

ABSTRACT

There have been many developments in alternative energy generating electricity to meet the electricity needs of the community. In this era of energy recycling has the potential to be one of the solutions to the needs of the community's electrical energy sources.

One of the potential energy that can be recycled is thermal energy. The use of home electronic appliances such as refrigerators, emit heat due to the condensation process which causes heat to be wasted into the environment. With the use of the peltier module as a thermoelectric generator (TEG) an electrical energy source can be generated from thermal energy.

TEG can be used to produce electrical energy when there is a temperature difference between two different semi-conductor materials, so that this thermoelectric element will flow current which will produce a voltage difference. This principle is known as the Seebeck effect.

This research was conducted to determine the output voltage of six peltier modules which will be an alternative source of converting heat energy to the refrigerator compressor. Measurements were made by arranging six TEC1-12706 type peltier modules in series on the refrigerator compressor and placing a cooling system in the form of a heatsink and aluminum water block.

By testing for 12 hours the maximum output voltage of 2.5V was obtained from the operating range ΔT of 4-8 ° C. And the output value of the voltage is an average of 1.05V with a measured current of around 0.11A. In this study the percentage of effectiveness of the energy conversion system thermoelectric generator applied to the refrigerator refrigeration unit compressor is 1.396231%. With the potential power that can be generated by the thermoelectric generator system and stored by a battery of 0.1155 Watt.

Keywords: *Peltier module, Thermoelectric generator, Seebeck effect*