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| Electric Cars vs. Gas Cars: Is the Conventional Wisdom Wrong? - Foundation  for Economic Education | | | | | | |
| **Comparison of Traditional Cars vs Electric Cars** | | | | | | |
| Conventions of Traditional Cars | | | | | | |
| A conventional vehicle is one that uses internal combustion engines to provide mechanical propulsion. Any reciprocating internal combustion engine operates on the premise that, upon ignition of a little quantity of a high-energy-density fuel (such as gasoline), enormous amounts of energy are released in the form of expanding gas.  That energy can be put to creative uses. For instance, if you can design a cycle that makes it possible to kick off explosions similar to this hundreds of times per minute and if you can effectively channel that energy, you have the basis for an automobile engine.  A four-stroke combustion cycle is used in almost every automobile with a gasoline engine to turn fuel into motion. In honour of Nikolaus Otto, who designed the four-stroke engine, the method is also known as the Otto cycle. The animation demonstrates the four strokes. As follows:   * intake motion * stroke of compression * Burning stroke * ejector stroke   A transfer case is where the drive shaft enters the vehicle. The transfer case, which is a component of the back axle, is rotated to move the gears within. The rotating drive shaft activates the wheels and rear axle at the back of the vehicle, propelling it forwards.  Petrol, which is typically produced from fossil fuel sources, powers spark ignition engines (crude oil).  Diesel, a heavy petroleum fraction typically derived from fossil fuel sources, is used in compression ignition engines (crude oil). Currently, plant-derived diesel can make up to 7% of forecourt mixes (bio diesel)  There is also gas-powered automobiles. There is a limited global market for these cars, which are typically dual fuel (gas/petrol). Any of various liquid mixes of the volatile hydrocarbons propene, propane, butene, and butane is known as liquefied petroleum gas (LPG), often referred to as LP gas. Its usage as a portable fuel source dates back to 1860, and since then, production and use for home and industrial purposes have increased. | | | Each minute, hundreds of little controlled explosions caused by igniting a combination of gasoline and oxygen drive the pistons up and down. The combustion or power stroke is the term used to describe each time the fuel ignites. The mini-heat explosion's and expanding gases force the piston downward in the cylinder.Today's internal combustion engines are almost exclusively of the four-stroke sort (for the sake of simplicity, we'll just discuss gasoline engines here). There are three further strokes after the combustion one, which drives the piston downward from the top of the cylinder: intake, compression, and exhaust.  Crude oil, which originates from deep down, is the source of gasoline and diesel. Petrol (known as gasoline in America) and diesel are produced through the refinement of crude oil. Lawnmowers, vehicles, buses, motorbikes, huge ships, and aeroplanes all have engines that are powered by either gasoline or diesel.  The Northern Carnarvon and Roebuck basins contain more than half of Australia's known crude oil resources. The Cooper Basin has around a quarter of Australia's crude oil reserves, while the Gippsland Basin holds almost a quarter of the country's remaining contingent resources.  By applying pressure to the pistons and exerting effort on them, the internal combustion engine of a car transforms the potential chemical energy in gasoline and oxygen into thermal energy, which is then translated into mechanical energy that drives the vehicle (raising its kinetic energy). You can see that the vehicle engine converts the chemical energy that is contained in the fuel into the kinetic energy of expanding gas through combustion in the engine and the wheels. This is a practical energy transfer.  The thermal (the heat) energy in the automobile engine is converted from the chemical energy contained in the fuel to the mechanical energy needed to drive the vehicle.  Expanding gas's kinetic energy is transformed into a linear piston movement, which is then transformed into a rotary crankshaft movement, which is then transmitted into the transmission assembly.  The rotational motion is transferred to the differential, then exits the differential to the drive wheels, and finally the drive wheels' rotating motion is transformed into the vehicle's linear motion. | | | |
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| Electric Cars, Solar & Clean Energy | Tesla | | | | | | |
| Tesla Model X, Tesla’s flagship SUV. | | | | | | |
| Conventions of Electric Cars | | | | | | |
