

# **Electric Vehicle Range Extender Market Report by Type (Fuel Cell Range Extender, ICE Range Extender, and Others), Component (Battery Pack, Power Converter, Generator, Electric Motor), Vehicle Type (Passenger Vehicle, Commercial Vehicle), and Region 2024-2032**

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## **Abstracts**

The global electric vehicle (ev) range extender market size reached US\$ 1.5 Billion in 2023. Looking forward, IMARC Group expects the market to reach US\$ 3.4 Billion by 2032, exhibiting a growth rate (CAGR) of 9.5% during 2024-2032. The rising need for eliminating the consumption of fossil fuels, owing to the increasing consumer environmental consciousness, is primarily augmenting the market.

**Electric Vehicle Range Extender Market Analysis:**

**Major Market Drivers:** The escalating demand for a considerable alternative to conventional vehicles, as they significantly contribute to noise and atmospheric pollution, is one of the key drivers fueling the market. Moreover, the shifting consumer preferences towards hybrid electric vehicles (HEVs) are also acting as significant growth-inducing factors.

**Key Market Trends:** The introduction of clean electric vehicle range extenders that offer electric propulsion with zero local carbon dioxide (CO<sub>2</sub>) emissions is stimulating the market. Apart from this, they are gaining traction, as they include solid oxide fuel cells (SOFCs) and micro gas turbines, which are compact and cost-effective, can be paired with an EV platform, provide high power density, etc.

**Competitive Landscape:** Some of the prominent companies in the global market include AB Volvo, AVL, Ballard Power Systems Inc., Bayerische Motoren Werke AG, Ceres Power, Emiss Mobile Systems B.V. (Precision Camshafts Limited), General Motors

Company, Magna International Inc., MAHLE GmbH, Nissan Motor Co. Ltd. (Groupe Renault), and Rheinmetall AG, among many others.

**Challenges and Opportunities:** One of the primary challenges hindering the market is the high cost of current technologies. However, the launch of more price-effective and optimal electric vehicle range extenders is expected to bolster the market in the coming years.

### Electric Vehicle Range Extender Market Trends: Growing Technological Advancements

Continuous innovations, including the introduction of hybrid range extender systems that combine internal combustion engines (ICE) with electric power, are augmenting the market. For example, in April 2024, Mazda launched a plug-in hybrid MX-30 that offers up to 400 miles of range at highway speed. Moreover, hybrid systems utilize a small ICE to generate electricity and charge the battery on the go, thereby extending the vehicle's range without relying solely on the electric drivetrain. For instance, in March 2024, Maruti announced its plan to unveil its series of hybrid technology, also referred to as range-extenders or self-charging electric vehicles, in India, in more affordable offerings like the Fronx, next-gen Baleno, and next-gen Swift. Additionally, in June 2024, Stellantis, one of the SUV brands, expanded the number of electrified powertrains across its lineup, which comprises extended-range plug-in hybrid versions of the Wagoneer and Grand Wagoneer. Apart from this, the elevating consumer inclination towards more sustainable electric mobility solutions is anticipated to stimulate the electric vehicle range extender market revenue over the forecasted period. For example, in May 2024, HORSE, one of the providers of low-emissions powertrain systems, launched its latest range extender technology for passenger and light commercial vehicles. This new power train offers a 200km pure-electric range, with an additional 600km provided by the engine.

### Demand for Improved Batteries

Significant improvements in battery technology are strengthening the market. For example, in September 2023, Geely's sub-brand, Farizon Auto, introduced its SuperVan commercial EV with a high-voltage swappable battery. It also features a methanol range extender and uses drive-by-wire technology. Moreover, in October 2023, Xiaomi launched its first EV in both electric and extended-range versions. Apart from this, the escalating demand for lithium-sulfur batteries and solid-state batteries, as they aid in reducing weight, increasing energy density, enhancing overall efficiency, etc., is also acting as another growth-inducing factor. For instance, in June 2024, a research team

at the University of Southern California (USC) pioneered advancements in lithium-sulfur battery technology with a US\$1 Million research grant from NantG Power, a California-based company. These advancements are critical as they directly impact the performance and range of EVs, which represents one of the electric vehicle range extender market's recent opportunities. In June 2024, Hyundai Transys, a components subsidiary of Hyundai Motor Group, signed a ten-year contract to supply its integrated electric drive system (EDS) to Ceer Motors, a newly established battery electric vehicle (BEV) manufacturer based in Saudi Arabia.

