Yes, the Electric Era Is Here

AND IT'S GOOD FOR PEOPLE AND THE PLANET

COX AUTOMOTIVE
MOBILITY

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INTRODUCTION

Electric vehicles have a long history, but the era for mass production and practical long-range customer use is upon us only now. Still considered by the general public as an emerging technology, it's not surprising confusion, skepticism, and even doubts persist. Misinformation and half-truths make it difficult to discern actual facts and some even claim that electric vehicles aren't living up to their "green" hype in one way or another.

While asking questions is productive during this period of change, it's important to recognize that we are at the beginning of end of the Oil Age in cars and trucks. A perfect storm of environmental commitments, greater OEM offerings, and changing consumer sentiments are driving electrification.

THE THREE LEVELS OF ELECTRIFICATION

Hybrid Vehicle aka Hybrid Electric Vehicle or HEV

Switches between a gas engine and an electric motor for higher gas mileage; no plug-in charging. The battery pack that supplies the motor is charged by the gas-powered engine and regenerative brakes.

Plug-In Hybrid Vehicle aka Plug-in Hybrid Electric Vehicle or PHEV

Runs on electricity first, with the gas engine used as back up. Batteries can be charged using a wall outlet or charging station or by the gas-powered engine or through regenerative braking.

Electric Vehicle aka Battery Electric Vehicle or BEV

Doesn't use a gas-powered engine at all; runs on battery power only. The battery is charged using a wall outlet or charging station or through regenerative breaking. The best option for the environment over its life cycle.

WHAT'S DRIVING THE ELECTRIC VEHICLE REVOLUTION

Environmental Commitments – The U.S. Rejoining the Paris Agreement

The U.S. has lagged Europe and China on mass adoption of electric vehicles, but 2021 marked a dramatic change on the policy front. President Biden announced on the first day of his presidency that the U.S. would rejoin the Paris Agreement, with a focus on electric vehicles and charging infrastructure. The U.S. officially rejoined the Paris Agreement on February 19, 2021.

The Paris Agreement brought all nations together — including the top emitters of greenhouse gases — in 2015 to fight the climate crisis. The goal of the Paris Agreement is to hold global temperature rise to "well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels" and cut net greenhouse gas emissions to zero by mid-century.[1]

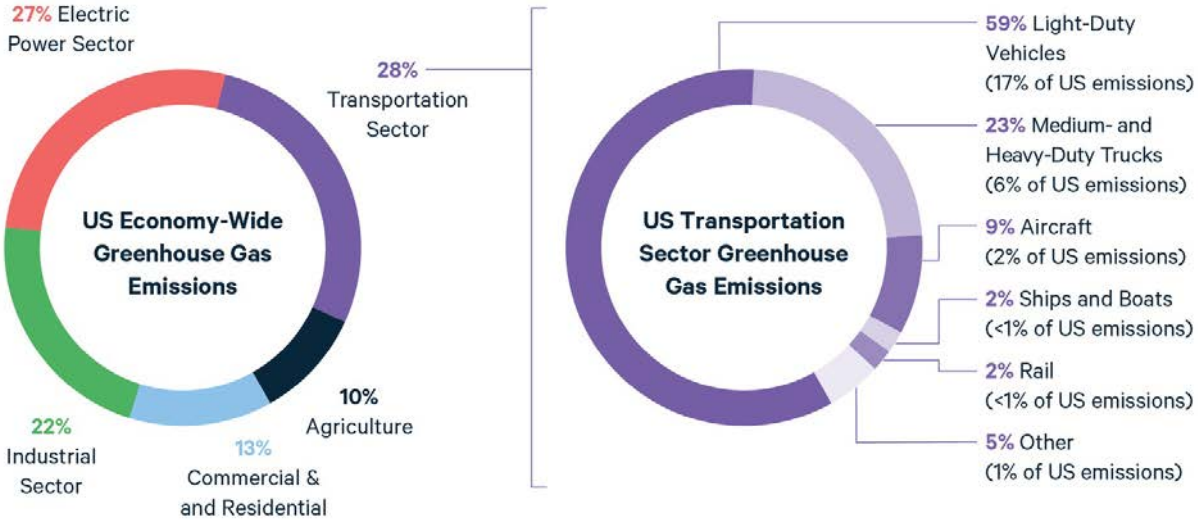
The U.S. has committed to cutting emissions by

50% - 52%

below 2005 levels by 2030.

Each country sets its own non-binding emissions reduction targets and outlines the actions they will take to meet them. This year, countries submitted their goals for 2030 and their plans to get there. The U.S. has committed to cutting emissions by 50% – 52% below 2005 levels by 2030.[2]

The Paris Agreement is a powerful signal to businesses that the nations of the world are committed to curbing emissions and accelerating the transition to a clean energy economy. It drives public policy and is a clarion call for companies — particularly automakers — to embrace renewable energy. Especially since the transportation sector is the largest source of emissions in the U.S., most of which comes from cars and trucks.[3]



Data from EPA "Inventory of US Greenhouse Gas Emissions and Sinks" (2018)

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[1] "The Paris Agreement." United Nations Framework Convention on Climate Change. 2015.

[2] "President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies." The White House Briefing Room. April 22, 2021.

[3] "Carbon Pollution from Transportation." U.S. Environmental Protection Agency, *www.epa.gov*.

