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Electric Vehicle Facts and Misconceptions

EVs...	Rebuttal
Environmental	
Are worse for the environment than gasoline vehicles on a lifecycle assessment.	<p>This is highly dependent on where EVs are charged and the grid. EVs have zero tailpipe emissions. Generating electricity will likely have some carbon pollution, depending on how the electricity is generated. The grid has been getting cleaner, using natural gas and renewables, and it is expected to continue to do so. Note, in 2020, renewables became the second most prevalent U.S. electricity source.¹ More must still be done to increase clean energy to support increased electric energy demand.</p> <p>With respect to battery manufacturing, battery manufacturing does require more energy to produce than an internal combustion engine. However, studies have shown² that it takes less than two years for a typical EV to pay off the “carbon debt” from its battery. Over the lifecycle of vehicles, an EV will generate less pollution than a gasoline vehicle, even including battery manufacturing and recycling.</p> <p>Because the U.S. has more stringent emissions regulations than other countries, increased onshoring of domestic battery production will continue to further reduce emissions related to manufacturing.</p>
Weigh more than ICE vehicles, therefore they increase particulate emissions through tire wear.	<p>PM emissions from brake and tire wear is a nascent active field of research. It is still early to characterize the magnitude of the problem, and there is much work in progress to measure and control these emissions.</p> <p>Tire wear is only one source of vehicle particulate matter emissions, along with exhaust emissions (EVs don’t have any), brake wear (EVs typically have regenerative braking resulting in less brake wear), and road abrasion.</p>
Cold Weather	
Can’t be charged in the cold.	<p>EVs can be charged in the cold; however, charge times can be longer in extreme cold.</p> <p>As the temperature drops, the electrochemical process the battery uses to charge slows down. To charge, the car first</p>

¹ U.S. Energy Information Administration (EIA): [Renewables became the second-most prevalent U.S. electricity source in 2020](#)

² <https://www.carbonbrief.org/factcheck-how-electric-vehicles-help-to-tackle-climate-change/>

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	<p>has to warm the battery, which requires time and energy. Because of this, the battery takes longer to charge the colder it gets.³</p> <p>Many EVs automatically pre-heat their batteries when they're approaching an EV charger. This allows them to charge quickly and efficiently when plugged in. Additionally, when charging at home, it is helpful to plug in right away while the vehicle is still warm.</p>
Have much worse range in cold weather.	<p>Similar to a cell phone or laptop, an EV battery does not perform as well in severe cold weather. Automakers know this and have been developing processes and components to reduce the cold impact on the battery.</p> <p>One approach is "pre-conditioning," in which a driver turns the heat on while an EV is still plugged in; this can typically be done through a smartphone app. Pre-conditioning allows the driver to use the charging station to heat the cabin, rather than using the battery.</p> <p>Additionally, most automakers use heat pumps to heat their EVs. A heat pump draws in heat from the outside air to warm the car's cabin much more efficiently than an electric resistance heater in most conditions. Some EV models have both heating technologies for maximum efficiency and cabin comfort across a wide range of outside temperatures.</p> <p>Finally, EV battery manufacturers are investing significant R&D dollars to develop batteries that improve performance in severe cold weather.</p>
Maintenance	
Batteries need to be replaced every X years.	<p>EV batteries have warranties of 5-10 years (California and other S177 states will mandate that all EV batteries have a warranty of at least 8 years and EPA will require that EV batteries have a warranty).</p> <p>Once a battery reaches end-of-life for the vehicle, typically 60-70% capacity,⁴ it can be used in a second life, i.e., stationary storage, or recycled.</p>
Are costly to maintain.	<p>EVs are less costly to maintain because they require less maintenance than internal combustion engines. EVs don't</p>

³ <https://www.usatoday.com/story/graphics/2024/01/18/evs-cold-weather-how-to-charge-help/72254406007/>

⁴ <https://www.caranddriver.com/features/a44022888/electric-car-battery-recycling/>

