

The Pros and Cons of Electric Cars

By David Morelo, February 22, 2017

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Even though the total number of electric cars has been on a steady rise for more than half a decade (and up 38% in the USA in 2016), many organizations and individual consumers still aren't aware of how electric vehicles compare to traditional gas-guzzlers. In this article, we have compiled a comprehensive list of the benefits and current shortcomings of EVs, to help inform your decision as to whether or not they may be a good choice for you or your organization.



Pros of Electric Cars

They're Cheaper to Run

The cost of gasoline heavily depends on the current political situation and our dwindling supplies of oil, which some expect to last us around 50 years. On the other hand, the cost of electricity is stable across the country, and improved sources of renewable power are in active development by some of the largest tech companies in the world.



Performing basic calculations, the average electric vehicle can save a driver who drives 15,000 miles in a year about \$850 annually on fuel. Keep in mind that these estimates have been made without taking any special charging systems into consideration. For EV owners and fleets participating in a smart charging program, the savings can be much higher.

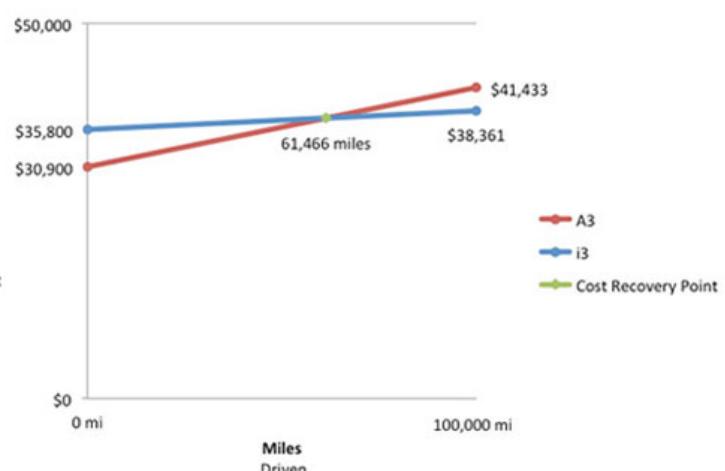
This, together with various tax breaks and government subsidies, means that virtually all electric vehicles start to pay for themselves a long time before they reach the end of their expected lifespans, leading to significant savings over time.

How long it takes to recoup extra cost of an electric car - 2016 models

Nissan LEAF vs. Honda Civic



BMW i3 vs. Audi A3



You Can Charge at Home or at Work

One overlooked advantage of electric vehicles is the ability to charge them at home or at a parking lot. People who live in family houses can simply plug in their vehicles after they return home from work, and leave the next morning with batteries fully charged. Fleet vehicles can be charged using smart EV charging systems that offer maximum cost savings, thanks to advanced energy management tools.

Currently, the fastest method of charging electric vehicles is known as DC Fast Charging. With it, most electric vehicles reach about 80% of charge in 30 minutes. EV owners can also pair home charging stations with solar panels, achieving true zero-carbon driving. But even without a home charging station, it's becoming easier than ever to charge an EV at a public station.

The Obama Administration unlocked up to \$4.5 billion in loan guarantees to support the commercial-scale deployment of innovative electric vehicle charging facilities, and Tesla wants to expand their network of Superchargers to cover all well-traveled highways and major city centers.

There's No Engine Noise

Noise pollution is detrimental to human health, and the engines of gasoline- and diesel-powered vehicles are among its most significant sources. According to a study published by the National Institute of Environmental Health Sciences (NIEHS), "Tens of millions of Americans suffer from a range of adverse health outcomes due to noise exposure, including heart disease and hearing loss." The same study claims that "nearly 100 million people in the United States (about 50% of the population) had annual exposures to traffic noise that were high enough to be harmful to health."

At 65 mph, the average interior noise of a car with an internal combustion engine is around 70 dB. Electric vehicles, on the other hand, are almost whisper-quiet.

To help pedestrians spot an incoming electric vehicle, the National Highway Traffic Safety Administration had to announce a new safety standard which requires all new hybrid and electric vehicles under 10,000 pounds to produce audible noise, even if the noise needs to be created artificially.