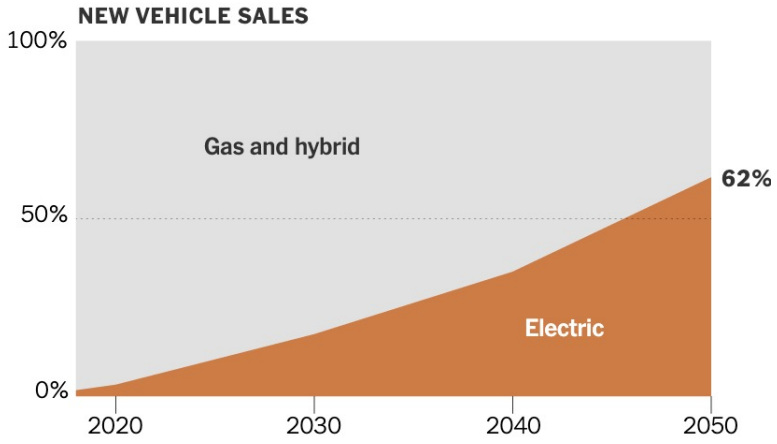
Switching from gasoline to electricity is a vital part of reducing emissions and avoiding the worst impacts of climate change. However, it's only one of many solutions. For example, you can plug leaks in your home insulation to save power, install a smart thermostat, switch to more efficient light bulbs, waste less food, and eat less meat. But, switching to an electric vehicle could be one of the biggest actions a household can take to reduce their carbon footprint, considering the average passenger vehicle emits 4.6 metric tons of carbon dioxide per year, according to the Environmental Protection Agency.

Setting the Stage for an All-Electric Future

Climate experts agree that vehicle electrification is one of the best ways to reduce planet-warming greenhouse gas emissions. Here are the key factors driving Original Equipment Manufacturers (OEMs) to provide greener mobility solutions:

- **Government Regulations and Incentives** – More stringent carbon dioxide emission regulations—particularly in overseas markets—along with incentives and subsidies that support electric vehicle investment promotion and sales. Different countries (and states) are in different stages of enacting limits on gasoline and diesel-powered vehicles, but the trend is clear: if you want to be part of the future in the biggest automotive markets you need to have a transition plan from petroleum to electric vehicles.
- **Infrastructure and Technology Development** – President Biden's infrastructure proposal as well as bipartisan compromises allocate billions of dollars toward a national electric vehicle charging network. Plus, Wall Street is getting into the act; electric car charging companies like ChargePoint Holdings (NYSE: CHPT), EVgo Services, Blink Charging, and Beam Global look to profit from deploying more public charging stations across the U.S. Although most electric vehicle owners currently charge up at home, more charging stations will alleviate consumer anxiety about running out of power on long-distance trips. In addition, technological advances such as greater battery capacity, life and performance, and faster charging times are helping to accelerate adoption.
- **Consumer Readiness** – The mobility industry has been responding to the demand for higher sustainability for many years, and the electric vehicle is part of the solution. Today, the general public has a greater awareness of the environmental impact of fossil fuels.[4] A recent Consumer Reports survey showed that seven out of ten consumers are interested in getting an electric vehicle in the future.[5]

Quite simply, electric vehicles offer a pathway to a sustainable transportation future that fossil fuel-powered vehicles cannot. As a result, automakers are shifting to electric vehicles, which are projected to make up 25 percent of new U.S. sales by 2035 and 60 percent of new sales in 2050 according to research firm IHS Markit.



[4] "From climate change awareness to action." International Institute for Applied Systems Analysis. ScienceDaily, March 9, 2020.

[5] "New CR survey finds the majority of consumers are interested in getting an electric vehicle." Consumer Reports, December 2020.

OEMs Providing More Electric Vehicle Offerings

Myth: There aren't a lot of electric vehicle options available.

As a leader in electric vehicle sales, it's no surprise that Tesla gets the lion's share of media attention. The introduction of the Tesla Model S in 2012 changed many people's impression of what an electric car is.

While Tesla has been a game changer, there are many more affordable electric vehicles in the market, though they tend to get much less press coverage. In fact, during the first half of 2021, consumers saw 19 new models entering the market in the U.S.[6] Almost 100 electric vehicle models are set to debut in the U.S. by the end of 2024, according to Consumer Reports.

American car shoppers can now find electric vehicles across a range of prices and automakers. For model year 2022, there will be fifteen mass-market electric vehicles launched (according to Kelly Blue Book). And that's just the beginning. Automakers and parts suppliers have announced plans to spend over $400 billion by 2025 on boosting the use of electric vehicles, with aggressive commitments for an all-electric future.[7]

General Motors says it will make only electric vehicles by 2035. Ford expects electric vehicles to make up almost half of its global sales by 2030. Volkswagen says 70% of its European sales and 50% of its U.S. sales will be electric by 2030. Jaguar plans to sell only electric cars by 2025. Volvo plans 50% of its global sales to be all-electric by 2025. Stellantis expects 40% of its U.S. sales to be either fully electric or plug-in hybrid within four years.

BMW expects roughly half of its global sales to be electric vehicles by 2030. By 2022, Mercedes-Benz will have battery electric vehicle offerings in all segments. Nissan targets 40% full battery electric vehicle sales in the U.S. by 2030. Hyundai will phase out combustion engines in most major markets by 2040. Amongst the hybrid pioneers, Honda expects to ditch gas-powered vehicles completely by 2040, with Toyota introducing 15 all-electric vehicles by 2025.

[6] "12 Best Selling Electric Vehicles of 2021 (so far)." *caranddriver.com*. July 19, 2021

[7] "Letter to President Joseph R. Biden, Jr." Alliance for Automotive Innovation. March 29, 2021.

Electric vehicles are the real deal: much cleaner than traditional, gas-powered, internal combustion engine (ICE) vehicles; better for the planet and our collective health; and better for our wallets, especially over the long haul. From cars to buses to trucks, electric vehicles are saving the climate and our lives. Here's how.

GOOD FOR THE PLANET: ELECTRIC VEHICLES ARE CLEANER FROM CRADLE TO GRAVE

The automotive industry is making the shift from a take-make-waste extractive industrial model to a circular economy focused on positive society-wide benefits. That means environmentally friendly vehicles along their entire lifecycle—from green production using renewable energies to responsible battery disposal and chemical recycling. Electric vehicles are a big step in that direction.

It's not that electric vehicles are perfect; it's just that they have a significantly smaller carbon footprint than gasoline-powered cars and that gap is widening. Electric vehicle technology has advanced quickly in recent years, yet the limits of early technology are still named as issues today. Let's debunk some of the myths about electric vehicles and set the record straight.

