

ABSTRACT

The need for electrical energy is increasing day by day. The power used at this time is still provided by PLN and of course in the next few periods the electricity supply will decrease and possibly increase in price due to the increasing scarcity of fossil fuels. Utilization of enormous potential energy can be done by using the technology of Solar Power Generation (PLTS). With the Circular Letter of the Minister of Energy and Mineral Resources Number: 363/22/MEM.L/2019 dated September 11, 2019 regarding the call for the installation of Rooftop Solar Power Plants (PLTS Rooftop) for offices in government agencies, if implemented, it will have an impact on reducing the use of conventional electricity. This study aims to determine how big the potential of PLTS on the roof of the Religious Court of Tasikmalaya City. This study discusses the design of the PLTS On Grid system with battery backup at the Religious Court Building in the City of Tasikmalaya by using technical analysis methods using the Helioscope application to calculate the energy value of PLTS for one year and economic feasibility analysis using payback period analysis. The results of the study Energy Consumption Intensity (IKE) method, show that the religious court building is classified as very efficient. The system designed is sufficient to supply 66.2% of the average daily energy use of the Tasikmalaya city religious court building of 184.3931938 kWh. The design requires 100 Longi LR4 – 72HPH-450M 450Wp solar panels, 2 Ario MEtaPower Hybrid30 inverters with a capacity of 30kW, 152 KIJO JM 12 V 200 Ah batteries and 1 AC Combiner Box containing protective equipment and supporting the PLTS system. The energy density of solar panels obtained in this plan is 61.87 W/m² or about 29.8% of the STC Power per unit of area of 19.2 W/ft² or 207 W/m² of solar panels used. The initial investment cost for this system is IDR 817,506,100.00. With operational and maintenance costs of Rp. 8,175,601/year. Life cycle cost for 25 years is Rp. 894,083,725.4. Cost Of Energy (COE) if want to generate energy/kWh, it costs Rp. 2100 /kWh. The investment feasibility analysis shows the PayBack Period value in the 8th year so that it can be said that the PayBack period for this project is shorter than the life of the project, so this PLTS project or system can be said to be feasible.

Keyword: Helioscope. PLTS, Roof PLTS