

# Cleaner Energy Systems Propel Thermal Energy Storage Market to \$56.4 Billion

*Growing renewable adoption and focus on sustainability are boosting demand for thermal energy storage to balance supply-demand from intermittent sources.*

WILMINGTON, DE, UNITED STATES, June 25, 2025 /EINPresswire.com/ -- According to a new report published by Allied Market Research, titled, "thermal energy storage market" size was valued at \$25.6 billion in 2023, and is projected to reach \$56.4 billion by 2033, growing at a CAGR of 8.4% from 2024 to 2033.



Thermal energy storage (TES) is a technology that captures and stores energy in the form of heat for later use. By retaining thermal energy, these systems help manage energy supply more efficiently and ensure it is available when needed. TES is particularly useful for shifting energy use to off-peak times, reducing energy costs, and enhancing system resilience.

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Thermal energy storage bridges the gap between intermittent renewable energy generation and consistent power demand, ensuring stability and efficiency in modern energy systems.”

*Allied Market Research*

TES systems are widely implemented in solar power generation, where they store excess heat collected during the day for use at night. They are also essential in heating and cooling systems for residential and commercial buildings, as well as in industrial operations that require large-scale energy management. Through improved energy balancing and efficiency, TES plays a crucial role in advancing sustainable and reliable energy infrastructure.

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## Market Dynamics

The increasing integration of renewable energy sources plays a pivotal role in propelling the

demand for thermal energy storage (TES) systems. As countries across the globe move toward cleaner and more sustainable energy alternatives, solar and wind power have gained significant momentum due to their environmental benefits. However, the inherent intermittency of these sources — generating power only when sunlight or wind is available — often creates a mismatch between energy supply and demand. TES systems offer a practical solution by storing excess energy generated during peak production periods and releasing it during high demand or low generation, thus enhancing grid stability and energy reliability.

Despite their benefits, TES systems face stiff competition from electrochemical battery technologies, particularly lithium-ion batteries. These batteries are gaining popularity across various applications such as electric vehicles and grid-scale energy storage due to their high energy density, rapid response time, and ease of scalability. Moreover, the continuous decline in battery costs has made them more affordable, especially in settings where space constraints and portability are critical. These competitive advantages are limiting the widespread adoption of TES technologies and present a major challenge to market growth.

Nonetheless, government support remains a critical enabler for the TES market. Public sector initiatives and policy frameworks are helping reduce the financial barriers that often inhibit the deployment of TES systems. Tax incentives, direct subsidies, grants, and low-interest financing are being offered to promote investments in energy efficiency and sustainable energy infrastructure. These incentives not only make TES projects more economically viable but also attract private sector participation, thereby driving market expansion.

In addition, TES technologies are increasingly being recognized for their versatility across various sectors, including residential, commercial, industrial, and utility-scale applications. From managing heating and cooling loads in buildings to optimizing power plant performance and supporting demand-side management strategies, TES solutions are being tailored to meet diverse operational needs. This adaptability enhances their market appeal and provides avenues for innovative deployment in both developed and emerging economies.

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Looking ahead, the thermal energy storage market is poised for significant growth as nations pursue decarbonization goals and transition to resilient, low-carbon energy systems. The synergistic effect of rising renewable energy installations, supportive government policies, and the need for grid flexibility will likely open new opportunities for TES adoption. However, overcoming technological and economic challenges posed by alternative storage solutions will remain essential for sustaining long-term growth in the TES sector.

#### Segment Overview

The global [thermal energy storage market analysis](#) is categorized based on technology, storage material, application, end user, and region. In terms of technology, it is segmented into latent heat storage, sensible heat storage, and others. Based on storage material, the market includes

water, molten salt, phase change materials (PCM), and others. By application, the market is classified into power generation, heating, and cooling. In terms of end users, it is divided into residential, commercial & industrial, and utilities. Regionally, the market is analyzed across North America, Europe, Asia-Pacific, and LAMEA.

### Regional Analysis

Regionally, Asia-Pacific dominates the global thermal energy storage (TES) market and is expected to maintain its lead during the forecast period. This growth is primarily driven by rapid industrialization, rising energy demand, and significant investments in renewable energy infrastructure across countries such as China, India, Japan, and South Korea. Government initiatives promoting sustainable energy, coupled with increasing deployment of solar thermal systems and district heating networks, further bolster the market in this region. Additionally, supportive policies and financial incentives are encouraging the adoption of TES technologies in both residential and commercial sectors.

In North America and Europe, the TES market is also witnessing steady growth due to a strong emphasis on reducing greenhouse gas emissions and improving energy efficiency. These regions benefit from advanced research and development activities, widespread use of smart grids, and high adoption rates of renewable energy systems. In Europe, the presence of stringent environmental regulations and ambitious net-zero carbon targets is pushing utilities and industries to integrate thermal storage systems into their operations. Meanwhile, North America, particularly the U.S., is focusing on modernizing its energy infrastructure, which includes expanding the use of TES technologies for grid stability and renewable energy integration.

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### Competitive Analysis

The global thermal energy storage (TES) market is highly competitive, with the presence of several key players actively investing in research and development to enhance storage efficiency and reduce costs. Companies such as Aalborg CSP, Abengoa, Cartesian, Enel Spa, EVAPCO, Inc, Kraftblock GmbH, Lumenion GmbH, Magaldi Green Energy, Man energy solutions, PCM products Ltd., Phelas GmbH, Spirax sarco limited., Sunamp Ltd., and Thermofin are leading the market through technological innovations, strategic collaborations, and large-scale project implementations. These players are focused on developing advanced TES technologies including molten salt systems, phase change materials (PCMs), and hybrid solutions to cater to a wide range of end-user applications in power generation, heating, and cooling.

In addition, partnerships with government agencies and utility companies are becoming a common strategy to scale up operations and secure long-term contracts. Market players are also exploring opportunities in emerging markets such as Asia-Pacific and the Middle East, where rising demand for renewable energy and efficient energy storage systems presents significant growth potential. Mergers, acquisitions, and capacity expansions are being employed by companies to strengthen their global footprint and capitalize on the accelerating transition

toward sustainable energy infrastructure.

#### Key Findings of the Study:

- **Renewable Energy Integration:** The growing adoption of renewable energy sources, such as solar and wind, is a major driver for TES systems, which help balance supply and demand by storing excess energy.
- **Technology Advancement:** Sensible and latent heat storage technologies dominate the market, with innovations in phase change materials and molten salt systems boosting efficiency and adoption across applications.
- **Government Support:** Incentives like tax credits, subsidies, and low-interest loans are significantly encouraging investments in TES infrastructure across residential, commercial, and utility sectors.
- **Regional Growth:** Asia-Pacific is emerging as a key region for TES market expansion, driven by industrialization, urbanization, and increasing renewable energy installations.
- **Competitive Landscape:** Leading players are focusing on R&D, strategic partnerships, and geographic expansion to enhance their market presence and develop scalable, cost-effective TES solutions.

David Correa

Allied Market Research

+15038946022 ext.

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