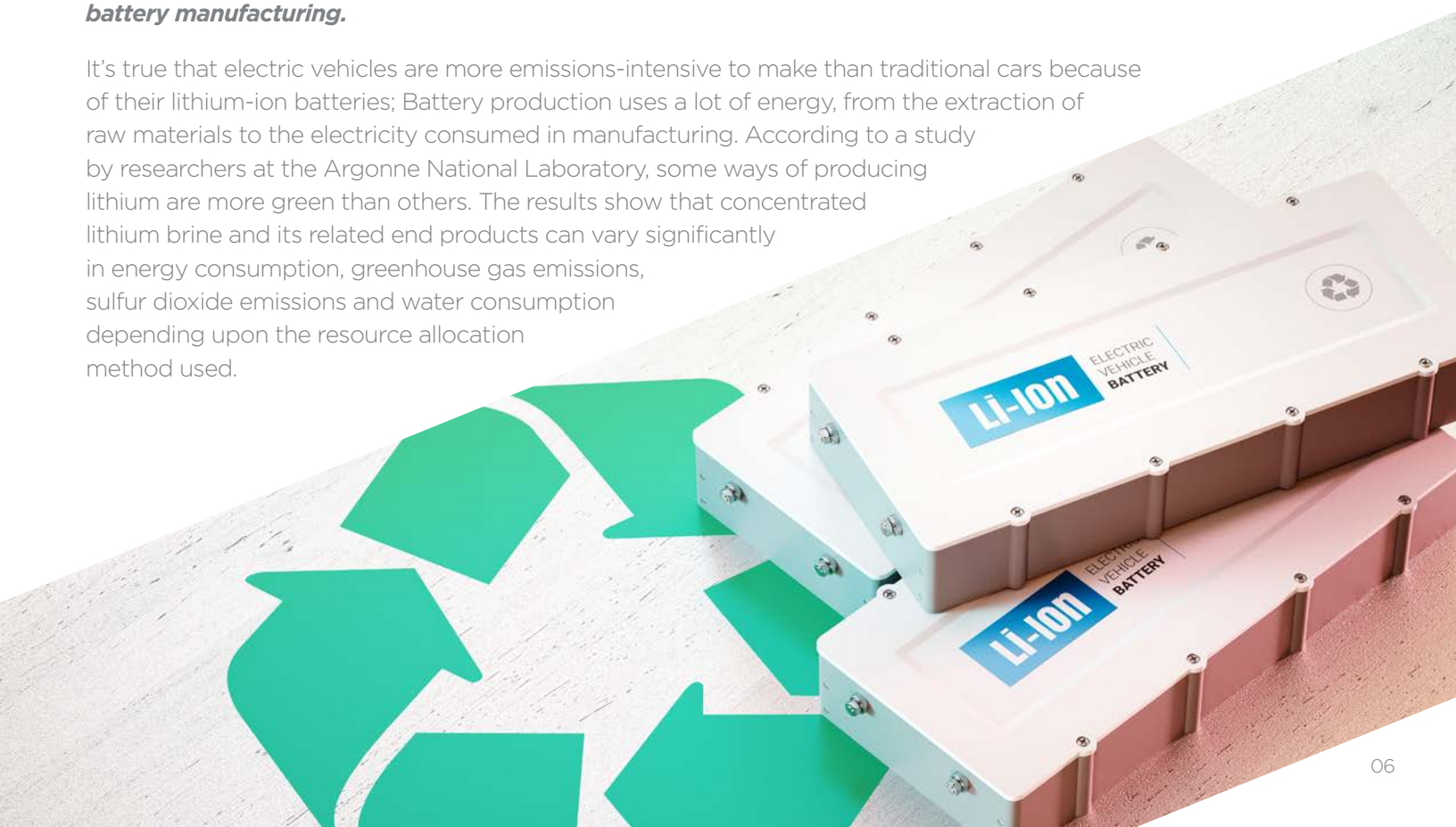
The life cycle of vehicle emissions has three phases: the manufacturing phase, the use phase, and the end-of-life phase.

MANUFACTURING PHASE

Greener Batteries

Myth: Electric vehicles are worse for the climate than gasoline-powered cars because of battery manufacturing.

It's true that electric vehicles are more emissions-intensive to make than traditional cars because of their lithium-ion batteries; Battery production uses a lot of energy, from the extraction of raw materials to the electricity consumed in manufacturing. According to a study by researchers at the Argonne National Laboratory, some ways of producing lithium are more green than others. The results show that concentrated lithium brine and its related end products can vary significantly in energy consumption, greenhouse gas emissions, sulfur dioxide emissions and water consumption depending upon the resource allocation method used.



But, despite producing more emissions during the battery production stage, electric vehicles are still better for the environment than gas-powered cars over the course of their life cycle. According to BloombergNEF, the carbon emissions from building the average 2020 model electric vehicle is about equal to the car making and burning gasoline associated with driving the average 2020 model ICE vehicle approximately 17,000 miles. But after that point, the electric vehicle is greener by leaps and bounds over the lifespan of a typical car.

In fact, the average electric vehicles sold today produce less than half the global warming emissions of comparable gas-powered vehicles, even when the higher emissions associated with electric vehicle battery manufacturing are taken into consideration.

