Performance Analysis of Pico Hydro Power Plant (PLTPH) at Elkisi Edupark, Mojokerto Regency

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ABSTRACT

This study aims to analyze the performance of the Pico Hydro Power Plant (PLTPH) located at Elkisi Edupark, Mojokerto Regency. This system is a small-scale power plant that utilizes river flow as its primary energy source. The research data were obtained through direct measurements of water discharge, head height, and generated electrical power. The analysis shows that the average water discharge is 0.104 m³/s, with a head height of 5.53 meters. The actual electrical output generated is 164.124 Watts, while the potential power based on technical parameters reaches 2.97 kW. The system's efficiency is calculated at only 5.53%, indicating a significant gap between available and utilized energy. The main issue identified is the suboptimal slope of the penstock due to structural damage to its support, resulting in pressure loss. The findings are expected to serve as an evaluation reference for future improvements and as a renewable energy model for educational tourism areas or remote regions.

Keywords*: Efficiency, Elkisi Edupark, PLTPH, Renewable Energy, Water Discharge.*