ABSTRACT

The working principle of solar panels with off-grid topology is a solar panel system that does not need other sources to release electrical energy. This topology only relies on solar panels and batteries to support energy. How it works uses solar panels as a capture of solar thermal energy which is then converted to DC electricity which electricity is used to charge batteries and electricity stored in batteries is converted back into electricity with AC current so that it can be used for household needs. But there are factors that need to be considered in making solar panels with this topology, namely the state of health (SOH) in the batteries because SOH greatly affects the price of electricity per KWh when compared with the price of electricity from PT. Perusahaan Listrik Negara (Persero).

In this final project the authors analyze the economic value of the batteries calculated by calculating how long the SOH reduction is compared with the KWh used so that it can compare with the price of electricity issued by PT. Perusahaan Listrik Negara (Persero). The SOH value is measured from the resistance value on the battery which is obtained from the voltage value and the current rating on the battery.

The results obtained from this final project research is that VRLA batteries are still not suitable for use as a storage system for solar power generators. The price of the battery is too high and the battery life is relatively short, causing the cost of production to reach Rp 12,276.49, which is still higher when compared to lithium ion batteries, which have a cost of production of Rp 9,063.01.

Keyword : *Solar panel off-grid topology, Battery state of Health, valve regulated lead acid Battery*