

Electric cars are nothing new. Thomas Parker built the first in London in 1884 – a full year before Karl Benz revealed his Benz Patent-Motorwagen, widely regarded as the first car.

But electric cars have lived in the shadow of the internal combustion engine ever since, with most buyers previously deeming them unsuitable because of their limited range and long charging times.

That's not the case any more. Going electric now has mainstream appeal with more than 10,000 UK drivers buying electric cars in 2016 and a further 9,000 in the first eight months of 2017, a 51% increase over the same period last year.

But the question is: is an electric car right for you?

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## **Electric versus petrol or diesel**

More than a century of petrol and diesel dominance won't disappear overnight. But dwindling natural resources, environmental concerns and tax incentives mean electric car sales will continue to grow.

News that Britain is to [ban the sale of all new petrol and diesel cars from 2040](#) has accelerated interest in electric vehicles, while calls to introduce 'clean air zones' within our towns and cities will drive EV sales, especially for those who live and work in urban areas.

Most major car manufacturers are investing heavily in electric technology, but what are the 'real-world' factors that might affect your decision to buy?

We break them down for you.

## **Cost**

Some early adopters buy electric cars because they're fascinated by the tech (we're looking at you, Tesla owners). Others base their decision on an ethical desire to 'go green'.

For most of us, though, an electric car needs to make financial sense, which means considering costs.

Generally speaking, electric cars are relatively expensive to buy, but cheaper than a petrol or diesel car to run. Any cost savings are therefore dependent on a number of factors, outlined below.

- **Upfront costs**

Electric cars are an initially expensive outlay. They typically range from entry level prices at around £15K, to £30K for a mid-range car and anything up to and above £100K for a top of the range sports electric car.

At the time of writing, the majority of manufacturers are offering 'scrappage' discounts when you trade in an old diesel car. For example, Volkswagen is offering a generous £5,500 off the price of an e-Golf, while BMW's 'Lower Emissions Allowance' adds an extra £2,000 to the trade-in value when buying a car with CO2 emissions of 130g/km or less.

Nissan offers what is arguably the most innovative scrappage deal, with the 'Switch Scheme' guaranteeing owners of cars built before 2010 up to £5,000 on top of the car's trade-in value. But there's more, because anyone anyone buying an approved-used Nissan Leaf will get up to £2,000 on top of the trade-in value, along with a three-year, 3.9% APR PCP scheme.

The list price of electric cars, however, isn't necessarily what you'll pay.

In addition to the scrappage offers, the government offers a Plug-In Car Grant (PiCG) to incentivise buyers of low-emissions cars. These can be summarised as follows:

### **Category 1 cars**

Vehicles that emit less than 50g/km CO2 and have an electric-only range of at least 70 miles (i.e. most fully-electric cars) attract a 35% subsidy, up to a maximum of £4,500.

Cars in this category include the BMW i3, Hyundai Ioniq Electric, Nissan Leaf, Renault Zoe, Tesla Model S and Volkswagen e-Golf.

### **Category 2 cars**

Vehicles that emit less than 50g/km CO<sub>2</sub> and have an electric-only range of at least 10 miles attract a 35% subsidy up to a maximum of £2,500.

Cars in this category include the Audi A3 e-tron, Kia Optima PHEV, Mitsubishi Outlander PHEV and Toyota Prius Plug-in.

### **Category 3 cars**

Vehicles that emit 50 to 75g/km CO<sub>2</sub> and have an electric-only range of at least 20 miles attract a 35% subsidy up to a maximum of £2,500.

At present, the only car in this category is the Mercedes-Benz E350 e AMG Line.

It's worth noting that category 2 and 3 cars with a recommended retail price over £60,000 are not eligible for a grant. These include the Audi Q7, BMW i8 and Porsche Panamera S E-Hybrid.

As with conventional cars, buying second-hand is a much cheaper option, but then you have the added consideration of a potentially deteriorated battery life to consider and as we explain later, buying a new battery is nearly tantamount to a write off.

