

**ANALISIS KINERJA TEKNOLOGI MIKROHIDRO DI PT LUIS JAYA
KECAMATAN SONGGONKABUPATEN BANYUWANGI**

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ABSTRACT

This study aims to analyze the characteristics of water resource potential and evaluate the operational technical performance, electrical power output, and efficiency of the Micro-Hydro Power Plant (MHPP) at PT Luis Jaya, Wisata Desaku area, Songgon District, Banyuwangi Regency. The research method involved collecting primary hydrological and electrical data during a five-day testing period (April 15–19, 2026). Field observations revealed that the water flow velocity in the settling basin channel ranged from 0.100 m/s to 0.267 m/s. Multi-sector water allocation analysis confirmed that the MHPP operation does not disrupt local agricultural irrigation, which maintains a flow of 0.0572 m³/s to 0.06864 m³/s. On average, the MHPP operates at a water flow rate of 0.0764 m³/s, generator voltage of 129.2 Volts, and load current of 3.63 Amperes, generating a continuous average electrical power output of 505.0 Watts with an integrated system efficiency of 22.98%. The highest conversion efficiency reached 21.80% (505.0 Watts output) under a medium-low flow of 0.0580 m³/s, operating near the Best Efficiency Point (BEP) of the crossflow turbine. Conversely, at a peak flow of 0.0980 m³/s, efficiency dropped to a minimum of 14.19% due to flow turbulence triggering high minor head losses. To maintain optimal performance, stable regulation of the intake gate within the flow range of 0.0580 m³/s to 0.0700 m³/s is highly recommended.

Keywords: MHPP, Performance Analysis, Water Flow Rate, System Efficiency, CrossflowTurbine.