The beginners guide to driving electric cars

Introduction to electric cars

Electric cars are growing increasingly popular as the 21st century progresses. With these more environmentally friendly options providing drivers with the chance to fight the potential threat of climate change, it's little wonder Bloomberg predict one in six cars sold by 2025 will be an EV (electric vehicle).

If you're thinking about taking to the road in one before that time, this is the perfect guide for you.

Whether you're thinking of purchasing an electric car or already have one, this guide will give you a better understanding of how they work and what benefits you might experience behind the wheel.

Early Development of Electric Cars & History

1830 - 1930 1950 - 1970 1990 - 2018

1830 - 1930

While the concept of a functional, reliant and consistent electrically powered car is something we associate with the modern technological world, it might shock many to learn the first vehicle of this nature was built as far back as 1837.

In fact, until the 1930s, electric cars were a popular option amongst road users. With less noise and vibration, as well as an easier means of starting (there was no cranking of a handle, as was the case with rival manufacturers), 28% of all vehicles on the road in 1900 were electric.

1950 - 1970

Things would change as the years progressed, with internal-combustion engines helping gas-powered cars to slash the price of their electric counterpart. The battery-powered electrics couldn't compete for value, with some figures showing them selling at $1,750, while the gas cars of the time sat at just $650 per model.

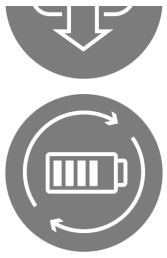
Positive Environmetal Impact

In the modern era, a primary motive for buying an electric car comes in the form of the benefits it has on the world itself. There are a cluster of reasons why choosing one of these models will have a positive impact on the Earth. Some of the most prevalent include:

Renewable energy – Electricity is a form of renewable energy. This means you won't be expending limited resources, like fossil fuels, to power your car.

Eco-friendly materials – Perhaps unsurprisingly, a lot of EVs are manufactured using base materials which are themselves ecologically beneficial. This is true of a lot of manufacturers, but was most notably done with the creation of the Nissan Leaf.

Lower levels of pollution – Owing to the nature of electric engines, there are far fewer emissions. In fact, an EV



Recycled batteries – You'll be able to recycle the engine (or battery) of an electric car. This reduces the need for production – which in turn lowers the overall damage done to the environment.

But an EV doesn't just have an impact on global factors. You can also experience benefits to your health and that of those around you.

Health Benefits of Driving an Electric Car

Having evolved in a world where there were little to no carbon emissions for thousands of years, it's perhaps no surprise the past couple of centuries have had such a sudden impact on people's health.

The World Health Organisation report as many as 7 million people die prematurely every year as a result of air pollution. They broke down the averages for outdoor pollution-caused deaths:

40%	40%	11%	6%	3%
Ischaemic heart disease	Stroke	Chronic Obstructive Pulmonary Disease - (COPD)	Lung cancer	Acute lower respiratory infections in children

Nitrous Oxide (NOx) is a gas emitted from cars powered by fossil fuel engines and is directly linked to respiratory issues. If fewer of these cars are on the road, there will be a reduction in the amount of NOx being pumped into the atmosphere.

Types of Electric cars

There are a variety of different EVs for sale. The popularity of the electrical revolution has seen some of the market leaders step up and try their hand in the sector.

Different Brands and Models

It's not just Toyota who are bringing excellence to the table. A series of European and American manufacturers have also risen to the challenge, offering their own eco-friendly models.

Nissan Leaf

This model was first produced in 2010 and is one of the leaders when it comes to recycled cars on the market. With a comfortable ride and a decent amount of space inside, the Leaf has sold 300,000 models as of January 2018.

BMW i3

Not to be outdone, reports suggest 95% of the BMW i3 can be recycled. This futuristic vehicle comes with a patented iDrive system, which works as both an in-built satnav and a means to check the battery life of your car.

Volkswagen e-up!

gas engine means there's actually more space for passengers – raising the number to three. There's also a trio of driving modes: normal, eco and eco+.

Renault Zoe

The Zoe looks most like a petrol and diesel option. In fact, it's hard to notice it's an EV at all, with its sleek finish more akin to a regular road vehicle.

