

Decreasing of grid-tied PV power output due to thick haze phenomena in Malaysia

ABSTRACT

Recently, thick haze and poisonous smoke has cloak the surrounding air in Malaysia due to the uncontrollable and unethical burning of nearby country. This devastating episode of open burning started in the year 1997 in Indonesia which deeply affected most of the ASEAN countries especially their neighbour Malaysia and Singapore. The Photovoltaic (PV) technology as an alternative means of energy generation experiences such significant energy decrease based on this condition which is due to the shading of sunlight. The six hours claims of good sunlight has become not more than 2 hours and gets worst when the Air Pollution Index (API) struck 200 levels which is at very unhealthy condition. This study embraces some findings from 1 kWp PV generator field data installed in Malaysia reflecting the daily energy decrease operated during this unhealthy weather condition. It is found that such significant energy decrease with the value of 0.43 W power output per increment of 1 point API. This value shows such concrete proof of additional factors to be considered in PV modelling in line to support PV technology adaptation in the Asean region.

Keyword: API; Environmental impact; Haze; PV performance; Tropical climate