

# **Heavy-Duty EV Powertrain Market Forecasts to 2032 – Global Analysis By Component (Traction Motors, Power Controllers, Inverters, Transmission Systems, E-Axles and Battery Packs for Heavy EVs), Charging Interface, Propulsion Type, Application, End User, and By Geography.**

<https://marketpublishers.com/r/H71E9E717F9FEN.html>

Date: January 2026

Pages: 200

Price: US\$ 4,150.00 (Single User License)

ID: H71E9E717F9FEN

## **Abstracts**

According to Statistics MRC, the Global Heavy-Duty EV Powertrain Market is accounted for \$54.5 billion in 2025 and is expected to reach \$99.6 billion by 2032 growing at a CAGR of 9% during the forecast period. A heavy-duty EV powertrain is an advanced integrated system combining electric motors, high-capacity batteries, inverters, and drivetrains to propel large commercial vehicles. Engineered for high torque output, durability, and extended driving range, it enables the electrification of freight, logistics, and public transport fleets. Intelligent thermal management ensures safe operation under heavy loads, while regenerative braking enhances energy efficiency and reduces wear. Together, these technologies deliver resilience, sustainability, and performance, positioning heavy-duty EV powertrains as essential for the transition to cleaner transportation.

### **Market Dynamics:**

Driver:

Emission mandates for commercial fleets

Stringent global emission mandates are accelerating the transition of commercial fleets toward electrification. Governments are enforcing stricter CO<sub>2</sub> reduction targets,

compelling logistics, mining, and public transport operators to adopt heavy-duty EV powertrains. These regulations drive demand for zero-emission trucks and buses, while incentivizing OEMs to innovate in battery technology, charging infrastructure, and hybrid solutions. Compliance pressures, combined with corporate sustainability goals, position emission mandates as a powerful driver reshaping fleet strategies and catalyzing large-scale adoption of heavy-duty EV platforms.

Restraint:

Thermal management and range limitations

Thermal management challenges and limited driving range remain critical restraints for heavy-duty EV powertrains. High-capacity batteries generate significant heat under heavy loads, requiring advanced cooling systems to prevent degradation and ensure safety. Range limitations hinder long-haul applications, restricting adoption in freight and logistics sectors. Frequent charging interrupts operational efficiency, while battery weight reduces payload capacity. Without breakthroughs in energy density, fast-charging, and thermal solutions, these technical barriers will continue to slow widespread deployment of heavy-duty EVs in demanding commercial environments.

Opportunity:

OEM partnerships with chipmakers and cloud

OEM partnerships with chipmakers and cloud providers present transformative opportunities for heavy-duty EV powertrains. Advanced processors and AI-driven platforms enable predictive maintenance, fleet optimization, and real-time energy management. Cloud integration supports scalable data analytics, enhancing performance and reducing downtime. Collaborations accelerate innovation in autonomous driving, smart charging, and connected logistics ecosystems. By leveraging semiconductor expertise and digital infrastructure, OEMs can deliver differentiated solutions, strengthen competitiveness, and unlock new revenue streams, positioning heavy-duty EVs as intelligent, efficient, and future-ready assets.

Threat:

ICE retrofits delaying full electrification

Internal combustion engine (ICE) retrofits pose a significant threat to heavy-duty EV

adoption. Many fleet operators opt for retrofitting existing diesel vehicles with emission-reduction technologies instead of investing in costly EV transitions. Retrofits provide short-term compliance at lower capital expenditure, delaying full electrification and undermining EV market momentum. This trend risks slowing infrastructure investment and technological innovation. Unless stricter mandates and incentives favor complete electrification, ICE retrofits could prolong fossil fuel dependence, challenging the pace of heavy-duty EV powertrain transformation.

### **Covid-19 Impact:**

COVID-19 significantly disrupted the Heavy-Duty EV Powertrain Market, causing delays in manufacturing, R&D, and large-scale fleet electrification projects due to lockdowns and supply chain interruptions. OEMs faced shortages of batteries, semiconductors, and rare earth materials, slowing product launches and increasing costs. However, the pandemic highlighted the importance of resilient, low-emission transport as logistics demand surged. Post-pandemic recovery plans and stricter emission mandates reignited interest in electrified heavy-duty fleets, positioning EV powertrains as critical to sustainable freight and public transport transformation.

