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## NUTS AND BOLTS OF PLUG-IN HYBRID ELECTRIC VEHICLES (PHEVS)

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As your Touchstone Energy cooperative, we want to be your source of power and information. Since electric vehicles are rapidly becoming more widely available, we put together this information to help answer questions you might have. Contact us for more information about electric vehicles. See other fact sheets in this series.

**For drivers with long commutes or those who take frequent long trips, a battery electric vehicle (BEV) may not provide the desired range. Plug-in hybrid electric vehicles (PHEVs) offer an alternative. PHEVs use both an electric motor and a battery to save on fuel and lower emissions. They also have a gas-powered engine to boost range.**

### WHAT ARE THE ADVANTAGES OF PHEVS?

- These vehicles offer the benefits of electric power; the gasoline engine can help out when needed.
- They offer better fuel economy (less gas burned) and lower fuel costs (because electricity is a cheaper “fuel” than gasoline).
- Because less gas is burned, PHEVs reduce our dependence on oil and also emit fewer greenhouse gases than conventional gas vehicles.
- PHEVs may qualify for a federal tax credit for a new vehicle purchase; the amount (up to \$7,500) depends on the size of the vehicle battery size. There may be some additional benefits offered by state and local areas, such as special parking spots and driving lanes.

### WHAT ARE THE DISADVANTAGES OF PHEVS?

- Because they have both electric and gasoline components, these vehicles have a more complicated design than all-electric vehicles.
- Maintenance is required on both systems. Gas engines require oil changes and the same checks that conventional gas engines require. And while the electrical components (battery, electric motor and electronics) require less maintenance than gas-powered engines, some maintenance is required.
- Having both a combustion engine and a battery pack takes up space and adds weight.



## HOW ARE PHEVS CHARGED?

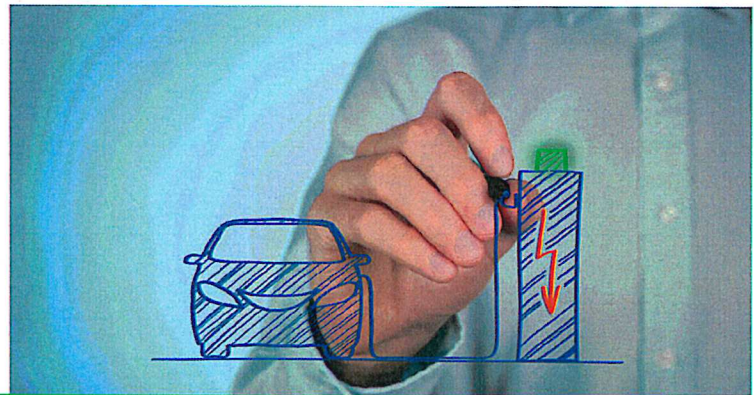
Just as with a Battery Electric Vehicle (BEV), it's necessary to recharge the electric battery. There are several levels of charging. How you charge and how often you charge depend on how far you drive your vehicle and charging method.

- A standard 120-volt home receptacle on a dedicated electric circuit (five to eight miles of driving range for every hour of charging).
- A 240-volt connection, installed by an electrician who understands BEVs (12 to 75 miles of range for every hour of charging).
- Some public areas and workplaces offer charging stations.
- Note, DC fast charging, available in some public stations, can be used by some BEVs, but this type of charging is typically not compatible with most PHEVs.

## WHAT IS NEXT?

Since technology is improving rapidly, the future of all types of electric vehicles is bright. Look for:

- Batteries that provide an extended driving range. This should decrease the amount of gas required for PHEVs.
- Faster and better charging stations in more locations, including workplaces, shopping areas and even grocery stores.
- More competition between auto manufacturers to produce more and better models, possibly at a lower price.



## HOW SAFE IS CHARGING ELECTRIC VEHICLES?

There are safety features built into electric vehicles and into charging equipment. The charging cable is not live while you handle it, only when the cable is connected to the vehicle. The charger senses that the connection is properly made before the electric current is turned on. Also, the charger has a ground-fault interrupter (GFI). To prevent shocks, charging stops immediately if leakage of even a few milli-amps of current occurs.

## HOW CAN MY ELECTRIC COOPERATIVE HELP ME?

- Because utilities, including your cooperative, often have excess capacity at night and during other periods of lower demand, the cost of electricity can be lower during those times. That is why some cooperatives are able to offer special rates for night-time electric vehicle recharging.
- Some cooperatives offer incentives or assistance with the installation of a home charger to ensure the process is done correctly and safely.

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