They're Quick

Most recent speed records have been achieved by electric vehicles. For example, the Tesla Model S P100D hit 60mph in 2.28 seconds, making it the first production car to reach 60mph in under 2.3 seconds. That's because electric vehicles offer superior power-to-weight-ratios compared to traditional cars.



Furthermore, electric motors provide constant torque over time and a greater amount of available power. Even relatively weak electric motors usually accelerate faster than similarly powerful cars with internal combustion engines (as illustrated in this hilarious smart fortwo ED vs. Porsche Boxster drag race commercial).

Tax Breaks and Government Subsidies Are Available

Most national and local governments around the world provide financial incentives for consumers to purchase electric vehicles. Every new EV purchased for use in the U.S. is entitled to the federal Internal Revenue Service (IRS) tax credit for \$2,500 to \$7,500. Specific tax credit amounts for individual vehicles are available at FuelEconomy.gov's Tax Credits for Electric Vehicles and Tax Credits for Plug-in Hybrids pages.

According to a study conducted by researchers from the University of California, Davis, the federal tax credit program was the main reason why more than 30% of customers have purchased an electric vehicle.

They're Safer

The main duty of any responsible fleet manager is to protect drivers' safety. Needless to say that drivers themselves want to ensure their own safety as well as the safety of passengers and the public.

Any accident that involves an electric vehicle immediately attracts the attention of mainstream media, but the fact remains that EVs are much safer than cars with internal combustion engines.

It's virtually impossible for a battery-powered car to explode on impact, and because heavy battery packs significantly lower an EV's center of mass, the car is less likely to rollover. Manufacturers of electric vehicles don't spare any expense on built-in safety systems, which is why EVs regularly exceed all safety standards.



In most modern electric vehicles, heavy battery packs sit below the passengers—making them easier to steer.

They're Simpler to Maintain

All new cars with internal combustion engines come with a long maintenance checklist, which includes an oil, transmission, and brake fluid change, spark plugs and wires, timing belts, a battery replacement, air filters, and other things – all of which quickly add up and increase the total cost of the vehicle.

Electric vehicles come with fewer maintenance requirements, and therefore the maintenance costs are lower as well. "The electric motor has one moving part, the shaft, which is very reliable and requires little or no maintenance. The controller and charger are electronic devices with no moving parts, and they require little or no maintenance," states Idaho National Laboratory in their paper.

They're Environmentally Friendly

Battery electric vehicles (BEVs) don't produce any tailpipe emissions, which are known to be a serious threat to human and environmental health. In comparison, the average gasoline car produces over 350 grams of CO₂ per mile.

It's important to note however that heavier vehicles are often accompanied by higher levels of non-exhaust emissions, but those are going to decrease as the technology improves.

Cons of Electric Cars

Some Have Limited Range

At the moment, the biggest perceived negative of battery electric cars is their limited range, which leads to what is known as range anxiety. To give an example, the 2016 Nissan Leaf can travel up to 107 miles on a single charge. The thought of only being able to drive 100 miles on a charge worries a lot of potential customers, who think that the somewhat limited range of electric vehicles isn't enough to meet their needs.



The truth is that electric cars can handle 87% of trips made by gasoline vehicles, according to a study released by MIT. That's a much higher number than most people would have guessed, and it will only increase as the technology improves and the network of fast charging stations becomes denser.

A number of vehicles have recently/are set to make their debut with significantly higher ranges:

- Tesla Model S & Model X (250 - 335 miles)
- Tesla Model 3 (215 - 300 miles)
- Chevrolet Bolt (238 miles)
- 2018 Nissan Leaf (200 miles anticipated)

Some people for a plug-in hybrid (PHEV) instead while they wait for the technology to improve. A Chevrolet Volt has 53 miles of electric range, and a gas tank available for longer trips.

