Study of Solar Energy Sources and Feasibility Analysis of the Use of Irrigation Water Pumps

(Case Study of Drilling Well Water Pumps for Irrigation in Kedungdowo Village, Ploso District)

Ir. Michael Joko Wibowo, M.T (*Thesis Counselor*)

Yogik Indra Lukmanto

Study Program of Renewable Energy Engineering

Department of Engineering

ABSTRACT

The need for electrical energy in Indonesia continues to increase, and the increasing need and consumption of energy in Indonesia is predicted to continue to increase along with economic growth. With the increasing need for electricity, it certainly has an impact on the workload of power plants, which in fact still use fossil fuels. In accordance with PP 79/2014, which states that the use of the renewable energy mix in Indonesia is targeted at 23% in 2025 and is targeted to reach 31% in 2050, research was conducted on the study of solar energy sources in the planning of irrigation pump stations. In this study, data collection was carried out primary and secondary with direct measurement methods, data retrieval from satellites, and data analysis. with the results of the average daily radiation measurement of 506 kwh/m2 per day and radiation for the past 5 years reaching an average of 3.90 kwh. This study employs PLTs on a 3 kW grid, with solar modules of type monocrystalline, brand Longi Solar 540 watts, and a 3 kW inverter to produce a potential energy estimate of 400,411 kwh per year.The PLTS development planning is considered feasible to continue despite receiving an energy price of Rp.851.04 less than pln electricity and an IRR value of 9.28%, where the IRR value is greater than the interest rate.

Keywords: Solar Power Plant, Radiation, renewable energy, Feasibility of Development