Analisis Performansi Lemari Pendingin Menggunakan Tenaga Surya Sistem *Off Grid* (*Analysis of Refrigerator Performance Using Solar Power with Off Grid System)*

Dewi Novi Wulandari
Renewable Energy Engineering Program Study
Engineering Department

ABSTRACT

The increasing number of households in Indonesia has an impact on the increase in household energy consumption, one of them is the use of refrigerators. So that energy saving efforts need to be done to reduce the rate of energy consumption that is by utilizing solar energy as a driver of refrigerator compressor. The energy savings made with the utilization of solar energy in the refrigerator will minimize the electrical power required to reduce the cost of using electrical energy derived from PLN with off grid system. This system is a power plant system that uses solar energy as the main energy source to generate electrical energy as much as possible but does not reduce the performance of the refrigerator to cool food and drink. The performance of photovoltaic used to supply electrical energy in the refrigerator is input power of 2610.96 Watt, maximum power of 318.42 Watt, fill factor of 0.73 and photovoltaic efficiency of 14.9%. The savings rate using photovoltaic can save 46 - 48% of the electricity consumption of PLN for refrigeration in the refrigerator. The coefficient of performance (COP) of the refrigerator is 3.4059 with the heat load to be absorbed by refrigeration for cooling process of 287,0643 joules per second. The refrigerator with photovoltaic power has optimum performance with the COP result because the higher the COP the lower the use of electrical energy.

Keywords**:** *performance, photovoltaic, refrigerator*