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Automotive Battery Thermal Management Market Research Report—Global Forecast till 2030

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Description:

Automotive Battery Thermal Management Market Overview:

Automotive Battery Thermal Management Market Size was valued at USD 3.12 billion in 2022. The Automotive Battery Thermal Management market is projected to grow from USD 3.59 Billion in 2023 to USD 6.27 billion by 2030, exhibiting a compound annual growth rate (CAGR) of 13.02% during the forecast period (2023 - 2030). The control of the thermal behavior of battery cells is a critical function performed by the Battery Thermal Management System (BTMS). Manufacturers of battery thermal management systems are constantly experimenting with new materials, designs, arrangements, and technologies to enhance the durability and longevity of powertrain technology. Energy consumption of automotive electrical equipment poses a challenge for battery manufacturers. The adoption of the latest energy-efficient technologies is likely to be facilitated by stringent emission regulations, which will encourage leading battery manufacturers to upgrade their systems.

Automotive Battery Thermal Management Market Overview

Source: Secondary Research, Primary Research, MRFR Database and Analyst Review

Automotive Battery Thermal Management System Market Trends

Increase in demand for electric vehicles to boost market growth

Various government authorities around the world have undertaken numerous initiatives to encourage the sales of electric vehicles. For instance, the US federal government is offering incentives such as tax breaks, fleet acquisition, manufacturing support, and R&D funding. Similarly, the Indian government is actively promoting the adoption of electric vehicles by providing incentives for building charging infrastructure, manufacturing EV batteries domestically, and producing electric components. Moreover, several governing bodies in emerging economies are implementing strategic policies to transition from internal combustion engines (ICE) to electric vehicles, in order to improve the air quality in densely populated areas. Therefore, the favorable government initiatives are anticipated to boost the growth of the global automotive battery thermal management market in the forecast period.

The increasing preference for advanced technology-based vehicles, particularly those that are lightweight, is expected to fuel the growth of the global automotive battery thermal management market. Industry leaders and customers alike tend to favor the use of lithium-ion battery technology in vehicles for various applications, given its higher energy density, longer battery life cycle, and superior resilience. Similarly, companies rely on these batteries in thermal battery management systems to ensure proper functioning and safety. Automakers have started to incorporate these batteries in various applications such as electronic devices, EVs, and industrial machinery. Furthermore, these batteries can detect various types of malfunctions, such as excessive temperature rise and electric leaks, as well as monitor the state of charge at different temperatures in the charging/discharging environment. The COVID-19 pandemic has prompted many developing countries, including India, to encourage local production of li-ion batteries and automotive battery thermal management systems. As a result, countries are now moving towards local production of all components and raw materials, rather than relying on China for Li-ion batteries, electronic components, and other requirements. These steps, along with supportive government policies and infrastructure development, are expected to drive the demand for the Battery Thermal Management market in the coming years.

Automotive Battery Thermal Management Market Segment Insights:

Automotive Battery Thermal Management Technology Insights

The Automotive Battery Thermal Management Market is segmented based on its application into Air, Liquid, Phase Change Material, and Thermo Electrics. The Liquid segment is projected to have the highest CAGR and dominate the Automotive Battery Thermal Management market share during the forecast period. The liquid battery cooling system relies on a flat heat pipe and offers an excellent thermal management effect on a single battery pack, making it the most efficient way to dissipate heat from the battery pack. Liquid coolants have higher heat capacity and conductivity than air, making them the optimal choice for maintaining battery temperature. Thermal management systems mainly use two types of liquids: direct-contact and indirect-contact liquid. Direct-contact liquids, such as mineral oil, come into direct contact with battery cells, while indirect-contact liquids, like a mixture of water and ethylene glycol, contact battery cells indirectly

January 2021: Robert Bosch GmbH utilized intelligent thermal management to increase the range of electric vehicles by up to 25%. To accomplish this, the company combined a heat pump with innovative coolant pumps and valves, enabling precise distribution of heat and cold within the vehicle

Automotive Battery Thermal Management Propulsion Insights

The Automotive Battery Thermal Management Market is segmented based on applications into Hybrid Electric Vehicles, Battery Electric Vehicles, Plug-in Hybrid Electric Vehicles, and Fuel Cell Vehicles. The Hybrid Electric Vehicles segment is projected to have the highest CAGR and dominate the Automotive Battery Thermal Management market share during the forecast period. Hybrid Electric Vehicles use a combination of fuel injection and electricity to operate, with the battery helping to use fuel more efficiently while being recharged by the fuel. These vehicles cannot be charged via a plug but rely on regenerative braking and internal combustion engines for recharging. Modern hybrid vehicles come equipped with technologies such as regenerative brakes and start-stop systems to improve their efficiency. The increasing focus on reducing emission levels and improving vehicle fuel economy is driving the demand for hybrid electric vehicles. For example, the Road and Transport Authority of Dubai has announced plans to convert 50% of the emirate's taxis to hybrid vehicles by 2021.

