TUGAS AKHIR

OPTIMASI KAPASITAS PEMBANGKIT DAYA LISTRIK PADA SISTEM *HYBRID* PEMBANGKIT ENERGI TERBARUKAN

Diajukan Sebagai Salah Satu Tugas Syarat Menyelesaikan
Pendidikan Tahap Sarjana

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ABSTRACT

World energy demand is increasing along with global population growth, urbanization and industrialization. The results of the energy used so far still use a lot of fossil energy resources, while these energy resources are starting to increase in price and causes environmental pollution. To overcome this, one solution that can be done is to invest in renewable energy sources. However, investing in renewable energy sources is very expensive. So it is necessary to do an optimization to minimize these costs. In this research, renewable energy capacity optimization is applied to an off-grid microgrid system using solar and wind energy resources. Optimization is made by numerical with Genetic Algortima method.

The results obtained from this research are Photovoltaic energy sources with an area of (2.482 m2), Wind Turbine with a rating of 1.500 Watt as many (15 pieces), and the capacity of the Energy Storage System (ESS) which is (5.111 Wh). The accuracy of this system is evidenced by the loss of power supply probability (LPSP) of 0,0722 which indicates a low system failure rate.

Keywords: Mentawai Islands Regency, renewable energy, off-grid microgrid, Genetic Algorithm, investment