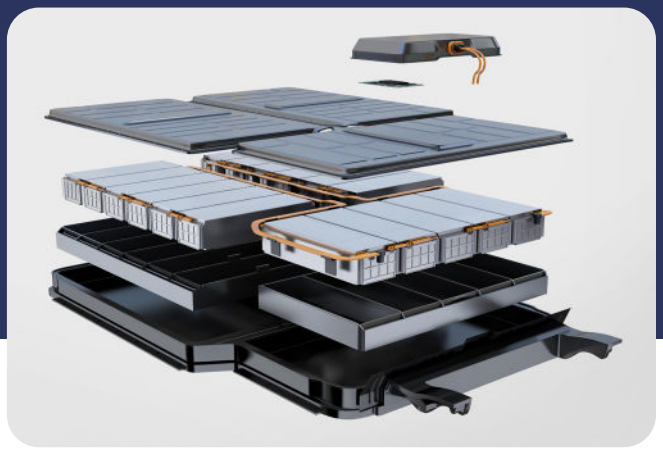
Generation180 / Electrify Your Life

Electric Vehicle Battery FAQ

There is a lot of misinformation out there about electric vehicles (EVs), especially around their batteries. As conscious consumers, we should celebrate the enormous benefits EVs bring to the table, but also be aware of battery mining impacts and push for improved battery recycling and reuse options.



Are electric vehicles good or bad for the environment?

EVs are an important part of the solution to address the climate crisis. The fact is that transportation is the number one source of carbon emissions in the US according to the US EPA. The transportation sector generates the largest share of greenhouse gas emissions.[1] In order to meet climate goals set forth in the Paris Agreement,[2] we must decrease our greenhouse gas emissions drastically. Thus, developing cleaner forms of transportation, such as electric vehicles, are vital to decreasing emissions and meeting our environmental goals. If you care about the climate, we must address personal vehicle transportation and the pollution from gasoline (or internal combustion engine (ICE)) cars.

Is it true EV battery manufacturing is more carbon intensive than producing a gas-powered car?

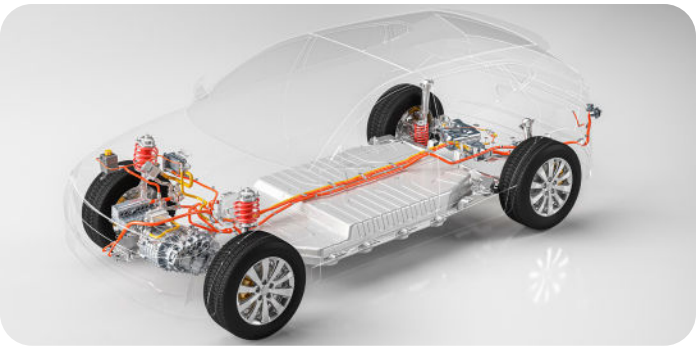
Yes, the production of EVs generally emits more greenhouse gasses per car than cars powered by fossil fuels due to the energy required to extract and refine battery materials. However, the fact that EVs do not have tailpipe pollution rapidly makes up for this. Over their lifetime, EVs produce roughly half the emissions of comparable gas cars. The difference is erased as the vehicle is driven (about 1.5 years for sedans, 1.9 years for S.U.V.s and 1.6 years for pickup trucks). Even when you factor in the entire production of an EV, electric vehicles still produce less than half the emissions of comparable gasoline cars over their lifespan.[3]

Where does the power come from when you plug your EV in? Aren't EV's ultimately powered with gas and coal anyway?

EVs do not have a gas tank that needs to be refilled, therefore they don't have tailpipe emissions. Instead, EVs have rechargeable batteries. In some cases these batteries are charged using energy that is created through the burning of fossil fuels, but as our power grid becomes increasingly powered by clean energy, the environmental effects of charging will only decrease in the future.[4] Additionally, many chargers are already powered by renewable energy such as solar. Residential homes that have solar panels can charge EVs without tapping into the U.S. power grid.