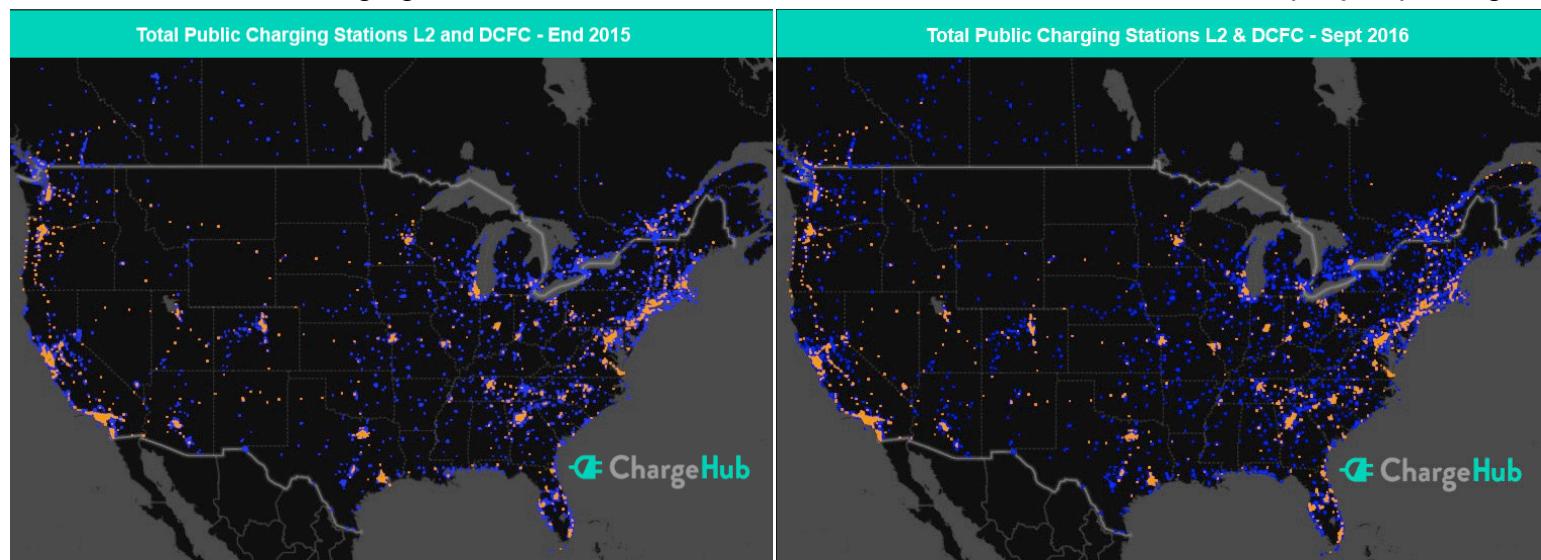
A Higher Initial Cost

Electric vehicles usually cost more upfront than their gasoline- or diesel-powered counterparts, but they are expected to be cheaper than conventional vehicles by 2022, even if the conventional cars improve their fuel efficiency by 3.5% a year.

Even though we still have a few years until we get there, most electric vehicles start to pay for themselves a long time before they reach the end of their lifespans, thanks to fuel savings, lower maintenance costs, and government subsidies.

Charging Infrastructure a Work-in-Progress

The current state of charging infrastructure leaves a lot to be desired, but the situation is rapidly improving.



A new EV Charging Infrastructure report by IHS predicts EV charging stations across the world to grow from more than 1 million units in 2014 to more than 12.7 million units in 2020. And it's not just the sheer number of charging stations that's improving, either. Fast charging stations capable of providing 80 miles of electric range per 30-minute charge are now more affordable than ever.

Fewer Options to Choose From

New electric vehicles are being introduced on a weekly basis, but it will take years before customers will be able to choose from the same range of models as they can now when it comes to cars with internal combustion engines. After all, the first automobile, Benz Patent Motor Car, started its engine for the first time on New Year's Eve 1879.

So, Are Electric Cars Worth It?

Even though the technology is still young, the pros of electric vehicles tend to significantly outweigh the cons in most scenarios. Thanks to their efficient nature, excellent safety, lack of tailpipe emissions, and other benefits, EVs make sense both from the point of view of a regular customer and a fleet manager.