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	<p>need oil changes, they have less fluids, and their brake systems generally last longer due to regenerative braking.</p> <p>In fact, one metric that can be useful to owners is the total cost of ownership, whereby the lower maintenance costs over an EV's lifetime, combined with the purchase price and charging prices, can equate to a lower total cost of ownership compared to an internal combustion engine vehicle.</p>
<p>Batteries cost more to replace than the actual cost of the vehicle.</p>	<p>Vehicle price includes battery at the time of purchase, and therefore the cost to replace a battery would not cost more than the vehicle (except maybe once the vehicle has aged to a point of depreciation that exceeds the battery's value).</p> <p>EV batteries typically have warranties of 5-10 years (California and other S177 states will mandate that all EV batteries have a warranty of at least 8 years and EPA will require that EV batteries have a warranty). Battery costs continue to decrease; therefore, by the time a vehicle needs a new battery outside of warranty, we would expect that cost to decrease from today.</p>
<p>End-of-Life</p>	
<p>Batteries will end up in landfills at the end-of-life.</p>	<p>EV batteries are extremely valuable at end-of-life, even after being used in a secondary application, due to the valuable and costly critical minerals included in the battery.. Recycling an EV battery is the quickest way to get critical minerals back into the supply chain to manufacture new EV batteries. Battery recyclers are constantly interested in obtaining batteries to recycle.</p> <p>Additionally, the logistics of an EV battery ending up in a landfill are very challenging. EV batteries require very specific tools and training to remove them from a vehicle, and the batteries can weigh on average 1,000 lbs (similar to a V8 engine),⁵ making transporting it a skilled trade that requires specialty shipping.</p>
<p>Do not have any residual value.</p>	<p>EVs are still considered a new technology, and as a result, used EVs are not yet valued in the same manner as a used ICE vehicle.</p> <p>However, used EVs will perform well, and with newer battery technologies maintain more range throughout the life of the vehicle. As a result, a used EV may be undervalued in the</p>

⁵ <https://www.hertz.com/us/en/blog/electric-vehicles/how-much-does-an-electric-car-battery-weigh>

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	<p>residual pricing but still be a viable and excellent product. This also means that used EVs have an important value in their second and third ownership, and in particular, could be the right product for a lower income buyer.</p> <p>EV battery technology continues to improve resulting in batteries lasting longer. Additionally, automakers are now required to provide a minimum warranty of 8 years / 100,000 miles with a minimum state of health parameter tied to that timeframe.</p>
Grid	
Are going to over-burden an unreliable grid.	<p>Given that EVs rely on the grid, there is an important and necessary relationship now between utility companies and automakers. Further, utilities have an increased role in working, communicating, and educating customers about how, when, and at what cost charging (especially at home) should occur.</p> <p>For instance, EVs typically have charging strategies that reward consumers for charging at off-peak times for the grid. In fact, in some cases, EVs can support grid reliability by flattening the load curve by charging at off-peak times when there is excess power on the grid or alternatively at times when there is an excess of solar or other renewable energy on the grid.</p> <p>Grid upgrades will still be necessary, and those upgrades need to be planned now. These upgrades are important to providing modern, efficient, and reliable electricity in addition to supporting the multitude of products electrifying, including LD, MD, and HD EVs, appliances, data centers, heating and cooling systems for homes and businesses, etc.</p> <p>Even with a 100% shift, EVs would only add 10% demand to the current grid use.⁶</p>
Weight	
Are heavier than ICE vehicles, which will cause more harm to the roads.	<p>The vast majority of road damage comes from semitrucks, not passenger vehicles. A semitruck with eight axles weighing 80,000 pounds does 2,500 times more road damage than a two-axled, 4,000-pound sedan, according to the American Institute of Physics.⁷</p>

⁶ <https://www.consumersenergy.com/residential/programs-and-services/electric-vehicles/faq>

⁷ <https://www.insidescience.org/news/how-much-damage-do-heavy-trucks-do-our-roads>

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<p>Are heavier than ICE vehicles, making them more dangerous to vehicles and pedestrians using the road.</p>	<p>Safety is a top priority of the auto industry. Vehicles continue to get safer as automakers across the board test, develop and integrate new safety technologies that can help reduce crashes, save lives, and prevent injuries.</p> <p>There are many factors that affect crash outcomes. With increased emphasis on breakthrough crash avoidance, collision mitigation, and pedestrian safety technologies, safety can be improved regardless of vehicle size and weight by helping avoid or reduce the severity of impacts.</p>
<p>Gas Tax / Highway Trust Fund</p>	
<p>Don't pay their fair share to the highway trust fund.</p>	<p>Most states have implemented an additional registration fee for EVs that provides EVs' share of funding for the HTF. Auto Innovators supports a registration fee for EVs that is in line with what a comparable ICE vehicle would pay through gas tax.</p>
<p>Critical Minerals / Mining</p>	
<p>Battery critical minerals are mined through forced and/or child labor.</p>	<p>Too long – make a high-level point and then add a few bullets of examples of how we are preventing this, i.e., Uyghur, CBP, membership of sustainable mining coalitions...</p> <p>The U.S. Customs and Border Protection (CBP) is responsible for preventing the entry of products made with forced labor into the U.S. market by investigating and acting upon allegations of forced labor in supply chains.</p> <ul style="list-style-type: none"> • Congress passed, and the President signed, the Uyghur Forced Labor Prevention Act in 2021 directing DHS to “develop a strategy for supporting enforcement of the prohibition on the importation of goods into the United States manufactured wholly or in part with forced labor in the People’s Republic of China, especially from the Xinjiang Uyghur Autonomous Region, or Xinjiang. • In addition to vehicle manufacturers conducting their own supply chain review, Section 307 of the Tariff Act of 1930 currently prohibits the importation into the United States of all goods and merchandise mined, produced, or manufactured wholly or in part in any foreign country by forced labor, convict labor, and/or indentured labor under penal sanctions, including forced child labor. The U.S. Customs and Border Protection Agency has enforcement authority

