

## ABSTRACT

Indonesia is a country on the equator causing solar energy to be one of the potential renewable energies to be developed. Besides being easily obtained from nature, solar energy is also friendly to the environment does not produce CO<sub>2</sub> emissions as well as destruction of nature to obtain it.

Solar energy is the energy originating from the sun. Solar cells turn sunlight into electrical energy directly. Solar cells consisting of various semiconductor materials that become electrically conductive when activated with light or heat. When the light is photon about the solar cells, its energy is transferred to the loading carrier. The electric field along the junction separates the positive (hole) charge generated by the light from the negative charge (electron). The electric current will flow if the circuit is enclosed with an external load. Then the resulting electrical energy used can fulfill the household load. The pattern of household load will increase during the night of electricity obtained during the day. Therefore it takes a battery to be able to store the energy produced in order to meet the needs of electricity at night

This final task discusses the optimization of the battery installation for a photovoltaic residential house in order to meet the needs of electricity by referring to load-usage patterns. For a 4400 VA power house spends 44,298 KWh of day by entering a panel of 100 WP that generates 278,82 watt of power. The panel is required to 159 panels with the scaling process generating power of 44.372,38 watts. Obtained from the above results so that the objectives can be achieved it requires a battery with a capacity of 37KWh.

**Keywords:** *solar panel, electrical load, battery*