| Plugging an electric vehicle into a charging station allows it to draw power from the grid. They power an electric motor, which rotates the wheels, by storing the electricity in rechargeable batteries. Electric automobiles seem lighter to drive because they accelerate more quickly than cars with conventional gasoline engines.  Several distinct types of electric vehicles exist (EV). Pure electric cars are those that just use electricity to operate. Additionally, certain hybrid electric cars may also be powered by gasoline or diesel.  Plug-in electric vehicles are those that only use electricity and obtain all of their power while being charged at a wall outlet. Like typical automobiles, this kind doesn't emit any pollution because it doesn't require gasoline or diesel to operate.  Plug-in hybrids: These vehicles primarily operate on electricity but also contain a conventional fuel engine, allowing you to switch to gasoline or diesel if the battery runs out. These vehicles emit emissions when they are operating on gasoline, but not when they are running on electricity. In order to recharge their battery, plug-in hybrids may be connected into an electrical outlet. Regenerative braking is used to replenish the electric battery in hybrid-electric vehicles, which primarily run on fuel like gasoline or diesel. With the push of a button, you may use either your gasoline engine or the "EV" mode thanks to them. These vehicles run only on gasoline or diesel and cannot be plugged into an electrical outlet.  Compared to an ICE (internal combustion engine) automobile, EVs have 90% less moving components. An EV's moving components are broken down as follows:  Power to turn the wheels is provided by an electric engine or motor. It may be of the DC/AC kind, however AC motors are more typical.  Electric current in the form of direct current (DC) is converted into alternating current using an inverter (AC)  Drivetrain: The motor in EVs transmits power to the wheels using a single-speed gearbox.  EV-required power is stored in batteries. The range increases with the battery's kW rating. Plug into an outlet or an EV charging station to start charging your battery. | | | Both all-electric and battery-electric vehicles, also known as plug-in hybrid electric vehicles (PHEVs) and battery electric vehicles (BEVs), are able to run entirely on the electricity generated in the United States from sources like natural gas, coal, nuclear energy, wind, hydropower, and solar energy.  Currently, EV charging depends on the electrical grid, however the system as we currently know it is undergoing change. Currently, renewable energy supplies about 50% of the power used in the National Electricity Market at some points, and by 2025, it is anticipated that this percentage will have greatly increased. As a result, EVs may one day emit no emissions, making them a desirable transportation option.  Stations for recharging electric vehicles often utilise the same type of power as your home. You effectively pay the owner of the charging station to connect through their outlet to that bigger power source when they are linked to the wider municipal grid (grid). The owners of the charging stations occasionally employ other energy sources at their facilities. These sources might be solar, natural gas, or something else.  Compared to their gasoline-powered predecessors, electric vehicles (EVs) are more efficient. Compared to 64% to 75% for a gasoline engine, an electric drive system in an EV only contributes to a 15%–20% energy loss. Regenerative braking is another feature of EVs that allows them to save energy when braking and avoid idling. To learn more, see All-Electric Vehicles. Depending on the drive cycle, EVs range from 60% to 73% efficient. However, if the energy recovered during regenerative braking is considered (i.e., when it is utilised again), EVs are 77% to 100% efficient. (Vehicle fuel efficiency has further details on how efficiency in vehicles is determined.)  In contrast to a conventional vehicle, an electric vehicle (EV) recovers and stores a large portion of its braking energy in the battery, making it accessible when it needs to regain momentum. In a typical automobile, the brakes merely turn the energy into heat and waste it. When braking, an EV may be two to three times more effective than a comparable conventional vehicle.  Depending on where the driver places their foot on the gas pedal, a controller adjusts the pace at which energy is transferred from the battery to the electric motor. The motor will receive its most energy if the pedal is depressed all the way. The motor is not receiving power if the vehicle is halted. Electrical energy is transformed into mechanical energy by the motor. A rotating rotor enclosed in coils produces a magnetic field, which produces the torque needed to move the automobile. By maintaining the ideal working temperature, the radiator harnesses thermal energy to prolong the battery range and durability. The vehicle's kinetic energy, which is created when it slows down, is transformed into stored battery energy via the regenerative braking system. By moving, the brakes work as a generator. | | | |
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| Diagram  Description automatically generated | | | | | | |
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| Energy Transformation Diagram For Electrical Car | | | | | | |
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| Energy Transformation Diagram for Traditional Car | | | | | | |
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| Mining for electric car batteries 'hundreds of times' better than petrol car  emission cycles | Electrek | | | | | | |
| Comparison of environmental impact | | | | | | |
