

## **ABSTRACT**

### ***“EFFECT OF PANEL TILT ANGLE AND ELECTRICAL LOAD ON THE INVERTER CONVERSION EFFICIENCY IN A 24V OFF-GRID PHOTOVOLTAIC SYSTEM WITH A CAPACITY OF 200 WP”***

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*Solar Power Plants (PLTS) are systems that convert solar energy into electrical energy through the principle of the photovoltaic effect. The efficiency of the Solar Power Plant (PLTS) in generating electricity is influenced by several factors, including the angle of the panel and load variations. This study aims to analyze the effect of panel tilt angles (0°, 10°, 20°, 30°, and 40°) and load variations (100, 200, 300, 400, 500 Watts) on the power conversion efficiency of a 200 WP capacity 24V Off-grid PV system inverter. The method used is pure experimentation with stages of preparation, testing, and data analysis. The research results show that a tilt angle of 0°–20° with a load of 500 Watts is the most optimal configuration, producing an input power of around 283–284 Watts and an inverter efficiency of up to 91%. The overall efficiency of the PV system reaches 12.7%. It is recommended that the panel angle be adjusted to the direction of incoming sunlight, and that the load selection and inverter capacity be aligned to improve the overall system efficiency.*

**Keywords:** *Solar Power Plant, tilt angle, electrical load, inverter efficiency, Off-grid PV.*