

# **Electric Vehicle (Ev) Thermal System Market Forecasts to 2032 – Global Analysis By Component (Radiators, Heat Exchangers, Compressors, Condensers, Cooling Pumps, Fans & Blowers, Thermal Management Units, Thermostats, HVAC Units and Other Components), Vehicle Type, Technology, End User and By Geography**

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## **Abstracts**

According to Statistics MRC, the Global Electric Vehicle (Ev) Thermal System Market is accounted for \$10.22 billion in 2025 and is expected to reach \$14.79 billion by 2032 growing at a CAGR of 5.42% during the forecast period. The thermal system of an electric vehicle (EV) is an essential component that controls the vehicle's internal temperature for maximum comfort, safety, and performance. It controls the temperature of important parts such the electric motor, battery, power electronics, and cabin. Battery longevity, overheating, and freezing are all reduced by efficient thermal management. Heat exchangers, pumps, refrigerants, and sensors are some of the parts of the system. By maintaining ideal temperature ranges, the EV thermal system assures energy efficiency, dependable operation, and passenger comfort under diverse driving and climatic situations.

Market Dynamics:

Driver:

Growth in EV adoption worldwide

Automakers are concentrating on maximising battery performance and safety through

sophisticated thermal management as more consumers and governments place a higher priority on sustainable transportation. Vehicle range is increased and battery longevity is prolonged with the aid of efficient thermal systems. Innovation in cooling and heating technologies as well as market expansion are being driven by this greater focus on thermal solutions. The market for thermal systems is also being driven by tighter environmental laws and growing consumer demands for EV performance. All things considered, the widespread use of EVs serves as a major stimulant for the development and advancement of EV thermal systems technology.

#### Restraint:

##### High cost of advanced thermal systems

The high cost of sophisticated thermal systems necessitates costly materials and innovative technology, raising the total cost of the vehicle. Manufacturers might be reluctant to implement them extensively as a result, which would impede market growth. Additionally, buyers are less inclined to spend more for EVs with pricey thermal management systems. Furthermore, the incorporation of these systems into reasonably priced EV cars may be delayed due to high expenses. In the end, this cost barrier limits wider acceptance and innovation in the field of EV thermal systems.

#### Opportunity:

##### Government support for localization and R&D:

Governments incentivise firms to make sophisticated heat management solutions locally by offering subsidies and financial incentives. This assistance shortens supply chains and lowers production costs, increasing competitiveness. R&D expenditures encourage innovation, which results in more dependable and effective thermal systems for EVs. Government initiatives that support sustainability and clean energy also raise consumer demand for better EV technologies. All things considered, this support speeds up the EV thermal system industry's technological adoption and commercial expansion.

#### Threat:

##### Risk of technological obsolescence

The speedy development of cooling and battery technologies can quickly make thermal solutions that are currently in use obsolete. Long-term investments in current designs

are discouraged by this risk because businesses worry that their products may soon become outdated. Furthermore, ongoing innovation necessitates ongoing R&D expenditures, which drive up expenses and squeeze profit margins. Additionally, it makes inventory management and supply chain planning more difficult, which could result in losses. In general, corporations become cautious and less eager to completely commit when technology becomes outdated, which inhibits market growth.

### Covid-19 Impact

The COVID-19 pandemic significantly disrupted the electric vehicle (EV) thermal system market. Supply chain interruptions, factory shutdowns, and reduced consumer demand led to production delays and decreased sales. R&D investments were temporarily stalled as companies prioritized essential operations. However, the crisis also accelerated interest in sustainable transportation, prompting governments to support EV adoption through incentives. As markets stabilized, the demand for efficient thermal systems rebounded, driven by growing EV sales and increased focus on vehicle safety and battery performance.

The radiators segment is expected to be the largest during the forecast period

The radiators segment is expected to account for the largest market share during the forecast period by batteries and power electronics. As EVs rely on lithium-ion batteries that operate optimally within a specific temperature range, radiators ensure efficient thermal regulation to extend battery life and performance. Advanced radiator technologies help maintain thermal stability during fast charging and high-load driving conditions. Their integration with other thermal components, like cooling loops and heat exchangers, enhances overall system efficiency. Growing EV adoption and stricter thermal management requirements are thus driving increased demand for high-performance radiators.

The two-wheelers segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the two-wheelers segment is predicted to witness the highest growth rate, due to its rapidly expanding user base worldwide. Efficient thermal management is critical for two-wheelers to maintain battery performance and safety in compact designs. Increasing government incentives and rising consumer adoption of electric scooters and motorcycles boost demand for advanced thermal systems. Additionally, the need for lightweight and cost-effective cooling solutions aligns well with

the two-wheeler market requirements. Overall, two-wheelers significantly propel market growth by pushing innovation and volume demand in EV thermal technologies.

Region with largest share:

During the forecast period, the Asia Pacific region is expected to hold the largest market share due to massive EV production, growing environmental concerns, and strong government policies, particularly in China, Japan, and South Korea. The region benefits from a robust supply chain, cost-effective manufacturing, and the presence of major battery manufacturers. Increasing urbanization and government subsidies for electric mobility enhance market demand. Innovative thermal management solutions are being developed to address hot climates and energy efficiency. Expansion of local automakers and exports is further propelling the regional market growth.

