



# Fact Sheet

California Environmental Protection Agency  
**Air Resources Board**

## Battery Electric Vehicles

Electric vehicles (EVs) are cars that run on electricity stored in batteries. EVs are often confused with hybrid electric vehicles, which combine an internal combustion engine with a battery. EVs are the only truly zero emission car available today because they have no tailpipe exhaust and no evaporative emissions from fuel systems. Manufacturers have developed a broad spectrum of EVs - from neighborhood electric cars which can be used for short trips around town to full function electric cars which can be used for longer trips and have the body of conventional cars. The availability and styles of these vehicles vary from year to year, but with battery technology getting more sophisticated, manufacturers will have the ability to design electric vehicles with extended range, faster charging and more power.

### Perks and Conveniences

- Drive alone in the HOV lane
- Free parking in some areas
- Cash incentives towards the lease or purchase of an EV from ARB and some local agencies
- Tax incentives from the Federal government
- You can recharge at your home or work --you don't have to make a trip to the gas station
- Fuel costs are less than a conventional car estimated at \$1 to \$2 a day for a 30 to 70 mile commute
- Maintenance costs are lower because there are fewer moving parts to service and repair
- No noisy engine

### Refueling

EVs are fueled by electricity and can be recharged at a charger installed at your home or workplace, or can be found at many other locations such as Costco and your local shopping mall. Currently there are two types of chargers, however in 2006 all vehicles produced will use the same system. Charging time varies depending on how "empty" the battery is, how much energy the battery holds (or how big the tank is) and other factors. In general, it takes approximately two to five hours to recharge vehicles that are  $\frac{1}{4}$  to  $\frac{3}{4}$  full and approximately six to eight hours to recharge vehicles that are on "empty." However, you'll probably be working, sleeping, shopping or watching a movie so it really doesn't seem that long.

### Technology

The heart of an EV has three main components: the batteries, the electric motor controller, and the electric motor. The controller takes power from the batteries and delivers it to the motor. The batteries

of an EV can vary in type, number, voltage and placement. The different battery types available now are Nickel-Cadmium, Nickel metal hydride, Lithium Ion, and Lead acid. To recharge the batteries, there is a charger component on the car which takes the electricity from a power source (ultimately the power plant) and converts the current from alternating current (AC) to direct current (DC).

## Facts

- No tailpipe exhaust or evaporative emissions
- No emissions system which can degrade or fail with time
- No emissions from the refining of fuel and service stations Electric vehicles are the cleanest and most environmentally friendly car around
- EVs reduce pollutants by more than 90 percent when compared to the cleanest conventional gasoline-powered vehicles (even when factoring in the emissions from power plants generating the electricity to the charge the vehicle).
- Fuel costs for a gasoline vehicle can be over five times greater than an electric vehicle.
- By driving an electric vehicle with a 30-mile commute, a person can reduce gasoline consumption by an estimated 750 gallons annually.

## Safety

EVs meet all federal motor vehicle safety requirements. The batteries are sealed and all high-voltage circuits are protected from casual contact. High-voltage circuits are marked, color-coded and posted with warnings to advise of their presence. These vehicles pose no additional risks over a conventional vehicle.

## Where can I get more information?

Please contact the ARB toll-free at (800) END-SMOG/(800) 363-7664 (California only) or (800) 272-4572. You may obtain this document in an alternative format by contacting ARB's Americans with Disabilities Act Coordinator at (916) 322-4505 (voice); (916) 324-9531 (TDD, Sacramento only); or (800) 700-8326 (TDD, outside Sacramento).

The energy crisis facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of sample ways you can reduce demand and cut your energy costs, see our web site: <http://www.arb.ca.gov>