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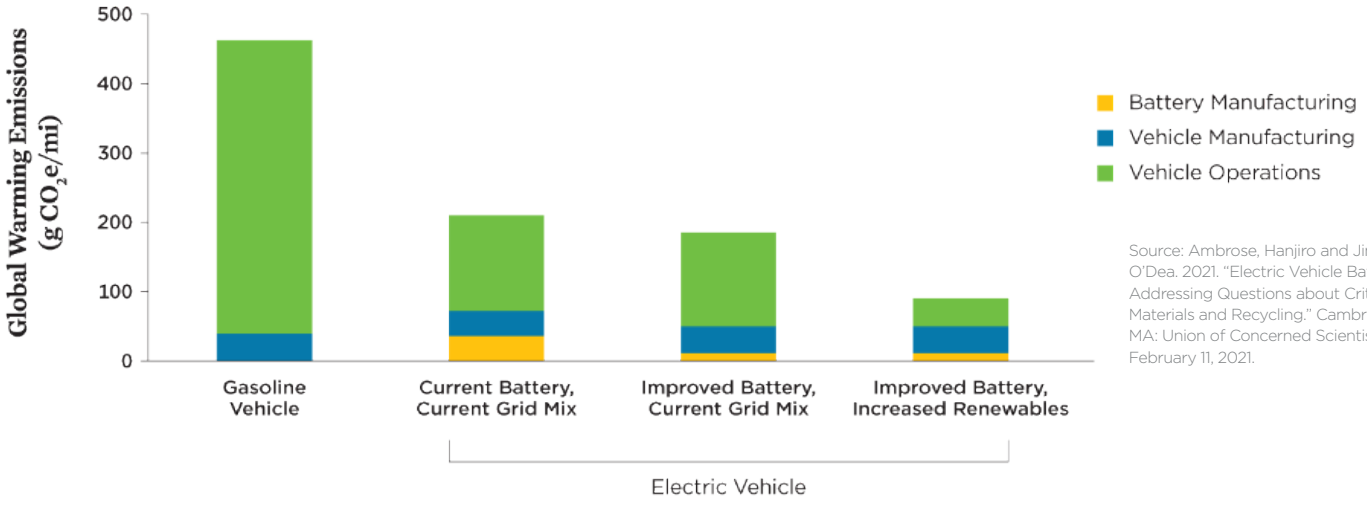
Mine-to-Wheel Life Cycle Global Warming Emissions of Different Passenger Vehicle Types



Source: Ambrose, Hanjiro and Jimmy O'Dea. 2021. "Electric Vehicle Batteries: Addressing Questions about Critical Materials and Recycling." Cambridge, MA: Union of Concerned Scientists. February 11, 2021.

Moreover, researchers say that electric vehicle batteries are cleaner today than they were even a few short years ago.[8] And the batteries keep getting cleaner. Analysts expect battery pack energy densities to increase another 15% over the next decade.[9]

This improved technology can:

1. **Extend the range a vehicle can travel before needing to plug in again, given the same battery size or**
2. **Shrink the size of the battery pack, resulting in greater efficiencies and additional cost savings.**

[8] Erik Emilsson, Lisbeth Dahllöf. "Lithium-Ion Vehicle Battery Production: Status 2019 on Energy Use, CO2 Emissions, Use of metals, Products Environmental Footprint, and Recycling." IVL Swedish Environmental Research Institute. ISBN 978-91-7883-112-8

[9] "By 2030, Battery Electric Vehicles will be Less Reliant on Lightweighting: Increasing battery pack energy densities holds the key to future vehicle design." Lux Research, Inc. November 12, 2020.

WHAT IS BATTERY ENERGY DENSITY? It's how much energy a battery contains in proportion to its weight. A battery with high energy density has a longer battery run time compared to other batteries of the same size. Alternately, a battery with high energy density can deliver the same amount of energy, but in a smaller footprint. Basically, it means that the lithium-ion battery in electric vehicles—the heaviest component—is getting smaller and more efficient. It's also becoming less costly—another win for consumers. Source: Flux Power

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What's more, producing batteries in regions with relatively low-carbon electricity or in factories powered by renewable energy is also substantially reducing battery emissions. Plus, the extra emissions associated with battery production are rapidly offset by the reduced emissions from merely driving.

Greener Materials

Lightweighting, or purposely designing more lightweight cars specifically for fuel efficiency, has been a key tool for improving the fuel economy of conventional vehicles. That's because the acquisition, processing, and transport of heavier materials to produce the vehicle components generate higher emissions.

Fortunately, electric vehicles are already overwhelmingly more efficient than conventional cars, due to regenerative braking and more powerful motors. But smaller, more efficient batteries and newer, lightweight body design advances are further cutting down electric vehicle weight for an even greener ride. According to Lux Research, Inc., automakers are also shifting to other climate-friendly material priorities, like sustainability, durability, and end-of-life repurposing.

USE PHASE

No Car Exhaust

Conventional cars use internal combustion engines that run on fossil fuels like gas or diesel. The exhaust coming from their tailpipes is a pollutant. Plus, the process of extracting oil, refining it into fuel, and transporting it to gas stations also generates a large amount of air pollution.

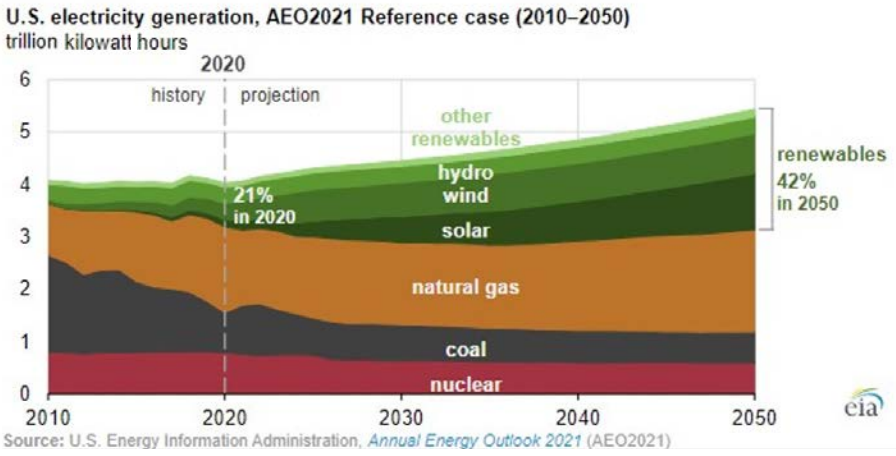
But electric vehicles do not directly rely on fossil fuels for power. Instead, they use one or more electric motors powered by rechargeable lithium-ion batteries, the same kinds of batteries that power smartphones and laptops. And like electronic devices, electric vehicles plug into external power sources for charging. Their lithium-ion batteries work more efficiently, with growing life spans.

