

ABSTRACT

Due to the increasing demand for electricity in South Sulawesi, West Sulawesi, and Southeast Sulawesi (Sulselbar), the government is developing renewable energy generation. Specifically, the Sidrap Wind Power Plant (PLTB) is expected to significantly contribute to increasing energy supply in the region. This study aims to assess the grid impact of the Sidrap PLTB integration on the South Sulawesi and Bar electricity system.

This research method uses DigSILENT software to simulate and analyze the region's electricity network. The simulation was conducted using a scenario of integrating the Sidrap WPP into the South Sulawesi and Bar electricity system. Technical data from the plant and the electricity system were taken from technical reports. Specific analyses included load flow studies, short circuit studies, dynamic studies by reducing WPP generation by 90% for 20 seconds, transient studies by disconnecting one power line, and creating a back-to-back system within a short time.

The results show that the Sidrap WPP integration provides significant benefits in reducing carbon emissions and increasing renewable energy capacity. However, the simulation results also detected voltage and frequency variations that require solutions such as additional energy storage capacity or strengthening of the transmission infrastructure. With proper management, the Sidrap PLTB integration can support the South Sulawesi and West Sulawesi electricity system.

Keywords: *Sidrap Wind Power Plant, Renewable Energy Integration, Load Flow, Short Circuit, Transient Stability, DigSILENT, Sulselbar Power System*