Thermal Energy Storage Market in Europe and Middle East is expected to reach $12.1 billion by 2033

The market is poised for strong growth driven by renewable energy integration and a focus on energy efficiency and sustainability.

WILMINGTON, DE, UNITED STATES, November 19, 2024 /EINPresswire.com/ -- The Europe and Middle East thermal energy storage market size was valued at $8.0 billion in 2023 and is estimated to reach $12.1 billion by 2033, exhibiting a CAGR of 4.4% from 2024 to 2033.

Introduction
Thermal energy storage (TES) is a technology that stores thermal energy by heating or cooling a storage medium. This process is critical for balancing the demand & supply of energy, particularly in systems where the energy source is intermittent such as solar or wind power. TES helps improve energy efficiency and reliability by storing excess thermal energy when it is abundant and released during periods of high demand or when the energy source is unavailable.

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Market Dynamics
TES solutions play a crucial role in advancing sustainability objectives by enabling the widespread deployment of renewable energy technologies. These intermittent and variable renewable energy sources pose significant challenges to grid stability and reliability. However, by incorporating TES systems into renewable energy infrastructure, excess energy generated during favorable conditions is stored for later use, smoothing out fluctuations in supply & demand and improving overall system reliability. All these factors are expected to drive the demand for thermal energy storage in the Europe and Middle East region during the forecast period.

However, the declining costs and increasing efficiency of alternative storage technologies pose a challenge to the competitiveness of TES solutions. As economies of scale drive down the prices of batteries and other storage technologies, the cost advantage of TES systems diminishes, particularly for applications requiring short-duration storage or high-power output. In addition, ongoing R&D efforts aimed at improving the performance and reliability of alternative storage technologies further erode the market share of TES solutions over time. All these factors hamper the Europe and Middle East thermal energy storage market growth.

Government incentives drive the market demand for TES technologies and incentivize private sector investment. These incentives take various forms such as tax credits, grants, subsidies, and low-interest loans, aimed at reducing the upfront costs and financial barriers associated with deploying TES systems. By providing financial incentives for energy efficiency improvements and renewable energy integration, governments accelerate the adoption of TES solutions across residential, commercial, industrial, and utility sectors. All these factors are anticipated to offer new growth opportunities for the Europe and Middle East thermal energy storage market.

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Segments Overview
The Europe and Middle East thermal energy storage market is segmented into technology, storage material, application, end user, and region. On the basis of technology, the market is bifurcated into latent heat storage and others. By storage material, the market is segmented into water, molten salt, phase change material (PCM), and others. On the basis of application, the market is categorized into power generation, heating, and cooling. By end user, the market is segmented residential, commercial & industrial, and utilities. Region-wise, the market is analyzed across Europe and the Middle East.

On the basis of technology, the market is bifurcated into latent heat storage and others. The latent heat storage segment is anticipated to grow at the fastest CAGR of 4.6% during the forecast period. Latent heat storage (LHS) systems are increasingly prominent in thermal energy storage due to their high energy density and efficiency in managing thermal energy. Latent heat storage uses phase change materials (PCMs) to store and release large amounts of energy during the phase transition, typically from solid to liquid and vice versa. This capability allows for a more compact and efficient design, making LHS systems ideal for applications where space and weight are constraints, such as in residential heating systems or portable energy solutions.

By storage material, the market is segmented into water, molten salt, phase change material (PCM), and others. The phase change material (PCM) segment is anticipated to grow at the fastest CAGR of 4.7% during the forecast period. The rising demand for energy efficiency and sustainability is another critical driver for the adoption of PCMs. As countries efforts intensify to reduce carbon footprints and increase energy savings, PCMs offer a compelling solution due to their ability to store and release thermal energy at constant temperatures. This feature ensures a stable and efficient thermal management system, reducing energy consumption for heating and cooling.

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On the basis of application, the market is categorized into power generation, heating, and cooling. The power generation segment is anticipated to grow at the fastest CAGR of 4.7% during the forecast period. Economic considerations play a crucial role in the growing interest in TES for

power generation. TES systems enhance the operational efficiency of power plants by enabling load shifting and peak shaving. By storing energy during periods of low demand and discharging it during high demand, TES helps power plants operate more efficiently and reduce the need for expensive and polluting peaker plants. This lowers operational costs and improves the overall economic viability of power generation projects.

By end user, the market is segmented residential, commercial & industrial, and utilities. The utilities segment is anticipated to grow at the fastest CAGR of 4.7% during the forecast period. As utilities expand their renewable energy portfolios, particularly with intermittent sources such as solar and wind, the need for reliable and flexible storage solutions becomes important. TES systems enable utilities to store excess thermal energy generated during periods of high renewable output and release it when renewable generation is low, or demand is high. This helps stabilize the grid, manage energy supply and demand fluctuations, and ensure a continuous and reliable energy supply, thereby facilitating a smoother transition to a renewable energy-dominated grid.

Region-wise, the market is analyzed across Europe and the Middle East. The Middle East region is anticipated to grow at the fastest CAGR of 4.9% during the forecast period. The growing urbanization and industrialization in the Middle East region are driving the demand for efficient and reliable heating solutions. TES systems offer a viable means to meet this demand by providing thermal energy on demand, thereby ensuring uninterrupted heating supply for residential, commercial, and industrial facilities.

Key players in the Europe and Middle East thermal energy storage market include 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.

Key Market Insights

- By technology, the others segment was the highest revenue contributor to the market accounting for less than four-fifths of Europe and Middle East thermal energy storage market share in 2023.
- On the basis of storage material, the molten salt segment was the highest revenue contributor to the Europe and Middle East thermal energy storage market share in 2023.
- On the basis of application, the heating segment was the highest revenue contributor to the market accounting for more than two-fifths of the Europe and Middle East thermal energy storage market share in 2023.
- On the basis of end user, the utilities segment was the highest revenue contributor to the Europe and Middle East thermal energy storage market share in 2023.
- Region-wise, Europe was the highest revenue contributor of Europe and Middle East thermal energy storage market share in 2023.

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