Because electric vehicles do not rely on gasoline or diesel for power, they don't have certain components of conventional cars like fuel lines, fuel tanks, and tailpipes. This means that most electric vehicles do not emit carbon dioxide, which helps reduce air pollution.

Cleaner Electric Grid = Even Cleaner Electric Cars

Myth: Electric vehicles are worse for the climate because of power plant emissions.

While electric cars produce significantly fewer planet-warming emissions than most cars that run on gasoline, their climate impact still depends on how much coal is being burned to charge up those plug-in vehicles.[10] But the U.S. energy transition is well underway. Over the last decade, electric utilities have reduced their reliance on coal plants, shifting to a mix of lower-emissions natural gas, wind, and solar power.



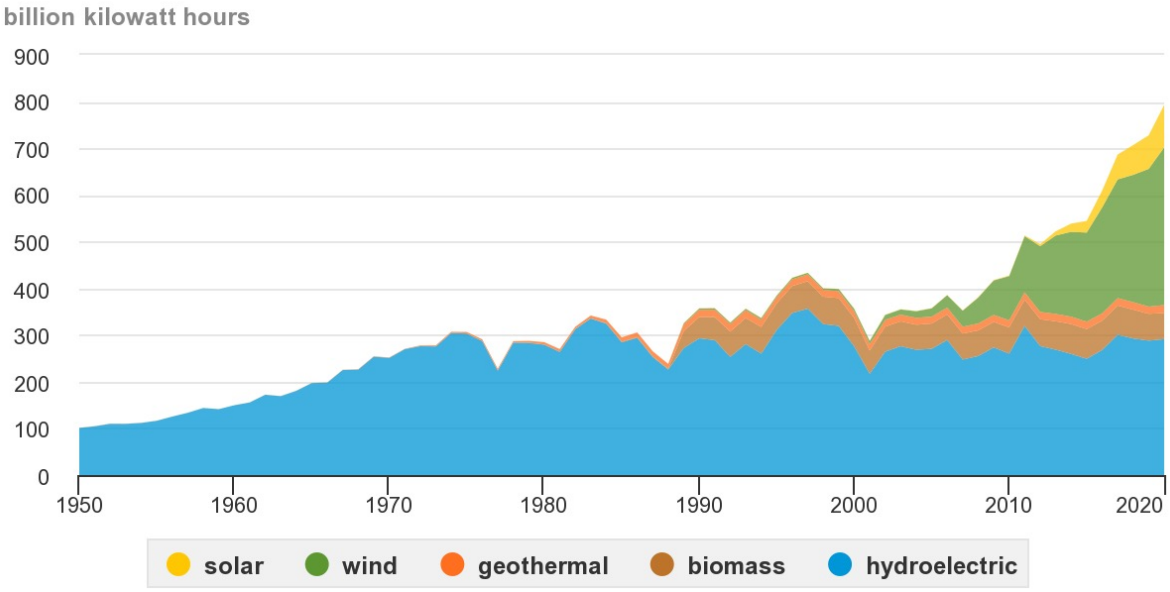
Source: U.S. Energy Information Administration, *Annual Energy Outlook 2021* (AEO2021)

[10] "Environmental Effects of Battery Electric and Internal Combustion Engine Vehicles." Congressional Research Services R46420. June 16, 2020.

U.S. electricity grid doubles in renewables by 2050

Electricity from solar and wind is increasingly competitive with natural gas power, and the grid is shuttering coal plants that no longer make economic sense. While many utilities have stated plans to reduce their emissions to net zero by 2050, the Biden administration has set a goal of a carbon-free electric grid by 2035.[11] The government will likely push to achieve that accelerated deadline through environmental and economic regulations. Investors in public utilities are also pressuring executives to support cleaner energy resources.

U.S. electricity generation from renewable energy sources, 1950-2020

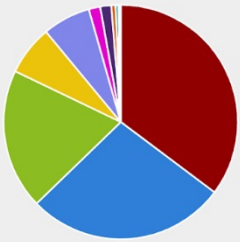


Note: Electricity generation from utility-scale facilities. Hydroelectric is conventional hydropower.
Source: U.S. Energy Information Administration, *Monthly Energy Review*, Table 7.2a, January 2021 and *Electric Power Monthly*, February 2021, preliminary data for 2020

Electric cars are almost always much greener than conventional cars—even when powering up from the current electric grid. And as electric grids get cleaner, electric vehicles will get cleaner, too.[12]

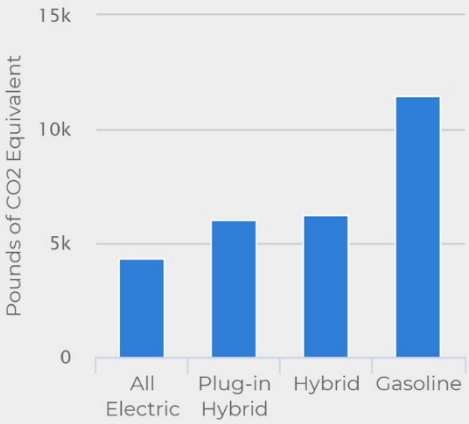
National Averages

Electricity Sources



- Natural Gas: 35.24%
- Coal: 27.52%
- Nuclear: 19.37%
- Hydro: 6.86%
- Wind: 6.60%
- Solar: 1.60%
- Biomass: 1.51%
- Oil: 0.59%
- Geothermal: 0.40%
- Other Fossil: 0.30%

Annual Emissions per Vehicle



Source: Emissions from Hybrid and Plug-In Electric Vehicles. Alternative Fuel Data Center, U.S. Department of Energy.

