

**ANALISIS EFISIENSI DAYA PEMBANGKIT LISTRIK TENAGA MIKROHIDRO
(PLTMH) GUNUNG SAWUR 2 DI DESA SUMBERWULUH KECAMATAN
CANDIPURO KABUPATEN LUMAJANG**

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ABSTRAK

Penelitian ini bertujuan untuk menganalisis efisiensi daya dan kinerja sistem Pembangkit Listrik Tenaga Mikrohidro (PLTMH) Gunung Sawur 2 yang berlokasi di Desa Sumberwuluh, Kecamatan Candipuro, Kabupaten Lumajang. Data yang dianalisis meliputi debit air, *head*, efisiensi turbin, efisiensi generator, rugi-rugi daya, serta *head loss*, dengan metode perhitungan manual dan simulasi perangkat lunak HOMER. Hasil penelitian menunjukkan rata-rata efisiensi daya PLTMH berkisar antara 68,06% hingga 74,93%, dengan efisiensi turbin sebesar 70,31%. Rugi daya total generator berkisar antara 1.398,39 watt hingga 5.081,41 watt, dengan rata-rata efisiensi generator sebesar 83,22%. Pengukuran *head loss* akibat gesekan dalam pipa dan sambungan mencapai 1,492 meter dari total tinggi *head* 6 meter. Simulasi HOMER menghasilkan daya keluaran rata-rata sebesar 15,1 kW, dengan total produksi tahunan 132.704 kWh dan surplus energi sebesar 72.318 kWh yang dijual ke jaringan PLN.

Kata Kunci: efisiensi daya, efisiensi turbin, rugi daya, *head loss*, simulasi HOMER.

**EFFICIENCY ANALYSIS OF MICRO-HYDRO POWER PLANT GUNUNG SAWUR 2
IN SUMBERWULUH VILLAGE CANDIPURO DISTRICT
LUMAJANG REGENCY**

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ABSTRACT

This study aims to analyze the power efficiency and performance of the Gunung Sawur 2 Microhydro Power Plant (PLTMH) system located in Sumberwuluh Village, Candipuro District, Lumajang Regency. The data analyzed include water discharge, head, turbine efficiency, generator efficiency, power losses, and head loss, using manual calculation methods and HOMER software simulations. The results showed that the average power efficiency of the PLTMH ranged from 68.06% to 74.93%, with a turbine efficiency of 70.31%. The total generator power loss ranged from 1,398.39 watts to 5,081.41 watts, with an average generator efficiency of 83.22%. Measurement of head loss due to friction in pipes and connections reached 1,492 meters from a total head height of 6 meters. The HOMER simulation produced an average output power of 15.1 kW, with a total annual production of 132,704 kWh and an energy surplus of 72,318 kWh sold to the PLN grid.

Keywords: Power efficiency, turbine efficiency, power loss, head loss, HOMER simulation.