

## **ABSTRACT**

Solar panels are devices that can convert sunlight energy into electrical energy. Solar panels have disadvantages, namely the temperature in the solar panel cannot be too hot. If this happens, there will be a decrease in performance on the solar panel. To reduce excessive heat on solar panels, an air flow simulator is made, which is a cooling fan. Then, to utilize the heat that is behind the solar panel, an additional thermoelectric generator (TEG) is added so that the electrical energy produced is greater. This research uses 10 Wp Polycrystalline solar panels and uses 10 TEG SP 1848 SA modules. This study compares the performance of solar panels without TEG and hybrid solar panels with TEG from several fan speed variations.

From the results of research conducted, it is known that the average power produced by solar panels without TEG is 1.66 W with an average efficiency of 7.65%, while the average power generated from hybrid solar panel systems with TEG is 1.78 W with efficiency an average of 9.34%. A TEG equipped with a heatsink can transfer excessive heat to the solar panel and function as a natural cooler on the cold side of the TEG. The average power produced by TEG is 1.32 mW with an average efficiency of 0.00297%. With the addition of TEG to the solar panel and the addition of an air flow simulator, the temperature of the hybrid solar panel was successfully reduced to 1.43°C.

**Keywords:** *solar panels, TEG, hybrid, temperature*