

ABSTRACT

Energy is one of the main needs in human life, however, the problem faced by countries experiencing economic growth, including Indonesia, is that most people still rely on fossil energy to meet energy needs, while the use of renewable energy is hindered in its development and use. One solution that can be done is by utilizing non-renewable natural resources, one of which is the sun with PV power plants that can utilize solar energy into electricity that replaces energy from conventional power plants. To build a PV power plant system, further research is needed on two aspects, technical and economic aspects.

This study was conducted with the intent to understand the performance of the PV power plant system in Taman Sentosa, both in terms of technology and economics. Economic value parameters used are the comparison between electricity tariffs paid to PLN before and after using PV power plants and COE calculations. As for the technological aspect, it will be seen from the performance of the PV power plant, which consists of capacity factor, losses, and energy production.

The results of this Final Project indicate that renewable energy can be realized in the Taman Sentosa environment using PV power plant + battery systems. After performance testing in Taman Sentosa Cikarang, the system is worthy to use with a total energy of 4314 kWh/year and a performance ratio of 80.56%. The solar energy potential in Taman Sentosa is said to be quite effective in terms of economics, with a COE of Rp. 2.552,26/ kWh.

Keywords: *PV Power Plant System, hybrid, electricity tariffs, COE, capacity factor, losses, energy production.*