

What are solar collectors and thermal energy storage systems?

In these applications, solar collectors and thermal energy storage systems are the two core components. This paper focuses on the latest developments and advances in solar thermal applications, providing a review of solar collectors and thermal energy storage systems.

What is a solar collector?

Solar collectors are essential components of systems that harness solar energy. These devices utilize sunlight, converting it into thermal energy, which is then transferred to a circulating medium like water, air, or a specialized heat transfer fluid as it flows through the collector.

How does a solar thermal collector work?

During night-time or overcast conditions, the circulating fluid transfers solar energy to a thermal energy storage tank, hot water heater, or space conditioning system. Solar thermal collectors (STCs) are typically classified into two types: non-concentrating and concentrating solar collectors, as shown in Figure 7.

Why is solar thermal collector technology important?

Solar thermal collector technology is crucial for capturing renewable energy to support sustainable thermal uses. Nonetheless, traditional designs frequently experience optical losses, ineffective thermal storage and variable performance under different levels of sunlight.

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Article Open access Published: 31 January 2026 Experimental investigation of energy and exergy characteristics of a novel solar collector with swirling reversed circular flow jet impingement ...

The use of solar energy to heat water is the more critical application of solar energy. Researchers are trying to develop different methods to improve the efficiency of solar water heaters ...

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Energy storage solar collector

One challenge facing the widespread use of solar energy is reduced or curtailed energy production when the sun sets or is blocked by clouds. Thermal energy storage provides a workable ...

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This review paper focuses to the developments and solar thermal applications, providing a review of thermal energy storage systems and solar collectors. Many types of solar collectors are ...

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