

# Ice Thermal Energy Storage Market By System (Simple, Detailed) , By Ice Storage Type (Ice on Coil Internal, Ice on Coil External) By Application (Residential, Commercial, Industrial) : Global Opportunity Analysis and Industry Forecast, 2024-2030

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# Report description:

The ice thermal energy storage market was valued at \$192.5 billion in 2023, and is projected to reach \$442.9 billion by 2030, growing at a CAGR of 12.6% from 2024 to 2030.

Ice thermal energy storage system is an advanced unit that freezes water during off-peak periods, particularly overnight when electricity demand and costs are lower, and eventually uses the stored ice to cool buildings during peak hours. These systems are advantageous in commercial and industrial settings, providing substantial cost savings, reducing peak electricity demand, and improving the overall sustainability. They enable significant energy savings and enhance operational efficiency in heating, ventilation, and air conditioning (HVAC) systems.

The growth of the global ice thermal energy storage market is majorly driven by surge in demand for cooling systems in residential, commercial, and industrial sectors, particularly in regions with hot climates. This is attributed to the fact that businesses are aiming to reduce their carbon footprint and achieve sustainability targets, and thus are increasingly adopting ice thermal energy storage systems as part of their energy management strategies. An analysis by the Environmental Protection Agency (EPA) indicated that ice thermal energy storage systems could reduce carbon dioxide emissions by approximately 10-20% compared to traditional cooling systems, depending on the energy mix of the local grid. Furthermore, rise in awareness among consumers and businesses about the benefits of energy efficiency and sustainable practices boosts the market growth. For instance, this systems allows for energy consumption during off-peak hours when electricity rates are lower, leading to substantial cost savings. A study from the U.S. Department of Energy estimated that commercial buildings using these systems could save up to 30% on cooling costs by shifting energy consumption to off-peak hours when electricity is cheaper. Supportive governments policies, subsidies, and incentives to promote energy efficiency and renewable energy solutions further propels the market

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growth. However, high capital investment required for installing ice thermal energy storage systems deter their adoption among cost-sensitive businesses and consumers, thus hampering the market growth. In addition, complexities associated with the installation of these systems and dearth of skilled technicians act as the key deterrent factors of the global market. On the contrary, innovations in ice thermal energy storage technology, including improved materials, system designs, and integration with smart grids, to enhance the performance are expected to offer lucrative opportunities for the market growth during the forecast period. Moreover, manufacturers are focusing on integrating smart grid technology and Internet of Things (IoT) devices in ice thermal energy storage systems to optimize energy management and system control. Such developments are anticipated to open new avenues for the expansion of the market in the coming years.

The global ice thermal energy storage market is segmented into system, ice storage type, application, and region. Depending on system, the market is classified into simple, and detailed. By ice storage type, it is segregated into ice on coil internal and ice on coil external. On the basis of application, it is divided into residential, commercial, and industrial. Region wise, the market is analyzed across North America, Europe, Asia-Pacific, and LAMEA.

**Key Findings** 

By system, the simple segment held the highest market share in 2023, and is expected to maintain its leadership status from 2024 to 2030.

On the basis of ice storage type, the ice on coil internal segment was the major shareholder 2023, and is anticipated continue this trend throughout the forecast period.

Depending on application, the commercial segment led the market, in terms of share, in 2023, and is projected to maintain its lead in the coming years.

Region wise, Asia-Pacific exhibited the highest growth, in terms of revenue, in 2023.

# **Competition Analysis**

Competitive analysis and profiles of the major players in the global ice thermal energy storage market include BrightSource Energy, ICE ENERGY SOLUTIONS PVT LTD, Thermofin, Thermal Energy International Inc., Terrafore Technologies LLC, EVAPCO, Inc., Enphase Energy., Viking Cold Solutions, Inc., IMEC Electro Mechanical Engineering, and Waaree Energies Ltd. These major players have adopted various key development strategies such as business expansion, new product launches, and partnerships to sustain the intense competition and gain a strong foothold in the global market.

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- New Product Development/ Product Matrix of Key Players
- Additional company profiles with specific to client's interest
- Brands Share Analysis
- Historic market data
- SWOT Analysis

**Key Market Segments** 

By System

- Simple
- Detailed

By Ice Storage Type

- Ice on Coil Internal
- Ice on Coil External

By Application

- Residential
- Commercial
- Industrial

By Region

- North America
- U.S.
- Canada
- Mexico
- Europe
- France
- Germany
- Italy - Spain
- UK
- Rest of Europe
- Asia-Pacific
- China
- Japan
- India
- South Korea
- Australia
- Rest of Asia-Pacific
- LAMEA
- Brazil
- South Africa
- Saudi Arabia
- Rest of LAMEA
- Key Market Players
- BrightSource Energy
- ICE ENERGY SOLUTIONS PVT LTD
- Thermofin
- Thermal Energy International Inc.
- Terrafore Technologies LLC
- EVAPCO, Inc.

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- Enphase Energy.
- Viking Cold Solutions, Inc.
- IMEC Electro Mechanical Engineering
- Waaree Energies Ltd.

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