

ABSTRACT

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Title : **POTENTIAL ANALYSIS OF SOLAR POWER GENERATION FOR TRASH TRAP SYSTEM IN CIMULU RIVER, TASIKMALAYA CITY**

This research aims to analyse the potential of Solar Power Plant (PLTS) in supporting the waste trap system in Cimulu River, Tasikmalaya City. The background to this research was the need for a self-sustaining renewable energy solution to support the operation of the litter trap system in the river. PLTS was chosen because it relies on the photovoltaic effect to convert solar energy into electricity. The purpose of this study is to describe the energy requirements of PLTS that are in accordance with the needs of the garbage catcher system, and evaluate the implementation of the Off-Grid PLTS system in fulfilling these energy requirements. The method used is a quantitative approach with field observation and narrative techniques. Structured observation was conducted to obtain data on solar radiation and land area available for solar panel installation. The results showed that the Cimulu River area receives an average solar radiation of 4.60 kWh/m²/day. By using CanadianSolar MaxPower CS6U-340M brand Monocrystalline panels, the total energy generated is 1,254,560 kWh from 1,121 panels. The designed waste trap system is capable of operating 5 hours a day with the help of a 746 Watt 1 phase motor and a 12V 200Ah battery. The system is proven to be efficient in moving waste automatically, supported by Homer Energy simulations that show an operational cost of IDR 1,689/kWh.

Keywords : Density, PLTS, Energi Potensial, Conveyor Belt