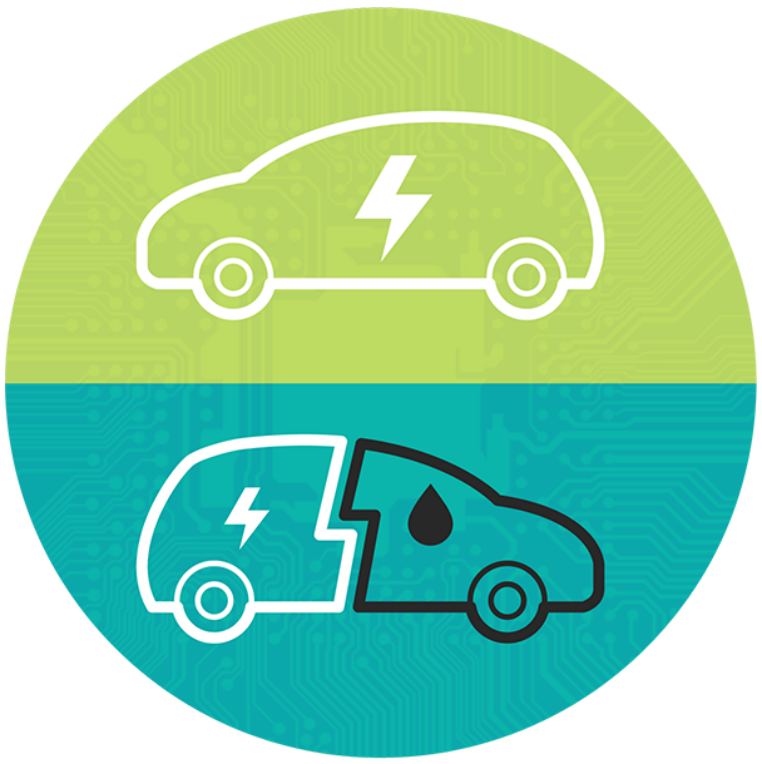
Tesla Model S

Unlike the other manufacturers mentioned, Tesla are a company who specialise solely in the production of electric vehicles. It's no surprise they're the only name who've been able to create a successful sports car on the EV market.

These vehicles provide just a small glimpse into the world of electric cars. Almost every top manufacturer has at least one model on the market, giving you more choice than you might realise.

The Difference Between an Electric Car & a Diesel/Petrol Option

While they're similar in nature, there are important differences between a hybrid (which mixes both electricity and fuel) and an EV.



1. A hybrid car is designed to be more environmentally friendly, but it still possesses a conventional engine. It mixes a petrol motor with an electrical battery to create a more powerful propulsion system.
2. Also, in the case of a hybrid, the internal combustion engine is the more important of the two power sources. The electric battery serves as more of a complement to the petrol engine and provides an additional level of support, rather than a primary means of power.
3. Hybrid cars have the potential to store electrical energy they've created, whereas an EV needs to recharge regularly at a power point. This self-production and storage is something electric cars have not yet managed to perfect.
4. Levels of pollution are also drastically different, given the hybrid's inclusion of a combustion engine. While levels of emission will be lower than in a regular petrol or diesel option, they'll still play something of a part.

The Difference Between an Electric Car & a Diesel/Petrol Option

When it comes to this comparison, the changes are a lot more noticeable. These apply to both the environmental impact and the design and build itself.

1. There are far fewer moving parts in an EV than a gas-powered car. This is largely due to the fact a battery powers it. In a combustion engine, you'll find a variety of parts making up the overall unit, including the transmission, drive shafts and a series of belts and fluids.
2. Electric cars tend to have a slightly shorter range than petrol or diesel. In fact, this is probably the main concern of most drivers with an EV. The fear, dubbed range anxiety, is being alleviated somewhat by constant improvements to battery life.

there's a concern a battery may die between destinations.

4 Most notably, electric cars will emit a considerable amount less pollution.

Check out the table below for a comparison of some of the core factors of each:

Electric

Nissan Leaf

CO2 emissions:	**0g/km**
Max driving range:	**155 miles**
RRP:	**£21,350**
Depreciation:	**£9,000 (year)**
Road tax:	**£0 (year)**

Hybrid

Toyota Yaris

CO2 emissions:	**75g/km**
Max driving range:	**678 miles**
RRP:	**£14,995**
Depreciation:	**£9,000 (year)**
Road tax:	**£0 (year)**

Petrol/Diesel Avg

Ford Fiesta

CO2 emissions:	**96.5g/km**
Max driving range:	**657.5 miles**
RRP:	**£14,795**
Depreciation:	**£7,000 (year)**
Road tax:	**£300-500 (year)**

Sources:

https://www.lv.com

https://www.theguardian.com

The Need-to-knows

you, this section tackles everything you need to keep in mind when it comes to the specifics of your vehicle.

