ABSTRACT

Currently, researchers are competing to develop renewable energy sources due to the rapid depletion of fossil fuels. This study focuses on Solar Power Plants (PLTS). However, current solar power systems remain suboptimal due to their static nature, while the Earth's rotation constantly changes the sun’s position. Therefore, researchers have developed solar tracker technology to address this limitation.

This research aims to present recent studies and literature on photovoltaic tracking systems for electricity production, particularly for individuals affected by natural disasters or those living in remote areas with limited access to electricity. In addition, this study seeks to reduce the use of electricity generated from non-environmentally friendly sources such as coal, petroleum, and natural gas. It also provides a comprehensive overview of photovoltaic tracking systems and recent developments in the past few years.

This research integrates a fuzzy algorithm to optimize the performance of the solar tracker. The fuzzy algorithm, particularly the Sugeno-type fuzzy method, is used to improve the efficiency and energy output of solar panel systems by accurately following the sun's movement. The implementation of the fuzzy algorithm enables energy savings and optimal orientation of the panel’s axes, resulting in up to 30% higher energy production compared to conventional static solar panels. The application of a solar tracker with a fuzzy algorithm is also highly beneficial in post-disaster emergency situations, providing critical electricity for emergency operations, medical centers, and evacuation facilities.

Keywords: solar tracker, photovoltaic, portable