DESIGN AND CONSTRUCTION OF OFF GRID SOLAR POWER PLANT FOR WATER PUMP VAT POOL FOR KOI FISH CULTIVATION

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ABSTRACT

Koi fish farming is a very profitable opportunity, both abroad and domestically. One of the koi fish cultivation is the cultivation of a recirculation system in tarpaulin ponds, using water repeatedly with the help of pumps and filters. One of the most important parts of the system is the use of electricity from PLN (State Electricity Company). However, electricity from PLN has a weakness, namely power outages which are very detrimental to consumers. For cultivators, blackouts due to any factor will be very detrimental. because it will stop the refiltration system, and interfere with cultivation activities. In the research conducted is to create a system that can supply electrical energy for water pumps by utilizing energy from the sun's heat. The off grid PLTS system is made using several components including a 200 Wp panel, SCC, 12 v 100 Ah battery and also a load in the form of a 12v BLDC motor. Equipment testing is carried out to determine the parameters of voltage, current, power, and the ability of solar panels and batteries. From the results of measurements and analysis of research that has been carried out, 200 Wp solar panels configured in parallel can produce an average of 725 Wh of energy per day. Energy revenue can already supply 600 Wh of load, and still has 0.20 days of energy remaining. The approximate ability of the solar panels to charge the battery under load is 8.19 days. This study uses a Lifepo4 12.8 V 100 Ah battery, with an actual capacity of 80 Ah or 1024 Wh. With this energy, the battery can supply the water pump until the stored energy runs out, which is about 45.5 hours with an average current of 1.85 Ampere and an average power of 24.4 watts. The 12 V BLDC pump used can circulate 19200 liters of water in one working day or 24 hours.

Keywords*: Solar Power, Off Grid, Lifepo4, Cultivation*