You're not exactly spoiled for choice, either, as there are far fewer pure electric cars for sale, then there are conventional petrol and diesel.

The Nissan Leaf is by far the most common used electric vehicle, although the Renault Zoe is the cheapest secondhand buy. But be warned, because the list prices are unlikely to include the cost of battery rental, although some Leaf owners may have bought the battery outright.

As a guide, the cost of battery rental on an entry-level Renault Zoe costs £49 per month when limited to 4,500 miles, rising to £110 for unlimited miles on the ZE 4.0 model. Nissan offers a similar tariff for the Leaf, with contracts ranging from 12 to 84 months and based on 7,500 to 12,000 miles.

As bonus, all cars that meet both the Euro 5 standard for air quality and emit CO<sub>2</sub> up to 75g/km qualify for a 100% discount on the London Congestion Charge. This could save drivers up to £11.50 per day.

- **Servicing and repairs**

Electric cars have far fewer moving parts than petrols or diesels, so there is less to maintain and repair.

Regenerative 'engine' braking means brake discs and pads last longer, too. Nissan says servicing a Leaf costs just £11 a month.

Unsurprisingly, having less to fix equates to lower costs. Tesla even boasts that it can perform many servicing functions remotely. These take the form of software updates, just like you'd have for your computer or mobile phone.

This does mean you are effectively tied-in to the main dealer network, but reduced wear-and-tear on consumables should compensate for this.

On the minus side, servicing an electric car requires specific expertise. You'll need a main dealer rather than a – potentially much cheaper – independent garages.

This should change over time, however, as electric cars become more popular.

If you rent the battery, Renault will guarantee performance to at least 75% of its original capacity, or pay for repair or replacement. If buying outright, the battery is covered for eight years or 100,000 miles, along with a performance guarantee to at least 66% of its original charge capacity.

- Fuel

According to Pod Point, charging an electric car overnight at home will cost around £3.64 for a full charge.. If we assume a typical range of 100 miles, that equates to less than 4p per mile – around a third as much as a very economical petrol or diesel car.

Many public charging points are still free, although you may have to pay for rapid chargers – such as those found at motorway service stations. Shell is planning to open a non-petrol station with EV charging in London, and has committed to installing charging points at traditional filling stations by the end of the year.

The Ecotricity 'Electric Highway' features around 300 charging points across Britain, covering the motorway network and beyond. It costs 17p per unit of energy used, along with a £3 connection fee for each charge.

Tesla offers free unlimited 'Supercharging' on the Model S, but will introduce 'pay per use' charging on the Model 3.

- Insurance

Insurance ratings – and thus costs – for electric cars tend to be slightly higher than for petrol or diesel equivalents.

This may, in part, be due to the more limited options when it comes to repairing them. That said, you may be able to negotiate a limited-mileage policy to keep costs down.

We'll cover battery leasing later, but it's important to bear this in mind. If you lease a battery, it remains the property of the car manufacturer, so your insurance company should be informed.

- Vehicle Excise Duty

Following changes to the rates of Vehicle Excise Duty (VED) in April 2017, only zero-emissions are exempt from 'road' tax in the UK. This applies to new cars registered on or after 1 April 2017.

However, if your electric vehicle has a published price of more than £40,000, you have to pay a £310 a year supplement for five years from the second time the vehicle is taxed.

## **Driving**

The 'milk float' image of electric vehicles (EVs) is long forgotten.

Indeed, most of the latest hypercars use electric motors to boost performance, while the two fastest accelerating production cars in the world are both electric, enter the Tesla Model S P100D and Rimac Concept One.

Back in the real world, electric cars offer performance that's at least on par with regular rivals. Just go easy on the right pedal if you want to preserve driving range.

- How does the feel of an electric car differ?

The first thing you'll notice when driving an electric car is the silence.

Apart from a faint hum when accelerating, the only noises come from the wind and tyres – and then only at speed. Even a typical electric hatchback is as quiet as a Rolls-Royce.

