ecoblock™

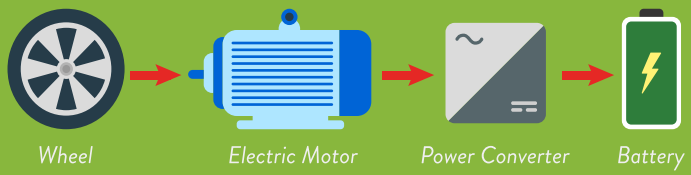
APPLIANCES 101:

KNOW YOUR *ELECTRIC VEHICLES*

01 *WHAT ARE ELECTRIC VEHICLES?*

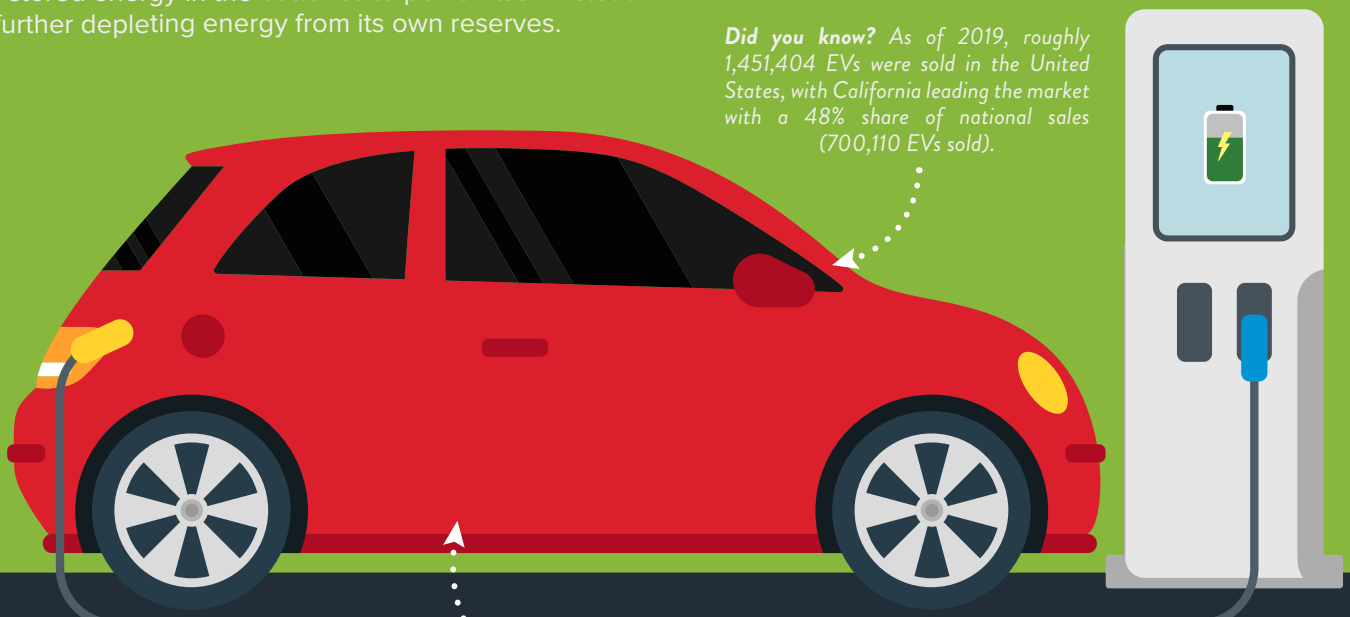
Plug-in electric vehicles, or EVs, are vehicles that are either **partially or fully powered by electricity.** They function by plugging into a designated **EV charging point** and drawing electricity from an **electric grid.**

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).*



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.*

02 *TYPES OF EVS*

AEVs (All-electric vehicles)

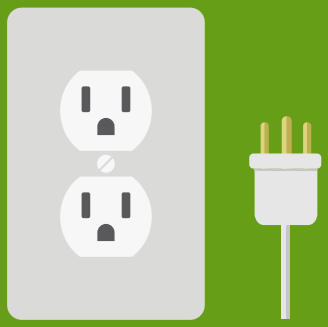
+ Powered by 1+ electric motors
+ Plugs into an electric grid to charge
+ Does not consume petroleum-based fuel & produce any tailpipe emissions
+ Includes Battery Electric Vehicles (BEVs) & Fuel Cell Electric Vehicles (FCEVs)

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



*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

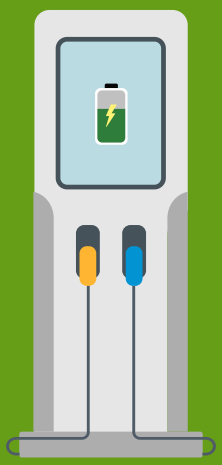
Amps
12 - 80 amps (typically 32 Amps)

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**

Design by Eunice Chung

Sources: Tim Lipman, EcoBlock • Advanced Energy • Car and Driver • Did You Know Cars • EDF Energy • Enel X • Energy.gov, U.S. Department of Energy • Inside EVs• Protect Our Winters