How long do EV batteries last?

While most people are aware of a gas car's lead acid battery that needs to be replaced every four to five years,[5] the battery of an EV is completely different. EVs typically use lithium ion batteries which hold their charge longer than standard car batteries. Generally, EV batteries last 10-20 years although some factors, such as hotter climates, may cause them to degrade faster.[6] EV batteries are warrantied just like gas powertrain (engine) warranties. In fact, Federal law requires automakers to warranty EV and hybrid batteries for at least eight years or 100,000 miles.



How are EV battery materials sourced, and are they sourced ethically?

Human rights are a serious issue in much of the world's raw material extraction, including both batteries and petroleum. Policymakers, activists, international organizations, and manufacturers are working to address these issues.[7]Additionally, a number of EV manufacturers (BMW, Ford, Tesla, General Motors, etc.) are participating in programs such as the Initiative for Responsible Mining Assurance (IRMA). And, innovation in battery recycling will decrease the demand for mining in the future. Research has shown that by effectively recycling end-of-life batteries, we could reduce global EV mineral demand by 55% for newly mined copper, 25% for lithium and 35% for cobalt and nickel by 2040.[8]

What are EV batteries made of?

According to the U.S. Department of Energy, most of today's EVs use lithium-ion batteries (just like your cell phone), but some use nickel-metal hydride batteries, lead-acid batteries, or ultracapacitors.[9]However, there is a lot of innovation going on in the EV battery space as researchers work to develop more efficient and sustainable batteries. One alternative technology is lithium iron phosphate (LFP) batteries, which use iron instead of cobalt. LFP batteries are much easier and cheaper to produce and are more heat-resistant than lithium-ion batteries, so they tend to have a longer lifespan. Additionally, LFP's avoid conflict minerals such as cobalt which is primarily mined in the Democratic Republic of Congo, where human rights issues are more prevalent. By using iron phosphate, LFP batteries reduce the demand for cobalt and the impact mining it has on people and the environment.

Is it possible to recycle or reuse EV batteries?

Yes. Most EV batteries are lithium based and rely on a mix of cobalt, manganese, nickel, and graphite, which are mined across the globe. Because of the value of raw materials in EV batteries, most of the materials are likely to be recycled or reused (which is not possible with oil since it is burned off). One of the more straightforward reuse strategies is "direct reuse," where an EV battery is inspected and tested to ensure quality and function before being sold as a replacement battery for other EVs. If a battery is unable to be reused, it can be repurposed. EV batteries can be repurposed and used as battery storage. For example, EV batteries are being used to store energy on solar grids in California.[10]

What role does the Inflation Reduction Act (IRA) play in EV batteries and manufacturing?

$92.3 billion in investments in EV and battery manufacturing have been announced in the 12 months following the passage of the IRA.[11] Additionally, The IRA requires a certain percentage of the battery supply chain to be in North America. In 2019, only 2 battery manufacturing plants existed in the U.S. As of August 2023, a year after the passage of the IRA, the number of battery manufacturing plants in the U.S. hit 30.[12] The creation of battery manufacturing plants in the U.S. helps ensure ethical sourcing, job creation, and national security.

What Can You Do?

As a current or future EV owner you have an important role to play. Use your voice as an informed advocate. Correcting misinformation will help your community make informed decisions about their transportation options.

Need help or have more questions?
Email hello@generation180.org

01 USA EPA, https://cfpub.epa.gov/ghgdata/inventoryexplorer/
02 UNFCCC, https://unfccc.int/process-and-meetings/the-paris-agreement
03 DOE, Alternative Fuels Data Center, https://afdc.energy.gov/vehicles/electric_emissions.html
04 EDF Vital Signs, https://vitalsigns.edf.org/story/yes-electric-vehicles-are-better-environment-and-answers-more-questions-about-evs#:~:text=EVs%20help%20the%20environment%20because,still%20powered%20by%20fossil%20fuels.
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