

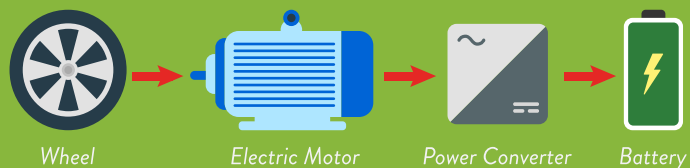
MOBILITY 101:

KNOW YOUR *ELECTRIC* VEHICLES

01 WHAT ARE ELECTRIC VEHICLES?

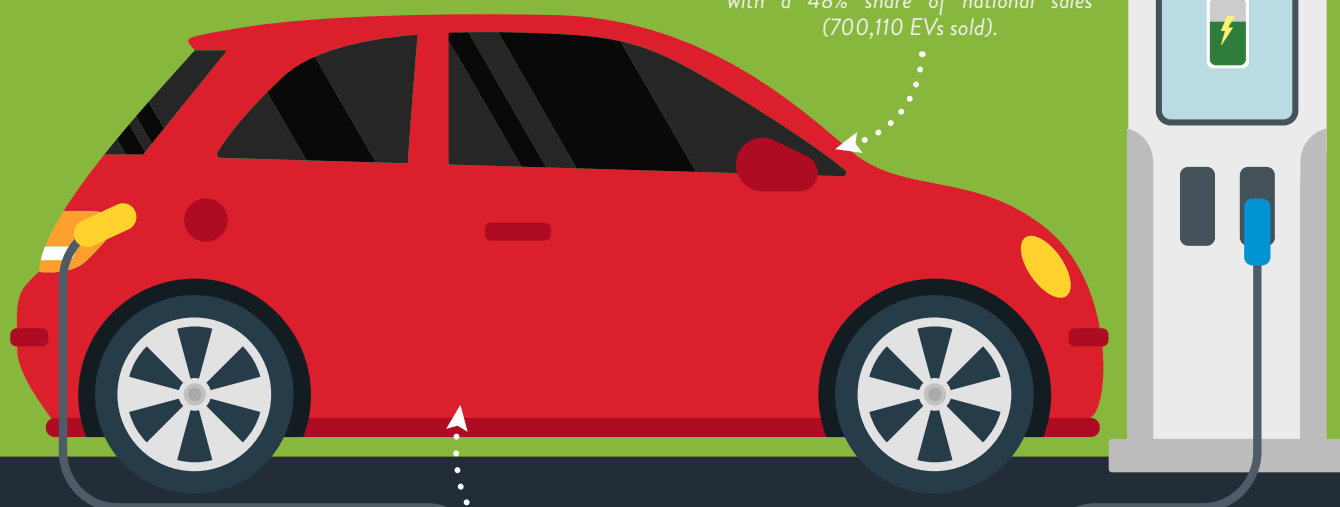
Plug-in electric vehicles, or EVs, are vehicles that are either **partially or fully powered by electricity**. They function by plugging into a designated **EV charging point** and drawing electricity from an **electric grid**.

EVs store electricity in **rechargeable batteries** that power an **electric motor**, which turns the wheels. Through a process of **regenerative braking**, the motor converts some of the kinetic energy that is typically lost when braking/decelerating into energy that is stored in the batteries. Thus, when the car accelerates, it **reuses** the stored energy in the batteries to power itself instead of further depleting energy from its own reserves.



The flow of power during regenerative braking.

Did you know? As of 2019, roughly 1,451,404 EVs were sold in the United States, with California leading the market with a 48% share of national sales (700,110 EVs sold).



02 TYPES OF EVS

Efficient EVs: Up to 80 percent of the energy in the battery is transferred directly to power the car, whereas gasoline-powered vehicles only utilize 14-26 percent.



AEVs (All-electric vehicles)

- + Powered by 1+ electric motors
- + Plugs into an electric grid to charge
- + Does not consume petroleum-based fuel & produce any tailpipe emissions
- + Includes Battery Electric Vehicles (BEVs) & Fuel Cell Electric Vehicles (FCEVs)



PHEVs (Plug-in hybrid electric vehicles)

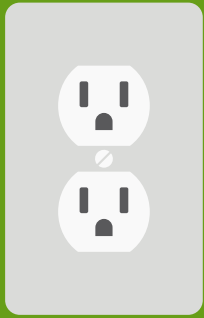
- + Powered by a petroleum-based internal combustion engine (ICE) and an electric motor that draws energy stored in a battery
- + Plugs into an electric grid to charge
- + Also known as Extended-Range Electric Vehicles (EREVs)



HEVs (Hybrid electric vehicles)

- + Powered by a petroleum-based internal combustion engine (ICE) & an electric motor that draws energy stored in a battery
- + Does not plug into an electric grid to charge; the battery charges via regenerative braking and the ICE

03 TYPES OF EV CHARGE POINTS



Level 1: AC*

Voltage

Standard 120V household outlet

Amps

12 - 16 amps

Charging Load

1.4 - 1.9 kW

Vehicle Charge Time

17 - 25 hours; 4-5 miles of range/hr. of charging

Location

Residential homes

Requirements

None

*AC = Alternating Current



Level 2: AC

Voltage

Supply from 208V or 240V outlet

Amps

12 - 80 amps (typically 32 Amps)

Charging Load

2.5 - 19.2 kW

Vehicle Charge Time

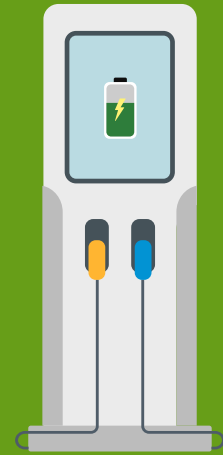
3 - 8 hours; 10 - 20 miles of range/hr. of charging

Location

Public areas (shopping centers, workplaces, etc.)

Requirements

In-home charging unit



Level 3: DC Fast Charge

Voltage

Supply from 208V or 480V outlet

Amps

< 125 amps (typically 60 amps)

Charging Load

< 90 kW

Vehicle Charge Time

20 min. - 1 hour; 20 - 70 miles of range/20-30 min. of charging

Location

Found in high-traffic public areas

Requirements

3-phase AC input & DC (direct current) fast charging capability

04 FACTORS THAT IMPACT CHARGING TIME



Type of charger



Weather



Battery size & state



Age of vehicle



Driving time



Max. charging rate of charge point

05 TO BUY OR NOT TO BUY?

Pros

- + More **energy-efficient** & **quieter** than gas vehicles
- + **Zero emissions**
- + **Cheaper** operating & maintenance costs
- + Eligible for **tax credits**
- + Qualifies for **HOV / carpool lane**

Cons

- + **Shorter** miles per charge range
- + Takes **time** to recharge
- + **Higher initial costs**
- + **Inconsistent** charging station availability
- + **Fewer model options**