

Should Your Next Vehicle Be Gas, Hybrid, or Electric?

First off, I asked the opinion of ChatGPT.

From ChatGPT:

The decision of whether your next vehicle should be gas, electric, or hybrid depends on various factors including your individual needs, budget, environmental concerns, and the infrastructure available in your area. Here are some considerations for each option:

1. Gasoline Vehicles:

- Pros: Generally less expensive upfront, widespread availability of fueling stations, well-established technology.
- Cons: Higher fuel costs over time, higher emissions contributing to pollution and climate change, reliance on fossil fuels.

2. Electric Vehicles (EVs):

- Pros: Lower operating costs (electricity is often cheaper than gasoline), reduced emissions (especially if powered by renewable energy), quiet operation, potential government incentives or tax credits.
- Cons: Higher upfront costs (although decreasing), limited driving range compared to some gas vehicles (although this is improving), availability of charging infrastructure (may be limited in some areas), longer charging times compared to refueling with gasoline.

3. Hybrid Vehicles:

- Pros: Improved fuel efficiency compared to traditional gasoline vehicles, potentially lower emissions and operating costs, no range anxiety as they have both a gasoline engine and an electric motor/battery.
- Cons: Higher upfront costs compared to traditional gasoline vehicles, may still rely on gasoline and produce emissions, additional maintenance complexity due to dual power systems.

Ultimately, the best choice for you depends on your priorities. If you're concerned about reducing emissions and can afford the initial investment, an electric vehicle might be the most environmentally friendly option. If you're looking for a more affordable option with less range anxiety, a hybrid could be a good compromise. Gasoline vehicles might be the most practical

choice if you have limited access to charging infrastructure or if you prioritize upfront cost savings.

AARP Course link:

<https://elearn.aarp.org/Users/LearningActivityAssetSingleViewer.aspx?LearningActivityAssetID=t5w4WUrAgkDhbriTkRokrg%3d%3d>

My experience:

I have owned three hybrid vehicles (Toyota Prius) since 2005. I currently still own two of them. My original Prius died a horrible death when it was t-boned by a reckless teenager. My current vehicle is a 2010 Prius with about 175,000 miles on the odometer. My wife's Prius is a 2011 model with about 55,000 miles on it. The only maintenance on any of these vehicles other than oil changes and new tires was a water pump on my first Prius at about 150,000 miles.

Gas mileage ranges from 38 mpg in the dead of winter in ND to as high as 55 mpg on the highway in the summer. I typically get around 48 mpg per tank on average. My understanding is that the newer models do somewhat better overall at about 52 mpg on average.

Two of my children have also had good experiences with hybrids.

My youngest son decided to take it one step further and purchased an all electric vehicle in May of 2023. He purchased a Hyundai Ioniq 6. It has an estimated range of 360 miles. He has driven from Grand Junction, Colorado to Bismarck, ND and to Mesa. He has to plan his route to be sure that there are charge stations close to where he needs to charge up. The cars GPS guidance system provides information about available charging stations along the route. Charging up to 80% of full charge takes about 20 minutes. Charging from 80% to 100% takes much longer as the charge rate slows down as it approaches 100%. Comes out to about 20 minutes of charging for every 3 hours on the road. As part of the purchase agreement he also received 2 years of free charging at any Electrify America charging facility. He also noted that other manufacturers offer different benefits. For instance, Nissan has a partnership with EVgo. The average cost for a charge is around \$15 to \$25 depending on the vendor and what part of the country you are in. Some vendors offer a membership, for a monthly cost, to get a discount on your charge cost.

<https://www.electrifyamerica.com/>

Enough about my experience.

Acronym Alert: ICE – Internal Combustion Engine

Are EVs Cheaper Than ICEs?

BY KATIE REES

PUBLISHED JAN 6, 2024

EVs may seem pricey, but are they more expensive than ICEs overall?

KEY TAKEAWAYS

- EVs are generally more expensive upfront compared to ICEs from the same manufacturer and year.
- The cost of running an EV, including fuel/electricity and maintenance, is typically lower than running an ICE.
- Insuring an EV can be more expensive than insuring an ICE due to the higher cost of EV parts and repairs.
- It's easy to assume that electric vehicles are catered towards those with a higher budget, as most models have a fairly high market price. But are EVs really the more expensive option overall, or are gas and diesel cars pricier than you'd think?
- The Initial Cost of EVs and ICEs
- The upfront price of a vehicle is what buyers tend to first consider when shopping around for a new ride. Typically, this is the largest cost incurred when you buy a car, so it's natural to keep it at the top of your list. So, when it comes to upfront price, how do ICEs (Internal Combustion Engines) and EVs (Electric Vehicles) compare to each other?
- Of course, different car manufacturers can have different price brackets. For instance, Toyota and Honda offer some very budget-friendly cars, whereas Mercedes and Jaguar models tend to start at a higher price bracket. So, to keep the comparison more direct here, we'll look at the prices of EVs and ICEs from the same manufacturer and year.

