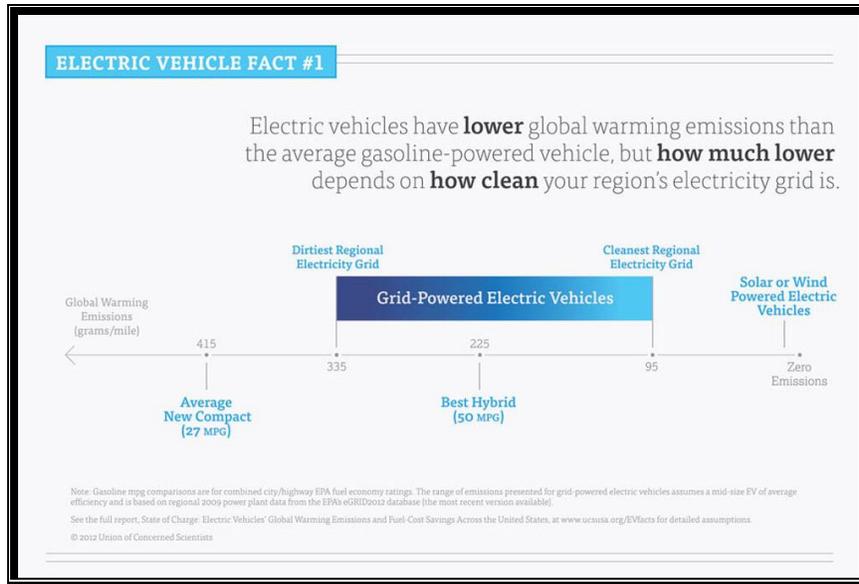


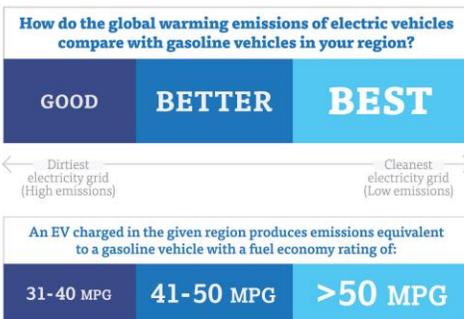
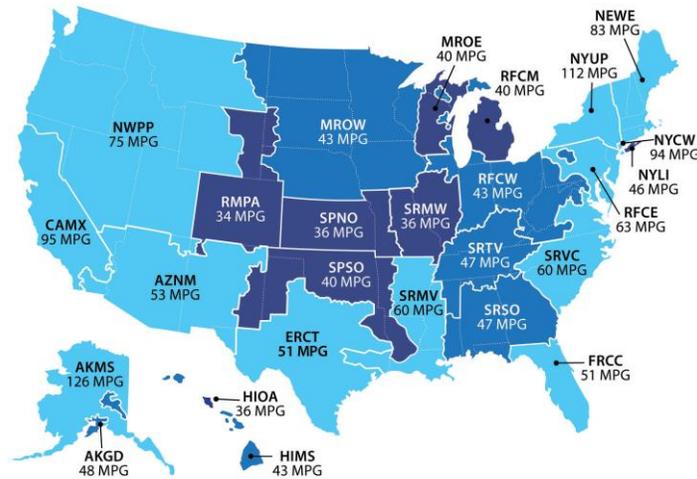
ELECTRIC VEHICLE (EV) MYTH BUSTING

MYTH: Electric Vehicles (EVs) are dirtier/more polluting/have a larger environmental impact than internal combustion engine (ICE) powered vehicles that run on gas/diesel fuel.

FACT: Electric Vehicles are always cleaner to operate than similarly classed gasoline/diesel powered vehicles but how clean depends on the energy that is used to charge their batteries.



FACT: In states where the electricity comes from primarily coal (the dark blue states on the following map) an EV is cleaner to operate than gasoline powered vehicles.



The sources of electricity generation vary by region, meaning the global warming benefits of owning an electric vehicle depend on the electricity grid where it is charged.

FACT: In areas where the energy to charge an EV comes more from renewable sources such as wind, solar and hydroelectric power (the light blue states on the following map) EVs are much, much cleaner to drive and have far less of an operational impact on the environment.

FACT: If you power an EV on 100% renewable energy such as a rooftop solar array - it will be truly zero emission and potentially free to fuel.

FACT: The US and world energy grid is getting cleaner and “greener” every year as more fossil fuel power plants are shuttered and more renewable energy production facilities continue to come online. This means EV's will only continue to get cleaner with every passing year. Petroleum powered vehicles will only continue to wear out and lose efficiency as they age robbing you of money in expensive fuel and maintenance costs as well as increasing the amount of toxic pollution they emit into our shared atmosphere. Source: <http://www.ucsusa.org/clean-vehicles/electric-vehicles/life-cycle-ev-emissions>

MYTH: Building more EV's will require us to build many more power plants to provide all the electricity to operate all of them.

