



NC CLEAN ENERGY TECHNOLOGY CENTER

Advancing Clean Energy for a Sustainable Economy

Clean Transportation | www.nccleantech.ncsu.edu

ELECTRIC VEHICLES

What are the benefits of using a electric vehicle?

Driving a plug-in electric vehicle (PEV) improves air quality. PEVs produce zero tailpipe emissions, and can produce zero emissions altogether if electricity from renewables is used to recharge.

Testing has shown that PEVs can accelerate and handle just as well as — or even better than — comparable gasoline vehicles. They're also quiet and more energy-efficient. The engine does not run if the car is not moving, and braking energy can be partially recovered to recharge the battery.

What types of electric vehicles exist?

Several *all-electric or battery electric vehicles (BEVs)* are now on the market in the U.S. These EVs are powered entirely by electricity, and can be charged from a standard wall outlet or a specialized charging unit.

Plug-in electric vehicles (PEVs) are common alternatives. These types of PEVs can be charged with electricity, but also run on gasoline. PEVs have greater range than all-electric vehicles, and enjoy significant fuel cost savings, emissions reductions, and other benefits over gasoline vehicles.



Extended-range electric vehicles (EREVs) are often equated with PEVs, but they're not quite the same thing. An EREV is a type of PEV whose gasoline engine is used to charge the batteries, much like in a generator.

EREVs are fully capable of performing any driving maneuver on electricity alone. PEVs may be capable of this, but not all PEVs can produce full power or speed from their electrical systems alone and may blend gasoline and battery power under a heavy load.

Medium and heavy-duty PEVs are also available, including all-electric transit buses and delivery trucks, plug-in hybrid utility trucks, and plug-in hybrid transit and school buses. Heavy duty plug-in hybrid vehicles often have more than double the fuel economy of conventional vehicles, which can significantly reduce emissions.

NC STATE UNIVERSITY

(Continued from page 1)



Neighborhood electric vehicles (NEVs) are widely available and are especially popular where short distances and low speeds are common. An NEV is a low-speed vehicle (LSV) that complies with certain U.S. National Highway Traffic Safety Administration standards. In North Carolina, NEVs can be operated on streets and highways where the posted speed limit is 35 mph or less and can be titled and licensed as private passenger vehicles. NEVs are charged by plugging into a common 110-volt outlet and can travel 30 to 60 miles before needing to be recharged.

Are there any challenges to owning an electric vehicle?

The main challenges PEV owners face are limited range (about 100 miles for a full-size PEV) and slow recharge times (typically 2-4 hours with a 208-240 volt outlet after 40 miles of driving), but these issues don't have to limit adoption. Since most drivers' daily travel is less than 40 miles per day, PEVs make a great primary car. Also, rapid charging systems (DC charging) that can cut recharge times to 30 minutes are just starting to hit the consumer market.

Where can I find more information about electric vehicles?

- Clean Transportation Program website, www.cleantransportation.org
- Alternative Fuels Data Center, www.afdc.energy.gov/afdc/vehicles/electric.html
- Advanced Energy, www.advancedenergy.org/transportation
- NC PEV Taskforce, www.NCPEVtaskforce.org
- Environmental Protection Agency, <http://www.epa.gov/otaq/carlabel/electriclabel.htm>

This document is supported by the Clean Fuel Advanced Technology project with funding from the N.C. Department of Transportation.