ABSTRACT

Solar cell technology that can convert sunlight energy into electrical energy is a potential alternative electricity supplier in Indonesia, which is located on the equator so that it has abundant sources of solar energy. However, the main problem faced by solar cells is that the power produced has low efficiency and highly dependent on the intensity of the sun received. Therefore, it is necessary to optimize the tilt angle and azimuth direction to maximize solar radiation received by solar panels.

The Application is made using python programming language, the Reindl Method (1990) was used to calculate the radiation received by the Solar Panels, using API from NASA as data for consideration of weather conditions, with the help of Objective Function will find the optimal tilt angle and azimuth direction with a test tilt angle of 0° to 30° and the azimuth 0° (North), 90° (East), 180° (South), and 270° (West) which has a maximum total solar radiation and total solar radiation with a minimum standard deviation.

The result that can be concluded that the optimal tilt angle and azimuth direction can maximize the radiation beam received by the solar panels, with panels whose angles are adjusted periodically to receive a higher maximum radiation than panels whose angles are fixed. However, panels that are angle adjusted regularly have a small standard deviation compared to panels that are periodically adjusted.

Key Words: solar panel, tilt angle, azimuth direction, reindl, nasa, python.