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Thermal Energy Storage Market Forecasts to 2034– Global Analysis By Storage Material (Water, Molten Salt, Phase Change Materials, Concrete and Other Storage Materials), Capacity, Technology, Application, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Thermal Energy Storage Market is accounted for $40.49 billion in 2026 and is expected to reach $105.38 billion by 2034 growing at a CAGR of 12.7% during the forecast period. Thermal Energy Storage (TES) is a technology that captures and stores heat or cold energy for later use, improving energy efficiency and grid reliability. It enables excess thermal energy generated during off-peak periods or from renewable sources to be stored in mediums such as water, molten salts, or phase change materials. This stored energy is released when demand rises, supporting heating, cooling, or power generation applications. TES reduces energy waste, balances supply-demand fluctuations, lowers operational costs, and enhances integration of renewable energy into modern sustainable energy systems, across multiple sectors.

Market Dynamics:

Driver:

Rising renewable energy integration

The increasing deployment of renewable energy sources such as solar and wind is a key driver for the Thermal Energy Storage market. These sources are inherently intermittent, creating imbalances between generation and demand. Thermal Energy Storage helps bridge this gap by storing excess heat or cold energy during peak

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generation periods and releasing it when needed. This improves grid stability, enhances energy utilization efficiency, and supports decarbonization goals, making TES a critical enabler of modern sustainable and resilient energy infrastructure systems.

Restraint:

High upfront capital cost

One of the primary restraints limiting widespread adoption of Thermal Energy Storage systems is the high initial capital investment required for installation and infrastructure development. Technologies such as molten salt tanks, phase change materials, and advanced storage systems involve significant engineering, material, and integration costs. These expenses can deter small and mid-scale industries from adoption despite long-term savings. Additionally, longer payback periods and financing challenges further slow market penetration.

Opportunity:

Growth of concentrated solar power (CSP)

The expansion of concentrated solar power projects presents a major growth opportunity for the Thermal Energy Storage market. CSP systems rely heavily on stored thermal energy to generate electricity even when sunlight is unavailable, making TES an essential component. As governments and utilities increase investments in large-scale solar infrastructure, demand for efficient storage technologies is expected to rise. This synergy enhances power reliability, supports round-the-clock renewable energy generation, and accelerates the global transition toward clean and dispatchable solar power systems.

Threat:

Supply chain constraints

Supply chain disruptions pose a significant threat to the Thermal Energy Storage market, particularly due to dependency on specialized materials such as molten salts, phase change compounds, and advanced insulation components. Global logistics challenges, geopolitical tensions, and raw material shortages can delay project execution and increase costs. Additionally, limited manufacturing capacity for certain TES components may create bottlenecks. These constraints can slow deployment

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timelines, impact project scalability, and reduce investor confidence in large scale thermal storage infrastructure development.

Covid-19 Impact:

The Covid-19 pandemic temporarily disrupted the market due to halted construction activities, supply chain interruptions, and delayed renewable energy projects. However, it also reinforced the importance of resilient and flexible energy systems. Post pandemic recovery policies emphasizing clean energy transitions accelerated investments in renewable integration and storage technologies. As economies reopened, demand rebounded strongly, with increased focus on energy security, sustainability, and grid modernization, ultimately positioning TES as a strategic solution in long term energy planning.

The molten salt segment is expected to be the largest during the forecast period

The molten salt segment is expected to account for the largest market share during the forecast period, due to its high thermal stability, cost effectiveness, and ability to store energy at elevated temperatures for long durations. It is widely used in concentrated solar power plants, enabling efficient heat retention and controlled energy release. Its scalability and proven commercial deployment make it a preferred choice for utility-scale applications. Additionally, its reliability and relatively mature technology base further strengthen its leadership position in the global TES landscape.

The power generation segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the power generation segment is predicted to witness the highest growth rate, due to increasing integration of Thermal Energy Storage systems in renewable-based electricity production. Utilities are adopting TES to stabilize grid fluctuations, ensure continuous power supply, and enhance the dispatchability of solar and wind energy. Growing investments in decarbonized power infrastructure and rising demand for peak load management further accelerate adoption. This segment benefits from strong policy support and technological advancements improving efficiency and cost competitiveness.