Road Tax on Electric Cars

Thanks to the lower CO2 emissions and the fact there's very little overall pollution, electric vehicles are largely exempt from tax. There are several different types of tax which car owners may have to pay.

Fuel Duty – This is the price applied to the combustible fuel which is found in petrol and diesel cars. This price will vary, dependent on the type of fuel used to power a vehicle. Electric cars will not incur a fee in this regard, as electricity is not charged in the same way.

Vehicle Excise Duty (VED) – This tax relates to the levels of CO2 produced by your car. It's worked out based on a percentile to kg ratio. For this reason, EVs are once again exempt from payment. You'll also receive a slight discount if you drive a hybrid. This will be £10 less than whatever rate the band showed for CO2 emissions on a petrol or diesel option.

Value Added Tax (VAT) – Everyone has to pay VAT, regardless of what kind of car they drive. As a flat rate, this sees a driver charged an additional 20% on top of the overall price of their purchase.

Government Plug-in Grant

The plug-in grant was set up with the intention of encouraging more people to purchase electric cars, reducing the amount of damage being done to the atmosphere. The money is provided via taxpayer credit, with a £100m total cap. The scheme was introduced in 2011 and will be readdressed in 2020.

While original prices were set at £5,000 for every electric vehicle purchased, things have since changed. There is now a three-tier category system in place, which awards grants based on the levels of CO2 being pumped into the atmosphere.

The system is laid out as such:

Category 1

Cars with a zero-emission range of 70 miles will receive a grant of £4,500. This covers every car with a purely electric engine.

Category 2

This includes cars that have CO2 emissions of less than 50g/km and a zero-emission range between 10 and 69 miles. Owners of these hybrid vehicles will receive a grant of £2,500.

Category 3

Cars in this bracket will receive the same level of financial support as category 2. The only difference between them is the fact the zero-emissions range starts at 20 and caps off at 75g/km.

If you're interested about where your car features – particularly if you own a hybrid – you can find out on the government website.

How charging your car works

The greatest difference between driving an electric car and a fuelled car is the manner in which you keep your power source operational. Petrol and diesel options require you to stop at a fuelling station and refill your tanks, but you'll need to charge an EV in a similar manner to how you would a mobile phone.

Charging from your home

When charging from home, you have the choice of using either a standard UK three-pin socket or a specially designed charging point. While using a regular socket is simple, it will take roughly twice as much time to achieve the same

As Pod-Point highlight, a 3.7kw charger (similar in strength to a three-pin socket) takes an hour to charge 15 miles' worth of journey. A 7kw charger will produce 30 miles' worth of charge in that exact same time.

While 7kw chargers aren't cheap, you'll be able to take advantage of government support to subsidise the potential cost. You'll be able to get a 75% discount (up to £500) on installation.

When it comes to costs, you'll find charging an EV is considerably cheaper than refuelling in a more traditional manner. Pod-Point report that you can expect to pay just 2p for every mile travelled with an electric car, as opposed to 15p per mile on average with a petrol or diesel car.

Charging in public

If you need to charge your car on the go, you'll be able to find charging points throughout the UK. There are around 6,500 individual charging points currently available, all of which can be located with the use of ZapMap. This handy app will allow you to instantly locate the nearest point to you and even save it for future reference.

Dependent on the provider, you may also be asked to produce a specialist card or use a specific app to unlock the port. This will vary between different operators, so always make sure to look for information when you're at the station itself.

Usually, you'll have to be a member of a company who provide these services to be able to use their port. This means having to pay a flat fee every month. As such, you may want to restrict yourself to using a specific provider's charging units, as opposed to spreading your costs across all of them.

