

ANALYSIS OF FRESNEL LENS AS A LIGHT CONCENTRATOR TO INCREASE THE POWER OUTPUT OF SOLAR POWER GENERATION

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ABSTRACT

One of the uses of solar energy is to convert it into electrical energy through solar panels. Solar panels as a PLTS (Solar Power Plant) unit are not without constraints, the output power of solar panels is very small compared to other types of power plants, in addition solar panels are also very dependent on natural conditions such as clouds, changes in the position of the sun including the apparent daily motion and apparent annual motion of the sun. Therefore, efforts are needed to optimize the power output of solar panels so that their efficiency increases. One possible solution is to maximize the intensity of solar radiation on the surface of the solar panel by using a light concentrator. This study aims to determine the effect of using a fresnel lens light concentrator and the addition of a 10 watt incandescent lamp for nighttime efficiency on a 10 WP solar panel. The method used in this study is the experimental method by conducting experiments on the research object material. Based on the results of the study, the addition of a light concentrator to the solar panel can affect the intensity of solar radiation that will be received by the solar panel, the temperature and the output power of the solar panel. Solar panels without a light concentrator have an average power output of 7.4 watts, while solar panels with a light concentrator only have an average output of 2.0 watts. The decrease in power output can occur because the light concentrator made of fresnel lens produces shadows that will block sunlight so that the solar radiation received by the solar panel is reduced.

Keywords: *Energy, Solar Panel, Light Concentrator, Fresnel Lens.*