FACT: As of the writing of this document (summer 2022) there are about 2 million electric cars in the USA.

FACT: Average driver drives about 40 miles per day...so 80 million miles driven per day.

FACT: You need about 1kWh per 4 miles driven in a typical EV.

FACT: The USA consumes 3.9 trillion kWh per year - over 10 billion kWh per day.

So we need 20 million kWh per day to keep those EV's on the road.

Hence, all those EV's add up to something like an eighth of one percent of the total US demand.

BUT: It gets better than that...

FACT: Most EV owners charge their cars overnight most of the time.

FACT: During the night, there is MUCH less electricity demand from consumers, so both the grid and the power stations are very under-used, so all those charging EVs can just soak up all that excess energy.

FACT: The US power grid is getting cleaner each day as dirty old fossil fuel power stations are shuttered and replaced with clean, renewable power stations. Therefore, no matter where or when you charge your EV - it is always cleaner to fuel and drive than its petroleum distillate powered counterparts.

FACT: Many EV drivers have solar/battery storage systems at home/work. Therefore, when they charge their EV - they are charging their cars battery via locally produced renewably generated electricity and their impact on the grid is negligible. Another great thing to point out here is this: rooftop/private solar power systems often produce energy in the positive and feed this excess energy back into the grid instead of taking from it so they become a local renewable energy power station offsetting the burning of more fossil fuels. Also, this energy is domestically sourced and produced energy so no wars or dirty political deals are needed to keep it flowing. No oil tanker/pipeline spills and no major impacts on the environment or wildlife have happened due to its sourcing, production, transmission, and use. Oh and its infrastructure has been installed by American workers as is its operation and maintenance - therefore it creates many good jobs for many people. In fact, jobs in the renewable energy, EV, and energy efficiency sectors are rapidly growing while fossil fuel and legacy automotive jobs are in decline – with many fossil fuel/automotive workers transitioning over to the renewable energy/EV sector.

FACT: The oil refineries, oil and gasoline pipeline pumps, and gas stations use a LOT of electricity - and with the reduced gasoline consumption due to EV's - there will be energy savings in these areas as well.

FACT: It takes 6 KWh of electricity to refine one gallon of gasoline (source US DOE).

FACT: The average EV can travel 24 miles on the power that it takes to refine just one gallon of gasoline!
FACT: It takes ~9 KWh of energy to extract and transport the crude oil that will be refined into that gasoline.

FACT: An EV could travel an additional 36 miles on this energy.

So...get an EV, and drive 60 all-electric miles on the same amount of energy we are generating today to refine all that dirty gasoline and since the average MPG of cars in the USA is 25.4 mpg - that means that replacing a gas car with an electric car actually REDUCES the amount of electricity we need.

Overall the extra load on the grid is very nearly zero...and we will actually SAVE electricity by switching to EV's!!

This will be true even if 100% of all vehicles in the US were electric."

and...by going electric you will save the 44 gallons of water that it takes to refine that one gallon of gasoline!

PLUS

FACT: EV's are charged from the same utility grid that your other mobile devices use and technically an automobile is a mobile device. Like your other mobile devices, most EV's are charged at night while you are sleeping, when electricity generated from emissions-free wind, hydro, and nuclear power is practically free and goes mostly unused - so there is ample supply to power your EV.

FACT: Due to the grid getting cleaner, EV's also get cleaner as they age. This is never a fact with ICE cars that constantly lose efficiency as they age due to wear and tear on their thousands of moving parts.

FACT: In the southeastern USA, one parking space covered with a canopy of photovoltaic solar modules (panels) with an output of 2.5KW would produce around 3,292 KWh or more of electricity per year. This will operate an EV for around 13-16K miles of 100% emissions free driving - on clean, renewably generated, sunshine sourced electricity!

FACT: Solar, wind, and hydroelectrically generated electricity used for charging the batteries of EV's (and provide electricity to power your homes, businesses etc.) are most often produced/harvested very close to where they are used. This makes these energy sources far more efficient than fossil fuels that are often sourced in faraway lands/locations at great expense to our country, our bank accounts, and to our shared environment.

MYTH: It is very expensive to power/charge an EV.

FACT: The average cost of electricity in the US is 12 cents/kWh. Therefore the average person driving an average EV 15,000 miles per year will pay about \$540.00 per year to charge it. How much did you pay for gasoline/diesel last year?
I bet it was much more than \$540.

