

## OPTIMIZATION OF ENERGY EFFICIENCY IN SOLAR SYSTEMS THROUGH ACTIVE COOLING STRATEGIES

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This summary highlights active cooling strategies as a means to improve energy efficiency in solar installations. With the increased use of solar energy, it is essential to address the challenges associated with excessive heating of solar panels. Active cooling strategies, including liquid cooling systems, air conditioning and forced ventilation, emerge as viable solutions. These techniques aim to maintain panel temperatures within ideal limits, avoiding efficiency losses and extending the useful life of solar components. The use of liquid coolants, for example, allows for effective heat dissipation, thus reducing thermal stress on solar cells. Likewise, air conditioning systems can keep temperatures under control in hot environments, ensuring constant performance. Forced ventilation is a practical option in many scenarios, allowing air to circulate to cool the panels. Case studies document the positive impact of these strategies, with significant improvements in the efficiency and reliability of solar installations. Implementation of these approaches depends on local conditions and specific needs, but clearly demonstrates the effectiveness of active cooling strategies in optimizing the use of solar energy. In summary, active cooling strategies offer practical solutions to improve energy efficiency in solar installations, contributing to a more effective and sustainable use of solar energy. These approaches play a key role in addressing the temperature challenges associated with solar energy, ensuring consistent yield over time.

**Keywords:** Solar Energy Efficiency; Active Cooling; Solar Thermal Control Strategies.

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