What Is An Electric Car?

By Brad Berman  July 16, 2014

An electric car is powered by an electric motor instead of a gasoline engine. The electric motor gets energy from a controller, which regulates the amount of power—based on the driver’s use of an accelerator pedal. The electric car (also known as electric vehicle or EV) uses energy stored in its rechargeable batteries, which are recharged by common household electricity.

Unlike a hybrid car—which is fueled by gasoline and uses a battery and motor to improve efficiency—an electric vehicle is powered exclusively by electricity. Historically, EVs have not been widely adopted because of limited driving range before needing to be recharged, long recharging times, and a lack of commitment by automakers to produce and market electric vehicles that have all the creature comforts of gas-powered cars. That has changed. As battery technology improved—simultaneously increasing energy storage and reducing cost—major automakers introduced a new generation of electric cars.

Efficiency Matters

Electric cars produce no tailpipe emissions, reduce our dependency on oil, and are cheaper to operate. Of course, the process of producing the electricity moves the emissions further upstream to the utility company’s smokestack—but even dirty electricity used in electric cars usually reduces our collective carbon footprint.

Another factor is convenience. In one trip to the gas station, you can pump 339 kilowatt-hours of energy into a tank commonly holding 10 or more gallons. It would take several days to get the same amount of energy from household electric current. Fortunately, it takes hours and not days to recharge an electric car.

Electric motors develop their highest torque from zero rpm—which means fast and silent zero-to-60 acceleration times.

### Electric vs. Gasoline

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<tr>
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In the illustration, we show the relative features of electric cars and gas-powered cars. However, it doesn’t have to be an “either-or” situation. Plug-in hybrids offer many of the benefits of electric cars while mitigating most of the drawbacks, such as limited driving range.
A Quick Guide to Plug-in Hybrids

By Brad Berman  July 16, 2014

A plug-in hybrid car is similar to a conventional hybrid vehicle—both use a gasoline engine as well as an electric motor. However, a plug-in hybrid uses larger battery packs that can be recharged by connecting to common 120-volt household electricity or 220 volts from a dryer outlet or special installation. Plug-in hybrids can be driven for long distances—from a few miles to as much as 60 miles—without using any gasoline. (Learn about the different types of plug-in hybrids.)

Plug-in hybrids provide most of the benefits of an electric car, while maintaining the same driving range as conventional vehicles—eliminating so-called “range anxiety” about plug-in cars. Plug-in hybrid drivers may travel in an all-electric mode for the vast majority of common local driving. When the battery’s electric charge is depleted, a downsized gas engine powers the car until the next opportunity to plug in and recharge the batteries.

Plug-in hybrid cars are also known as plug-in hybrid electric vehicles or PHEVs. Plug-in hybrid cars that use a gas engine exclusively for recharging batteries—rather than directly powering the wheels—are also called Extended-Range Electric Vehicles or EREVs or plug-in series hybrids.

Plug-in hybrid cars have considerable fuel efficiency benefits compared to other vehicles:
- A hybrid car, depending on the model, achieves about as much as twice the fuel economy as a conventional car of the same size and capacity.
- A plug-in hybrid car can deliver about twice the fuel economy of a standard hybrid.

**PLUG-IN HYBRID**

**1. REFUELING:** Minimal trips to gas station. Batteries charged at home or work.

**2. ENERGY STORAGE:** Fuel is stored as electricity in batteries, with back-up gas tank.

**3. PROPULSION:** Drives mostly on electric power, until batteries are depleted.

Common Plug-in Hybrid Criticisms

- The extra batteries weigh too much.
  Response: The extra weight of the batteries will be offset somewhat by the reduced weight of the gas engine. At high speeds in particular, fuel efficiency is affected primarily by aerodynamics—the MPGe is minimally affected by adding weight that’s roughly equivalent to one or two additional passengers.