• Vehicle Type	Make and Model	Year	Price
ICE	Nissan Micra Base Model	2023	<u>\$16,300</u>
EV	Nissan Leaf Shiro	2023	<u>\$36,300</u>
ICE	Chevrolet Malibu 2LT	2023	<u>\$32,000</u>
EV	Chevrolet Bolt 2LT	2023	<u>\$30,695</u>
ICE	Mistubishi Outlander	2023	<u>\$28,395</u>
PHEV	Mitsubishi Outlander	2023	<u>\$40,345</u>
ICE	Fiat 500	2023	<u>\$19,690</u>
EV	Fiat 500e	2023	<u>\$34,095</u>

As you can see above, the majority of manufacturers price their EV models higher than their ICE models. There are exceptions out there, such as Chevrolet's Malibu 2LT and Bolt 2LT. While one of these models is an ICE and the other is an EV, the two come in at the same price.

However, what we don't see is an EV that's cheaper than a similar ICE produced by the same brand. This is because EVs are generally more expensive to produce than ICEs, mostly due to their batteries. According to an Energy5 report, the general cost of producing an EV battery ranges between \$130 and \$250 per kWh. EV Database reports that a Tesla Model S battery has a storage capacity of 100 kWh, meaning it could cost anywhere between \$13,000 and \$25,000 to produce a single Model S battery, according to Energy5's statistics.

With this in mind, the cost of EVs compared to ICEs starts making more sense. However, the point still stands: EVs are usually considerably pricier than ICEs.

EV Home Charging Installation

Before you start charging your EV at home, you need to set up your charging station, which involves a wall connector and cable.

According to Fixr.com, the average cost of setting up a home EV charging station in the US is \$1,200, with an average range of \$1,000 to \$2,500. These figures relate to the installation of a

240-volt Level 2 charger and wall-mounted system, but prices can get as steep as \$4,500 if your charging station has additional features, such as a circuit panel upgrade or pedestal mount.

Setting up an EV home charging station is optional, but, if you choose to go ahead with it, it'll likely add a substantial amount onto the up-front EV price.

As we all know, the upfront price of a vehicle is far from where the costs end. Fuel, maintenance, insurance, and vehicle inspections amount to thousands, or even tens of thousands of dollars, over a car's lifetime. But which is more expensive to run over time: an EV or an ICE?

The Costs of Running EVs and ICEs

Fuel and Electricity

The most frequent cost one incurs with their ICE is from fuel, be it gas or diesel. Gas and diesel prices are always changing, but they generally increase over time in the US. According to the AAA website, the average US price of gas on December 12, 2023, was \$3.137 per gallon. To fill a 15-gallon tank, it will cost just over \$47.

The US Energy Information Administration reported that, on December 11, 2023, the average US price of diesel was \$3.136 per gallon. To fill up a 15-gallon tank for a diesel engine will also cost just over \$47. Depending on how much you use your car, you may fill your tank daily, weekly, or on an even rarer basis, so the cost each individual will incur varies based on lifestyle.

But how do EV charging prices compare here?

EV charging prices depend on two things: the general electricity rate in a given area, and the additional fees charged by the provider if a public charging station is being used. For home charging, one also needs a charging cable, though these often come with the car as part of the upfront price.

Let's take a look at a given EV-owner in Texas, for example. SaveOnEnergy reports that the cost of electricity in Texas in August 2023 was 14.01 cents per kWh. To charge a Chevrolet Bolt at home, with a battery capacity of 65 kWh, it would cost just over \$9 in Texas. On the other hand, to fuel up a Chevrolet Malibu 2LT (with a tank size of 15.8 gallons) with gas, it would cost just under \$50, according to the AAA statistics used previously.

Even if you're in California, a state in which electricity rates are higher than the rest of the US, you can still save with an EV. As reported by Energy Sage, the average Californian electricity

rate is 30 cents per kWh. If you charge the same Chevrolet Bolt at home in California, you'll spend \$19.50.

Public charging stations like Electrify America and ChargePoint not only charge for the electricity used; an additional fee is charged for use of the equipment, which makes things a little pricier. These stations can charge by the kWh or the minute. Electrify America, for instance, can charge either way, though this fee will vary based on your location.

To truly understand the price differences here, it's important to consider EV range versus fuel tank capacity.

A Chevrolet Bolt has a range of 259 miles according to the manufacturer website, meaning every 0.25 kWh of its 65 kWh battery capacity covers one mile. Given that it costs \$9 to charge a Chevrolet Bolt fully in Texas (as discussed above), this means that each kWh costs \$0.14, and so each mile taken by the Bolt costs \$0.035.

On the other hand, if you're fueling up a Chevrolet Malibu, the tank has a capacity of 15.8 gallons, so, according to the gas prices previously mentioned, it would cost just under \$50 to fully fill a Malibu. How far this can take you varies depending on speed, weather conditions, road conditions, and more, but according to Insurance Navy Brokers, one gallon of gas can provide between 20 and 30 miles of range. Let's go in the middle here and say 25 for the sake of our calculation.