[11] Grubert, Emily. "Fossil electricity retirement deadlines for a just transition." Science. December 4, 2020

[12] Knobloch, F., Hanssen, S., Lam, A. et al. "Net emission reductions from electric cars and heat pumps in 59 world regions over time." Nat Sustain 3, 437–447 (2020). *https://doi.org/10.1038/s41893-020-0488-7.*

END-OF-LIFE PHASE

Myth: Electric vehicle batteries are wasteful and end up in landfills.

Battery Reuse

Federal law requires automakers to warranty electric vehicle batteries for at least eight years or 100,000 miles, whichever comes first. Autotrader.com says electric vehicle batteries can last 10 years under normal driving conditions before they need to be replaced—longer than most people keep a new car. Most manufacturers guarantee that your battery will retain at least 70% of its original capacity.

So the batteries aren't dead when they come to the end of their useful life in an electric vehicle. That leftover power can be harnessed for other applications. Like powering homes or buildings; electrical grids; communications towers; or for energy storage to be tapped at a future time.

Solutions are within reach as a growing number of technology startups and major automakers work to advance the second-life battery segment. The challenge is establishing a degree of standardization given that batteries differ widely in chemistry and construction.

Battery Recycling

Electric vehicle batteries contain raw materials such as cobalt, lithium, and nickel. Mining these materials irresponsibly can leach toxic compounds into the environment, and the extraction process can emit air pollution. It's also water-intensive and linked to human rights violations. Once tossed into landfills, metals from the batteries can pollute the water and soil.

When batteries do reach the end of their working life, recycling is a green option that is getting greener every day. While the technology to completely eliminate problematic metals is still under development, carmakers have made recent strides in establishing more sustainable manufacturing guidelines for their battery suppliers and in keeping batteries out of landfills. Recycling and refurbishing electric vehicle batteries reduces the need for additional extracting, refining, and transporting new minerals—and supports the establishment of a national or local supply chain of raw materials.

THE STAGES OF BATTERY RECYCLING

Battery recycling has three general stages:

- Pretreatment primarily consists of mechanically shredding and sorting plastic and metal materials.
- Secondary treatment involves separating the highest-value materials in the cathode from the aluminum collector foil with a chemical solvent.
- The final step is separating the cathode materials through leaching chemicals ("hydrometallurgy"), electrolytic reactions, and/or heat treatment ("pyrometallurgy" or "smelting").

Source: "Electric Vehicles" Fact Sheet. Union of Concerned Scientists (*ucsusa.org*).

A number of companies and several automaker-sponsored ventures are developing meaningful recycling innovations. For example, while Volkswagen's current battery recycling methods recover about 60 percent of a battery pack's materials, its pilot plant in Salzgitter, Germany can recover up to 95 percent. Canadian firm Lithion has developed an efficient and cost-effective process for recycling lithium-ion batteries. The process allows for 95% of battery components to be recovered and treated, in order to be reused by battery manufacturers, closing the loop on the battery life cycle.[13]

New government policies and incentives for recycling and reusing batteries can further lessen the environmental impacts of electric vehicle batteries. The Department of Energy unveiled a five-year, $200M funding program for securing access to raw materials, supporting growth of a processing sector, beefing up manufacturing, and enabling recycling and end-of-life reuse for batteries.

$200M funding program

Other Recyclable Materials

The battery packs often have steel, aluminum, plastics and wiring that can be recycled. Some electric vehicles already have interior parts – such as the seats, door trim panels, and dashboards—that are made from recyclable materials. For example, BMW says that a quarter of the interior in its electric i3 car is made of recycled plastics or renewable materials, while 95% of the car can be recycled when the life cycle is complete.

[13] "Hyundai Canada and Lithion Recycling Announce Agreement on Recycling of Hybrid and Electric Vehicle Batteries." *www.lithionrecycling.com.*

