

## Characterization of Solar Panel Efficiency Using Sun Tracking Device and Cooling System

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**Abstract :** This paper focused on studying the performance of the solar panels that were equipped with water-spray cooling system, solar tracking system, and combination of both systems. The efficiencies were compared with the solar panels without any efficiency improvement technique. The efficiency of each setup was computed on an hourly basis every day for a month. The study compared the efficiencies and combined systems that significantly improved at a specific time of the day. The data showed that the solar tracking system had the highest efficiency during 6:00 AM to 7:45 AM. Then after 7:45 AM, the combination of both solar tracking and water-spray cooling system was the most efficient to use up to 12:00 NN. Meanwhile, from 12:00 NN to 12:45 PM, the water-spray cooling system had the significant contribution on efficiency. From 12:45 PM up to 4:30 PM, the combination of both systems was the most efficient, and lastly, from 4:30 PM to 6:00 PM, the solar tracking system was the best to use. The study intended to use solar tracking or water-spray cooling system or combined systems alternately to improve the solar panel efficiency on a specific time of the day.

**Keywords :** solar panel efficiency, solar panel efficiency technique, solar tracking system, water-spray cooling system

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