

PROTOTYPE OF HYBRID POWER PLANTS FROM SOLAR ENERGY AND SAVONIUS TYPE WIND TURBINE USING VEHICLE SPEED FOR STREET LIGHTING AND LED WARNING SYSTEMS

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ABSTRACT

Hybrid system is a power plant that combines several energy sources, both renewable and non-renewable. Solar energy and wind energy are included in renewable energy sources that are widely developed in Indonesia to meet the increasing electricity needs over time. However, the limited availability of fossil energy is the main reason why the use of hybrid systems with renewable energy is expected to be the right alternative in electricity generation. The research methods used in this study include literature studies, tool design, tool manufacturing, tool testing, and data collection and analysis. The test results show that solar panels and Savonius-type wind turbines have significant differences in battery charging efficiency. Solar panels are able to increase battery voltage from 12.20V to 13.30V in 14 hours, charging a battery of 10.14 Ah with an average efficiency of 81.85%. On the other hand, Savonius-type wind turbines are only able to charge a battery of 8.42 mAh. The initial battery voltage of 12.23V even drops to 12.20V, with an average efficiency of 40.82% in the same time. The results of this test confirm that solar panels are much more efficient in generating power to charge batteries compared to Savonius type wind turbines.

Keywords: *Hybrid System, Solar Energy, Wind Turbine, Savonius, lighting*