| It takes a lot of energy to produce electric vehicles. Even after accounting for the production of the batteries, electric vehicles are still a greener choice. This occurs as a result of the decrease in emissions produced throughout the course of the car's lifetime.  Electric cars often produce more pollution during manufacture than do conventional cars. This is a result of the production of lithium ion batteries, a crucial component of an electric vehicle. The energy needed to manufacture an electric automobile accounts for more than a third of its total lifetime CO2 emissions. This is evolving better as technology develops.  The market for battery reuse and recycling is also expanding. Reusing batteries in new technologies like power storage is the focus of research into the usage of used batteries. We could one day all have batteries in our houses that we can utilise to store energy. Such possibilities will lessen the overall environmental effect of battery manufacturing.  Even after producing energy, according to research by the European Energy Agency, driving an electric car emits between 17 and 30% fewer carbon emissions than doing so in a gasoline or diesel vehicle. When low carbon power is used, the emissions from electricity generating are also significantly reduced.  The usage of lithium-ion batteries as a primary power source in electronic products, such as mobile phones, laptops, and electric automobiles, has grown significantly over the past ten years, accounting for 58% of the global rise in lithium mining. The risk of mining out lithium appears to be low in the foreseeable future, however there is a negative impact on the environment.  The Atacama Salt Flat in Chile, the biggest lithium extraction location in the world, is subject to aquifer depletion and environmental harm due to the significant water requirements of the mining process. However, scientists have created strategies to extract lithium from water. | | | The best comparison is based on a life cycle analysis, which makes an effort to take into account all carbon dioxide emissions during the production, usage, and recycling of vehicles. Emission estimates varies by nation because conditions change, and life cycle projections are never completely accurate.  In 2017, 82% of the energy used to generate power in New Zealand came from renewable sources. Compared to places like Australia or China, where there are lower quantities of renewable power, EVs are more appropriate for New Zealand. However, this just tells a portion of the tale. The assumption that all electric vehicles in New Zealand have almost zero carbon emissions or are completely sustainable is unwarranted.  Three phases are taken into account in a life cycle study of emissions: the production phase.  Ore mining, material processing, the production of vehicle components, and vehicle assembly are the primary operations in the manufacturing phase. According to a recent research on automotive emissions in China, internal combustion engine cars now emit roughly 10.5 tonnes of carbon dioxide (tCO2) per vehicle, as opposed to about 13 tonnes for electric vehicles (including the electric car battery manufacturing).  The production of a lithium-nickel-manganese-cobalt-oxide battery alone was expected to produce 3.2 tonnes of emissions. The manufacturing phase of an electric automobile produces more emissions than a fossil-fueled vehicle does, assuming a vehicle life of 150,000 kilometres. However, the study demonstrates that EV emissions are 18% lower than those from fossil-fueled vehicles during their whole life cycle.  Vehicle disassembly, vehicle recycling, battery recycling, and material recovery are the main procedures in the recycling phase. Based on a research in China, the anticipated emissions in this period are around 1.8 tonnes for a fossil-fueled automobile and 2.4 tonnes for an electric car (including battery recycling). This discrepancy is mostly brought on by the 0.7 tonnes of emissions from battery recycling.  This demonstrates that during the recycling process, electric automobiles produce higher pollutants than their petrol-powered equivalents. It's crucial to remember that recycled auto parts may be utilised to build new cars, and batteries recovered through direct cathode recycling can be used to make new batteries. Future gains in terms of emissions reduction might result from this. | | | |
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| America and Israel have been key strategic partners for decades. | | | | | | |
| Conventional Cars: Pros and Cons | | | | | | |
| A small-but-powerful petrol engine is available. Petrol engines, in contrast to diesel engines, may be tweaked to produce extra power without using a turbocharger.  Because the parts for petrol engines are less expensive, after-sales services are rather reasonable. Additionally, as most consumers choose petrol-powered models, components are readily available. Compared to their diesel counterparts, gasoline engines are also quieter and more refined. If properly maintained, they also tend to produce fewer pollutants.  The availability of fuel is the main reason why gasoline-powered vehicles are so popular. These days, recharging stations are virtually ubiquitous. It keeps your car's tank full in addition to being handy.  The cost of EVs and their adoption in Australia is one of the main problems. The cost of electric automobiles compared to fuel cars is notably greater as a result of the government's failure to provide any major subsidies to customers, as other governments have done in Europe and the US, resulting in a sales spike. Some EV versions of a specific model might cost nearly twice as much as the gasoline-powered equivalent, which makes EVs less alluring to buyers looking to save a few dollars on a new car.  