

## ABSTRACT

This project report presents a comparative analysis of the efficiency of flat plate solar collectors using nanofluid and traditional fluid. The motivation behind this study stems from the potential benefits of nanofluids, which exhibit enhanced thermal conductivity and optical properties, in improving the performance of solar thermal systems. The experiment involved synthesizing nanofluids with varying nanoparticle concentrations and characterizing their thermal properties. A custom experimental setup was employed to measure the thermal efficiency of solar flat plate collector. However, considerations regarding stability, longevity, cost, and environmental impact must be carefully evaluated for practical implementation. This study contributes to the understanding of nanofluid-based solar collectors and provides insights for future research and development in renewable energy technologies.

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