Design and Planning of PLTS *OFF GRID SYSTEM* for industry TEFA Fish Canning Politeknik Negeri Jember

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ABSTRACT

The use of fossil fuels in sustainable quantities certainly has a negative impact on the environment, so solutions in the form of renewable energy are needed in this case. In an industry, renewable energy solutions are needed because industry is the largest supplier of CO^2 gas, and the importance of sustainable electrical energy makes Off Grid PLTS solutions very helpful in the process of running production in an industrial project. The purpose of this study was to determine the design and planning of Off-Grid PLTS for the Tefa Fish Canning industry of State Polytechnic of Jember and the amount of energy generated in the Off Grid PLTS system project. This research was conducted in February 2023 to June 2023 located at TEFA Fish Canning State Polytechnic of Jember. For the planning system starting from determining the load capacity, determining the value of the battery capacity, determining the capacity of the inverter, determining the value of the PV module used, determining the value of the conductor and the capacity of the protection system used and finally the detailed engineering drawing to clarify the installation project description. The results of the research obtained the amount of energy covered by PLTS amounted to 31,290 kWh. The battery capacity used is 46,080 kWh. The number of PV modules used is 68 pieces with a module capacity of 540 Wp. The PV inverter used is Huawai 30 KTL M3 and the battery inverter used is SMA Sunny Island 4.4. The estimated production of electrical energy generated by the solar power plant in a year based on manual calculations is 53,655 Kwh/year with a specific energy of 1,461.98 kWh/kWp which has a performance ratio of 66.5%. While based on the results of PVSyst simulation, the estimated production of electrical energy generated by PLTS in a year is 50,600.4 kWh in the first year with a performance ratio of 67.5% and specific energy of 1,378.2 kWh/kWp.

Keyword : : Off Grid Solar System, Coupled AC System, TEFA Fish Cannig