The Toyota Land Cruiser Prado, a petrol vehicle, has a range of 1,875 kilometres (km) on a full tank, almost three times as far as the Tesla Model S, an electric vehicle, which has a maximum range of 647 kilometres. Another factor to consider is convenience. Since there are gas stations almost everywhere, the only way you'll run out of gasoline is if you venture out into the middle of nowhere without planning where and when you'll need to refuel. | | | Petrol is more expensive than diesel and raises the lifetime operating costs of the vehicle. Additionally, the car's mileage falls as a result of the volatile nature of gasoline.  Petrol engines typically clog up easily and require more regular maintenance. Petrol engines can degrade more quickly than diesel engines if proper maintenance is not performed. Additionally prone to contaminants, gasoline can harm not only the engine but also the fuel pump and injection system if not acquired from a reputable pump.  Believe it or not, gasoline-powered vehicles have both immediate and long-term effects on the planet. It disperses a wide range of gases that contribute to acid rain, global warming, and other negative effects on the environment and human health. In addition, engine noise and fuel leaks contribute to air pollution. Although gasoline and diesel-powered vehicles, including automobiles, trucks, buses, and other forms of transportation, are the main contributors to air pollution in the United States, thanks to modern technology and inventions  The production of gasoline from fossil fuels, which are non-renewable energy sources, takes place underneath the surface of the planet. One of the most dreaded drawbacks of gasoline automobiles and other vehicles is that we could run out of petrol in the upcoming years. Gas-powered vehicles' value will sharply decline.  Exposure to gasoline can happen when you fill up your tank, when your engine leaks gas, and from other spills and mishaps. In the US alone, there are more than 5000 gas station fires recorded each year. Ingestion, inhalation, and even fire accidents at gas filling stations can have an impact on people. In roughly 5% of thermal burn fatalities and injuries, gasoline cans allegedly ignited or burst.  . | | | |



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| electric-car-charging-point | | | | | | |
| America and Israel have been key strategic partners for decades. | | | | | | |
| Electrical Cars: Pros and Cons | | | | | | |
| You never have to buy gas again since electric automobiles are totally charged by the power you produce. Driving a car that runs on petrol might drain your wallet because fuel costs are at an all-time high.  Driving a gas-powered automobile costs the typical American roughly 15 cents per mile, but many electric cars only cost 5 cents per mile. In general, electricity is less costly than gasoline.  The nicest part about the electric vehicle is that you won't have to rush to the gas station to refuel it before heading out on the road! An electric automobile may even be charged using a regular wall outlet.  The main benefit of an electric car is its environmental friendliness. Since their engines are powered by electricity, electric automobiles are completely environmentally benign Since it uses a clean energy source to power itself, it doesn't release any harmful fumes or smoke into the air. As emissions are produced by hybrid automobiles that operate on gas, they are much better. You'll help maintain a clean, green environment.  Since the engines in electric automobiles are electrically powered, there is no need for lubrication, anything connected to the combustion engine, or the numerous maintenance procedures that are typically involved with a gas engine. The days of such pricey engine work are over. As a result, these automobiles now require less maintenance. It doesn't need to go to the service station as frequently as a typical gasoline-powered vehicle would.  The development of electric fueling stations is still in its early phases. Since there aren't many locations you frequent on a regular basis that offer electric fueling stations for your car, it could be more difficult to find a charging station if you're on a long journey or decide to visit family in a rural or suburban region and run out of energy. It's possible that you're stranded. To ensure you can charge your new EV when you need to, be sure to have a charging station map of the areas you visit and where you reside until charging stations are more prevalent. | | | Used Batteries on Ground. Hazardous Waste Polluting Environment. the  Concept of Recycling of Batteries. Save the Earth Editorial Image - Image  of battery, energy: 177121810  Speed and range limitations apply to electric vehicles. The majority of these vehicles only have a range of 50 to 100 miles before they need to be recharged. Long trips just cannot be taken with them at this time, while improvements are anticipated.  While filling up your gasoline-powered automobile just takes a few minutes, completely charging an electric vehicle might take up to a day. Because it takes so long to recharge them, you need dedicated power stations. Therefore, some people are turned off by the time commitment and required planning. There are kits that help speed up the charging process. But once more, that will require extra funding. Think about that as well.  If you don't carefully weigh your alternatives, electric automobiles may also be an inconvenience for your energy bill. You can be making a bad investment if you haven't done your homework on the electric car you want to buy. Electric cars occasionally need a large charge to operate correctly, which may have a negative impact on your monthly power cost.  . | | | |