ABSTRACT

THE COMPARISON PERFORMANCE SYSTEM OF SOLAR ENERGY WITH AC (*Alternating Current)* LOAD AND DC (*Direct Current*) LOAD.

By

Muhammad Zaini

Electronic equipment in Indonesia are generally used in the form of AC (alternating curent), while the energy released by the solar panels have a Direct Current or DC. Therefore, if you want to use the electronic devices must change into alternating current by using an inverter. Addition of inverter can increase the power needed by the AC load, because of the power used in part to turn the inverter. The objective of this research was to compare the performance of solar panel under AC and DC load utilization. Experiments was conducted by testing a solar panel consisted three moduls under different load types and sizes, namely DC 5W, 15W, and 65W as well as AC 15W, 18W, and 25W. Analysis was performed on the important parameters, including solar insolation, voltage, and electric current. Data for solar insolation at the observation days were collected from Climatology Station of Politeknik Negeri Lampung.

The results showed that the energy expended by the battery to the AC load 15W, 18W, and 25W respectively MJ 4.10, 2.8 and 3.71 MJ; energy required by loads was 2,04 MJ (49,4%), 2,39 MJ (96,8%), and 1,78 MJ (48,1%). The energy released from battery and used to operate the inverter was 50,6%, 3,2% dan 51,9%, respectively. Energy used DC load 5W, 15W, and 65W is 0.64 MJ (8.07%), 3.08 MJ (55.9%), and 2.12 MJ (49.5%). It was concluded that solar panel system was more efficient using DC loads as compared to AC loads.

Keywords: Solar panel, inverter, AC load, DC load.