

DESIGN AND BUILD PROTOTYPE OF SOLAR POWER PLANT (PLTS) AS THE MAIN ELECTRICITY SOURCE TO MEET THE NEEDS OF SMARTHOME

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ABSTRACT

Electricity has a very important role to support activities for human daily life. Until now, the electricity used is very dependent on PLN (State Electricity Company). This causes the fuel used by PLN is coal which is dwindling and also causes environmental pollution. One of the efforts made by using new and renewable energy is by utilizing solar heat which is easily obtained and is also environmentally friendly. In this study, the PLTS system was designed to meet the needs of a smarthome system. In this design, an analysis of the total load power requirements, the number of solar panels, the number of batteries, lifetime and system testing is carried out. From this analysis, the total power load of the smarthome system is known to be 49.84 Wh, in this study the number of solar panels used with a capacity of 1.1 Wp which amounted to 6 solar panels arranged in 3 connected in series and 2 in parallel, 5 lithium ion batteries with specifications 3.7 V 3 Ah and it is assumed that if there is no sunlight for 2 days then the batteries used are 9 pieces which are arranged in 3 connected in series 3x and 3 parallel to get a battery capacity of 99.9 Wh, with this battery capacity, a lifetime can be obtained. accommodate the smarthome system for 2 days or 48 hours. From the tests carried out for 3 days, on the 1st day the power obtained was 7.83 Wh, the second day the power obtained was 13.08 Wh and the 3rd day the power obtained was 11.47 Wh. . The power gain depends on the intensity of sunlight.

Keywords: Renewable energy, PLTS, Smarthome.