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Will Electric Cars Take Over, or Will They Stay as a Gimmick?

Electric cars, a revolutionary new form of automobile transportation, have taken over the conversation of becoming a carbon neutral world. As they are becoming more accessible to the masses, one must wonder whether committing to electric vehicles is worth it for the long run, regarding cost, practicality, and the environment. There are also many disadvantages that come with adopting electric vehicles as well, and if not adopted properly, can be horrible for the environment as well.

Electric cars have always been on the forefront in the conversation of slowing down global warming. This is because their counterparts, cars with internal combustion engines, (gas cars) create a substantial amount of pollution and carbon dioxide. Vehicles that use gasoline create 28% of the world's emissions alone. This is because of how the waste from the gas vehicles interact with the environment. US Energy Information Administration states, "The vapors given off when gasoline evaporates and the substances produced when gasoline is burned (carbon monoxide, nitrogen oxides, particulate matter, and unburned hydrocarbons) contribute to air pollution. Burning gasoline also produces carbon dioxide, a greenhouse gas." All of this causes a snowball effect, leading to rising sea level, extreme weather patterns, barely breathable air quality in some locations, which in turn, will create climate refugees and health problems. We are already seeing the effects of car emissions today. Large car-oriented cities have visible effects from internal combustion engines. Cities like Los Angeles, California, have

seen a reduction in air quality due to influx of gas cars in the last few decades, to the point of people seeing a visible layer of smog above the city. A way to combat emissions caused by gasoline cars is by introducing a different type of vehicle, the electric car.

The best way to view how electric cars can benefit the fight against large scale emissions caused by gas vehicles, and climate change as a whole, is to compare the pros and cons of both electric and gas vehicles. Electric cars, of course, use electricity. Though some forms of gaining electricity may cause emissions, like coal power, natural gas, etc. However, there are cleaner ways of harvesting energy, like solar panels, wind turbines, hydropower, and many more methods that do not have carbon dioxide as a byproduct. There are practical and cost benefits that come with owning an electric vehicle as well. The first being that electricity is far cheaper than gasoline. Price of gasoline have been increasing recently due to numerous factors, including the obvious one, the COVID-19 Pandemic. Another large factor is that the world is realizing that we are consuming oil more by the decade. Oil fields around the world are finite. Today, in Massachusetts, the price of gas per gallon is \$3.658. However, the cost per kilowatt of power, which is about equivalent of a gallon for electric cars, is around \$0.23. According to Detroit Free Press, "a 2018 study from the University of Michigan's Transportation Research Institute found the average cost to operate an EV in the U.S. was \$485 per year compared with a gasoline-powered vehicle at \$1,117." This study includes maintenance of the cars as well. But when only regarding refuel and recharging costs, according to CNBC, "A 2020 Consumer Reports study found that EV owners, on average, spend 60% less on fuel compared to internal combustion engine vehicles." And speaking of maintenance costs, electric cars rarely require

maintenance due to less moving parts unlike gas cars. With all of this information, how do gas vehicles and electric vehicles compare directly?

The comparisons between the two sides of the aisle will be made from the production of an average vehicle to its lifespan, and to its disposal. To start off with production, gas cars require 7 tons of raw materials on average, being steel and aluminum, while electric cars require roughly 8 tons. Electric cars on average weigh more than gas cars due to the battery weighing between 1 to 2 tons alone. Over the course of a gas car's life span, it will produce pollution with every gallon the internal combustion engine burns. On average, a gas vehicle will produce 57 metric tons of emissions. On the other side of the aisle however, electric cars run on electricity, which itself does not create a byproduct from the vehicle driving. However, an electric car will produce 28 metric tons of emissions. The only reason an electric car produces that amount of emission is due to the disposal of the battery at the end of its lifespan. But the battery does not need to be thrown away. It can be recycled and reused in other vehicles or products, which reduces that emission number to zero. Gas vehicles rarely get their parts recycled and instead are disposed in dumps. With all of this information, electric vehicles are empirically better for the environment than gas vehicles. They produce on average 50% less emissions than their gas counterparts.

There are valid counterarguments to the adoption of electric vehicles that cannot be ignored as well. The first con of owning an electric car is having less range than a gas car. A Tesla Model 3, for example, has only 300 miles of range in its battery, and that is only in ideal conditions, which are not speeding, no air-conditioning or heating being turned on in a car, and outdoor temperature. A Tesla can lose about 20% of its battery just to cold temperature alone.

Another factor than can deter someone from owning an electric vehicle is the long charging times. Using a Tesla model 3 again as an example, it takes 20 minutes to charge and a supercharger from 0% to 80%, while filling up a gas car with petrol will only take a couple minutes maximum. The most significant factor that makes people change their mind on the thought of purchasing an electric vehicle is the lack of charging locations. In the United States, there are over 3 times more gas stations per just one public EV charging port. In most rural parts of the country, and average electric car cannot get from one charging station to the next on a full charge, making long road trips difficult.

There are however ways Tesla are tackling these shortcomings of owning an electric vehicle. They are twitching to a new battery technology called “tables batter,” which increases range by around 16%. Hundreds of new EV chargers are being installed around the country by the week by many companies including Tesla, who are also expanding on their supercharger technology to have an increase in charge speeds by 50%. According to Tesla themselves, they plan to double their public chargers from what they already have in 1-2 years.

Electric vehicles are going to be the new method of transportation that completely takes over gas vehicles. Today, there is an EV for every class of vehicle, sedans, sport cars, SUVs, trucks, semi-trucks, and utility vehicles. There are electric cars that can fit anyone’s needs. Electric cars are the future and are not a gimmick.

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