FACT: Believe it or not - five 100 watt incandescent light bulbs left on continuously for a year use nearly the same amount of energy as it takes to power an electric car 15,000 miles! Here's how: Five 100 watt light bulbs use 500 watts. In 24 hours they use 12,000 watt-hours or 12kWh. In 365 days they use 4,380kWh. A typical EV that uses 30 kWh for every 100 miles will use 4,500 kWh to drive 15,000 miles! Simply by turning unnecessary lighting off at your home, you can drastically reduce or completely eliminate your annual transportation fuel cost. Try doing that with a petro-chemical powered vehicle!

Cars are not the only way you can reduce emissions by switching to EV's

FACT: One piece of gas burning lawn equipment emits more hydrocarbon pollution into our shared atmosphere than a gasoline-guzzling crew-cab pickup truck! You would have to drive a 6.2L V8 truck almost 4000 miles to equal the emissions produced in 30 minutes of use by a gas powered 2-cycle engine such as a string trimmer (weed-eater) or leaf blower. Why not use an all-electric string trimmer, leaf blower, or lawn mower—there are many great choices available now and they all can even be fueled with renewable energy you can generate at home – and will you never need to mix gas and oil or breathe toxic exhaust fumes ever again!

MYTH: EV's, and renewable energy sources are not patriotic and are un-American because they do not create jobs or use the oil/gas that we fight deadly wars to acquire.

FACT: Today there are more Americans employed in solar jobs than there are coal miners mining coal.

FACT: Sourcing our energy domestically (be it solar, wind, hydro, coal—whatever the source) provides many tens of thousands of good jobs to Americans and is much more efficient and much safer than traveling thousands of miles, making deals with foreign governments—that are often hostile—extracting it, then finally transporting it back home (using oil we

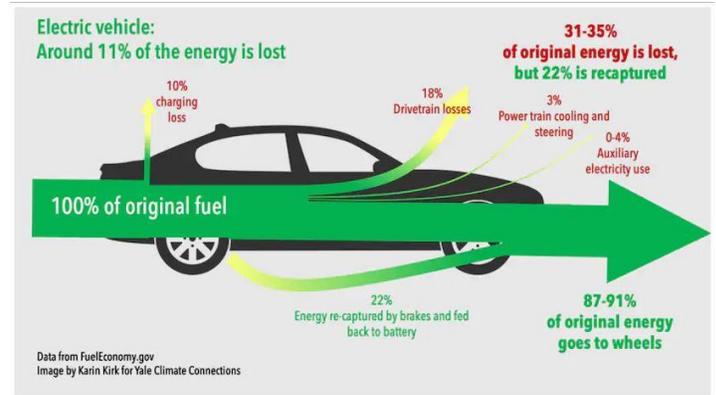
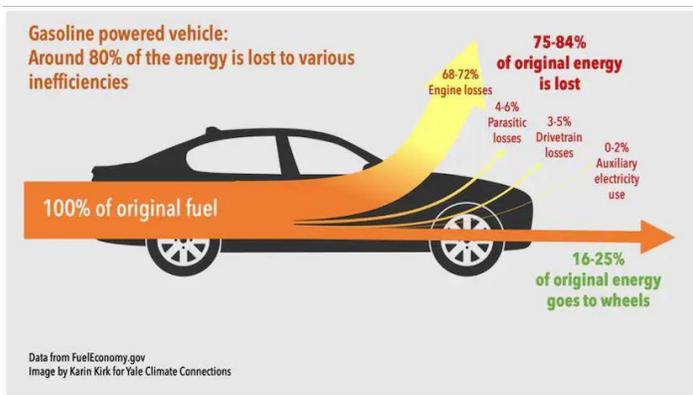
previously mined/transported/refined) to then be refined and used...often at great cost and loss of life due to the wars that often must be fought to keep it flowing.

FACT: It is more American to be self sufficient and produce your own energy at home, than it is to rely on a distant outside source to provide you with that energy.

FACT: You can power your home and your EV with renewable energy (solar, wind, hydro, etc.) that you make at home...and even make a profit/credit from the excess!

MYTH: EV's are not efficient.

The facts show that electric vehicles are far more efficient to fuel and drive than petroleum powered vehicles. This graphic explains this better than words.



Therefore, the facts reveal that driving petro-chemical powered vehicles is not only very inefficient – it is like lighting on fire up to 84% of your fuel (and/or the money you use to buy the fuel) and then just tossing it out the window.

MYTH: “EV's are expensive to maintain.”

FACT: EV's rarely need major servicing of their drive systems because they have far fewer moving parts than petro-chemical powered vehicles. EV's have a handful of moving parts in their motor and drive-train whereas the average gas/diesel engine has thousands! Therefore, EV's require far less maintenance to keep them “healthy” and are therefore far more economical.

FACT: EV's produce a portion of their own fuel via the energy recapture process known as regenerative braking - try and find a gas or diesel powered vehicle that does that! In fact, regenerative braking means the EV driver will rarely step on the car's friction brakes (the kind of brakes legacy vehicles have had for over a century). Therefore, EV brakes typically last far longer than those on petroleum-powered vehicles.

