

## **ABSTRAK**

### **ANALISIS KARAKTERISTIK PENGISIAN DAN PEGOSONGAN BATERAI PADA SISTEM PEMBANGKIT LISTRIK TENAGA SURYA OFF-GRID**

(2026: xiv + 51 Halaman + 25 Daftar Gambar + 4 Daftar Tabel + Lampiran)

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Pembangkit Listrik Tenaga Surya (PLTS) off-grid merupakan sistem pembangkit listrik yang memanfaatkan energi matahari sebagai sumber energi utama dan bekerja secara mandiri tanpa terhubung dengan jaringan listrik PLN. Penelitian ini bertujuan untuk menganalisis kinerja sistem PLTS off-grid pada proses charging dan discharging baterai. Metode penelitian dilakukan dengan pengukuran tegangan, arus, dan daya pada baterai selama proses pengisian dan pengosongan energi. Hasil pengujian charging menunjukkan nilai rata-rata tegangan sebesar 13,306 V dan 13,434 V, arus sebesar 0,71 A dan 0,838 A, serta daya sebesar 9,602 W dan 11,272 W. Sementara itu, pada proses discharging diperoleh nilai rata-rata tegangan sebesar 12,49 V, arus sebesar 0,774 A, dan daya sebesar 9,958 W. Hasil penelitian menunjukkan bahwa sistem PLTS off-grid mampu melakukan pengisian dan pelepasan energi dengan baik. Kinerja sistem dipengaruhi oleh intensitas penyinaran matahari pada saat charging, sedangkan selama proses discharging baterai mampu menyuplai energi listrik secara stabil kepada beban.

**Kata kunci:** PLTS Off-Grid, Baterai, Panel Surya, Pengisian, Pengosongan.

## **ABSTRACT**

### **ANALYSIS OF BATTERY CHARGING AND DISCHARGING CHARACTERISTICS IN AN OFF-GRID SOLAR POWER GENERATION SYSTEM**

(2026: xiv + 51 Page + 25 List of Figures + 4 List of Tables + Attachment)

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*An off-grid Solar Power Plant (SPP) is a power generation system that utilizes solar energy as its primary energy source and operates independently without being connected to the public utility grid. This study aims to analyze the performance of an off-grid solar power system during the battery charging and discharging processes. The research method was carried out by measuring voltage, current, and power during battery charging and energy discharge. The charging test results showed average voltage values of 13.306 V and 13.434 V, average current values of 0.71 A and 0.838 A, and average power values of 9.602 W and 11.272 W. Meanwhile, the discharging process produced an average voltage of 12.49 V, an average current of 0.774 A, and an average power of 9.958 W. The results indicate that the off-grid solar power system is capable of performing battery charging and energy discharging effectively. System performance during charging is influenced by solar irradiance intensity, while during discharging the battery is able to supply electrical energy to the load in a stable manner.*

**Keywords:** *Off-Grid Solar Power System, Solar panel, Battery, Charging, Discharging.*