



Executive Summary

U.S. Consumer Survey Results

December 2022

EVs + Battery Recycling

New Research: Americans Warming Up to EVs, but Misconceptions Remain

Nearly half of US consumers mistakenly believe EV batteries aren't recyclable

There are more EVs on the road today than ever before, and attitudes towards them are changing rapidly. As innovation and competition drive unprecedented sales of EVs, Ascend Elements wanted to better understand the attitudes and perceptions that everyday Americans have about this ubiquitous new technology.

Ascend Elements commissioned an independent research firm to survey a random sample of 1,004 US consumers about their beliefs and attitudes regarding battery technology and electric vehicles. The survey was conducted in August 2022.

The margin of error for this study is +/-3% at the 95% confidence level.

KEY FINDINGS

Survey of 1,004 U.S. consumers was conducted in August 2022. The margin of error is +/-3% at the 95% confidence level.

- 47% of US consumers think that Lithium-ion electric vehicle batteries cannot be recycled when they reach their end of life.
 - **FACT:** Lithium-ion electric vehicle batteries can be recycled when they reach their end of life.
- 37% of US consumers think that Lithium-ion electric vehicle batteries cannot be made with recycled metals and materials.
 - **FACT:** Lithium-ion electric vehicle batteries can be made with recycled metals and materials.



47% of US consumers think lithium-ion electric vehicle batteries cannot be recycled.

53% of US consumers say their attitude towards EVs is more positive than it was 3 years ago.



- 37% of US consumers think that old laptop and cell phone batteries cannot be recycled and then used to make new electric vehicle batteries.
 - **FACT:** Companies like Ascend Elements are recycling old consumer electronics batteries and converting the material into new, battery-ready cathode material for new EV batteries.
- Only 39% of US consumers understand that the critical materials in lithium-ion EV batteries can be recycled over and over without performance loss.
 - **FACT:** Battery materials like lithium, nickel and cobalt are infinitely recyclable. The critical materials in lithium-ion EV batteries can be recycled over and over without performance loss.
- 44% of US consumer think that it is more expensive to make new lithium-ion batteries using recycled lithium-ion battery materials.
 - **FACT:** Ascend Elements can manufacture new lithium-ion battery materials at a lower cost compared to traditional cathode manufacturing methods.
- 34% of US consumers think that Lithium-ion batteries can be recycled in the household recycling bin.
 - **FACT:** Lithium-ion batteries contain hazardous materials and should never be placed in the household recycling bin.

- 27% of US consumers think that Lithium-ion batteries can be put in the trash.
 - **FACT:** Lithium-ion batteries contain hazardous materials and should never be placed in the trash.
- 41% of US consumers do not think electric vehicles (EVs) are better for the environment than gas-powered cars.
 - **FACT:** Many studies have shown electric vehicles (EVs) to be better for the environment over the lifetime of the vehicle.
- 43% of US consumers think that manufacturing an electric vehicle (EV) uses a lot more energy than manufacturing a similar-sized gas-powered vehicle.
 - **FACT:** Manufacturing an electric vehicle (EV) indeed uses more energy than manufacturing a similar-sized gas-powered vehicle. Use of recycled materials in new batteries promises to reduce the carbon-footprint of EVs dramatically.

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- 46% of US consumer think that electric vehicles will outsell gasoline-powered cars in their lifetime.
 - **FACT:** Demand for EVs is growing fast and many industry analysts agree EVs will outsell gas-powered vehicles by 2040. Source: BNEF 2022 Electric Vehicle Outlook
- 40% of US consumers think that the batteries in electric vehicles are more dangerous than gas-powered cars.
 - **FACT:** Both gasoline and Lithium-ion batteries are hazardous and must be handled with care.



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- 38% of US consumers think that Lithium-ion electric vehicle batteries are sourced using destructive mining techniques.
 - **FACT:** Use of recycled battery materials in new EV batteries promises to reduce the need for mining.
- 42% of US consumers think that Lithium-ion electric vehicle batteries don't offer as much power as internal combustion engines.
 - **FACT:** Many EV models offer more power and acceleration than traditional internal combustion engine models.
- 51% of US consumers think that Lithium-ion electric vehicle batteries don't offer as much range as internal combustion engines.
 - **FACT:** Range anxiety is a legitimate concern for many drivers, but installation of a nationwide fast-charge infrastructure will help alleviate concerns.
- 36% of US consumers think that Lithium-ion electric vehicle batteries are sourced using unjust mining practices.
 - **FACT:** Use of recycled battery materials in new EV batteries promises to reduce the social justice impacts of mining.