- The extra batteries cost too much.
  Response: Any premium required for plug-in hybrids is less than the higher cost of a pure electric car (with its larger battery pack). Regardless, once sold in high volumes by carmakers, more powerful and cheaper batteries can be sold at prices only a few thousand dollars above that of today's hybrids. Several plug-in hybrids available today are available at prices barely higher than their gas-powered equivalents. Recharging will take place mostly at night during off-peak hours when electricity can be much cheaper. Despite the higher initial price (reduced by federal and some state tax incentives), counting purchases, fuel and service, total lifetime cost of ownership is lower than a gas car.

- Producing power from the grid (to charge the cars) simply switches pollution to the power plant.
  Response: What the industry calls “well-to-wheel” emissions (especially greenhouse gases) for grid-powered vehicles are far lower than gasoline, even for the average for the U.S. power grid (which is 50 percent coal). Cars charging off-peak will use power from plants that can’t turn off at night. Many parts of the country get most of their power from cleaner sources such as natural gas and hydropower. It’s far easier to capture conventional emissions from a few centralized power stations than millions of aging cars. Finally, plug-in hybrids recharged from rooftop photovoltaic systems have virtually zero emission.
Electric Cars Pros and Cons
By: [Author Name]  |  July 16, 2014

Like almost anything in life, electric cars have their pros and cons. You can expect a sizeable list of PlugCarro's generally promote EVs as being greener, but a list rest benefits that have yet to be quantified. The electric car is in its infancy, and so it is good to be aware of the pros and cons of cars that use electricity rather than petrol. Here's a short and sweet.

**PROS**

The Tesla Model S is acclaimed as the fastest-selling electric car, but all electric cars are very quiet.

**Quiet and Quick**

It only takes one note in a battery-powered car to understand the improved ride quality of an EV compared to a vehicle using a gasoline-powered engine. An electric car is smooth, makes less noise, and is more enjoyable to drive. It also makes more regular cars seem clunky and outmoded. What surpluses people most in the high fuel fees is the high fuel efficiency.

**Home Recharging**

Imagine never going to a gas station again. All you have to do is pull into your garage or driveway, reach out for a plug, and push into it. Charging is nothing. It's very convenient and takes all of about 15 to 60 seconds. Wake up to the moment and you have a car ready to go another 80 to 100 miles—or longer, depending on the model. That's plenty for everybody except long-distance commuters. (This equation can be much more difficult for people living in condos and apartments, but access to real-world and workplace charging is improving everyday.)

**Cheaper to Operate**

It is a large part of the world, electricity is ubiquitous and cheap—again with big cost advantage over petrol.

**No Tailpipe Emissions**

Nearly all credible researchers believe that electric cars, even in coal-dependent regions, have a smaller environmental impact than conventional vehicles. In regions with a strong grid mix of renewables—such as hydro, wind, and solar—electric vehicles are almost CO2 free; the emissions benefits are dramatic. You can expect some analysts to argue the opposite. But it's not that EVs don't have a tailpipe, and therefore provide a real benefit is improving air quality for you, your family, and your community.

**CONS**

It's everybody's cool EV term: Range Anxiety. It stands for the worry that because something is more electric car, electric cars only have about 80 to 100 miles of range, and takes time to fully charge. EV advocates argue that 100 miles is plenty for most driving. As a result, nearly all electric car drivers rarely if ever experience range anxiety. It is also true that the cost of range and electric car battery is consistently improving around budget. Still, you know of an electric car with a back-up range-extension engine, so you need to properly plan to ensure that your plans beyond predictable local driving are within range or arrive for a time to recharge.

**Limited Range**

The current crop of electric cars are mostly priced between $3,000 and $40,000. That makes EVs considerably more expensive than compactly equipped small to medium-sized gasoline-powered vehicles. (For example, the Mazda3 and Ford Focus can be had for less than $20,000.) In the light EVs, this paid is due to increased electrical costs, but it is also the expense. Cost comparisons usually fail to consider a number of factors, including incentives, sorely needed. 

