

Electric Vehicle Charging Infrastructure Frequently Asked Questions

The market for plug-in electric vehicles (PEVs) has grown rapidly in recent years and is projected to become significantly larger during the next decade. The following are frequently asked questions about the cars, the technology, the energy issues and the infrastructure to support the growing population of EVs around the globe.

Why do people buy electric cars?

Buyer values include energy savings, electric car performance, national energy security, reducing emissions/green lifestyle, and lifecycle cost savings.

What is a BEV? PHEV? EREV?

BEV stands for Battery Electric Vehicle, or a fully electric vehicle powered by an electric motor with no gas engine, such as the Nissan Leaf or Tesla S; a PHEV, or plug-in hybrid electric vehicle, has both an electric battery and a gasoline engine to power the car, such as a Toyota Prius Plug-In Hybrid. An EREV is an extended range electric vehicle, like the Chevy Volt, that has an electric motor that powers the car with an onboard gas-powered generator to extend driving range with when the battery's range is depleted. The difference between an EREV and a PHEV is that the EREV does not use the gasoline engine to provide mechanical energy to the drive train.

Does the premium paid for buying an EV offset the energy savings over gasoline?

It can, especially over time. Cost savings are realized by the lower cost of electricity versus gas and greatly reduced maintenance. To note, many automakers are showing declining prices and competitive lease deals; coupled with a trend in the reduced cost of batteries, this is an ever-evolving equation toward faster payback.



Electricity is a fossil fuel based source of energy as well, so are EV's really more green?

Yes. Even when your car is 100% fueled by electricity generated by coal, EVs have a lower carbon footprint in terms of both CO₂ and traditional pollutants like nitrogen oxides, carbon monoxide and volatile organic compounds. Not only is the overall emissions content lower, but the location and timing of the emissions is better: gasoline vehicles emit pollution in the middle of the city during the day. The emissions from fueling your EV typically happens at off-peak driving hours at plant locations away from population centers. In addition, an EV's carbon footprint is improved even further as electricity generation portfolios add more renewable sources and improve technology to generate cleaner fossil-fueled power.

How much savings can be achieved when using electricity as fuel over traditional petroleum gasoline?

Electricity fueling a car generally costs 1/3 to 1/5 that of gas, depending on electricity rates and gas prices in a given region. An example: if electricity costs at an average of 15 cents per kWh; fueling an EV with around 120 km of range would cost a little more than € 3,60. Those same 120 km would cost around € 14,- in gasoline in a conventional car that gets around 1 on 14, with Euro 95 at € 1.65/L, or € 12,- in diesel at € 1.45/L.

Do electric cars have the same speed and performance as traditional gas-engine vehicles?

Yes, top speeds for EV's are comparable to similarly sized gas-engine vehicles. In fact, vehicles powered by electric motors enjoy the benefit of high torque and can get up to traveling speed very quickly.

Are maintenance costs higher with an EV?

Electric vehicles do not require oil changes, have no transmission or exhaust system service needs, have much longer brake life, etc, so maintenance costs for EVs are have been shown to be significantly lower than comparably equipped gas-powered cars.

Will an electric motor last as long as traditional gas engine?

Longer. Most electric vehicles employ brushless DC motor technology which offers high reliability, low maintenance and longer lifetime than traditional combustion engines that have many moving parts and require frequent maintenance.

How long does an EV battery last?

Current lithium ion battery technology applied in electric vehicles is estimated to last between 5-10 years depending on use conditions such as extreme climate temperatures. Most electric vehicle manufacturers offer extended battery warranties as standard.

Can EV batteries be recycled?

EV batteries can be recycled and can also find significant afterlife in energy storage applications to manage electricity supply and demand for utilities and users.

Is an EV more dangerous in an accident than a gas engine vehicle?

Overall, a vehicle's battery system is safer than the volatile petrochemicals used in gas engine vehicles. However, whenever there is stored energy, there are potential risks. One of the major factors being discussed is the first-responder / EMS response protocols for the unique properties of batteries in the event of an accident. In many communities, emergency personnel are now being trained on how to approach electric and hybrid vehicles most safely.

Who is ABB?

ABB is a global leader in power and automation technologies. We have over 145,000 employees in over 100 countries. In the US we employ over 25,000 people.

Does ABB manufacture electric vehicles?

No, we provide the charging infrastructure, both hardware and software, to enable drivers, service providers and utilities to fuel electric vehicles.

Do I need special infrastructure at my home to charge an EV?

No, all EV's come with a standard plug for charging in a 230V outlet. DC fast charger units are not recommended for home installation as they are rated at 400V, which is generally not a residential voltage capability.

How fast do EVs charge?

A standard 230V outlet can charge at about 15 km of range per hour; DC fast charging units can charge a vehicle in about 20-30 minutes.

What is the difference between AC and DC charging?

An AC charger supplies AC (Alternating Current) to an onboard charging device that charges the battery. Fast charging is done through DC (Direct Current). A DC fast charger supplies a DC current safely to the battery management system inside the vehicle, so the charger is external to the vehicle. In DC charging, an advanced communication protocol is used to communicate between the charger and the vehicle.

What is the benefit of fast charging?

Case studies in EV deployment show that fast charging is a key instrument in the successful roll-out of electric vehicles to reduce or eliminate range anxiety.

Which cars are able to fast charge?

Most EV's launched into the market in the last year and nearly all announced EV's have fast charging capability; these include the Nissan Leaf, Mitsubishi iMiEV and Peugeot iOn. The recently developed SAE Combined Charging System standard will increase the number of fast charging models from automakers like GM, Ford, BMW and Volkswagen, with several models launching over the next couple of years.

Where are fast chargers installed?

Fast chargers are mainly used in quick fuel need applications such as en route or on-demand charging, as well as fleet charging. They're also used in other commercial applications like places of work, shopping centers, restaurants, hotels, hospitals, college campuses and parking lots.

Will a rise in EVs strain our electric grid?

In the last few decades, the explosion of industrial and residential electricity demand has greatly increased our dependence on an aging grid. Fortunately, there are many technologies being developed to manage supply and demand including smart grid solutions, energy storage and demand response technology. ABB supports these technologies for infrastructure providers and utilities.



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