

ABSTRACT

Solar power plants have the working principle of solar panels with an off-grid topology, namely a solar panel system that does not require other sources to produce electrical energy. This topology only relies on solar panels and batteries to support energy. The way it works is using solar panels as a catcher of solar thermal energy which is then converted to DC electricity whose electricity is used to charge the battery and the electricity stored in the battery is converted back into electricity with AC current so that it can be used for household needs.

However, there are factors that need to be considered in making solar panels with this topology, namely the depth of discharge (DOD) on the battery because DOD greatly affects the price of electricity per-KWh when compared to the price of electricity from PT. State Electricity Company (Persero). In this final project, the author analyzes the economic value of the battery which is calculated by calculating how long it takes to reduce the DOD excess discharge based on the battery usage cycle used compared to the KWh used so that it can compare with the price of electricity issued by PT. State Electricity Company (Persero).

The DOD value is measured from the resistance value in the battery which is obtained from the voltage value and current value in the battery. The results obtained from this final project research is that lithium ion batteries can be used as storage systems. the battery life is relatively long and the price of lithium ion batteries is quite cheap with a price difference of Rp.8.024.28 when compared to VRLA type batteries.

Keyword : *Solar panel off-grid topology, Battery depth of discharge, lithium ion Battery*