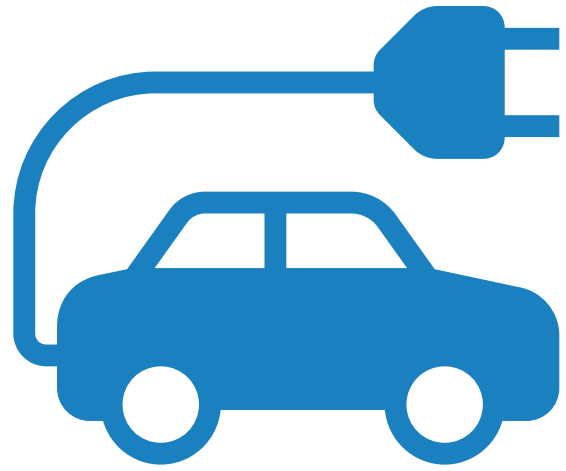


Battery Electric Vehicles

What Is It?

A battery electric vehicle, or EV, is a vehicle that runs on one or more electric motors and is powered by electricity stored in batteries rather than gasoline. Other EV technologies utilize fuel cells to supply power.



How Clean Is It?

EVs emit no exhaust and generate lower overall emissions than an internal combustion engine. Producing EV batteries and motors requires mining and harvesting resources such as cobalt, lithium carbonate, neodymium, and copper at significantly higher rates than to supply traditional fleets.



What Does It Cost?

EVs cost more than gas-powered vehicles, though sticker prices are expected to fall if demand increases. EV charging costs are lower than gasoline costs, although limited charging infrastructure availability and longer charge times are a convenience cost.



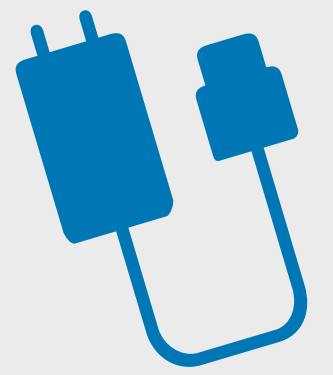
Space

The average EV can drive an estimated 200 miles on a single charge. There are over 100,000 charging outlets in the U.S. Charging stations can be as small as a single parking space and are typically found in public parking lots.

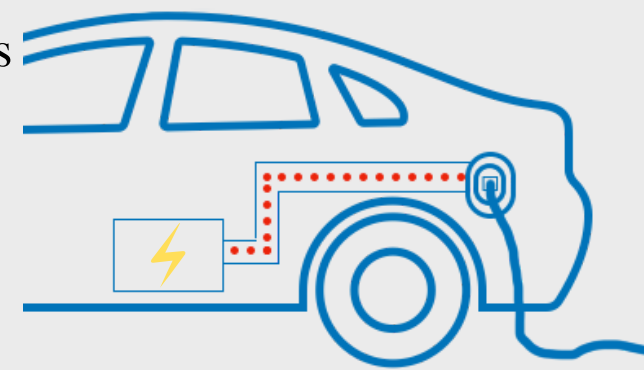


How Does It Work?

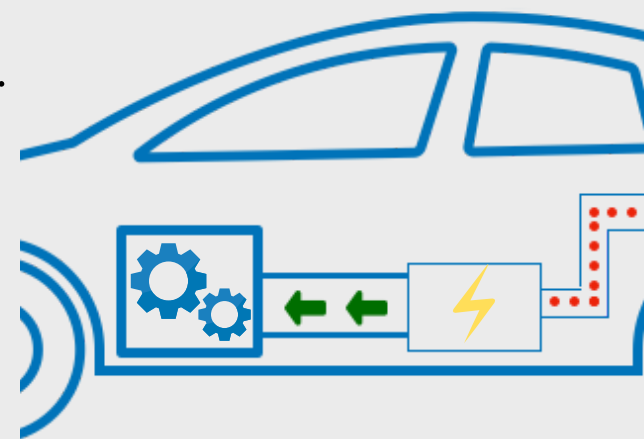
1. Battery EVs require a charger and a source of power, just like any rechargeable electronic device.



2. There are multiple charging connectors and adaptors to match a vehicle's specifications to that of the charging station.

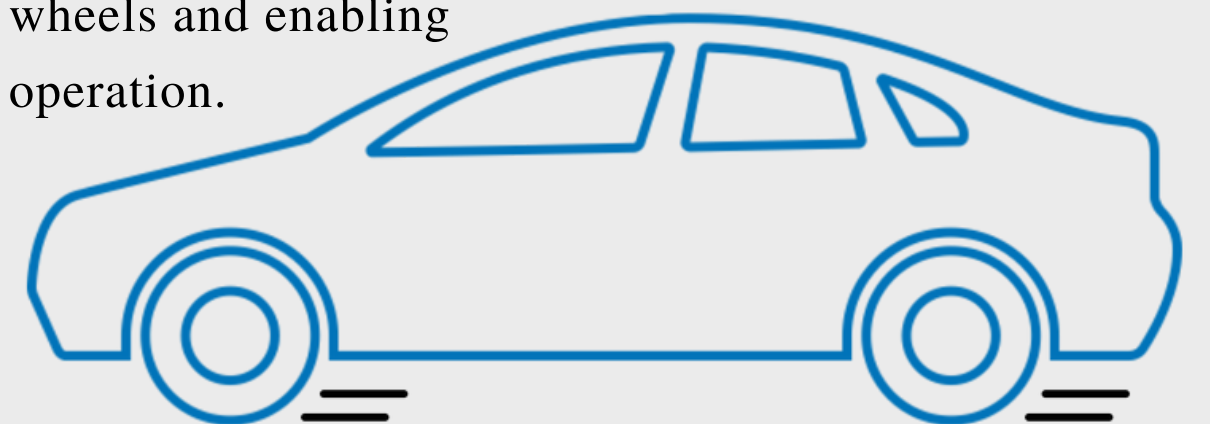


3. Once plugged in, the EV pulls a current of electricity either from a household outlet or public charging station, supplied by the grid.



4. This electricity charges the battery which supplies power to electronics and other EV systems.

5. The motor pulls power from the battery, turning the wheels and enabling operation.



Point

- There are no exhaust emissions from electric vehicles.
- EVs cost about \$14,000 less to power than gas-powered vehicles over a 15-year span.
- EVs are often government subsidized.
- EV technology will become more prevalent across the entire vehicle fleet including commercial vehicles and trucks.
- EVs reduce reliance on hydrocarbons as a direct fuel source, such as gasoline.



Counterpoint

- Mining the resources necessary for EVs has a considerable impact on the environment.
- The average EV is about \$19,000 more expensive to purchase than the average gas-powered vehicle.
- EVs do not pay the fuel tax, which governments rely on to build and maintain roadways.
- EVs do more damage to the roads as they are typically heavier than their counterparts.
- Charging stations generally pull power from the grid, which is largely supplied by hydrocarbons.



Did You Know?

Electric Vehicles are very energy efficient, losing far less than internal combustion engine vehicles to heat loss and other inefficiencies. Up to 90% of original energy goes to turn the wheels.

What's Next?

Improvements in battery technology continues to progress, allowing for greater distances traveled on a single charge and bringing costs down. Manufacturers are working on expanding EVs into the commercial trucking industry. Regenerative braking systems also resupply power to the battery to improve overall efficiency and reduce losses.