

PV Cell Temperature/ PV Power Output Relationships Homer Methodology Calculation

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Abstract: Because of the intermittent solar irradiation which highly influences the resulting energy production, the major aspects in the design of PV power generation systems are the reliable power supply of the consumer under varying atmospheric conditions and the corresponding total system cost. Thus it is necessary to select the number of PV modules and batteries, and their installation details such as the power will be uninterruptedly supplied to the electrical load, and simultaneously the minimum system cost would be achieved. But it's especially so judicious to take into account the whole system parameters such as cell temperature, a task ensured by several software tools as Homer from the NREL Laboratory. As known, meteorological parameters especially the array temperature, do not remain constant the whole day long, but change considerably. Then, it is worth investigating the influence of the daily average temperature variation on the predicted performances of the optimized system. It's so important to seize how such software proceeds to get around any result calculation and a possible problem at the same time. So, the goal achieved through this study is to investigate the influence of the cell temperature and head changing effects on the system performances. So an approach by a mathematical formalism is then indispensable.

Keywords : solar layer, PV cell temperature, PV power output, mathematical formulation, calculation, Homer.