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Molten Salt Thermal Energy Storage Market Forecasts to 2030 – Global Analysis By Storage System (Direct Molten Salt Thermal Energy Storage, Indirect Molten Salt Thermal Energy Storage and Thermal Storage with Phase Change Materials (PCMs)), Storage Medium, Capacity, Technology, End User and By Geography

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Abstracts

According to Stratistics MRC, the Global Molten Salt Thermal Energy Storage Market is accounted for $9.44 billion in 2024 and is expected to reach $25.48 billion by 2030 growing at a CAGR of 18.0% during the forecast period. A technique called Molten Salt Thermal Energy Storage (MSTES) uses molten salts, usually a combination of potassium and sodium nitrate, to store thermal energy as heat. Later on, this thermal energy can be transformed into electricity or put to use in industrial settings. By delivering dispatchable electricity, MSTES is frequently used in solar thermal power plants, providing an affordable energy storage option and enhancing the effectiveness of renewable energy systems.

Market Dynamics:

Driver:

Rising demand for renewable energy integration

Molten salt storage, which stores surplus energy and releases it when needed, provides a steady energy supply even when solar and wind power output, fluctuates. Globally, governments are encouraging renewable energy initiatives and boosting spending on

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thermal energy storage technologies. Molten salt technology is perfect for integrating renewable energy sources on a big scale because of its high efficiency, long-duration storage, and affordability. Performance and uptake are further improved by developments in thermal storage materials and system architectures. The market for molten salt storage is still expanding due to this increased dependence on sustainable energy sources.

Restraint:

High initial capital costs

Complex engineering and costly materials are needed to build molten salt storage facilities. Exorbitant initial expenditures raise financial risks and deter small and medium-sized businesses from joining the market. Adoption is further slowed down by lengthy repayment terms and a lack of finance choices. Projects with unclear short-term profits may make governments and private investors hesitant to finance them. Consequently, even if the technology has long-term advantages, commercial expansion is limited.

Opportunity:

Development of hybrid systems

Hybrid systems ensure continuous power generation by combining renewable energy sources like solar and wind with molten salt storage. As a result, energy systems become more sustainable by reducing carbon emissions and reliance on fossil fuels. Advanced hybrid setups enhance overall performance by optimising energy conversion and heat transport. Adoption in the utility and industrial sectors is growing as a result of increased investments in hybrid TES systems. Hybrid systems are essential for scaling up molten salt TES applications as the need for renewable energy increases.

Threat:

Competition from other storage technologies

Lithium-ion batteries, for instance, provide faster response times and higher round-trip efficiency, making them preferable for short-duration energy storage. Pumped hydro storage continues to be a leading contender in large-scale energy storage due to its extended lifespan and scalability. Molten salt TES is further challenged by emerging technologies that promise more energy density and flexibility, such as solid-state

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batteries and hydrogen storage. Developments in flywheels and supercapacitors also draw money away from molten salt systems. Consequently, market uptake decreases, reducing prospects for expansion in the renewable energy industry.

Covid-19 Impact

The COVID-19 pandemic significantly impacted the Molten Salt Thermal Energy Storage (TES) market, causing delays in project timelines, disruptions in supply chains, and a slowdown in new installations. As construction and manufacturing activities were temporarily halted, investments in renewable energy storage technologies faced setbacks. However, the market showed resilience as governments increasingly focused on renewable energy transition post-pandemic, driving demand for TES solutions. The long-term outlook remains positive, with renewed emphasis on sustainable energy storage technologies.

The sensible heat storage segment is expected to be the largest during the forecast period

The sensible heat storage segment is expected to account for the largest market share during the forecast period by enabling efficient heat retention and release. Molten salts, with their high thermal capacity, store excess energy from solar power plants for later use. This enhances grid stability by providing continuous power generation, even during cloudy periods or at night. The cost-effectiveness and long lifespan of molten salts make them a preferred choice for large-scale energy storage. As a result, the market experiences steady growth, driven by the increasing need for sustainable energy solutions.