### Government Incentives

Government policies are offering tax breaks, subsidies, and other incentives to promote the adoption of electric vehicles and the development of supporting technologies like range extenders. For instance, in May 2024, the Government of India launched an electric vehicle incentive program to offer financial incentives for the purchase of electric three-wheelers and two-wheelers. Moreover, the development of supporting technologies like range extenders is also positively influencing the electric vehicle range extender market outlook. For example, in February 2024, regulatory bodies in Indonesia introduced a series of initiatives to purchase imported and locally produced EVs. Apart from this, the implementation of stricter emission regulations is pushing manufacturers to innovate and invest in cleaner, more efficient range extender solutions. In December 2023, Virginia-based REVO ZERO, one of the start-up hydrogen infrastructure and solutions providers, launched its electric vehicle SUV, ENERGY, which packages an EV battery pack with a Nuvera hydrogen fuel cell range extender.

### Global Electric Vehicle Range Extender Industry Segmentation:

IMARC Group provides an analysis of the key trends in each segment of the market, along with the electric vehicle range extender market forecast at the global, regional, and country levels for 2024-2032. Our report has categorized the market based on the type, component, and vehicle type.

### Breakup by Type:

- Fuel Cell Range Extender
- ICE Range Extender
- Others

The report has provided a detailed breakup and analysis of the market based on the type. This includes fuel cell range extender, ICE range extender, and others.

Fuel cell range extenders generate electricity through a chemical reaction between hydrogen and oxygen, providing a clean and efficient way to increase the range of EVs with minimal environmental impact. These systems are particularly appealing due to their ability to produce only water as a byproduct. For example, in November 2023, Daimler Buses delivered the first series vehicles of the Mercedes-Benz eCitaro G fuel cell to Verkehrsbetriebe Rhein-Neckar-Verkehr (RNV) in Germany. ICE range extenders, on the other hand, utilize small, efficient internal combustion engines to generate electricity and recharge the vehicle's battery on the go, effectively extending the driving range. While not as environmentally friendly as fuel cells, ICE range extenders are advantageous due to the widespread availability of gasoline and diesel fuels. Other range extender solutions include auxiliary power units like micro gas turbines and advanced battery packs that can be swapped or recharged quickly. As per the electric vehicle range extender market statistics, these varied technologies cater to different market needs and preferences, offering flexibility and a range of options for consumers looking to mitigate range anxiety and enhance the practicality of electric vehicles.

#### Breakup by Component:

- Battery Pack
- Power Converter
- Generator
- Electric Motor

The report has provided a detailed breakup and analysis of the market based on the component. This includes battery pack, power converter, generator, and electric motor.

Electric vehicle range extenders consist of several critical components that work together to enhance the vehicle's driving range. The battery pack serves as the primary energy storage unit, storing electrical energy for the vehicle's operation and ensuring a reliable power source. The power converter plays a pivotal role by converting the electrical energy from the battery pack into the appropriate voltage and current levels needed by various vehicle systems. The generator, often powered by an internal combustion engine or a fuel cell, produces electricity to recharge the battery pack on the go or directly power the electric motor. The electric motor, which is the heart of the EV drivetrain, converts electrical energy into mechanical energy to propel the vehicle. This seamless integration of components ensures that the range extender effectively supplements the battery's energy, providing additional mileage and alleviating range

anxiety for drivers. According to the electric vehicle range extender market overview, each component must be optimized for efficiency and performance to ensure the overall effectiveness of the range extender system, ultimately enhancing the vehicle's practicality and appeal.

#### Breakup by Vehicle Type:

Passenger Vehicle  
Commercial Vehicle

The report has provided a detailed breakup and analysis of the market based on the vehicle type. This includes passenger vehicle and commercial vehicle.

