

Photovoltaic Grid-Connected Modeling and Characterization Based on Experimental Results

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Abstract

A grid-connected photovoltaic (PV) system operates under fluctuated weather condition has been modeled and characterized based on specific test bed. A mathematical model of a small-scale PV system has been developed mainly for residential usage, and the potential results have been simulated. The proposed PV model based on three PV parameters, which are the photocurrent, I_L , the reverse diode saturation current, I_0 , the ideality factor of diode, n . Accuracy of the proposed model and its parameters evaluated based on different benchmarks. The results showed that the proposed model fitting the experimental results with high accuracy compare to the other models, as well as the I-V characteristic curve. The results of this study can be considered valuable in terms of the installation of a grid-connected PV system in fluctuated climatic conditions.

DOI:10.1371/journal.pone.0152766