

Daily harvested energy of cadmium telluride thin Film photovoltaic

ABSTRACT

The power generated by solar photovoltaic (PV) is highly affected by the weather environment. Thin-Film solar module of cadmium telluride (CdTe) is one of the Semi-transparent PV (STPV) that can be employed in a wide application range as a means to sunlight permeability while supplying solar electrical energy with some shading which also preferable in hot areas. The system behavior and the forecast of a STPV harvested energy requires an accurate and reliable discription for the power pattern rate during the day time. This research presents a real-time daily measurements for CdTe PV modules that serve the system design, prediction, and modeling. Multilayer and single installation categories are configured to be experimentally tested at different weather conditions (temperature and irradiance). The measurements were conducted at UPM University, Serdang, Malaysia, where a 6 different modules are expreined. A wireless monitoring system with high sampling frequency employed for this puse. The results show an efficiency of 2.51 as a maximum in cloudy day conditions, while the harvested daily energy show that a multi-layer configuration may only be effective when the transparency is high. This new generation of PV module is similar to that for Silicon-based PV but it has threshold value to start power generating and promises for efficient sustainable building materials.

Keyword: PV thin-Film; Photovoltaic systems; System efficiency; Real-time monitoring; PV modeling