Figure 2: Global Automotive Battery Thermal Management Market, by Propulsion, 2022 & 2030 (USD Billion)

Source: Secondary Research, Primary Research, MRFR Database and Analyst Review

Automotive Battery Thermal Management System Regional Insights

The Automotive Battery Thermal Management Market is segmented into North America, Europe, Asia-Pacific, Middle East & Africa, and South America regions. Asia-Pacific is projected to hold the largest revenue market share during the forecast period. This region is the largest Automotive Battery Thermal Management market for automobiles and comprises both emerging and developed economies. With a high focus on reducing carbon emissions and electrifying transportation, the use of electric vehicles in Asia-Pacific is prevalent. Governments have incentivized the adoption of electric vehicles through subsidies and tax exemptions, further driving the growth of the automotive battery thermal management market in the region.

Figure 3: Global Automotive Battery Thermal Management Market Share By Region 2022 (%)

Source: Secondary Research, Primary Research, MRFR Database and Analyst Review

In Europe, the European Union (EU) is leading the development of a sustainable circular economy and carbon-free transport system. The manufacturers in Europe have adopted two different approaches for developing electric vehicle models: conversion and purpose. The "conversion" approach involves incorporating new technology such as electric motors and batteries into existing models, while the "purpose" approach involves developing new vehicles that incorporate the latest technologies. These approaches allow manufacturers to install electric drives in cars, driving the growth of the European automotive battery thermal management market. Additionally, the EU has regulated two policies to regulate average CO2 emissions for new passenger vehicles and vans.

Automotive Battery Thermal Management Key Market Players & Competitive Insights

Major market players are spending a lot of money on R&D to increase their product lines, which will help the Automotive Battery Thermal Management market grow even more. The Automotive Battery Thermal Management Market participants are also taking a range of strategic initiatives to grow their worldwide footprint, including new product launches, contractual agreements, mergers and acquisitions, increased investments, and collaboration with other organizations. Competitors in the automotive battery thermal management industry must offer cost-effective items to expand and survive in an increasingly competitive and rising market environment. The automotive battery thermal management market is characterized by intense competition, with players vying for greater market share. The market is challenged by factors such as rapid technological advancements, changes in government policies, and strict environmental regulations, which could impede its growth. In this competitive landscape, vendors are competing based on product quality, reliability, cost, and aftermarket services. To remain viable and thrive in this environment, vendors must deliver products

that are both cost-effective and efficient.

Hanon system is the world's leading automotive supplier and expertise in automotive battery thermal management solution supplier company. The company has pioneered in providing a wide product portfolio specializing in thermal and energy management. The company started offering its wide range of products, including thermal battery management, to support vehicle manufacturers supplying electric, fuel cell, hybrid, and autonomous vehicles to the global Automotive Battery Thermal Management market.

Key Companies in the Automotive Battery Thermal Management market includes

- LG Chem (South Korea)
- Continental (Germany)
- GenTherm (U.S.)
- Robert Bosch (Germany)
- Valeo (France)
- Calsonic Kansei (Japan)
- DANA (U.S.)
- Hanon Systems (Korea)
- Samsung SDI (Korea)
- Mahle (Germany)
- VOSS Automotive (Germany)
- CapTherm Systems (Canada) among others

Automotive Battery Thermal Management Industry Developments

November 2022: *Denso Corp. released a new LD9 electric thermal management unit for buses and coaches with zero emissions during the Bus & Coach Expo in Sydney, Australia.*

August 2022: *BorgWarner Inc. secured two contracts in August 2022, one from a global automaker and the other from a Chinese automaker, to supply its state-of-the-art High-Voltage Coolant Heater (HVCH) technology for their upcoming electric vehicle (EV) models.*

April 2022*: Apr 2022: Hanon Systems announced to relocate its manufacturing facility in Turkey from Gebze to Dilovasi.*

March 2022: *Hanon Systems opened a new plant in Huchai, China in March 2022, dedicated to the production of heating, ventilation, and air conditioning (HVAC) modules for electric vehicle*

March 2021: *Dana Limited announced its acquisition of Pi Innovo LLC in March 2021, with the aim of improving its in-house electrodynamics capabilities and electrification product line.*

Automotive Battery Thermal Management Market Segmentation:

By Technology Outlook

- Air
- Liquid
- Phase Change Material
- Thermo Electrics

Propulsion Outlook

- Hybrid Electric Vehicles
- Battery Electric Vehicles
- Plug-in Hybrid Electric Vehicles
- Fuel Cell Vehicle

Vehicle Type Outlook

- Passenger Cars
- Commercial Vehicle

Regional Outlook

- North America
    - US
    - Canada
- Europe
    - Germany
    - France
    - UK
    - Italy
    - Spain
    - Rest of Europe
- Asia-Pacific
    - China
    - Japan
    - India
    - Australia
    - South Korea
    - Australia
    - Rest of Asia-Pacific
- South America
    - Brazil
    - Argentina
    - Rest Of South America
- Middle East & Africa

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