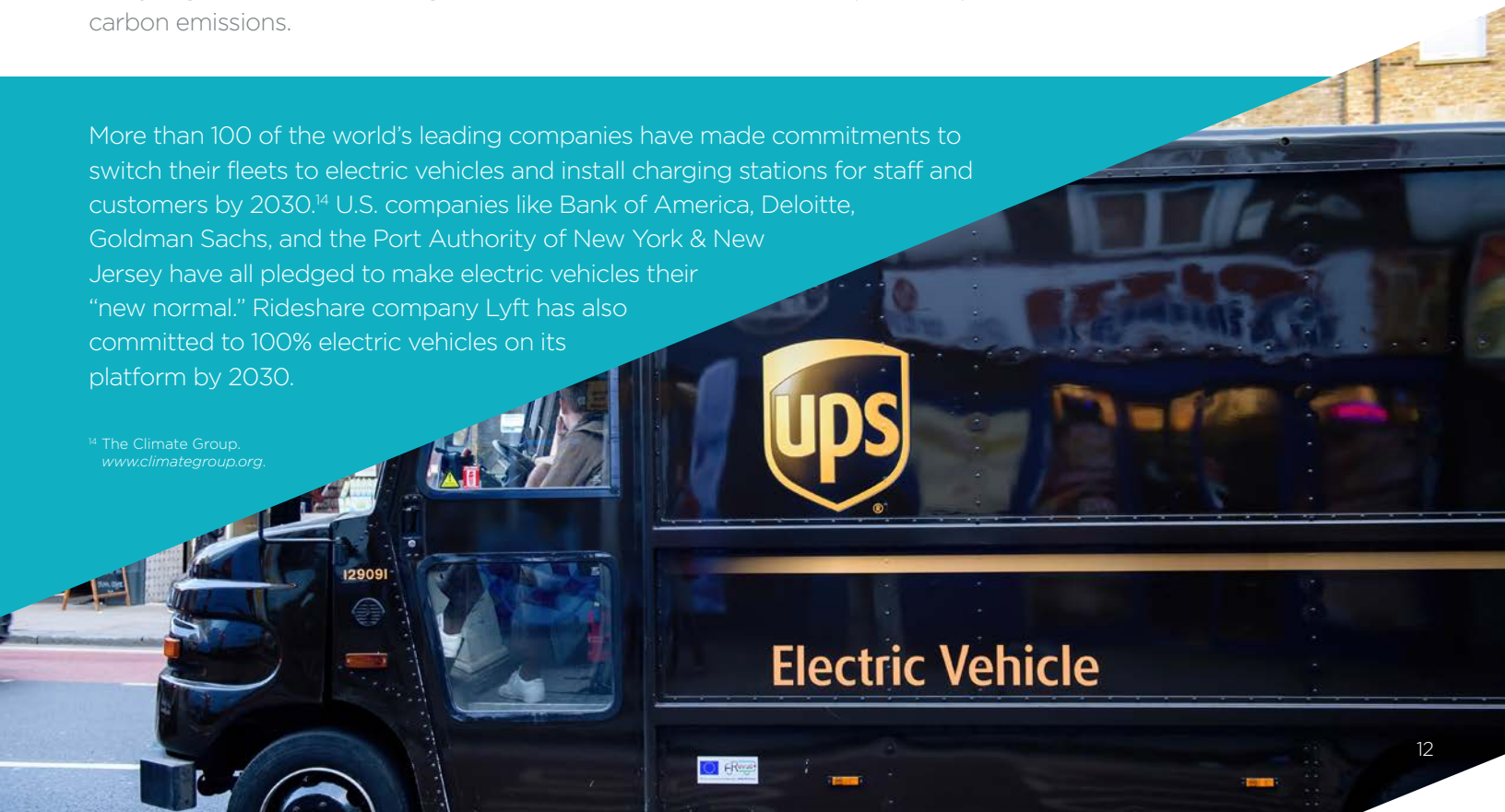
GREENER FLEETS

Myth: Electric fleets don't make good business sense.

With fuel costs on the rise and more government pressure to switch to greener alternatives, many organizations are adding electric vehicles to their fleets to help lower operational costs and carbon emissions.

More than 100 of the world's leading companies have made commitments to switch their fleets to electric vehicles and install charging stations for staff and customers by 2030.[14] U.S. companies like Bank of America, Deloitte, Goldman Sachs, and the Port Authority of New York & New Jersey have all pledged to make electric vehicles their "new normal." Rideshare company Lyft has also committed to 100% electric vehicles on its platform by 2030.

[14] The Climate Group. *www.climategroup.org.*



And the list keeps growing. Many national, state and local government-owned fleets are also under mandates to transition to 100% electric by certain dates. Even though, there is an upfront investment needed for the EV charging infrastructure, the benefits of electric vehicle fleets can't be overlooked.

Lower operational costs: Eliminating or reducing a fleet's dependency on fossil fuels, can save on the cost of gasoline. According to the U.S. Department of Energy, all-electric vehicles and plug-in hybrid electric vehicles have a typical energy cost of $50-80/month, compared to the ICE gasoline cost of $160-200/month. Switching from a gas-powered car to an electric car can save on fuel alone.[15]

Fewer maintenance issues: With fewer moving parts to maintain, electric vehicle owners save thousands of dollars per year on maintenance costs. There are only around 20 moving parts in an electric vehicle engine versus 2,000+ in an ICE vehicle, making them cheaper to operate day to day and maintain over the years.[16] In fact, electric car owners report spending one-third of the cost to maintain their electric vehicles than traditional vehicles.

Vehicle safety: According to The Insurance Institute for Highway Safety and the affiliated Highway Loss Data Institute, electric vehicles have a more favorable safety profile than conventional internal combustion engine vehicles for a few reasons: Experts agree that lithium-ion batteries are less flammable than gasoline.[17] Electric vehicles are also less likely to roll over in a collision due to their weighted base. Electric car automakers have also begun to strategically place vehicles' batteries further away from the "crumple zones"—or areas that are susceptible to getting smashed in a crash—in order to mitigate risk of fire in the case of a collision.

Good corporate citizenship: In the past year, purpose has become a greater corporate priority, with an increasing number of companies seeking to differentiate themselves by acting as a force for positive change. Because travel is a major avenue for businesses to alleviate emissions, more and more companies are considering how they can support a shift to electric vehicles.

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[15] "Fuel Economy Guide." U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, U.S. Environmental Protection Agency. Updated May 18, 2021.

[16] "Electrification May Disrupt the Automotive Supply Chain." Congressional Research Service. February 8, 2019.

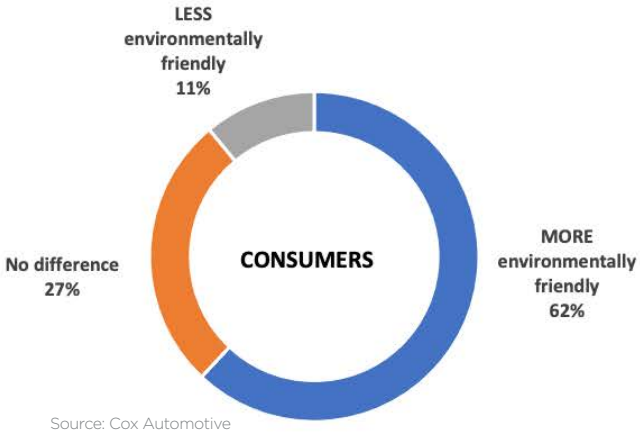
[17] "Electric vehicle fires are rare, but challenging to extinguish." Popular Science. April 26, 2021.

CONSUMER & DEALER PERCEPTIONS

Myth: People don't see the environmental benefits of electric cars.

The results of the spring 2021 Cox Automotive Electric Vehicle survey of consumers and dealers indicate that public perception of electric vehicles as environmentally friendly is trending toward the mainstream.

Sixty-two percent of consumers surveyed agree that electric vehicles are better for the climate. Although the dealers surveyed have more doubts about phasing out gas-powered vehicles, a meaningful 48% affirm that electric vehicles are more environmentally friendly.



Source: Cox Automotive

The dealers and consumers who believe electric vehicles are more environmentally friendly than gas-powered vehicles cite fewer emissions and pollution as reasons.