Region with highest CAGR:

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR by rising EV adoption, stringent emission regulations, and advancements in battery technology. Major automakers are integrating sophisticated cooling systems to boost vehicle performance and battery longevity. Government incentives and investment in EV infrastructure further support growth. The U.S. leads the region with high R&D spending and collaborations between tech companies and automotive OEMs. Demand for efficient HVAC and battery cooling modules is accelerating as range, safety, and thermal comfort become key priorities.

Key players in the market

Some of the key players profiled in the Electric Vehicle (Ev) Thermal System Market include Denso Corporation, Valeo SA, MAHLE GmbH, Hanon Systems, BorgWarner Inc., Robert Bosch GmbH, Gentherm Inc., Dana Incorporated, LG Chem Ltd., Continental AG, Modine Manufacturing Company, VOSS Automotive GmbH, Calsonic Kansei Corporation, Eberspacher Group, Sanden Holdings Corporation, Delphi Technologies, Johnson Electric Holdings Limited and Schaeffler AG.

Key Developments:

In October 2024, Valeo introduced the Smart Heat Pump Dual, a compact module integrating both refrigerant and coolant loops. This all-in-one solution aims to optimize energy efficiency and cabin comfort in EVs, potentially extending driving range by up to

30% in winter conditions.

In February 2024, DENSO partnered with Betterfrost and the Ontario Vehicle Innovation Network (OVIN) to develop a low-energy defrost and defog system for EVs. This technology aims to use 20 times less energy than current solutions, enhancing energy efficiency and extending EV range in extreme weather conditions.

In January 2024, Valeo and Teledyne FLIR entered into a strategic collaboration to integrate thermal imaging technology into automotive safety systems. This partnership aims to enhance night vision capabilities in advanced driver-assist systems (ADAS), improving safety for both passenger and commercial vehicles.

#### Components Covered:

Radiators

Heat Exchangers

Compressors

Condensers

Cooling Pumps

Fans & Blowers

Thermal Management Units

Thermostats

HVAC Units

Other Components

#### Vehicle Types Covered:

Battery Electric Vehicles (BEVs)

Hybrid Electric Vehicles (HEVs)

Plug-in Hybrid Electric Vehicles (PHEVs)

Fuel Cell Electric Vehicles (FCEVs)

Technologies Covered:

Air Cooling System

Liquid Cooling System

Phase Change Material (PCM) Cooling

Thermoelectric Cooling System

Integrated Thermal Management System

End Users Covered:

Passenger Cars

Commercial Vehicles

Two-Wheelers

Other End Users

Regions Covered:

North America

US

Canada

Mexico

Europe

Germany

UK

Italy

France

Spain

Rest of Europe

Asia Pacific

Japan

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

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 2024, 2025, 2026, 2028, and 2032
- 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

## Contents

### **1 EXECUTIVE SUMMARY**

### **2 PREFACE**

- 2.1 Abstract
- 2.2 Stake Holders
- 2.3 Research Scope
- 2.4 Research Methodology
  - 2.4.1 Data Mining
  - 2.4.2 Data Analysis
  - 2.4.3 Data Validation
  - 2.4.4 Research Approach
- 2.5 Research Sources
  - 2.5.1 Primary Research Sources
  - 2.5.2 Secondary Research Sources
  - 2.5.3 Assumptions

### **3 MARKET TREND ANALYSIS**

- 3.1 Introduction
- 3.2 Drivers
- 3.3 Restraints
- 3.4 Opportunities
- 3.5 Threats
- 3.6 Technology Analysis
- 3.7 End User Analysis
- 3.8 Emerging Markets
- 3.9 Impact of Covid-19

### **4 PORTERS FIVE FORCE ANALYSIS**

- 4.1 Bargaining power of suppliers
- 4.2 Bargaining power of buyers
- 4.3 Threat of substitutes
- 4.4 Threat of new entrants
- 4.5 Competitive rivalry

## **5 GLOBAL ELECTRIC VEHICLE (EV) THERMAL SYSTEM MARKET, BY COMPONENT**

- 5.1 Introduction
- 5.2 Radiators
- 5.3 Heat Exchangers
- 5.4 Compressors
- 5.5 Condensers
- 5.6 Cooling Pumps
- 5.7 Fans & Blowers
- 5.8 Thermal Management Units
- 5.9 Thermostats
- 5.10 HVAC Units
- 5.11 Other Components

## **6 GLOBAL ELECTRIC VEHICLE (EV) THERMAL SYSTEM MARKET, BY VEHICLE TYPE**

- 6.1 Introduction
- 6.2 Battery Electric Vehicles (BEVs)
- 6.3 Hybrid Electric Vehicles (HEVs)
- 6.4 Plug-in Hybrid Electric Vehicles (PHEVs)
- 6.5 Fuel Cell Electric Vehicles (FCEVs)