Electric cars are also very easy to drive. Gears are invariably automatic, while regenerative brakes slow the car when you lift off the accelerator to top-up the batteries. The result can be 'one-pedal' driving around town.

- How does the performance of an electric car differ?

Electric motors produce their peak pulling power from a standstill.

That means there's no need to rev the motor for swift acceleration, unlike a petrol or (to a lesser extent) diesel car. It's also why cars like the Tesla Model S P100D are regularly breaking 0-62mph records. EVs often handle well, too.

Manufacturers have more flexibility when it comes to packaging electric drivetrains – mounting battery-packs close to the floor to lower the centre of gravity, for example. The BMW i3 is arguably the best option for EV owners who place dynamics high on the list of priorities.

## Maintenance

Keeping your electric car in tip-top condition will reduce the risk of unexpected bills and boost its value when the time comes to sell. It will also ensure you stay on the right side of the law.

- Are they more or less reliable than petrol or diesel cars?

Electric cars have only sold in significant numbers since about 2013, but evidence so far suggests they are very dependable.

A survey, for example, found that the Nissan Leaf's electric drivetrain was 25 times more reliable than an average internal combustion engine.

- Does all that tech mean more services?

Electric cars still need regular servicing according to the manufacturer's schedule, although there are fewer parts to fix. And in terms of 'more tech' a lot of these issues would likely be software related and can be fixed remotely by some EV manufacturers.

They use no oil or filters, for example, and have no conventional clutch. Until the battery needs replacement, your biggest outlay is likely to be new tyres.

- What's the battery life like for an electric car? Are they expensive to replace?

You can expect electric car batteries to last for around 10 years. However, battery capacity will decline with age and use, potentially to around 60% of its original figure after a decade of typical use.

That means an EV with a 100-mile range would only be capable of 60 miles on a full charge.

But as electric car technology improves, so too does the likely battery life. A 2017 report found that a Tesla Model S will retain between 90 and 95% capacity, even at 93,000 miles. After 150,000 miles, a Model S can expect a reduction of just 15%.

The cost of replacing batteries probably won't prove economical as the car gets older – which could mean that an EV's life-span is shorter than that of a combustion engine vehicle.

## Environment

With no emissions out of the exhaust – and no exhaust at that – electric cars are brilliant for reducing pollution in cities.

Forget the nasty particulates belched out by diesels, EVs are as emissions-free as walking.

Detractors will point to the pollution created by producing electricity

Detractors will point to the pollution created by producing electricity, but this varies widely depending on the type of power generation used.

A wind farm is vastly cleaner than a coal-fired power station, for example.

However, even the ‘dirtiest’ electricity is still less damaging to the environment than hundreds of individual petrol or diesel engines.

Also, if environmental-friendliness is high on your agenda, certain energy companies offer ‘green’ tariffs, using electricity produced from sustainable sources.

## **Safety**

There are no significant safety issues with electric cars. Indeed, the lack of flammable fuel is a tangible safety benefit.

At present, many electric cars are based on conventional petrol/diesel models. But the number of purpose-built EVs is growing, and the ability to package components more creatively (such as fitting batteries beneath the floor) potentially allows for more effective crash structures.

Euro NCAP conducted its first crash test of a pure electric vehicle in 2011, when the Mitsubishi i-MiEV was awarded a four-star rating. Other EVs have since been tested, but it’s worth noting that a Euro NCAP test in 2017 is more rigorous than the equivalent test in 2011.

Here’s a list of pure electric vehicles tested by Euro NCAP, along with the date and star rating:

- Hyundai Ioniq (all models): 5 stars (2016)
- Tesla Model S: 5 stars (2014)
- Kia Soul EV: 4 stars (2014)
- Nissan e-NV200: 3 stars (2014)
- Renault Zoe: 5 stars (2013)
- BMW i3: 4 stars (2013)
- Nissan Leaf: 5 stars (2012)
- Citroen C-Zero: 4 stars (2011)
- Peugeot iOn: 4 stars (2011)
- Mitsubishi i-MiEV: 4 stars (2011)
- Renault Fluence: 4 stars (2011)

## **Are electric cars future-proofed against fines?**

In a word, yes. At some point, fossil fuel resources will start to dwindle and alternatively-fuelled cars, including EVs, will offer a viable alternative.

