The Case for Electric Vehicles

Plug-In Hybrid Electric Vehicles (PHEV) and Electric Vehicles (EV)

Cost Savings • Driving Experience & Ownership
Energy Security & Economic Development • Environmental Benefits
Sales, Service & Warranty • Regional Charging Options

Cost Savings

- Plug-in vehicles have a lower overall cost of operation due to lower fuel cost per mile and lower maintenance cost.
- Electric vehicles are 3.4 times more efficient than gasoline. An electric car can travel roughly 100 miles on the energy equivalent of 1 gallon of gasoline, about 75% less than gasoline.
    - Electric vehicles cost approximately $0.03 per mile
    - A gasoline car getting 27 mpg costs $0.13 per mile
    - One e-Gallon of electricity costs $1.15 vs. gasoline at $3.50
    - Electricity saves up to $1,000 on fuel for every 10,000 miles driven.
    - Learn more at energy.gov/articles/egallon-how-much-cheaper-it-drive-electricity
    - PHEVs use low-cost electricity for short trips of 10-40 miles. PHEVs shift to gasoline on longer trips, operating as efficient hybrids getting 37-50 mpg, still using less gasoline than the average car.
    - Electricity costs are more stable over time compared to petroleum.
- Maintenance costs are lower.
    - EVs have no engine oil at all; transmission oil lasts 100,000 miles.
    - PHEVs use engines less: engine oil lasts up to 2 years, 20,000 miles.
    - EV and PHEV brake pads can last 100,000 miles or more, because regenerative braking uses electric motors to recharge the battery before applying the friction brakes.
- State and federal tax credits can offset part of the higher sticker price of electric vehicles. State tax credits range from $1,300 to $6,000, and federal tax credits range from $2,500 to $7,500.
    - Ford Focus gasoline $16,800; all-electric w/tax credits $21,700. Payback: 50,000 miles.
    - Fiat 500 gasoline $16,200; all-electric w/tax credits $18,500. Payback: 25,000 miles.
    - Toyota Prius gasoline hybrid $24,200, plug-in electric model with tax credits $28,700.

Driving Experience & Ownership

- Plug-in vehicles are fun to drive, especially around town. Stepping on the pedal makes instant speed. No waiting for a transmission to downshift to make the engine speed up.
- Travel range is limited. A typical car can travel about 400 miles on a tank of gasoline. A typical EV can travel about 75 miles per charge. A plug-in-hybrid can travel 10 to 40 miles per charge, plus 300 to 500 miles using its gasoline motor.
- Most plug-in vehicle owners can recharge at home or at work. No more stops at the gas station.
- Plug-in vehicles are great in the winter**.** Front-wheel drive means great snow handling. Many can automatically pre-warm the battery on cold days for best performance.
- An electric vehicle can pre-condition itself before you drive. It can warm the cabin before you even get out of bed, or pre-start the air conditioning on hot days.
- Plug-in vehicles sold by major automakers have 4-star or higher crash test ratings and must comply with the same federal safety standards as conventional cars and trucks.

- Electric-only EVs have even more benefits:
    - Less maintenance. The only wear items are tires and windshield wipers.
    - No loss in horsepower at elevation. Gasoline cars lose 15% at 5,000', 30% at 10,000'.

Energy Security & Economic Development

- Electricity is a domestic, Colorado-produced fuel that supports hundreds of jobs. It's unlikely to suffer supply shocks from tariffs, blockades, civil unrest or international politics.
- Colorado imports 70% of its petroleum, more than half of that from foreign countries. The U.S. sends nearly $1 billion overseas each day for oil, some to governments unfriendly to U.S. policies. Replacing expensive petroleum imports with electricity straight from a wall plug builds Colorado's economy and U.S. energy security.
- Automakers selling hybrid and electric vehicles are building advanced technology car parts in at least 20 U.S. states, creating thousands of good jobs.

Environmental Benefits

- All-electric vehicles produce zero tailpipe emissions. Plug-in-hybrids avoid most tailpipe emissions by driving on electricity for most daily trips. The electricity comes from power plants where emissions are regulated, and most plants are located away from populated areas where tailpipe-caused smog is a problem.
- Today's cars and light trucks account for about 20% of U.S. carbon dioxide emissions. Charging from the electric grid, EVs emit 20 to 75% less greenhouse gases per mile, depending on the grid power mix in each state. As more renewable energy and low-carbon fuels are added to the grid, the carbon footprint of EVs will shrink further.
- The lifetime carbon footprint to build and fuel a plug-in vehicle is approximately 50% less than a conventional vehicle. Using renewable electricity reduces that to 80% less lifetime carbon.
- In the U.S., 98% of car batteries are recycled, 0% of gasoline is recycled. Toyota offers a $200 bounty to keep batteries out of junkyards.
- As automotive technology progresses, manufacturers are working to reduce the need for rare earth elements. Already, Tesla Motors uses no rare earth elements in its electric motors.

Sales, Service & Warranty

- Toyota, Ford, Chevrolet, Honda and Nissan are manufacturing many models of plug-in and plug-in hybrid vehicles. Contact a dealer to learn more about new models and their features.
- Plug-in batteries have a great warranty and replacement program**.** Currently, battery manufacturers offer an eight-year, 100,000-mile warranty.
    - Many EV batteries are designed to last 10 years or 150,000+ miles.
    - Some manufacturers can replace a single battery module rather than the entire pack.
    - If a battery fails after the eight-year warranty, replacement batteries of the future will likely hold more energy and cost much less than today.

Regional Charging Options

- More than 19,400 public plug-in recharging outlets at more than 7,600 locations nationwide, including 130+ public charging stations in Colorado. Numbers grow every week. Check the U.S. Dept. of Energy's online charging station locator: www.afdc.energy.gov/locator/stations
- A Level 2 charging station refills a car for about 25 miles of travel for each hour it's plugged in.
- An outdoor Level 2 electric vehicle plug-in station costs $600 to $6,000, plus installation costs.