## **7 GLOBAL ELECTRIC VEHICLE (EV) THERMAL SYSTEM MARKET, BY TECHNOLOGY**

- 7.1 Introduction
- 7.2 Air Cooling System
- 7.3 Liquid Cooling System
- 7.4 Phase Change Material (PCM) Cooling
- 7.5 Thermoelectric Cooling System
- 7.6 Integrated Thermal Management System

## **8 GLOBAL ELECTRIC VEHICLE (EV) THERMAL SYSTEM MARKET, BY END USER**

- 8.1 Introduction
- 8.2 Passenger Cars
- 8.3 Commercial Vehicles

8.4 Two-Wheelers

8.5 Other End Users

## **9 GLOBAL ELECTRIC VEHICLE (EV) THERMAL SYSTEM MARKET, BY GEOGRAPHY**

9.1 Introduction

9.2 North America

9.2.1 US

9.2.2 Canada

9.2.3 Mexico

9.3 Europe

9.3.1 Germany

9.3.2 UK

9.3.3 Italy

9.3.4 France

9.3.5 Spain

9.3.6 Rest of Europe

9.4 Asia Pacific

9.4.1 Japan

9.4.2 China

9.4.3 India

9.4.4 Australia

9.4.5 New Zealand

9.4.6 South Korea

9.4.7 Rest of Asia Pacific

9.5 South America

9.5.1 Argentina

9.5.2 Brazil

9.5.3 Chile

9.5.4 Rest of South America

9.6 Middle East & Africa

9.6.1 Saudi Arabia

9.6.2 UAE

9.6.3 Qatar

9.6.4 South Africa

9.6.5 Rest of Middle East & Africa

## **10 KEY DEVELOPMENTS**

- 10.1 Agreements, Partnerships, Collaborations and Joint Ventures
- 10.2 Acquisitions & Mergers
- 10.3 New Product Launch
- 10.4 Expansions
- 10.5 Other Key Strategies

## **11 COMPANY PROFILING**

- 11.1 Denso Corporation
- 11.2 Valeo SA
- 11.3 MAHLE GmbH
- 11.4 Hanon Systems
- 11.5 BorgWarner Inc.
- 11.6 Robert Bosch GmbH
- 11.7 Gentherm Inc.
- 11.8 Dana Incorporated
- 11.9 LG Chem Ltd.
- 11.10 Continental AG
- 11.11 Modine Manufacturing Company
- 11.12 VOSS Automotive GmbH
- 11.13 Calsonic Kansei Corporation
- 11.14 Eberspacher Group
- 11.15 Sanden Holdings Corporation
- 11.16 Delphi Technologies
- 11.17 Johnson Electric Holdings Limited
- 11.18 Schaeffler AG

## List Of Tables

### LIST OF TABLES

Table 1 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Region (2024-2032) (\$MN)

Table 2 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Component (2024-2032) (\$MN)

Table 3 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Radiators (2024-2032) (\$MN)

Table 4 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Heat Exchangers (2024-2032) (\$MN)

Table 5 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Compressors (2024-2032) (\$MN)

Table 6 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Condensers (2024-2032) (\$MN)

Table 7 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Cooling Pumps (2024-2032) (\$MN)

Table 8 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Fans & Blowers (2024-2032) (\$MN)

Table 9 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Thermal Management Units (2024-2032) (\$MN)

Table 10 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Thermostats (2024-2032) (\$MN)

Table 11 Global Electric Vehicle (Ev) Thermal System Market Outlook, By HVAC Units (2024-2032) (\$MN)

Table 12 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Other Components (2024-2032) (\$MN)

Table 13 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Vehicle Type (2024-2032) (\$MN)

Table 14 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Battery Electric Vehicles (BEVs) (2024-2032) (\$MN)

Table 15 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Hybrid Electric Vehicles (HEVs) (2024-2032) (\$MN)

Table 16 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Plug-in Hybrid Electric Vehicles (PHEVs) (2024-2032) (\$MN)

Table 17 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Fuel Cell Electric Vehicles (FCEVs) (2024-2032) (\$MN)

Table 18 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Technology

(2024-2032) (\$MN)

Table 19 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Air Cooling System (2024-2032) (\$MN)

Table 20 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Liquid Cooling System (2024-2032) (\$MN)

Table 21 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Phase Change Material (PCM) Cooling (2024-2032) (\$MN)

Table 22 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Thermoelectric Cooling System (2024-2032) (\$MN)

Table 23 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Integrated Thermal Management System (2024-2032) (\$MN)

Table 24 Global Electric Vehicle (Ev) Thermal System Market Outlook, By End User (2024-2032) (\$MN)

Table 25 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Passenger Cars (2024-2032) (\$MN)

Table 26 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Commercial Vehicles (2024-2032) (\$MN)

Table 27 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Two-Wheelers (2024-2032) (\$MN)

Table 28 Global Electric Vehicle (Ev) Thermal System Market Outlook, By Other End Users (2024-2032) (\$MN)

Note: Tables for North America, Europe, APAC, South America, and Middle East & Africa Regions are also represented in the same manner as above.

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