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Navigating the challenges of electric vehicles

HSB, a Munich Re company, is a technology-driven company built on a foundation of specialty insurance, engineering, and technology, all working together to drive innovation in a modern world.

A lot has happened in the electric vehicle (EV) market since HSB began investigating the emerging use of electric vehicles a decade ago. At that time, most people weren't paying much attention. But now that everyone is aware of electric vehicles, many own one or know someone who does.

EV use is accelerating

There are several factors driving the growing popularity of EVs:

- Governments are supporting and subsidizing the use of EVs to become less dependent on non-renewable fossil fuels for transportation. This support is not only for personal use vehicles but also for business-use vehicles, including delivery trucks, school buses, and public transportation.
- The initial cost of EVs has dropped to an acceptable range to be considered by many consumers.
- Many different auto manufacturers are producing a wide range of vehicles to give consumers great choices.
- The charging infrastructure is developing and accounts for the short-range and long-range EV user requirements.
- Battery technology continues to advance to pack more energy into each cell.

Charging infrastructure is under construction

There are many people who love the idea of EVs but still may have what is called "range anxiety." This is the fear of not being able to go as many miles without recharging as compared to conventional gasoline-powered vehicles. Most people are aware of the existing gasoline station infrastructure that exists across the country that they can count on for refueling. By contrast, many have a hard time recalling where the nearest EV charging stations are along their travel routes.

Using your EV for long trips could present different charging challenges. Certain states may be further along than others when it comes to adopting and embracing EV technology and providing the charging infrastructure to support it. Various apps may be needed to map the route to pass charging facilities that can recharge your vehicle in a reasonable time.

Also, it's important that the EV charging providers maintain their charging equipment so that it's truly available and functional when you arrive. In addition, there are several types of charging plugs that are used, depending on the vehicle manufacturer. All available charging stations may not be compatible with your EV charge cord.

Getting charged up

Driving routines have a lot to do with how well EVs may work for you. If you use your personal EV for commuting to work at a reasonable distance each day, then it may be quite easy to install a charger in your home and use a charger installed at your workplace. The home charger can easily charge the vehicle battery overnight, and the workplace charger can do the same during the workday.

Level-2, AC charger for home/work. The most common charger arrangement for home or business use is called the Level-2, AC charger. This arrangement uses a charger built into the vehicle by the manufacturer. The home or business unit only provides electricity to the onboard vehicle charger. These work well when longer charge times are acceptable. They can be installed in homes or businesses using their typical utility electrical supply. The charger may require a plug like that used on a household electric range or dryer. These chargers have limited electrical supply, and it will take many hours for the battery to be recharged. In the daily work commute model, this is fine and would work without any problems.

Installing a large capacity plug for a charger may require a larger breaker panel and utility service for the house. This potential cost needs to be factored into the overall economics of owning an EV. Employers typically cover the cost to install the workplace AC chargers for the benefit of their employees. Some may provide free charging or use a provider that charges for the electricity consumed. AC chargers installed in public places may impose a fine if the EV is not removed from the charging station after its charging cycle is complete. This helps to free up the charger for others who are waiting to charge their vehicles.

DC fast charger for long distance/industrial use. The most common type of charger for long distance travel is called the DC fast charger. This charger is designed to quickly charge the battery in less than an hour. It delivers high amounts of energy directly to the battery and bypasses the onboard vehicle charger. DC fast chargers need a very large utility service that is commonly used for large commercial or industrial users. Because of this large power requirement, DC fast chargers are not used in homes. The charging rate tapers off as the battery gets closer to being fully charged. For this reason, most drivers are satisfied with getting the battery up to 80% charged before getting back on the road.

The EV charging infrastructure includes systems that easily accommodate the commuter driving model by using the Level-2 AC chargers. For those wanting to travel longer distances across multiple states, the DC fast chargers are quickly being deployed. Various service providers are involved with providing DC fast chargers. Business owners may install both types of chargers to attract more patrons to their site. Governments are also providing both types of charging equipment with the use of federal and state grants to promote cleaner environment goals.

Batteries. As with any new technology implementation, there can be challenges along the way. The batteries used in EVs today are lithium-ion technology. The batteries are heavy and must be carried by the vehicle, affecting the vehicle efficiency and performance. Lithium-ion batteries also have the potential to overheat and cause a fire under certain conditions, such as physical battery damage or submersion in flood waters. First responders are actively working to develop new firefighting procedures for fighting lithium-ion vehicle fires.

Ahead of the trend

Although EVs and their charging infrastructure may be new to many, HSB has been following this technological evolution for over 10 years. HSB continues to develop relevant new products and risk management services that keep pace with our technologically changing world in order to provide modern-day risk solutions.

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2023-156 (Revised 10/23 - ES956)