

ABSTRACT

Name : Yesi Indri Heryani

Study Program : Electrical Engineering

Title : **HYBRID POWER GENERATION SYSTEM TO MEET THE NEEDS OF ELECTRIC CAR CHARGING STATIONS AT THE UNSIL RECTORATE BUILDING**

Electric vehicle charging stations powered by solar power plants (PLTS) and wind power plants (PLTB) can reduce carbon emissions and fossil fuel consumption. This study aims to analyze the potential, density, topology, performance, and simulation results of power plants to meet electric vehicle charging needs. This hybrid power generation system also includes supporting devices such as batteries and converters. The solar energy potential is indicated by solar radiation of 4.6 kWh/m²/day, while the wind energy potential is based on an average wind speed of 3.57 m/s. The results from the HOMER Energy simulation show that the energy needs can be met, along with economic calculations such as Net Present Cost (NPC), Operation and Maintenance (O&M), initial capital, and Levelized Cost of Electricity (LCOE). The hybrid power plant produces 1,142,958 kWh/year as simulated, which is used to calculate energy density, the electric vehicle load system, and power plant performance scenarios for the electric vehicle charging cycle.

Keywords : *Electric Vehicle, Solar Power Plant, Wind Power Plant, HOMER Energy*