

ABSTRACT

Nowadays, dependence on energy sources of electricity supplied by PLN is very high. However, in providing electricity, PLN was still using the fuel in the form of petroleum, natural gas, coal and others. These fuel including an expensive energy sources and over time these fuel will run out. Therefore, the search for alternative energy instead of electricity from PLN should begin. Of the many alternative energy, heat energy is the energy that has an abundant source, so heat energy suitable as a replacement electricity from PLN. Seeing heat energy is an abundant source, thermoelectric technology is one of the major alternative source that can be used to convert heat energy into electrical energy (thermoelectric generator). This technology are environmentally friendly, very durable and also able to produce energy in small or large scale.

In this final project, a direct current power plant using 4 thermoelectric module arranged in series has designed and implemented. Heat input derived from the sun's heat, the wax heat, and the 100 watt lamp heat. To step-up the output voltage from the thermoelectric module, a flyback transformer is used with switching flyback converter topology as the methods. MOSFET used as a switch which is controlled by an astable multivibrator at 15KHZ frequency from IC NE555.

The results of testing and analysis has been obtained indicates that the open circuit voltage from the sun's heat is about 0.409 volt, 0.675 volt from the wax heat and 1,378 volt from the 100 watt lamp heat. The output voltage of flyback converter circuit is about 9.05 volt for the sun's heat, 11.01 volt for the wax heat, and 18,49 volt for 100 watt lamp heat. The biggest power output obtained is about 1,186 mW with the power efficiency is about 31.7% in the 100 k resistive load.

Keywords : *Thermoelectric, Flyback Converter Topology, Flyback Transformer*