*Source: [U.S. Environmental Protection Agency](#)

- 59% of US consumers think that Lithium-ion electric vehicle batteries make cars more expensive
 - **FACT:** It's true that new EVs are about 38% more expensive than new internal combustion engine vehicles, but eventually increased use of recycled battery metals will help lower the cost -- and carbon footprint -- of EV batteries.
- 45% of US consumers think that the US isn't competitive when it comes to manufacturing Lithium-ion electric vehicle batteries.
 - **FACT:** Asia dominates the world Lithium-ion battery market currently, but significant investments in the U.S. Lithium-ion battery infrastructure have been made in 2022.
- 60% of US consumers think that Lithium-ion electric vehicle batteries are "greener" than internal combustion engines.
 - **FACT:** Manufacturing an electric vehicle battery actually creates more carbon emissions than manufacturing an internal combustion engine. However, over the lifetime of the vehicle, EVs have a far lower environmental impact. In time, increased use of recycled battery materials will reduce the carbon footprint of new EV batteries.

60%

of US consumers think that Lithium-ion EV batteries are "greener" than internal combustion engine (ICE) vehicles.

- 41% of US consumers think that Lithium-ion electric vehicle batteries won't save them money compared to gas powered cars.
 - **FACT:** Charging an EV is approximately 3.5 times cheaper per mile than the cost of fueling a gas-powered car. In the long term, opting for an electric vehicle over a traditional internal combustion engine (ICE) vehicle can save you a huge amount of money.

Source: [Zero Emission Transportation Association \(ZETA\)](#).

41% of US consumers think EVs are too small and slow compared to gas-powered cars.



- 48% of US consumers think that across all product types, recycled products are not as good as new ones.
 - **FACT:** Recycled EV batteries have been shown to perform just as well as batteries made with virgin materials.
- 41% of US consumers think that electric vehicles are too small and slow compared to gas powered cars.
 - **FACT:** While many consumers may have visions of the first-generation EVs in mind, today's battery electric vehicles can be fast (Tesla Model S Plaid) or large (Ford F-150 Lightning).
- 46% of US consumers think that EV batteries made with recycled materials are just as good as EV batteries made with newly mined metals.
 - **FACT:** Independent studies have shown EV battery cells made with recycled materials perform just as well as battery cells made with new materials.
- 54% of US consumers are concerned about what we will do with all these lithium-ion EV batteries after they reach end of life.
 - **FACT:** Lithium-ion EV batteries are recyclable and highly valuable. Recycling companies are paying for used EV batteries. Used batteries are becoming a new source of critical battery materials.

- 48% of US consumers think that EVs will cause toxic landfills full of old lithium-ion batteries.
 - **FACT:** Lithium-ion EV batteries are recyclable and highly valuable. Recycling companies are paying for used EV batteries. Used batteries are becoming a new source of critical battery materials.
- 50% of US consumers think that owning an EV means they'll need to wait in long lines for charging stations.
 - **FACT:** Unlike gas stations, electric vehicle charging can be dispersed over larger areas and incorporated into parking lots and cityscapes, giving EV drivers many options for charging.
- 47% of US consumers think that too many EVs will overwhelm the power grid.
 - **FACT:** EVs are most likely to be charged overnight at home, which is the time of day with the lowest demand for electricity.

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of US consumers think too many EVs will overwhelm the power grid.

- 53% of US consumers think that EVs are more expensive to repair.
 - **FACT:** EV motors are virtually maintenance free compared to internal combustion engines.
- 51% of US consumers are concerned because China makes 80% of the world's EV batteries.
 - **FACT:** This is a legitimate concern, but the United States and other countries are investing in Lithium-ion battery materials and manufacturing infrastructure.

- What US consumers think are the most valuable parts of an electric vehicle battery:
 - Lithium
 - Copper
 - Aluminum
 - **FACT:** The most valuable parts of an electric vehicle battery are:
 - Cathode materials
 - Anode materials
 - Electrolyte

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Ascend Elements leaders are available to discuss the survey results.

MEDIA CONTACT

Thomas Frey, APR
Ascend Elements

Email: media@ascendelements.com
Phone: 734.658.0143