Consumers

- "The batteries are more environmentally friendly and thus less climate change damage than pure gasoline vehicles as numerous studies have pointed this out." – Consumer
- "There are many pros and cons, but one thing for sure is, electric vehicles would put much less pollution into our atmosphere, and lungs." – Consumer
- "The battery does not emit pollutants." – Consumer
- "Internal combustion engines produce carbon monoxide which is aiding in the depletion of the ozone layer and changing our climate. Electric engines do not produce any chemicals and help in keep our air and ecology clean." – Consumer

Dealers

- "Less emissions and even less noise pollution." – Independent, General Manager
- "Zero emissions!" – Independent, Service & Parts Manager/Director
- "Battery-powered vehicles leave a smaller print because they are not polluting the air with smog. Less gas consumed and also the ability to use solar power for charging." – Franchise, Used Vehicle Sales Manager
- "Less use of fossil fuels seems like the reasonable answer. Less emissions." – Franchise, Salesperson/ Sales Consultant

Dealers and consumers have concerns about the production and disposal of electric vehicle batteries and their impact on the environment, as well as how electricity for the vehicles is generated.

Consumers

- "Although their use is environmentally friendly, their manufacture and disposal are not." – Consumer
- "As electric vehicles become more popular, they're posing another environmental challenge: what to do with their batteries once they're off the road." – Consumer
- "EVs produce fewer emissions but disposing of the batteries is a problem for the environment, as is mining lithium, generating electricity to charge them, etc." –Consumer
- "Although I think electric cars are friendlier to the environment than gas cars, they are still not 100% friendly since the battery and the electricity charging the battery are using fossil fuel for the battery to be made and the charging." – Consumer

Dealers

- "Obviously limiting the fossil fuels required to power a vehicle is a good thing for the environment. The unknown is what ramifications we will see with battery production, recycling, and waste." – Franchise, General Sales Manager – New and Used Vehicles
- "EV is better for emissions but there are major concerns about how all of the electricity needed to run all the EVs will be made and how the EV batteries will be disposed of in the future." – Franchise, Operations Manager
- "While there are no emissions produced from an electric car, that doesn't quite tell the whole story of the environmental impact of a BEV. The reality is that the majority of electricity is still produced by coal power plants, meaning carbon is still being released into the atmosphere, just not from the vehicle's tailpipe. There's also the impact from the increased demand for coal-produced electricity with more BEV on the road. Finally, there's the impact of the batteries themselves and the impact of the materials required to make them and the effects of their disposal." – Franchise, CFO/Controller
- "When you take into account where the power comes from to recharge the battery as well as the disposal of the battery at the end of its life there is little difference between these and combustion engines. There is a huge perception problem in this area." – Franchise, General Sales Manager – New and Used Vehicles

GOOD FOR PEOPLE: CLEANER AIR, BETTER HEALTH AND A PLANET THAT ENDURES

Myth: Electric vehicles won't make a difference in climate change

Every region in the U.S. is already experiencing the effects of climate change—including coastal areas threatened by rising sea levels and more intense hurricanes; Midwest farmlands facing more crop-damaging heat waves, pests, and flooding; and communities in the West and Southwest experiencing drought and wildfires. Children, the elderly, and the poor are particularly vulnerable to respiratory, cardiovascular, and heat-related illnesses exacerbated by these global warming conditions.

Action to sharply reduce our emissions can greatly curb the human toll and the economic damage from climate change, especially over the longer term. Driving an electric car is a meaningful way to help our country move away from burning fossil fuels and create healthier and more resilient communities where we live.

Improved Air Quality

Electric cars help improve air quality in towns and cities. With no tailpipe, electric cars produce no carbon dioxide emissions when driving, considerably reducing air pollution. Simply put, electric cars give us cleaner streets, making our towns and cities a better place to live. Better air quality means fewer health problems, the associated costs, and human suffering.

Decreased Noise Pollution

Electric vehicles are quieter than gas cars, which means less noise pollution. Traffic noise is actually a serious environmental threat to public health. According to the World Health Organization (WHO), long-term exposure to high environmental noise levels such as traffic, can result in adverse health effects such as elevated blood pressure, coronary artery disease, hearing loss, and even heart attacks.

Mitigating Racial Health Disparities

In the Federal Aid Highway Act of 1956, urban planners routed freeways through communities of color. These populations have borne a disproportionate impact of transportation air pollution, reflected in greater rates of heart and breathing deaths. Electric vehicles can mitigate the harm done to these underserved communities.

Preserving Vital Ecosystems

Making a dent in global warming could help lessen the harm to coastal barrier reefs, which protect communities from storm surges, and wetlands, which filter impurities from water. Climate-change-driven drought and pests imperil forests, which provide lumber. Warming temperatures and growing acidification threaten oceans, lakes, and rivers, which sustain our fisheries. Plus, many animal and plant species provide us with important medicines and other products.

Cutting emissions also reduces the amount of mercury and other heavy metals—by-products of coal-fired power plants—that enter our water and food.

CONCLUSION: RIDE THE WAVE OF THE ELECTRIFICATION REVOLUTION

The sustainability revolution is already underway and the initial uncertainty of whether electric vehicles will become a key part of the mainstream vehicle market is over. Electric vehicles are a critical part of the transportation present—and future—given their propensity to dramatically cut global warming emissions, charged by an ever-cleaner electricity grid.

KEY TAKEAWAYS

Bottom Line: Fewer Emissions
From factory to road, electric vehicles, with zero tailpipe emissions, emit on average less than one-half of the global warming pollutants that gas-powered vehicles produce – and are getting even better over time.

A Cleaner Grid for an Even Cleaner Ride
As we retire more coal plants and bring cleaner sources of power online, the emissions from electric vehicle charging drop even further. The U.S. has a goal to achieve a carbon-free electric grid by 2035.

Greener Batteries
The electric vehicle industry is pivoting to batteries that are more responsibly sourced and have a higher percentage of recycled components. Automakers are also building recycling plants to reduce the amount of new material required for a new electric vehicle battery.

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