sap tree itself. This study analyses the electrical energy consumption for the palm sap harvest monitoring system under solar panel conditions with and without shading. Solar panel shading conditions were varied with 25% and 50% shading. The calculation result of the estimated energy consumption based on the datasheet is 119,088Wh which works for 12 hours. The generated electrical energy is 20,35Wh, 2,47Wh, and 1,05Wh for solar panels without shading, with 25% shading and 50% shading, respectively. The data shows that the greater the shading covering the surface of the solar panel, the less energy that can be converted into electricity, and even unable to recharge the battery. The battery capacity used in the system is 13Ah. Based on the calculation, the battery can last without recharging from full power for 12,48 hours.

Keywords: solar panel, shading, monitoring system