**Long Refueling Time**

Concerns about range are closely tied with ideas related to long it takes to refuel an electric car. EV's range can vary from 80 to 100 miles of the charging time is a 10-hour process. So, while you can run down to the gas station and add a couple hundred miles of range in ten minutes, and while some cars are not yet available, drivers putting that at amounts of miles on their cars will be repaired by recharging stations at various hours of the day, as long as they recognize to refuel before going to sleep. On the other factors, faster (DC) Quick Charging, capable of adding only 60 miles of range in around 25 to 30 minutes, are increasingly available in regions with relatively high numbers of electric cars.

**Higher Cost**

The current crop of electric cars are mostly priced between $3,000 and $40,000. That makes EVs considerably more expensive than compactly equipped small to medium-sized gasoline-powered vehicles. (For example, the Mazda3 and Ford Focus can be had for less than $20,000.) In the light EVs, this paid is due to increased electrical costs, but it is also the expense. Cost comparisons usually fail to consider a number of factors, including incentives, sorely needed. 

**Lack of Consumer Choice**

The 20 on sale plug-in electric vehicles on the market currently result of compact and subcompact-compact electric cars, and walk-in plug in hybrid sedans. There are two stand out exceptions, both exceptionally expensive - the full-size Tesla Model S is $164,000, and the limited edition Toyota RAV4 EV is $62,000, with a $9,500 tax credit. Unfortunately, this style of popular EVs is poetizing the country very well if you have a lot of support for an electric car. EV choice will expand over time, but is also market driven by trends of demand and hundreds of millions, the choice for buyers wanting an electric car. electric cars are currently limited.
Eight Rules of Electric Vehicle Charging Etiquette
By Brad Berman  July 16, 2014

1. EV Spots for EVs
It’s absolutely never acceptable for an internal combustion car to park in a spot designated for a plug-in car. That’s a firm rule, no matter how crowded a parking lot is, and no matter how infrequently the charging location is used.

2. No Nasty Notes
Electric car drivers should never leave nasty notes. If the charging spot you counted on using is ICEd—the term referring to a charging spot occupied by an internal combustion engine car—by all means, the plug-in driver should leave a note on the windshield explaining the predicament. The note can be firm, but should be expressed in polite language—in a good-will gesture that will hopefully convince the offender not to make the mistake again.

3. Charge Only When Necessary
Don’t charge if you don’t need a charge. Leave the spot free for another EV driver that might need the charge to safely complete his or her daily travels.

4. Charge Up and Move On
Only occupy a charging spot while your car is being charged. As soon as the charging session is completed—either when your battery is full or when you have adequate range to comfortably reach your destination—be prepared to unplug and move your car as soon as possible, making way for a fellow plug-in driver. (Many charging networks and car apps can be set to notify you by email or text when your charging session is completed.)

5. It’s Okay to Ask for a Charge
If a charging spot you need is being used, and you are able to park next to a car that is currently charging, it’s perfectly fine to leave a note asking the owner to plug your car in after his or her session is complete. If you have received such a note, honor the request. If the charging session requires a fee, you are obviously not obligated to activate the charging session (and incur a fee)—although that kind gesture will likely be returned some day. As with any note left on a windshield, it’s advisable to include your name and cell phone number so you can be contacted.

6. Don’t Unplug Plug-in Hybrids...
An owner of a pure electric car owner, like a Nissan LEAF, does NOT have the right to unplug a plug-in hybrid, such as a Chevy Volt—just because their car has a back-up gas engine.

7. ...Except When Plug-in Hybrid Is Done Charging
The exception to Rule #6—and applicable in fact to any other plug-in car—says that it’s okay for one plug-in car owner to unplug another car. If the first car has clearly finished charging. In this event, the driver who makes the switch should leave a note explaining why it was unplugged. The note should be full of gratitude and include your cell number. (The PlugShare app has a notification function so drivers can contact each other prior to unplugging. Drivers should try to make contact prior to unplugging.)

