

Analisis Sistem Photovoltaic Beban Arus Searah Terhubung Jala PLN dengan Penyearah Terkendali

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Accreditation	2
Abstract	Photovoltaic (PV) systems can be connected to the utility grid to ensure the reliability and continuity of the electrical energy supply. Although the output of the PV modules and many electrical loads are direct current (DC), most grid connected PV systems use alternating current (AC) grid through the inverter. This study presents an analysis of DC microgrid PV system connected to PLN utility grid using controlled rectifier. The controlled rectifier circuit uses a thyristor which can be controlled at its ignition angle to regulate the output voltage and current supplied from utility. The proposed PV system configuration simulations are performed using PSIM software. The system supplies resistive loads in the form of DC lights. Simulations are carried out with variations in load resistance and the thyristor ignition angle. The simulation results show the rectifier circuit has a voltage ripple of 1.57 V (6.47%). While the efficiency of the system under various loading conditions and ignition angle varies between 95.08%–97.72%. The highest system efficiency is obtained under high thyristor ignition conditions.
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