THE ANALYSIS OF CONCENTRATED SOLAR DISH PERFORMANCE FOR SOLAR THERMAL POWER PRODUCTION

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ABSTRACT

The concentrated parabolic solar dish is a green technology that can generate power from solar. This system only uses light from the sun as energy source. The objective of this study is to analyse the concentrated solar dish performance for solar thermal power production. There are some criteria must be considered before start the experiment as performance of solar dish may be different with different condition such as material of reflector, the shape of reflector, diameter of the concentrator, focal length of concentrator dish, and rim angle. The study involves the design and optimization of thermal performance of solar parabolic dish collector under Malaysia tropical climate. A recycle satellite dish has been utilized and wrapped up with aluminium film as a reflector to concentrate the sunlight and the aluminium block as the receiver. The focal point had been calculated to place the concentrated beam receiver correctly. The amount of heat received was calculated based on radiation heat transfer. The heat is to be collected by tap water flow through the manifold attached to the receiver. An Arduino system was used to collect the temperature data from the experiment. During the experiment, the parabolic dish reflects the sunlight and concentrates the light to the receiver at focus point. The high temperature was produced at the receiver. The performance was measured by calculate the heat extracted by the water in the system. The experiment results obtained showed that temperatures up to 400˚C can be achieved in relatively short periods of time. It has indicated that the solar concentrator can be an alternative to provide