8. Safety First
Practice safe charging. The means properly managing the cord. Neatly wind the cord on its holder, and tuck it in so people will not trip on any excess length, or drive over it.
Seven Things To Know About Buying a Plug-In Car

By Brad Berman  |  July 16, 2014

1. Shop Around
For all the differences between gas and electric cars, there is one key similarity. You still need to go through a sales person at a car dealership. And dealerships are in competition with another for your business. Once you decide on a specific model, speak to several dealerships in your area to see which one has the best deal. This small step can save you thousands of dollars. (Tesla is the exception to this rule. The innovative company operates its own retail stores.)

2. Consider the Incentives
There are three basic kinds of incentives for purchasing a plug-in vehicle: tax credits, rebates, and perks. Uncle Sam offers a tax credit of between $2,509 and $7,500, depending on the vehicle. Take note, this credit is applied against future tax liability, so the full amount of the tax incentive might not be fully realized. On the other hand, rebates, like the $2,500 offered in California, come in the form of a check in the mail. The range of other perks includes access for solo drivers in carpool lanes, and preferred or free parking.

3. Have Faith in the Battery
One of the biggest myths about electric cars is that, in a few years, you will be slapped with a whopping bill to replace the car's battery when it craps out. That is extremely unlikely. Yes, there will be some loss of range over many years—perhaps a bit faster in locations with extremely hot weather. Regardless, these plug-in cars have substantial battery warranties, usually in the realm of 8 years and 100,000 miles (some even longer), that cover all battery problems, including excessive loss of range. Rest easy, the batteries will last the lifetime of the vehicle.

4. Install a Home Charger
Numerous studies show that electric cars have a lower total cost of ownership than gas-powered vehicles. But don't forget to include the installation of a home EV charger in your calculation—commonly between $1,000. The off-board charger, officially known as an E.V. SE E. electric vehicle supply equipment, supplies electricity 240 volts of juice—significantly cutting down charging time at home. You're going to want one. See our buying guide for details.

5. Don't Obsess About MPGe Window Labels
A few years ago, a window sticker with 100 m.p.g. or more was unimaginable. Now, the entire segment of plug-in cars is offering efficiency at or close to that level. Automakers frequently market their efficiency numbers, especially when they are higher than the competition. But truth be told, all electric cars have very similar levels of efficiency. Lighter EVs driven carefully will get about four miles per kilowatt-hour. Heavier EVs driven with gusto will get about three miles per kilowatt-hour. Most of us settle somewhere in between. At the end of the day, there's all you need to know. All EVs are much more efficient than gas cars.

6. Don't Have Anxiety about Range Anxiety
As every new electric car driver discovers, the typical EV offering 50 to 100 miles of driving range, is enough to satisfy 90 percent or more of common trips. The remaining journeys simply take a little planning to know when and where you will charge. (You have to be crazy and/or masochistic to pay no attention to your range—and drive until the battery pack passes E.) Range anxiety happens only once in a blue moon, when a daring driver goes off course on an impromptu trip.

7. Connect with the Vibrant Community of EV Drivers
Thanks to the Internet, connecting to fellow EV shoppers and drivers is only a click or two away. And believe it or not, many high-tech early adopters of electric cars actually engage in an anachronistic activity known as getting together in person. There are vibrant regional groups for owners of the Nissan LEAF, Tesla Model S and other EVs. The calendar also includes National Drive Electric Week, Earth Day, and other electric rallies, conferences and parties. Plan to join Plug In America of the Electric Auto Association. And in the meantime, create a user account on PlugCars.com and become an active member of our online community.
Eight Factors Determining Total Cost of Ownership of an Electric Car

By Brad Borman - July 16, 2014

1. Actual Price of Vehicle

It’s easy enough to pinpoint the MSRP for a car, but most calculations use the lowest base price, rather than what most people pay before driving off the lot. Options and trim levels can mean a swing of thousands of dollars. Then, there are dealership incentives and deals, regardless of the model, that can add thousands more in variation. If you want accuracy, use a number that comes directly from the dealer for the specific car you plan to buy.