FACT: EV's do not have exhaust pipes, mufflers, catalytic converters, transmissions, fuel tanks, air and fuel filters, spark plugs, glow plugs, plug wires and on and on – and they do not need “tune ups” or emissions inspections. The most maintenance an EV typically needs is wiper blades, a wash, and a new set of tires every few years.

MYTH: “EV's are slow, like golf carts, dangerous, and I heard that they catch on fire and burn to the ground.”

FACT: EV's are anything but slow. They are in fact the fastest accelerating production cars on the roads. Just check out some EV vs. gas cars racing on YouTube and you will see what I mean. Dangerous, totally the opposite - the Tesla Model S was rated by the NHTSA as the safest car ever tested...in history! Fires, there have been an average of 287,000 vehicle fires per year since 2003...less than a few dozen of those involved electric cars...ALL of the others were fossil fuel powered vehicles. Think of it like this: if everyone had been driving clean, fast, safe, low maintenance electric vehicles for the last 100 years and someone tried to get you to drive or even ride in a vehicle powered by an incredibly toxic, flammable, explosive liquid fuel that emitted a toxic-to-all-life-forms-and-damaging-to-the-atmosphere by-product and was often noisy and leaky—what would you do?

MYTH: Electric vehicles are expensive to purchase.

FACT: While it is true that a new Tesla Model S Plaid will set you back over 130K, you can get a new EV for less than \$35k and a used one for much less (search Nissan Leaf, Chevrolet Bolt EV, Tesla Model 3 on Cargurus.com or Carvana.com).

You must also factor in that you will NEVER pay for gas and oil ever again - and that in itself adds up to thousands of dollars/year...even when you account for the cost of the electricity used to fuel your EV! Then, when then you factor in all the money spent on tune-ups and engine/transmission/exhaust system repairs for most fossil fuel powered vehicles – all those savings add up to reveal that most EV's are far more economical to own and drive than your average ICE powered vehicle.

MYTH: EV's have limited range.

FACT: While the range of the earlier EV's was somewhat limited, most newer EV's have driving ranges over 200 to 300 miles per charge with the Lucid Air Dream topping the list at 520 miles of driving range and the Tesla Model S coming in second at 405 miles. The average American drives around 40 miles/day so this is a non-issue for most people.

MYTH: There is nowhere to charge an EV so I will run out of "juice"?

FACT: All EV's are able to charge from any standard electrical outlet and most EV drivers charge their cars at home at night while they are sleeping. When out on the road there are over 57,058* public and thousands more private charging stations with over 141,000* individual public access EV charging plugs for electric vehicles all over the country (see maps via links below). *As of 08/23/22. To find out how many are near you just take a look at Plugshare.com or https://afdc.energy.gov/fuels/electricity_locations.html#/find/nearest?fuel=ELEC

Running out of charge is a non-issue – when was the last time you ran out of gas? The car has a gauge so you know when you will need to stop and charge.

MYTH: Some say "at the end of their life solar panels, EV batteries, and wind turbines, etc cannot be recycled and are just tossed into landfills."

FACT: In reality - solar panels are made mostly of glass and aluminum and these things can be recycled - into more solar panels.

FACT: EV batteries, when they are not able to push a car down the road, are most often repurposed into stationary energy storage such as storage batteries for homes and businesses (think backup generator - but with batteries.) Then, after another decade or so of life as stationary storage - they are recycled - into more batteries. In other words, we can mine the battery for its resources and therefore do not need to dig more holes for more raw materials to make more batteries - we already have them. In fact, it is just bad business (and illegal in some places) to throw away a battery due to the high value of the raw materials contained inside. This is why when you need a new 12 volt starting battery the auto parts store will pay you money (the core charge) for your old one and it is then recycled into a new battery. It is no different with used Lithium-ion batteries.

FACT: Most of the raw materials used in the construction of EV batteries, solar modules (panels), and wind turbines are things like aluminum, steel, copper, etc. - all of these things are recyclables that can be turned into more wind turbines, solar modules, electric car batteries, etc. Fossil fuels are single use. Burn them in your engine and they are gone forever – and you are forever filling up your gas tank – stuck in a subscription to dependency, a never ending loop of reliance on a very long, very dirty, very energy insecure, supply chain that ends when the fossil fuels run out. With EVs and renewable energy sources – that will never happen.

Renewable energy sources and electric vehicles are a win-win for everyone...well, except for those who want to stay stuck in the past and not accept the EVolution of energy and transportation technology.

Knowledge conquers fear.

Be the change you wish to see in the world and the world will change.

Do good things.

Leave the world better than you found it.



The ENP Outreach EV - a 2019 Chevrolet Bolt EV – and a solar farm.

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