

**Performance Analysis of a Solar PV Hybrid PLN System for Lighting in a
Small-Scale Day Old Chick (DOC) Poultry House.**

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ABSTRACT

Day-Old Chick (DOC) poultry houses require a reliable electricity supply to maintain lighting conditions. This study aims to analyze the performance of a hybrid solar power system—combining solar energy with the PLN grid—as a lighting power source for small-scale DOC poultry houses. The system comprises solar panels, a Solar Charge Controller (SCC), a battery, and the PLN grid as a backup source. The study employed a quantitative method with a field experiment approach. Data collection was conducted between 09:00 and 14:00 WIB at 30-minute intervals, covering solar irradiance, temperature, voltage, current, and system output power. Performance analysis was carried out based on the IEC 61724 standard using specific parameters. Reference Yield (Yr), Array Yield (Ya), Yield Factor (Yf), Capacity Utilization Factor (CUF), and Performance Ratio (PR). Selain itu dilakukan analisis efisiensi panel surya, SCC, dan baterai. Hasil Research indicates that solar irradiation intensity affects the power output of solar panels. The solar power system is capable of meeting the lighting requirements for day-old chick (DOC) poultry houses by charging during the day and discharging at night. The performance of the Solar Charge Controller (SCC) and battery demonstrates the system's ability to distribute and store electrical energy, indicating that a hybrid solar-PLN system can be implemented as an alternative energy source in the livestock sector.

Key words: Battery, Day-Old Chick (DOC) Brooder, Hybrid Solar Power Plant IEC 61724, Solar Panel.