

ENHANCING SOLAR ENERGY EFFICIENCY THROUGH PASSIVE COOLING STRATEGIES

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This abstract centers on the utilization of passive cooling strategies to optimize energy efficiency in solar installations. As solar energy assumes an increasingly pivotal role in sustainable energy production, effective management of solar panel temperatures has become paramount. Passive cooling strategies offer a cost-effective and efficient solution to address this challenge. These strategies encompass the use of reflective coating materials to reduce heat absorption, the incorporation of solar module designs that facilitate natural ventilation for efficient heat dissipation, and the implementation of appropriate shading, such as solar protection structures. These strategies not only enhance the efficiency of solar energy conversion but also extend the lifespan of components, ensuring sustained long-term performance. Examining the example of a passive cooling system in a large-scale solar park, where modules are designed to allow for natural air circulation and are coated with reflective materials, significant reductions in operational temperatures are observed, consequently leading to increased energy efficiency. In summary, passive cooling strategies present a practical and effective approach to enhance energy efficiency in solar installations, exemplifying a commitment to sustainability and optimized performance within the context of the growing adoption of solar energy.

Keywords: Passive Cooling; Solar Energy Efficiency; Thermal Control.

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