Region with largest share:

During the forecast period, the Europe region is expected to hold the largest market

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share, due to strong governmental policies supporting renewable energy adoption and carbon neutrality targets. The region has a well-established infrastructure for district heating systems and concentrated solar power integration, both of which heavily utilize TES technologies. Significant investments in energy transition projects, coupled with advanced technological capabilities and favorable regulatory frameworks, further strengthen Europe's leadership position in deploying large-scale thermal storage solutions across industrial and utility sectors.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR, owing to rapid industrialization, urbanization, and rising energy demand. Countries in the region are heavily investing in renewable energy expansion and grid modernization to enhance energy security. Government initiatives promoting clean energy adoption, along with large-scale solar power projects, are accelerating TES deployment. Increasing focus on reducing carbon emissions and improving energy efficiency further supports strong market growth across emerging economies in the region.

Key players in the market

Some of the key players in Thermal Energy Storage Market include Siemens Energy AG, Abengoa S.A., Aalborg CSP A/S, BrightSource Energy, Inc., CALMAC Corporation, EVAPCO, Inc., Baltimore Aircoil Company, Burns & McDonnell, SaltX Technology Holding AB, Trane Technologies plc, EnergyNest AS, Antora Energy, Brenmiller Energy Ltd., Rondo Energy and Ice Energy.

Key Developments:

In December 2025, Siemens?AG and GlobalFoundries have forged a strategic collaboration to integrate advanced AI?driven automation, predictive maintenance, and digital solutions into semiconductor manufacturing, enhancing efficiency, reliability and security across chip production while addressing growing global demand and strengthening supply chain resilience.

In November 2025, Siemens AG and NEC Corporation have partnered to advance smart factory innovation by integrating AI-driven digital twin technology with robotic simulation. Their collaboration combines NEC's Robot Task Planning with Siemens' Process Simulate software to automate robot programming, reduce setup time, and

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enhance productivity.

Storage Materials Covered:

- Water
- Molten Salt
- Phase Change Materials
- Concrete
- Other Storage Materials

Capacities Covered:

- Small Scale
- Medium Scale
- Large Scale

Technologies Covered:

- Sensible Heat Storage
- Latent Heat Storage
- Thermochemical Storage

Applications Covered:

- Power Generation
- Heating & Cooling

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- Industrial Process Heat
- Refrigeration & Cold Storage

End Users Covered:

- Utilities
- Residential
- Commercial & Industrial

Regions Covered:

- North America
  - United States
  - Canada
  - Mexico
- Europe
  - United Kingdom
  - Germany
  - France
  - Italy
  - Spain
  - Netherlands
  - Belgium

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- Sweden
- Switzerland
- Poland
- Rest of Europe

Asia Pacific

- China
- Japan
- India
- South Korea
- Australia
- Indonesia
- Thailand
- Malaysia
- Singapore
- Vietnam
- Rest of Asia Pacific

South America

- Brazil
- Argentina

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- Colombia
- Chile
- Peru
- Rest of South America

Rest of the World (RoW)

- Middle East
  - Saudi Arabia
  - United Arab Emirates
  - Qatar
  - Israel
  - Rest of Middle East
- Africa
  - South Africa
  - Egypt
  - Morocco
  - Rest of Africa

What our report offers:

- Market share assessments for the regional and country-level segments
- Strategic recommendations for the new entrants
- Covers Market data for the years 2023, 2024, 2025, 2026, 2027, 2028, 2030, 2032 and 2034
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment

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Opportunities, and recommendations)
- Strategic recommendations in key business segments based on the market estimations
- Competitive landscaping mapping the key common trends
- Company profiling with detailed strategies, financials, and recent developments
- Supply chain trends mapping the latest technological advancements

Free Customization Offerings:

All the customers of this report will be entitled to receive one of the following free customization options:

Company Profiling

Comprehensive profiling of additional market players (up to 3)

SWOT Analysis of key players (up to 3)

Regional Segmentation

Market estimations, Forecasts and CAGR of any prominent country as per the client's interest (Note: Depends on feasibility check)

Competitive Benchmarking

Benchmarking of key players based on product portfolio, geographical presence, and strategic alliances

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Note: Tables for North America, Europe, APAC, South America, and Rest of the World (RoW) are also represented in the same manner as above.

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