More immediately, many cities such as [Paris are already imposing restrictions on polluting cars and lorries](#).

Driving an electric car future-proofs you against such legislation – and saves you the cost of city-centre congestion charges (as in London, for example) in the meantime.

**READ MORE:** [How to future-proof yourself against the London T-Charge](#)

## **Driving needs - does an electric car suit your situation?**

If you live in the Highlands of Scotland, you might believe an electric car probably isn't right for you. On the contrary, a report by the Energy Saving Trust found that Scotland's North Coast 500 route can be travelled using an electric car.

There are 11 rapid charging points on the 500-mile route, which recharge batteries to 80% in 30 minutes. "There is now a rapid charge point within many communities within the Highlands," said Rebecca Fretwell of the Energy Saving Trust.

Conversely, when the presenters of the Motoring Podcast drove an electric Hyundai Ioniq around Britain, they found a distinct lack of rapid charging points in Wales, meaning they were effectively forced to bypass the country.

Right now, EV's limited range means they are best suited to city-dwellers or suburbanites who commute less than 100 miles a day. The charging infrastructure is far more developed in cities, too.

That said, it may not be easy to own an electric car if – like many city drivers – you don't have a dedicated parking space.

Without a garage, driveway or dedicated parking space, an electric vehicle will be a non-starter, as ideally, you need a driveway in order to park and charge the car overnight.

The Government offers grants for a free on-street charging point to be installed near your home, although that doesn't guarantee that other residents won't park and plug-in there.

Budget is also a consideration. If you have less than £5,000 to spend, an electric car isn't really an option. Indeed, you'll struggle to find many for sale at that price.

## **Technology - should I wait until it develops more?**

That depends on whether you meet the criteria above. If an electric car suits your needs, go for it. These vehicles have a loyal following and their popularity is set to grow.

For most people, a conventional car is still a better choice – particularly if you only have one car. But for how long? In the words of Bob Dylan, the times they are a-changin' – and changin' fast.

## **Summary**

In short, the best things about electric cars are low running costs, ease of driving and the clean conscience that comes from going green.

On the down side, they are expensive to buy and longer-term reliability is unproven. They also have a comparatively limited range – and even using a rapid or fast charger takes a lot longer than filling up with fuel.



## Electric cars - pricing, grants and warranties

So, you've taken the plunge and decided to go electric. Here are a few points you need to bear in mind.

### How much do electric cars cost?

Purchase prices for electric cars vary widely, from less than £7,000 for a Renault Twizy to £120,000+ for a top-spec Tesla Model S.

Below we have outlined rough prices (correct at the point of writing) for new electric cars within three budget levels:

#### Top end

Tesla Model S: from £65,000

Tesla Model X: from £70,000

BMW i8 ~ from £100,000

#### Medium level

Tesla Model 3 (unconfirmed, but at the time of writing it is expected to be widely available on the UK market by 2019): The only released price as of yet is \$35,000

BMW i3: from ~ £29,500 (after incentives)

Volkswagen e-Golf: from ~ £27,500 (after incentives)

Hyundai Ioniq: from ~ £25,000 (after incentives)

Volkswagen e-up: from ~ £25,000 (after incentives)

#### Entry level

Nissan Leaf: from ~ £21,500 (after incentives)

Renault Zoe: from ~ £14,000 (after incentives)

Smart ForTwo ED: from ~ £16,500 (after incentives)

If you're buying used, choice can be limited – and you won't find electric for banger money. [Used Nissan Leafs – the UK's best-selling electric car – start from around £7,000](#), for example, while Renault Zoe prices start from £4,500.

## **What is the cheapest electric car available?**

If we ignore the two-seat Twizy (technically a quadricycle, rather than a car), the cheapest electric car currently on sale is the Renault Zoe.

