Design of a Solar Panel-Based Automatic Grass Chopper Machine as a Source of Electrical Energy

Risse Entikaria Rachmanita, S.Pd., M.Si. as a councelor

Muhammad Syah Radian
Study Program of Renewable Energy Engineering
Majoring of Engineering

ABSTRACT

Agriculture is an important sector in the Indonesian economy because it makes the largest contribution to GDP and covers around 40% of the national workforce (Central Bureau of Statistics, 2021). One of the important agricultural activities is the management of grass as animal feed. However, the grass chopping process is still carried out manually by breeders using a simple sickle which requires human power or a diesel engine which requires a continuous supply of energy from diesel fuel. The use of solar panels as a source of electrical energy for a lawnmower can be the right solution to overcome this problem. This study aims to determine the design and manufacture of a solar panel-based automatic lawn mower and to determine the increase in the performance efficiency of the tool and the energy efficiency of solar panels produced by a solar panel-based automatic lawn mower. The stages of the research include preparation, literature study, tool design, tool making, tool testing, and drawing conclusions. The test was carried out on Friday, March 3, 2023 for 2 hours with data being collected every 5 minutes. The automatic grass chopper is designed from several main components in the form of a 200 Wp solar panel, a 30 Ampere solar charger controller, 2 chopper blades, a 2800 Rpm dynamo, a 1000 Watt inverter, and a 100 Ah VRLA SHOTO battery. The test results of an automatic lawnmower based on solar panels as a source of electrical energy produce an average grass chopping capacity of 33.36 kg/hour or show that the work efficiency of the calculation results increases by 14.64% while the energy efficiency of solar panels on an automatic lawnmower is 15.29%.

Keywords**:** *Grass Chopper Machine, Solar Panels, Eco Friendly*