

DESIGN OF SOLAR POWER PLANT IN SHRIM POND USING HYBRID SYSTEM

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Abstract

The utilization of solar energy has become a primary focus in efforts to reduce dependence on depleting fossil energy sources. This research resulted in the design of a hybrid solar power plant system that meets the needs of the shrimp farming industry, especially during power outages, thus replacing the role of a generator as a backup power source. The potential solar radiation is 4.63 kWh/m²/day, and the total daily power consumption is 280.3 kWh. The design of this PLTS system uses PVsyst 7.2. From the calculations, it is known that the planned capacity of the hybrid solar power plant system will have a PV Array capacity of 76.7 kWp, 578 units of 12V 100Ah batteries, and 1 unit of a 100 kW grid-tied hybrid inverter. The initial investment to build the hybrid PLTS system is Rp.1.946.906.000, with annual operational and maintenance costs of Rp 13.806.000. The Net Present Value (NPV) generated shows that the PLTS is more feasible than the generator, with a difference of Rp. 475.788.000