The battery packs for heavy EVS segment is expected to be the largest during the forecast period

The battery packs for heavy EVS segment is expected to account for the largest market share during the forecast period, due to their central role in vehicle propulsion and energy storage. These packs enable long-range operation, high torque delivery, and compatibility with regenerative braking systems. Advances in energy density, thermal management, and fast-charging capabilities are driving OEM adoption. As fleet operators prioritize electrification, demand for robust, scalable battery solutions tailored to heavy-duty applications continues to surge, securing this segment's dominance across global markets.

The Combined Charging System CCS segment is expected to have the highest CAGR during the forecast period

Over the forecast period, the Combined Charging System CCS segment is predicted to witness the highest growth rate, driven by its universal compatibility, high-power delivery, and growing standardization across commercial EV platforms. CCS supports both AC and DC charging, making it ideal for depot and en-route applications. As governments and OEMs converge on CCS as the preferred interface, infrastructure

deployment accelerates. Its ability to support ultra-fast charging for heavy-duty vehicles positions CCS as the backbone of scalable, interoperable charging ecosystems worldwide.

### **Region with largest share:**

During the forecast period, the Asia Pacific region is expected to hold the largest market share, fueled by aggressive electrification policies, high-volume manufacturing, and rapid urbanization. Countries like China, Japan, and South Korea are investing heavily in EV infrastructure, battery production, and domestic OEM capabilities. The region benefits from cost-effective labor, favorable regulations, and strong demand for commercial transport electrification. Strategic partnerships and government subsidies further reinforce Asia Pacific's leadership in heavy-duty EV powertrain deployment and innovation.

### **Region with highest CAGR:**

Over the forecast period, the North America region is anticipated to exhibit the highest CAGR, driven by stringent emission regulations, federal incentives, and rising demand for sustainable freight solutions. Electrification of logistics fleets, especially in urban and long-haul segments, is accelerating. Investments in megawatt charging corridors, battery manufacturing, and AI-enabled powertrain optimization are reshaping the landscape. Collaboration between automakers, utilities, and tech firms is fostering rapid innovation, making North America a hotspot for next-generation heavy-duty EV powertrain growth.

### **Key players in the market**

Some of the key players in Heavy-Duty EV Powertrain Market include Continental AG, Magna International, Rivian, Hyundai Motor Group, AVL, Bosch, Dana Incorporated, Proterra, BYD, Tritium, Cummins Inc., Daimler Truck, ZF Friedrichshafen AG, Volvo Group, Meritor, and Siemens.

### **Key Developments:**

In November 2025, Continental unveiled its next-gen eAxle system for heavy-duty trucks, delivering higher torque efficiency, reduced emissions, and improved durability, reinforcing its leadership in electrified commercial vehicle powertrain technologies worldwide.

In October 2025, Magna introduced a modular heavy-duty EV powertrain platform, enabling OEMs flexible integration across buses and trucks. The innovation enhances scalability, efficiency, and sustainability, supporting global electrification of commercial fleets.

In September 2025, Rivian announced its heavy-duty EV drivetrain expansion, targeting commercial delivery trucks and long-haul applications. The system emphasizes extended range, fast charging, and rugged reliability, strengthening Rivian's footprint in fleet electrification.

#### Components Covered:

Traction Motors

Power Controllers

Inverters

Transmission Systems

E-Axles

Battery Packs for Heavy EVs

#### Charging Interfaces Covered:

Combined Charging System CCS

Megawatt Charging System MCS

Pantograph Charging

Wireless Inductive Charging

#### Propulsion Types Covered:

Battery-Electric Powertrains

Fuel-Cell Electric Powertrains

Hybrid Heavy-Duty Powertrains

Extended-Range Powertrains

#### Applications Covered:

Freight Transport

Industrial Hauling

Construction Operations

Municipal Services

#### End User Covered:

Logistics Companies

Fleet Operators

Commercial Vehicle OEMs

Public Transport Agencies

Mining & Construction Firms

#### 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

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