It costs £14,245 after the £4,500 Plug-In Car Grant has been deducted, but you'll need to factor in £59 a month for battery hire.

Read more about the fantastic Renault Zoe on our [best electric cars of 2017](#) page.

## **Where can I buy one?**

Not all franchised car dealers sell their chosen marque's electric models – and those that do tend to be in cities. So you may need to travel further afield to buy one.

Used electric cars are widely for sale in the classifieds, although the majority are offered at dealers, rather than private sales.

## **What's the warranty like?**

EVs typically have between five and eight years' warranty on the electric motor and battery components.

For the rest of the car, the length of warranty depends on the manufacturer – ranging from three years and 60,000 miles to seven years and 100,000 miles.

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## **Electric cars - charging, maintenance and performance**

Now you are the proud owner of an electric vehicle, but what next, how do you charge it? Where do you charge it? And how do you get the best out of it?

Read on for the answers.

### **Charging an electric car - your questions answered**

Charging your electric car can be done at home, at work or at a public charging point. The latter are still few and far-between outside major cities and motorway service areas, though.

- How do you charge an electric car?

The same way you'd charge a phone – you simply plug it in.

Unfortunately, the electric car industry hasn't yet standardised the type of connector used, so while some can use a conventional three-pin plug, other require you to fit a wall-box for charging at home.

Equally, some public charge points won't be compatible with some electric cars. This can prove frustrating for owners but, again, we expect such issues to be ironed-out as electric cars enter the mainstream

- How long does it take to charge an electric car?

How long it takes to charge an electric car depends on the type of charging point, which is defined by the power (kW) and speed at which they charge. There are three main charging speeds: Slow, Fast and Rapid.

#### **Slow chargers (up to 3kW)**

Slow charging is the most common method of charging an electric vehicle and is typically done by owners at home and overnight. Other slow charging points can be found in office car parks, but public points are uncommon, as a full charge can take 6-12 hours.

#### **Fast chargers (7-22kW)**

These are the charging points you'll find in supermarket car parks and shopping centres. A 7kW will recharge an EV in 3-5 hours, while a 22kW point will be faster, typically charging a car in 1-2 hours.

#### **Rapid chargers (43,50 or 120kW)**

Travel on a motorway and the chances are you'll find a rapid charging point at a motorway service station. A rapid charger can provide up to 80% of charge in just 20-40 minutes.

- How many miles do you get from one charge?

Again, this varies – anything from around 100 miles for a budget electric car to 300 miles for a Tesla. Range drops significantly in colder weather, however – and, of course, if you drive aggressively.

Battery technology isn't standing still. With the new ZE 4.0 battery, a Zoe can provide a theoretical range of 250 miles, but Renault provides real life estimates of up to 186 miles in the summer and 124 miles in winter.

- Where are the electric car charging points?

[Zap Map](#) is a useful online tool showing the location of charging points across the UK. Many electric cars also have sat nav that recognises these locations and can direct you those within range.

At the time of writing (October 2017), data from Zap-Map reveals a total of 4,856 locations with a public charging point installed, with a total of 13,896 connectors. More than 300 new connectors had been added over the past 30 days.

## **Does an electric car need a regular MOT?**

You don't escape the MOT test simply by choosing an EV. Like all cars, electric cars have to pass an annual road-worthiness inspection after they are three years old. The main difference is that there is no emissions test, so that's one less area to potentially fail on.

At the time of writing, the maximum car MOT test fee is £54.85. However, there are many garages that will undercut this.

## **Electric car maintenance video - charging tips, preserving the battery life and vehicle health checks**

### **How to get the best mileage out of your electric car**

Exactly the same way you'd eek the most miles per gallon from a conventional car. Accelerate gently, steer smoothly and look well ahead to avoid sudden braking.

Creature comforts such as air conditioning and heated seats are power-hungry, so use them sparingly. Some electric cars allow you to pre-heat or pre-cool the cabin before you set off, using mains electricity rather than the car batteries.

'Hypermiling' driving styles are just as effective with EVs - read our [top fuel saving tips](#) for advice on this.