

Analisis karakteristik sistem fotovoltaik on-grid daerah tropis dalam implementasi metode perhitungan weather-corrected performance ratio = Characteristic analysis of on-grid photovoltaic system in tropical region in the implementation of weather-corrected performance ratio calculation method

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Abstrak

ABSTRAK

Disebabkan lokasinya di iklim tropis, Indonesia memiliki faktor kondisi cuaca yang berbeda dari iklim subtropis sehingga memengaruhi bebarapa indikator evaluasi kinerja sistem fotovoltaik. Salah satu indikator tersebut ialah performance ratio yang dipengaruhi faktor suhu. NREL mengajukan metode perhitungan Weather-Corrected Performance Ratio untuk mengoreksi faktor cuaca suhu dalam menghitung performance ratio pada sistem fotovoltaik. Tetapi, implementasi penggunaan metode ini pada kondisi operasi sistem fotovoltaik pada lingkungan yang sebenarnya, terlebih di daerah tropis belum mendapat perhatian khusus. Selain itu koefisien perubahan daya modul terhadap suhu pada keadaan uji standar STC , yang digunakan pada metode perhitungannya mungkin berbeda jika pada kondisi yang sebenarnya. Penelitian ini dilakukan untuk mengetahui efek implementasi metode weather-corrected performance ratio dan mengetahui karakteristik nilai koefisien perubahan daya modul terhadap suhu sebagai faktor koreksi dalam metode weather-corrected performance ratio, pada kondisi yang sebenarnya di daerah tropis. Melalui pengolahan data sistem fotovoltaik dari data logger didapat bahwa nilai range dari metode weather-corrected performance ratio lebih besar dari metode konvensional, dengan kenaikan maksimum 2,43 . Selain itu diketahui bahwa suhu rata-rata iklim tropis yang lebih tinggi dari subtropis membuat persentase penurunan daya terhadap kenaikan suhu di iklim tropis lebih tinggi dari iklim subtropis.

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<i>ABSTRACT</i>

Indonesia has different weather factors than the subtropical climate that influences the performance indicators of photovoltaic systems. One of them is performance ratio that affected by temperature factors. NREL propose calculation method of Weather Corrected Performance Ratio for correcting factors temperature in calculation performance ratio of photovoltaic systems. However, the implementation of this method on real operating conditions of photovoltaic systems, especially in the tropics has not received special attention. In addition, temperature coefficient of power photovoltaic in Standard Test Condition , used in the calculation method may be different in real operating condition. This study was conducted to determine the effects of weather corrected performance ratio method and to know characteristic of temperature coefficient of power photovoltaic as factors in of weather corrected performance ratio method, in real operating condition, especially in tropics. Through analysis photovoltaic system data from the data logger it is found that the range values of weather corrected performance ratio are greater than conventional methods, with a maximum increase of 2.43 . Moreover it is found that because average temperature of tropical climate is higher than subtropical climate, it makes the percentage of power decrease to rise in temperature in tropical climate is higher than subtropical climate.