ELECTRIC VEHICLE & CHARGE STATION INFORMATION FOR CITY OF RICHMOND

Bureau of Permits and Inspections
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The Vehicles

What is an EV?

The term "**EV**" is used to describe all vehicles that connect to, and derive energy from, the electricity grid. These include

Plug-In Hybrid Electrical Vehicles (PHEV)

Range-Extended Electrical Vehicles (REEV)

Battery Electric Vehicles (BEV).

Where would I charge my electric vehicle?

It is expected that most charging will take place at home, overnight. Since the **BEVs** are expected to have a range of between 80-100 miles on a full battery, an overnight **(Level 2)** charge will be enough to cover the daily commute needs of the majority of people in the City of Richmond. Businesses and local governments are also providing charging locations for people who want to recharge while at work or at other locations.

What is Level 1 charging?

Level 1 charging refers to the use of standard 110 volt power that is the lowest common voltage found in both residential and commercial buildings. Due to the length of charge time required (15-20 hours), it is anticipated that most users will be installing Level 2 systems.

What is Level 2 charging?

Level 2 charging systems recharge (electrical vehicles) EVs in 4-8 hours utilizing 220 volt power. Level 2 charging systems are typically used for overnight charging at home or at businesses that operate fleets of EVs. Level 2 chargers will be available for homes, fleets, commercial locations and public use sites.

What is Level 3 charging?

Level 3 charging, often referred to as "fast charging," allows vehicles to be recharged in less than 30 minutes. These units are not yet commercially available, but installation of fast charge units is expected throughout the State of Virginia and along I-95 corridor. These units will be ideal for applications such as highway rest stops to enable fast and significant range extension for longer trips.

Will all cars have the same plug-in adapters?

Yes. The J-1772 plug is the universally adopted Level 2 model for all new electric Vehicles to be sold in the United States.

Purchasing, Prices and Costs

Which automakers are going to make electric vehicles?

Many automakers have announced plans to release **BEV** or **PHEV** model vehicles between now and 2012. These include Nissan, Audi, Ford, General Motors, Toyota, Volvo, BMW, Chrysler, Ford, Hyundai, Mitsubishi, Rolls Royce, and. Thousands of electric vehicles (cars and bicycles) are already in use in China, Canada, Europe, and United Sated

How much will the EVs cost?

The Nissan Leaf, has a manufacturer's suggested retail price (MSRP) of $33,720. The Chevy Volt, a combined PHEV, has an MSRP of $40,280. The 2012 Ford Focus Electric is expected to have an MSRP of $35,000.

What are the incentives for buying an EV?

A federal tax rebate of $7,500 is currently being offered with your purchase of an electric vehicle that has greater than 4 kW of battery storage capacity. Both Nissan Leaf and Chevy Volt models currently qualify.

What are the maintenance requirements and associated costs of EV ownership?

Due to the lack of product history, long-term maintenance requirements are not yet known. The fact that electric vehicles have fewer components is anticipated to lead to lower long-term maintenance and replacement costs. Your auto dealer would be the best resource for more details.

Charging Stations – General

Will the charger be built into the vehicle?
Yes. To charge, you will simply need to plug in to an appropriate charging dock which supplies power safely to the charger.

Am I able to determine what time the charging of my vehicle starts and stops?

Yes. You will be able to set a charging timer in the car. Some models will allow you to control the car's functions and charging from any computer or internet-enabled phone.

Charging Stations- Residential

For more detailed **home charger installation** info please see our Public Information Handout **"Installing an Electric Vehicle Charge Station for Single-Family Residences."**

How much does it cost to charge a plug-in vehicle?

Much less than it costs to buy gasoline. Exactly how much will vary depending on the vehicle and electricity rates. On average, it will be less than $1 to charge a plug-in hybrid and $2–$3 for an all-electric car.

I live in an apartment. How would I go about charging the car?

You should start by talking to your apartment complex owner about getting charging stations. You can also use public and commercial infrastructure as it becomes available.

Charging Stations – Public Use

Where will public-use charging stations be located?

The state, county, cities, and the private sector will all have a role in the gradual development of a public charging station network. Between your car's navigation system, computer, or Smartphone, you will be able to access information about station locations and availability, and even make reservations. You can click on this link to find public charging stations: http://www.afdc.energy.gov/afdc/locator/stations/

How long will it be before you can charge a car anywhere? Like at a gas station?

In northern Virginia region, look for dozens of publicly available Level 2 charging stations to be installed at government and commercial facilities throughout 2011. There are plans for a few Level 3 "fast chargers" to be installed throughout on the I-95 corridor, but not likely before 2012.

Other Considerations and Questions

What if I run out of power and get stranded?

The vehicles come equipped with multiple systems to prevent this from happening, as well as with technologies to locate nearby charging systems should you be running low. Vehicle manufacturers are also developing roadside assistance programs for emergencies.

Does the battery still drain when you are not moving?

Only if you are using lights, stereo, and other accessories. No power is being used to "idle."

Isn't generating electricity for electric cars just as bad for the environment as the gasoline burned by traditional engines?

No. Electric engines are far more energy efficient than gasoline engines. On average, approximately 30% of the fuel burned by a gasoline engine is used for propulsion, whereas nearly all the electricity in an EV is used for that purpose. Additionally, the clean fuel from hydro and wind components, make it even cleaner. As we transition to more renewal sources of electricity, driving EVs will get cleaner and cleaner.

How long will the battery last?

According to an Electric Power Research Institute report, battery durability tests demonstrate that current lithium-ion batteries are likely to retain sufficient capacity for more than 3,000 dynamic deep-discharge cycles (about 10-12 years of typical driving.) To offer additional comfort, major automakers are offering extended warranties.

Why would I want to invest in an electric vehicle?

Three words: Cheaper. Cleaner. Domestic.

Cheaper: Electricity is about a third of the current cost of gas, and electric cars require next to no maintenance. (No oil changes, no muffler, no catalytic converter, etc.)

Cleaner: Even on a coal-fired electrical grid, driving on electricity is cleaner than driving on gasoline. Our abundant use of clean hydro and wind to generate power makes it even cleaner.

Domestic: Both the electricity and many of the new EVs are domestically manufactured.
Bonus: Plug-in cars are quiet, convenient, and really fun to drive!

Am I able to determine what time the charging of my vehicle starts and stops?

Yes. To charge, you will simply need to plug into an appropriate charging dock which supplies power safely to the charge. The length of the charging time depends on the type of charging unit. A typical homeowner will use a normal 120 volt AC, ground fault interrupted dedicated branch electrical circuit and the charging time is 5-12 hours. A level 2, hardwired dedicated branch circuit with 240 volt AC/single phase service with a 40 amp current rating, will charge in 1-4 hours. A level 3, 480– VAC/3 phase service with 60 amp breaker for 30 kw output or a 125 amp breaker for 60 kw output, will charge in 15-30 minutes.