

Perencanaan Sistem Energi Terbarukan Fotovoltaik dan Genset Biodiesel Minyak Sawit Untuk Pasokan Listrik Alternatif Base Transceiver Station (BTS) = Hybrid Energy of Photovoltaic and Genset Palm Oil Diesel for alternative electricity supply of Base Transceiver Station (BTS)

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Abstrak

Keterbatasan pasokan listrik dari PLN karena lokasi geografis yang terpencil dan jauh, menyebabkan beberapa BTS mengandalkan generator diesel sebagai pembangkit listrik utama. Sehingga, biaya pembangkit listrik di BTS tersebut sangat besar karena transportasi bahan bakar ini berbiaya tinggi. Studi ini menganalisis model hibridisasi Sistem Fotovoltaik dan Biodiesel dari minyak sawit untuk mendapatkan pembangkit listrik yang memiliki keandalan tinggi, biaya energi rendah dan emisi rendah untuk suplai listrik BTS di daerah terpencil yang terletak di Desa Sungai Ketupak Ogan Komering Ilir-Sumatera Selatan (Latitude $3^{\circ}19.9S$ dan Longitude $105^{\circ}38.9E$). Dari hasil simulasi, diperoleh bahwa pembangkit listrik offgrid yang optimum untuk BTS Sungai Ketupak adalah hibrid antara PV, baterai, dan genset dengan kapasitas masing-masing sebesar 6,59 kWp, 4,8 kWh, dan 5 kW.

.....The lack of electricity supply from PLN due to the remote and far geographical location, Some of the BTS rely on diesel generators as the main power plant. So, the cost of electricity generation in the BTS is immense because of the transportation of these fuels high cost. Therefore, efficient use of diesel fuel requires a renewable model of energy-based power generation by utilizing the natural potential around the area. This study analyzes the hybridization model of Photovoltaic System with Palm oil Diesel (POD) to get power plants that have a high reliability, low energy costs and low emissions for powering BTS in remote area located at an Sungai Ketupak Village of Ogan Komering Ilir-South Sumatera (Latitude $3^{\circ}19.9S$ and Longitude $105^{\circ}38.9E$). The simulation results show the optimum power plant at BTS offgrid Sungai Ketupak is a hybrid between PV, batteries, and generators with capacity 6.59 kWp, 4.8 kWh, and 5 kW respectively.