

ABSTRACT

Solar panels have high potential in Indonesia and supported by the Ministry of Energy and Mineral Resources regulation number 49 of 2018 provides an opportunity for solar panels to be more widely used. However, solar panels have low efficiency and are very dependent on the received solar radiation. Therefore, it is necessary to optimize the tilt angle and direction of the photovoltaic azimuth to maximize the radiation received by the solar panels.

The Hay-Davies method (1980) was used to calculate the radiation received by solar panels. Weather condition consideration data obtained from NASA LaRC POWER Project with the help of Objective Function will find the angle of inclination and direction of azimuth with a test angle of 0° to 30° , azimuth 0° (North) and 180° (South) which has a maximum total solar radiation and total solar radiation with a deviation smallest standard.

The results obtained for the optimal angle of the main test are 10° North for the maximum radiation, and 6° South for the smallest standard deviation. For periodic settings January 22° South, February 11° South, March 6° North, April 22° North, May-July 30° North, August 27° North, September 12° North, October-December 5° , 19° , 25° South. The smallest standard deviations are January-March 30° North, April-November 30° South, December 30° North. It is concluded that the optimal angle can maximize the radiation beam received by the solar panel. And panels whose angles are adjusted periodically receive higher maximum radiation radiation compared to panels that are installed permanently.

Keywords: solar panel, tilt angle, standar deviation, hay-davies, nasa.