

Design and Development of an Off-Grid Photovoltaic System as an Energy Source for a Rotary Dryer Heater

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ABSTRACT

The background of this study is based on Indonesia's high solar energy potential and the need to develop renewable energy sources to reduce dependence on fossil fuels. This research focuses on the design of an off-grid Solar Power Generation System (PLTS) as an energy source for a heater in a rotary dryer. The designed system consists of two 100 Wp solar panels, a 12V 100Ah battery, a 20A Solar Charge Controller (SCC), a Pure Sine Wave inverter, and a heater coil as the main load. The research was conducted through several stages, including literature review, system design, power requirement calculations, component installation, and system testing at the rooftop of the Engineering Building of Politeknik Negeri Jember. The results indicate that the off-grid solar power system is capable of independently supplying the energy required by the rotary dryer heater by utilizing solar energy as the primary source of electricity.

Keywords: *heater coil, Off-grid photovoltaic system, photovoltaic system design, performance ratio , rotary dryer, solar panel efficiency.*