ABSTRACT

REVIEW THE EXPERIMENTAL ADDITION OF PCM (PHASE CHANGE MATERIAL) OF PV (PHOTOVOLTAIC) WORK WHICH APPLIED ON THE WALL OF THE BUILDING

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The Sun is one of the most potential source of energy for the future. Photovoltaic could change solar energy into the electrical energy. In Indonesia, the photovoltaic is potential because of the solar radiation intensity in Indonesia is quite high which reached 4.8 kWh/m$^2$/day with a very effective time of 8 – 10 hours/day. For silicon solar cells, the elevation related to the operation temperature reduces the electrical power output, producing a temperature coefficient of -0.4 to -0.5%/K$^{-1}$ characterization of temperature goes beyond them. Because of silicon solar cells are marked on the 1000 W/m$^2$ and 25°C, keeping the temperature of the cells at 25°C can maintain the efficiency of the cell values. In the most common passive approximation to heat dissipation, the channel is set up in the wake of natural convection in a PV module. But this natural method still has a cooling system that is less effective due to poor heat transfer. As a new method to regulate the temperature increase, phase change material (PCM) which absorbs energy as latent heat of phase transition temperature in constant work. This research was conducted on the model of the building, where the photovoltaic were installed on the wall with the mounting angle and position of the variations of the lamp shines with a light intensity of 300 Watt/m$^2$ and 600 Watt/m$^2$. Phase change materials (PCM) used is Palm oil (CPO) because Indonesia is one of the palm oil producers (CPO), the third largest in the world. The research results showed that installation of PCM can increase the efficiency of photovoltaic and make the rising of room temperature increases slowly.

Keywords: photovoltaic, phase change materials (PCM), irradiance