2. Tax Credits and Other Incentives

Nearly everybody immediately drops $7,500 directly off the price of an EV, because that’s the “up to” federal tax credit amount that could be used on your tax returns. But many tax-paying buyers and up claiming less than that, due to your specific tax liability in the year that you are claiming the credit, and the Alternative Minimum Tax. (State and regional rebates are also key factors, and are very much based on geography.)

3. Depreciation

EVs have not been on the market long enough for us to know what a robust used electric car market looks like. In times of high gas prices, conventional hybrids have done very well. But it’s a harsh reality that EV range diminishes over time, especially for battery-powered cars that don’t have active thermal management. What happens to used EV prices when the market discovers that LEAFs and other cars have 10 percent or less range after several years? Only time will tell.

4. Price of Fuel

The common assumption is $0.12 a kilowatt-hour for electricity and about $4 a gallon gas. There’s little doubt that lower fuel costs put EVs at a distinct advantage over time. That edge can grow wider when gas prices spike. But the actual cost for a kWh varies widely across the U.S., and can swing wildly even within a location based on utility rate plans, season, time-of-use programs and home solar. Forecasting actual EV fuel costs is a tough challenge.

5. Miles Driven

Based purely on anecdotal information, EV owners clock fewer miles per year in their electric cars (given limited range) than in internal combustion automobiles. So, using a national average of 12,000 or so miles in a lower cost-per-mile analysis is problematic.

6. Maintenance Costs

EVs benefit from not requiring oil changes or other maintenance costs for exhaust systems. Studies have shown that this represents a 35 percent decrease in cost over time. Some calculations peg this to about 3 or 4 cents per mile of maintenance cost in an EV versus closer to 6 cents in an internal combustion car. But it’s hard to know for certain.

7. Home Charging Equipment

It’s the rare calculation that figures in anywhere from $500 to $1,500 of upfront cost for buying and installing an EVSE, the 240-volt wall-mounted box that funnels electricity into your car.

8. Insurance Rates

A number of forward-thinking insurance companies offer small discounts for EV owners, but it’s also common for vehicles with advanced and unproven technology to get slapped with higher rates.
Federal and Local Incentives for Plug-in Hybrids and Electric Cars

Renton, Washington

Non-Profit Car Partnership

Did you know that there are incentives for plug-in hybrid and electric vehicles? Our partnership with the City of Renton is offering a variety of incentives for customers. The incentives include a $500 credit for registration and an additional $250 credit for a charging station. These incentives are available for new plug-in hybrids or electric vehicles. The City of Renton is also offering a $1,000 credit for the purchase of a charging station. For those with a second vehicle, the City of Renton is offering a $500 credit for a charging station. If you are interested in purchasing a plug-in hybrid or electric vehicle, we encourage you to contact our sales team today. We can help you navigate the incentives and make sure that you get the best deal possible. Contact us at info@rentonalternatives.com or visit our website at www.rentonalternatives.com. We look forward to serving you!
Get help with a rate plan from your utility company.

Utilities have a network of resources available to help you choose a rate plan that makes sense for your home or business. Many utilities offer a range of options to choose from, so you can find a plan that fits your needs.

Get the absolute lowest rate for charging your EV, subscribe to a time-of-use plan, and only charge at off-peak hours.

Before you charge your electric car, make sure you know the time-of-use rates in your area. This will help you choose a plan that fits your budget and your lifestyle.

To subject yourself to the absolute highest rate, sign up for a time-of-use rate and only charge at peak hours during the day.

During peak hours, you’ll be charged a higher rate for using power. If you want to avoid this, you can sign up for a time-of-use plan that will help you choose the best time to charge your EV.

Do a careful cost calculation before going with a simple energy bill.

Before you sign up for an energy bill, make sure you understand the costs involved. This will help you choose the best plan for your needs and budget.

Choosing a time-of-use plan can be a complex decision. You need to consider your energy usage patterns and your budget to make an informed decision.