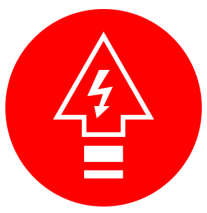
If you're on a long journey, you'll also be able to find a limited supply of chargers on the motorway. This will largely be provided by Ecotricity, and will cost you up to £3 to connect for 45 minutes of use. If you're a regular user of this provider, you'll be able to enjoy a discount.

Battery Life

It's impossible to provide a definitive figure when it comes to understanding the exact lifespan of an electric vehicle's engine. There are a number of key factors which will go into deciding how long a battery lasts.

These include the likes of:

Temperatures (both external and internal)



Overcharging or excessively high levels of voltage

Deep discharges or low voltage

High discharges or high currents

Effectively, much as you might discover with your smartphone, overcharging a battery will cause its lifespan to shorten. This happens as a result of Lithium batteries exceeding their terminal voltage capacity.

Individual manufacturers will offer different rates when it comes to battery life. The Nissan Leaf, for example, is guaranteed to go at least 100,000 miles or last for a total of 8 years.

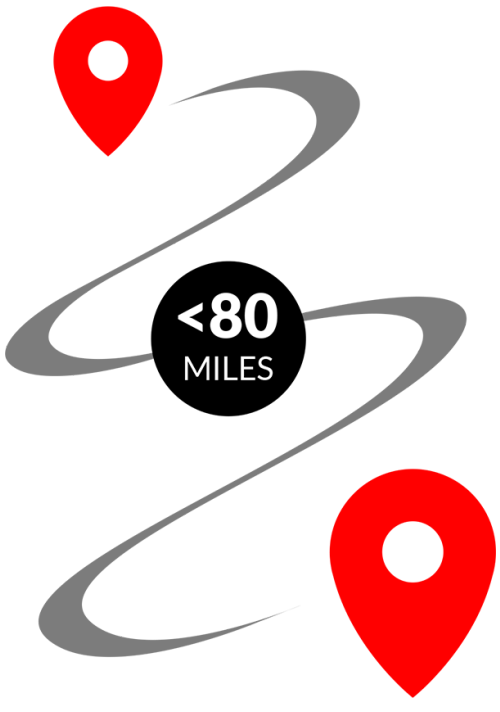
Deciding if an Electric Car is Right for You

But what about the nitty-gritty stuff? We've looked at the overall package, but what goes into owning an EV? From road tax to the different types of government grants available to you, this section tackles everything you need to keep in mind when it comes to the specifics of your vehicle.

What will you need the car for?

The kinds of journeys you make will decide whether or not having an electric car would be appropriate for you. EVs have a limited charge when it comes to how far they can travel.

With the possible exception of Tesla models – which can usually travel anywhere up to 300+ miles in one charge – most electric vehicles will struggle to manage 100 miles off the back of one charge.



As such, if you're someone who has to travel on long distances with reasonable regularity, they may not be a good option for you. While recharging theoretically won't cost a huge amount, it's going to be a long and arduous process if you have to stop every 80-100 miles on a journey from the south of England to the north.

To summarise:

Do: Get an electric car if you're not someone who needs to make regular lengthy journeys (of more than 80 miles)

Don't: Get an electric car if you'll need it for business trips or long journeys to visit family members

What are the downsides of using an electric car?

As great as EVs are when it comes to the environment, there are nevertheless still a series of negatives which have to taken into account. These include:

Long refuelling time – While the overall cost might be considerably cheaper, the amount of time you have to dedicate to charging your car will be a lot longer. If you're going to run out during your journey, you'll need to factor this into your plans.

Range – On that note, the range of a car will play an important role when it comes to your choice. This inability to travel long distances without the constant need to recharge can be infuriating, and even lead to the aforementioned range anxiety which some EV drivers experience.

Price – Despite grants from the government, the overall cost of an electric car is considerably greater than that of a petrol or diesel car of the same size and power. Some of the most popular EVs of 2018 could set you back:

- 1) Tesla S – £127,135
- 2) Volkswagen e-Golf – £32,730
- 3) Nissan Leaf – £31,990
- 4) Hyundai Ioniq – £31,295

Consumer variance – Unlike a regular car, you have far fewer options to choose between when it comes to the

Keep these primary concerns in mind when weighing up whether or not to purchase an EV. Are you willing to put up with these faults to experience the benefits they offer?

The needs of your family:
Is an electric car good for your family?