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	<p>for Section 307 (https://www.cbp.gov/trade/forced-labor).</p> <ul style="list-style-type: none"> • CBP implements Section 307 of the Tariff Act of 1930 (19 U.S.C. §1307) through issuance of Withhold Release Orders (WRO) and Findings, and enforcement of the Uyghur Forced Labor Prevention Act (UFLPA) and Countering America's Adversaries Through Sanctions Act (CAATSA), to prevent merchandise produced in whole or in part in a foreign country using forced labor from being imported into the United States.
Safety	
Are unsafe.	EVs must meet the same comprehensive Federal Motor Vehicle Safety Standards as internal combustion engine vehicles. EVs, just like their ICE counterparts, undergo extensive testing, including crash testing.
Catch fire a lot or are difficult to extinguish in the event of a fire... burdening first responders.	EV fires are more difficult to extinguish than gas powered engines due to the battery design and the fact that the batteries take a longer time to cool. However, figures from Norway, where more than a fifth of cars on the road are electric, show that standard combustion engine vehicles catch fire around five or six times more often than EVs. ⁸
Do not have safety information for emergency responders	There are a lot of resources for training emergency responders dealing with EVs. The U.S. DOE has compiled a collection of a lot of the training offered today (https://afdc.energy.gov/vehicles/electric-responders)
Are more susceptible to cyber-attacks.	EV manufacturers adhere to stringent security standards, including cybersecurity. The auto industry is actively working with EV charging companies, utilities, the government, and other stakeholders to ensure that the appropriate comprehensive cybersecurity standards are in place.
Other	
Are challenging to fuel if you do not have a charger hat home	This is why building codes are so important. Building codes need to be updated to require EV charging capability in multi-unit dwellings such as apartments and condos. It is not equitable that a person living in an apartment complex does not have access to the convenience of home charging that someone with a single-family home and a garage.

⁸ <https://www.carbonbrief.org/factcheck-21-misleading-myths-about-electric-vehicles/>

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	<p>Additionally, there are currently over 64,000 publicly available EV charging stations across the U.S. (Cross reference figure with latest Get Connected Report).</p>
Are not available in the make and model that suits my needs	<p>There are currently 114 unique EV models offered for sale in the U.S. The vehicles offered range from sedans to crossovers to utility vehicles to pick-up trucks. There is an EV model available to suit the needs of almost every ICE vehicle sold today.</p>
Do not perform well	<p>EVs have more torque and power than internal combustion engines.</p> <p>Additionally, automakers are offering these vehicles with the latest advanced technology and features.</p>

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Resources:

- <https://driveelectricus.com/>
- <https://www.epa.gov/greenvehicles/electric-vehicle-myths>
- <https://energy.drax.com/insights/electric-vehicle-myths/>
- <https://www.carbonbrief.org/factcheck-21-misleading-myths-about-electric-vehicles/>
- <https://www.consumersenergy.com/residential/programs-and-services/electric-vehicles/faq>
- <https://charge.net.nz/knowledge-article/ev-myths/>
- <https://www.nbcnews.com/business/autos/ev-battery-range-cold-weather-charging-rcna134355>
- <https://www.energy.gov/articles/winterizing-your-electric-vehicle>
- <https://www.usatoday.com/story/graphics/2024/01/18/evs-cold-weather-how-to-charge-help/72254406007/>
- https://www.ey.com/en_us/automotive-transportation/why-electric-vehicles-are-changing-how-we-evaluate-residual-values