

Impact of two types flat reflector materials on solar panel characteristics

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Abstrak

Reflector is used to increase the amount of solar radiation that the solar panels are exposed with, thus increasing the production of electric power. Parameters and I-V characteristic curve of a solar panel is strongly influenced by the amount of solar radiation received by the solar panels. This paper will discuss the effects of flat reflectors on the parameters and I-V characteristic curve of the solar panels. The parameters are solar radiation and temperature at solar panel, maximum power output (PMPP), voltage when PMPP is reached (VMPP), current when PMPP is reached (IMPP), short circuit current (ISC), open circuit voltage (VOC), and Fill Factor (FF). In this study, the types of reflector material are stainless steel mirror and aluminum foil. Reflector is placed beside solar panels. Reflector tilt angle was varied at 30, 45, 60, and 75 degrees. The measurement results show that the greatest increases in solar panel producing electric power are achieved at 75 degrees tilt angle. Aluminum foil reflector and stainless steel mirror can increase power output of solar panels until around 31.5 % and 21.5% respectively. In this tilt angle, for these two types of material reflector, VOC and VMPP tend not to change, ISC, IMPP, solar radiation and temperature on solar panel are increasing, whereas FF is decreasing around 4%. Changes in these parameters refer to the condition without a reflector.