This will really depend on the size of your family. If there's only three or four of you, there's a good chance an electric vehicle will be big enough to match your needs. However, in the case of larger clans, it might be necessary to upgrade to a more robust car to find the required space.

Boot options will also vary, dependent on the model you opt for. With the likes of prams and buggies needing to be taken into account (as well as luggage for holidays), having a decent enough boot space is a large factor for family travel.

Taking stats from Nimblefins, some of the most popular EVs have the following amount of boot room:

BMW i3	260
Renault Zoe	338
Nissan Leaf	370
Tesla model S	894

Litres

Other considerations to make

With all of that in mind, there are still a host of other details which need to be taken into account. These won't be day-to-day concerns, but still provide some food for thought heading forwards.

Space for a charger port – While you may have taken costs into account, you'll also need to consider if you have room for a charger port on your property. If you don't own the land, you'll also have to make sure you've got permission to build. It could be the case that the landowner doesn't want a charging point added.

Public chargers near you – If you live in an area where there are little to no charging units readily available, it might be difficult to maintain your car's battery on a regular basis. While certain pockets of the country (such as London and Newcastle) are densely populated with chargers, there are plenty of areas where which aren't. This map highlights how someone in an area like northern Wales might struggle.

Resale value – If you're purchasing a used EV, it might be worth considering how old the car is and how long you're expecting to use it. Does it seem like there's going to be any resale value when it comes to passing the car on in a few years?

The feel of the car – Make sure to test drive the car before you buy (especially if you haven't driven an electric car in the past). There's a marginal difference between these and petrol or diesel models when it comes to handle, so try to get accustomed to it before making a purchase.

Keep these primary concerns in mind when weighing up whether or not to purchase an EV. Are you willing to put up with these faults to experience the benefits they offer?

Secondary sources and FAQs

We've covered a lot in this guide, but you may still have further queries. Read through some frequently asked questions to discover even more about electric vehicles.

Frequently asked questions

How do I know if the battery is running low?

Just like a petrol car and its fuel gage, you'll have a dashboard which tells you exactly how much power is left on vehicle. This means the chances of you suddenly being left with an empty battery are unlikely – although not impossible if you aren't diligent.

What will happen if the battery runs out while I'm driving?

Some cars, such as the Nissan Leaf, will have a "turtle mode", which allows you to crawl along at a slower pace for a few miles once your natural refuge of power has gone.

Are EVs slower than a petrol or diesel car?

Contrary to some beliefs, EVs are not naturally slower than a normal car. Most will be able to reach 80+mph as a top speed, while others can reach 0-60mph within a matter of seconds. For standard, everyday use they'll prove just as efficient as any other kind of vehicle.

Could someone pull out the power chord while charging overnight?

Theoretically, yes – which is why these chargers are often designed with a locking system on their cables. This prevent people from getting access to your unit.

Do electric cars get serviced?

Yes, and it should be much cheaper and quicker than with a regular car, owing to the fact they have far fewer parts. They should be checked out with the same regularity as a normal car (about once a year). You may not be able to get it out at your local garage, however – not all mechanics are trained to fix EVs.

Secondary sources

Read through some of our secondary sources to discover more about electric vehicles.

The BBC look further at the growing concern of range anxiety:

http://www.bbc.co.uk/news/uk-scotland-41181129

Carbuyer look at some of the best electric vehicles currently on the market:

http://www.carbuyer.co.uk/reviews/recommended/best-electric-cars

Difference Between analyse the variation between a hybrid and purely electrical car:

http://www.differencebetween.net/object/difference-between-hybrid-and-electric-cars/

Ergon look at the benefits of travelling with an electric vehicle:

https://www.ergon.com.au/network/smarter-energy/electric-vehicles/benefits-of- electric-vehicles

The government offer a series of grants dedicated to helping electric car drivers:

https://www.gov.uk/plug-in-car-van-grants

Mandatory analyse some of the negatives of driving an EV:

http://www.mandatory.com/fun/131790-top-5-disadvantages-of-electric-vehicles

Virgin take a look at how an electric car helps the world as a whole:

https://www.virgin.com/disruptors/electric-cars-benefits-and-barriers

Zap-Map provide their own guide to charging your vehicle:

https://www.zap-map.com/charge-points/