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 by enabling efficient energy storage for renewable sources like solar and wind. It enhances grid stability by supplying stored energy during peak demand periods. The high heat capacity and low cost of molten salt make it a preferred choice for large-scale power plants. Increasing government support and investments in renewable energy further boost its adoption. As a result, the demand for molten salt TES continues to grow, ensuring reliable and sustainable power generation.

Region with largest share:

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During the forecast period, the North America region is expected to hold the largest market share due to increasing demand for renewable energy and grid stability. Government incentives and policies supporting clean energy drive investments in concentrated solar power (CSP) plants with molten salt storage. Technological advancements are improving efficiency, reducing costs, and enhancing large-scale energy storage capabilities. The U.S. leads the market, with key projects in states like California and Nevada, while Canada explores potential applications. Rising energy needs and decarbonization goals further boost market expansion in the region.

Region with highest CAGR:

Over the forecast period, the Asia Pacific region is anticipated to exhibit the highest CAGR, owing to increasing renewable energy adoption and government initiatives supporting clean energy. Countries like China, India, and Japan are investing heavily in concentrated solar power (CSP) projects that utilize molten salt storage for enhanced grid stability. Widespread use in industrial and utility-scale applications is being fuelled by advancements in thermal storage technologies and falling costs. The region's market is expanding due to rising energy consumption and the need for carbon neutrality. It is anticipated that new project developments and strategic partnerships would improve Asia Pacific's standing in the global energy storage market.

Key players in the market

Some of the key players profiled in the Molten Salt Thermal Energy Storage Market include Abengoa Solar, BrightSource Energy, SolarReserve, NextEra Energy, Acciona, Fluor Corporation, Siemens Energy, Schneider Electric, General Electric (GE), ACWA Power, Foster Wheeler, SENER, ESI Energy, Bechtel Corporation, TerraPower, CSP Services, SunPower Corporation and Tata Power Solar.

Key Developments:

In February 2025, Tata Power Renewable Energy Limited (TPREL) signed a Memorandum of Understanding (MoU) with Oil and Natural Gas Corporation Limited (ONGC) to explore opportunities in the Battery Energy Storage System (BESS) sector1235. This collaboration aims to identify commercial opportunities across various segments of the BESS value chain, including utility-scale systems, grid stabilization, renewable energy integration, microgrids, and EV charging infrastructure.

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In April 2024, Schneider Electric partnered with Terrestrial Energy to deploy Terrestrial Energy's Integral Molten Salt Reactor (IMSR) for zero-emission power to industrial facilities and data centers1. The partnership aims to develop commercial opportunities for high-energy users seeking reliable, affordable, and zero-carbon baseload supply.

Storage Systems Covered:

- Direct Molten Salt Thermal Energy Storage
- Indirect Molten Salt Thermal Energy Storage
- Thermal Storage with Phase Change Materials (PCMs)

Storage Mediums Covered:

- Sodium Nitrate-based Molten Salt
- Potassium Nitrate-based Molten Salt
- Sodium Potassium Nitrate-based Molten Salt
- Other Storage Mediums

Capacities Covered:

- Small-scale (200 MW)

Technologies Covered:

- Sensible Heat Storage
- Latent Heat Storage
- Thermochemical Heat Storage
- Other Technologies

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End Users Covered:

- Power Generation
- Chemical Industry
- Oil & Gas
- Steel Manufacturing
- Other End Users

Regions Covered:

- North America
  - US
  - Canada
  - Mexico
- Europe
  - Germany
  - UK
  - Italy
  - France
  - Spain
  - Rest of Europe

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- Asia Pacific
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  - China
  - India
  - Australia
  - New Zealand
  - South Korea
  - Rest of Asia Pacific
- South America
  - Argentina
  - Brazil
  - Chile
  - Rest of South America
- Middle East & Africa
  - Saudi Arabia
  - UAE
  - Qatar
  - South Africa
  - Rest of Middle East & Africa

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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 2022, 2023, 2024, 2026, and 2030
- Market Trends (Drivers, Constraints, Opportunities, Threats, Challenges, Investment 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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Contents

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12 COMPANY PROFILING

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List Of Tables

LIST OF TABLES

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