Passenger vehicles equipped with range extenders aim to alleviate range anxiety and provide a seamless transition for consumers from traditional internal combustion engines to electric drivetrains. These vehicles often prioritize comfort, convenience, and efficiency, making range extenders an attractive feature for long-distance travel and daily commuting. On the other hand, commercial vehicles, including delivery vans, trucks, and buses, benefit significantly from range extenders due to their higher energy demands and the necessity for extended operational ranges. For commercial fleets, range extenders help reduce downtime associated with recharging, enhance route flexibility, and improve overall operational efficiency. They are particularly valuable in logistics and transportation sectors where reliability and long-distance capabilities are critical, which is elevating the electric vehicle range extender market's recent price. For instance, in January 2024, leading the way in zero-emission solutions, Stellantis Pro One introduced internal combustion engine, battery electric, hydrogen fuel cell, and range extender variants in the commercial vehicle industry.

#### Breakup by Region:

North America  
United States  
Canada  
Asia-Pacific  
China  
Japan  
India  
South Korea  
Australia

Indonesia  
Others  
Europe  
Germany  
France  
United Kingdom  
Italy  
Spain  
Russia  
Others  
Latin America  
Brazil  
Mexico  
Others  
Middle East and Africa

The market research report has also provided a comprehensive analysis of all the major regional markets, which include North America (the United States and Canada); Asia Pacific (China, Japan, India, South Korea, Australia, Indonesia, and others); Europe (Germany, France, the United Kingdom, Italy, Spain, Russia, and others); Latin America (Brazil, Mexico, and others); and the Middle East and Africa.

In North America, the electric vehicle range extender market demand is propelled by increasing government incentives and a strong focus on reducing carbon emissions, with companies like General Motors exploring range extender technologies for models like the Chevrolet Volt. The Asia Pacific region, particularly China and Japan, is experiencing rapid growth due to substantial investments in EV infrastructure and government initiatives promoting electric mobility. For example, in May 2024, the Government of India launched an electric vehicle incentive program to offer financial incentives for the purchase of electric three-wheelers and two-wheelers. Europe remains a significant player, with stringent emissions regulations and a strong push towards sustainability driving the adoption of range extenders in both passenger and commercial vehicles. BMW's i3 with a range extender option is a prime example. In the Middle East Africa, the increasing awareness of environmental issues and investments in clean energy projects are escalating the market.

#### Competitive Landscape:

The market research report has provided a comprehensive analysis of the competitive landscape. Detailed profiles of all major electric vehicle range extender market



companies have also been provided. Some of the key players in the market include:

AB Volvo  
AVL  
Ballard Power Systems Inc.  
Bayerische Motoren Werke AG  
Ceres Power  
Emoss Mobile Systems B.V. (Precision Camshafts Limited)  
General Motors Company  
Magna International Inc.  
MAHLE GmbH  
Nissan Motor Co. Ltd. (Groupe Renault)  
Rheinmetall AG

(Please note that this is only a partial list of the key players, and the complete list is provided in the report.)

#### Electric Vehicle Range Extender Market Developments:

June 2024: Hyundai Transys, a components subsidiary of Hyundai Motor Group, signed a ten-year contract to supply its integrated electric drive system (EDS) to Ceer Motors, a newly established battery electric vehicle (BEV) manufacturer based in Saudi Arabia.

May 2024: HORSE, one of the providers of low-emissions powertrain systems, launched its latest electric vehicle range extender technology for passenger and light commercial vehicles.

April 2024: Mazda introduced a plug-in hybrid range extender system equipped with optimal electric power.

#### Key Questions Answered in This Report:

How has the global electric vehicle range extender market performed so far and how will it perform in the coming years?

What has been the impact of COVID-19 on the global electric vehicle range extender market?

What are the key regional markets?

What is the breakup of the market based on the type?

What is the breakup of the market based on the component?

What is the breakup of the market based on the vehicle type?

What are the various stages in the value chain of the industry?

What are the key driving factors and challenges in the industry?

What is the structure of the global electric vehicle range extender market and who are

the key players?

What is the degree of competition in the industry?



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