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Thermal Energy Storage Materials Market Size, Share & Trends Analysis Report By Material Type (Latent Heat Storage Materials, Thermochemical Storage Materials), By End-use (Power Generation, Building & Construction, Industrial Processes, Transportation), By Region, And Segment Forecasts 2025 - 2033

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Abstracts

The global thermal energy storage materials market size was estimated at USD 5.51 billion in 2024 and is projected to reach USD 10.36 billion by 2033, growing a CAGR of 7.3% from 2025 to 2033. The demand for thermal energy storage materials is rapidly increasing as industries and governments worldwide seek efficient methods to balance energy supply and demand.

With the rising adoption of renewable energy systems, particularly solar and wind, the need for energy storage that can maintain grid stability has surged. Thermal energy storage (TES) materials play a vital role in capturing and reusing waste heat, significantly improving energy efficiency across residential, commercial, and industrial sectors. The shift toward decarbonization and sustainable energy utilization is also fueling demand. In addition, the growing construction of energy-efficient buildings and the expansion of district heating and cooling networks are driving further adoption.

The key drivers for the thermal energy storage materials industry include increasing renewable energy deployment, growing investments in smart grid infrastructure, and rising industrial waste heat recovery applications. The demand for phase change materials (PCMs) and molten salts is expanding due to their ability to store heat for long durations with minimal energy loss. Advancements in thermochemical materials that offer higher storage density and operational efficiency are accelerating market growth.

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The shift toward electrified heating and cooling, combined with industrial modernization, is further boosting adoption. Moreover, corporate sustainability goals and the growing need for reliable off-grid power solutions have enhanced TES material relevance globally.

The TES materials market is witnessing innovations in composite phase change materials, bio-based PCMs, and nanomaterial-infused storage solutions. Companies are developing modular, compact, and recyclable storage units that enable easy integration with renewable plants and buildings. Molten salts are being improved for higher temperature stability in concentrated solar power (CSP) systems. Digital technologies, including IoT-enabled monitoring and AI-based predictive management, are optimizing TES performance. Furthermore, hybrid systems combining sensible, latent, and thermochemical storage techniques are becoming increasingly popular. The shift toward sustainable and recyclable materials align with the global focus on circular energy economies.

Global Thermal Energy Storage Materials Market Report Segmentation

This report forecasts revenue growth at the global, regional & country levels and provides an analysis on the industry trends in each of the sub-segments from 2021 to 2033. For this study, Grand View Research has segmented the thermal energy storage materials market report based on material type, end-use, and region:

Material Type Outlook (Revenue, USD Million, 2021 - 2033)

Sensible Heat Storage Materials

Latent Heat Storage Materials

Thermochemical Storage Materials

End-use Outlook (Revenue, USD Million, 2021 - 2033)

Power Generation

Building & Construction

Industrial Processes

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Transportation

Others

Regional Outlook (Revenue, USD Million, 2021 - 2033)

North America

U.S.

Canada

Mexico

Europe

UK

Germany

France

Spain

Asia Pacific

China

Japan

India

South Korea

Central & South America

Middle East & Africa

Saudi Arabia

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UAE

Egypt

Qatar

Kuwait

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