Maximizing Solar Energy: Improving the Efficiency of Solar Panels Using Solar Trackers

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Evidence shows that energy consumers are adopting solar panels as an alternative to conventional energy for their environmental and economic advantages. More comprehensive data is needed to improve solar panels' efficiency and maximize energy conversion. Research shows that orientation and tilt significantly influence solar panels' performance. Customers need to be made aware of how shading can affect a series of panels, for shade can adversely affect the electricity output of solar panels. Based on these facts, this experiment focused on utilizing a solar tracker to improve the efficiency of a solar panel. A solar tracker enables the solar panels to continuously align with the sun's position throughout the day, maximizing direct sunlight exposure. Two solar panels were observed at the exact location. One solar panel utilized a built solar tracker, while the other remained stationary. The researchers established a measurement schedule, taking readings for five days. Data collection involved two sessions. The voltage production was taken for both panels using an electrical multimeter. After data collection, A comparative analysis showed that the solar panel with a solar tracker demonstrated an 8% increase in energy production compared to the static solar panel. Statistical evidence showed that a solar tracker directly influences higher efficiency in converting solar than a static solar panel. It improves its ability to maximize energy production by optimizing its orientation towards the sun. These results may influence decisions regarding integrating solar tracker technology into the renewable energy industry, allowing for improved energy generation and efficiency.

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