

All-Electric Vehicles

All-electric vehicles (EVs) run on electricity only. They are propelled by one or more electric motors powered by rechargeable battery packs. EVs have several advantages over conventional vehicles:



- **Energy efficient.** EVs convert over 77% of the electrical energy from the grid to power at the wheels. Conventional gasoline vehicles only convert about 12%–30% of the energy stored in gasoline to power at the wheels.
- **Environmentally friendly.** EVs emit no tailpipe pollutants, although the power plant producing the electricity may emit them. Electricity from nuclear-, hydro-, solar-, or wind-powered plants causes no air pollutants.
- **Performance benefits.** Electric motors provide quiet, smooth operation and stronger acceleration and require less maintenance than internal combustion engines (ICEs).
- **Reduced energy dependence.** Electricity is a domestic energy source.

EVs have some drawbacks compared to gasoline vehicles:

- **Driving range.** EVs have a shorter driving range than most conventional vehicles —although EV driving ranges are improving. Most EVs can travel more than 100 miles on a charge, and some can travel in excess of 200 or 300 miles depending on the model.
- **Recharge time.** Fully recharging the battery pack can take 3 to 12 hours. Even a "fast charge" to 80% capacity can take 30 min.



ALSO IN THIS SECTION...

[Compare Side by Side](#)

[About Electrics](#)

[New and Upcoming Vehicles](#)

[Links](#)

RELATED TOPICS...

[Tax Incentives](#)

[Charging](#)

[Green Power: Make Your Plug-in Vehicle Even Greener](#)

Batteries for EVs are designed for extended life, and a study by DOE's National Renewable Energy Laboratory suggest these batteries may last 12 to 15 years in moderate climates and 8 to 12 years in severe climates. However, these batteries are expensive, and replacing them may be costly if they fail.

More Information

[Hybrid and Plug-In Electric Vehicles](#)

[Benefits and Considerations of Electricity as a Vehicle Fuel](#)

[Maintenance and Safety of Hybrid and Plug-In Electric Vehicles](#)

[Batteries for Hybrid and Plug-In Electric Vehicles](#)

[Electric Vehicles \(EERE electric vehicle resource\)](#)

View Data Sources...

[Contacts](#) | [Download EPA's MPG Ratings](#) | [Find and Compare Cars](#) | [USA.gov](#) | [Info for Auto Dealers](#) | [Privacy/Security](#) | [Feedback](#)