

# ANALYSIS OF PHOTOVOLTAIC CAPACITY HOSTING ON THE 20 kV BANTUL DISTRIBUTION NETWORK USING ETAP 19.0.1 SOFTWARE

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## ABSTRACT

*The massive target of renewable energy installation is a primary factor in adopting solar energy, reflecting governmental efforts to diminish reliance on fossil fuels. Deploying large-scale photovoltaic power plants (PLTS) within the distribution system can adversely affect voltage stability and power quality. This study aims to determine the Hosting Capacity (PV) value that can be accommodated within the 20 kV Bantul distribution network. The voltage profile, which acts as a limiting factor, restricts the export power to higher voltage levels, considering the annual peak load projections as a reference for the Hosting Capacity value. This is achieved by applying various scenarios and annual load assessments conducted at three bus points, where PV power is injected from 0 kW until the system's limits are reached. Simulation results obtained using ETAP 19.0.1 software indicate that under the 2025 load projection of 106.89% (equivalent to 51.797 MW), the PV hosting capacity that can be integrated into the system is 51.599 MW. This integration enhances the voltage profile at each bus, increasing from an initial value of 0.85 per unit (pu) to 0.9 pu, with the maximum voltage rising from 1.01 pu to 1.03 pu. Furthermore, under the 2030 load projection of 130.85% (or 63.633 MW), the PV hosting capacity that can be incorporated into the system is 63.143 MW. This increases the voltage at each bus, with the lowest voltage rising from 0.81 pu to 0.9 pu and the highest voltage increasing from 1 pu to 1.03 pu.*

**Keywords:** *Hosting Capacity, Distributed Generation, Photovoltaic, Voltage Profile*