If one gallon of gas can take you 25 miles, a 15.8-gallon Chevrolet Malibu should be able to take you 395 miles. If it costs \$50 to fill up a 15.8-gallon tank in the US (as previously discussed), this means that each mile is costing you \$0.13, compared to a Chevrolet Bolt's rate of \$0.035 per mile.

Evidently, there's a huge difference in running costs between EVs and ICEs, which can mean a difference of thousands of dollars over a vehicle's lifetime.

Insurance

In many countries, insuring your car is a legal requirement. In the US, all drivers must have car insurance, but the cost of this cover can vary based on various factors, such as your age, previous driving convictions, and your vehicle's engine size.

Whether you're driving an ICE or EV can also affect your insurance quote. So, what do these varying rates look like?

At the time of writing, it is generally more expensive to insure an EV than an ICE. According to ValuePenguin, EVs cost 25 percent more to insure than their ICE equivalents, a hefty difference indeed.

Furthermore, Insurify conducted a direct comparison of certain EV models' insurance rates compared to their ICE equivalents. For example, insuring a gas-powered Ford Mustang costs \$288, whereas ensuring a Mustang EV costs \$309. Similarly, insuring a gas-powered KIA Soul costs \$223, but insuring the EV alternative costs \$232.

On top of fueling or charging up, ICEs and EVs also need fairly regular maintenance. Changing brake pads, windscreen wipers, and tires all comes at a cost, and fixing faulty hardware can also be very pricey. Of course, the price always varies depending on what's being fixed or replaced, but all costs are worth keeping in mind here.

Because ICEs are more mechanically complex than EVs, there's more of a chance of something going wrong with the former than the latter. However, because EVs are more niche than ICEs, there's a good chance an EV replacement part will be pricier. According to CCC Intelligent Solutions, the average total cost of repair on a non-luxury EV model from a front-end impact is \$4,041. On the other hand, the average cost of repair on a similar grade of non-EV model for the same kind of impact is \$3,191.

When looking at luxury car models, CCC Intelligent Solutions also reported a difference in repair costs for front-end collisions. While repairs cost an average of \$8,037 for EVs, they drop to an average of \$5,242 for non-EVs.

The Verdict

When it comes to overall cost, EVs and ICEs have their own ups and downs. While EV prices aren't very affordable, they're much cheaper to run than ICEs. It's also important to note that, over time, the cost of new and used EVs compared to ICEs may decrease as manufacturers find more cost-efficient ways to produce vehicles.

What's more, the increasing scarcity of gas and diesel will likely cause the cost of fuel to increase as the years pass (on top of general inflation). But legal limitations placed on ICEs could have the opposite effect. In the UK, for example, a law has been put in place that will ban the purchase of new petrol and diesel cars after 2035. After this point in time, the demand for ICEs will plummet, which will also have a domino effect on the demand for petrol and diesel. This could cause a price drop for these fuels, which will be good news for those who still own ICEs.

On the other hand, a boost in EV demand when laws like this are put in place may result in higher prices for electric cars and parts. There's no knowing how this will play out yet, but it's worth keeping in mind that things are likely to change a lot in the next decade or so.

Check out our piece on EV myths and misconceptions to make sure you're not making any incorrect assumptions about electric cars.

EV and ICE costs don't stop at the price of the vehicle. There's a myriad of other factors you should also consider to determine whether an ICE or an EV is the best option for you. Keep the pointers above in mind before you buy your next car.

What is Range Anxiety?

The worry about how far an electric vehicle can go.

Here are the published ranges for various Tesla models:

- **Tesla Model S** - 405 miles per charge
- **Model S Plaid** - 396 miles
- **Model X** - 348 miles
- **Cybertruck AWD** - 340 (est.)
- **Model 3 Long Range** - 333 miles
- **Model X Plaid** - 333 miles
- **Model Y Long Range** - 330 miles
- **Cybertruck Cyberbeast** - 320 (est.)
- **Model 3 Performance** - 315 miles
- **Model Y Performance** - 303 miles
- **Model 3 RWD** - 272 miles
- **Model Y RWD** - 260 miles
- **Cybertruck RWD** - 250 (est.)

Remember that even though Tesla claims these ranges, and vehicles will display a remaining range while in use, that doesn't necessarily mean your car will hit those numbers. A lot of factors go into overall mileage, plus multiple reports suggest that Tesla overinflates these numbers. For example, new Cybertruck owners aren't getting anywhere near the promised 320 miles on the Cyberbeast. Basically, your mileage may vary.

What about tax credits?

Up to \$ 7500 for 2024 in federal tax credits.

<https://www.consumerreports.org/cars/hybrids-evs/electric-cars-plug-in-hybrids-that-qualify-for-tax-credits-a7820795671/>

Here is a state by state rundown of incentives:

<https://www.kbb.com/car-advice/electric-vehicle-rebates-by-state/>

Article on car cost comparisons:

<https://www.consumerreports.org/cars/hybrids-evs/will-an-electric-car-save-you-money-a9436870083/>