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INVESTIGATION OF SOLAR PHOTOVOLTAIC MODULE POWER OUTPUT BY VARIOUS MODELS

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Abstract:

This paper aims to investigate the power output of a solar photovoltaic module by various models and to formulate a suitable model for predicting the performance of solar photovoltaic modules. The model was used to correct the configurations of solar photovoltaic systems for sustainable power supply. Different types of models namely the efficiency, power, fill factor and current-voltage characteristic curve models have been reviewed. It was found that the examined models predicted a 40% yield of the rated power in cloudy weather conditions and up to 80% in clear skies. The models performed well in terms of electrical efficiency in cloudy days if the influence of low irradiance were incorporated. Both analytical and numerical methods were employed in the formulation of improved model which gave $\pm 2\%$ error when compared with the rated power output of solar photovoltaic module. The proposed model is more practical in terms of number of variables used and acceptable performance in humid atmospheres. Therefore, it could be useful for the estimation of power output of the solar photovoltaic systems in Sarawak region.

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