

# Electric vehicles

Your guide to electric vehicles



### Intro

If you're wondering whether buying an electric car (also known as 'EV') makes sense, you're not alone. The Government are committed to phasing out the combustion engine in the coming years, so electric vehicles will form part of our future.

This guide will help explain the benefits and considerations to switching to electric vehicles.

### Types of Electric Vehicles



#### Zero emission 100% electric vehicles

100% electric vehicles (sometimes called BEV) produce zero emissions which means that they do not emit any harmful CO<sub>2</sub> or other greenhouse gasses into the atmosphere while driving. They are the cleanest cars on the road and are generally powered entirely by a rechargeable electric battery. Owners can charge their 100% electric vehicles either at home using a specially designed car charging unit, or at one of the more than 55,000 public charging points across the UK.

#### **Plug-in hybrid vehicles**

A plug-in hybrid (sometimes called PHEV) pairs a battery and electric motor with an economical petrol or diesel engine. This gives you around 20 or 30 miles of pure electric driving for the urban area plus hundreds of miles using the petrol or diesel engine. You will need to plug the car in to keep the electric battery topped up.

#### Hybrid vehicles (non plug-in)

A hybrid car (sometimes called HEV) still pairs a battery and electric motor with an economical petrol or diesel engine, but these cars do not need to be plugged in to keep the electric battery topped up. Instead, the battery is charged through regenerative braking and by the internal combustion engine. The extra power provided by the electric motor can potentially allow for a smaller engine, meaning these cars are economical to run.

#### Hydrogen fuel cell vehicles

Hydrogen fuel cell vehicles are advanced EVs that are powered by an electrochemical process which combines hydrogen and oxygen. This process happens in an intelligent fuel stack which fuses highly pressured hydrogen gas with oxygen, thereby creating a reaction that produces the electricity required to power the vehicle's motor and drive its wheels. This process means the only exhaust it produces is water. Because hydrogen fuel cell cars are powered by the chemical process of fusing hydrogen and oxygen, they do not need to be recharged and can be driven as long as they are fuelled by a supply of hydrogen. Filling up the car takes less than 5 minutes and the average range of hydrogen fuel cell cars is around 300 – 350 miles. They can be used in much the same way as conventional petrol powered vehicles, for shorter commutes as well as much longer journeys. However, currently the number of hydrogen refuelling sites in the UK is limited.

### **Benefits**

The cheapest and most sustainable way of getting around will always be to walk, cycle or take public transport, but cars are necessary for some of our journeys. Therefore, there are benefits to switching to electric vehicles over older, polluting petrol or diesel vehicles, such as:

#### Cheaper to run

The cost of charging a plug-in hybrid electric vehicle can be much lower than the cost of filling a conventional petrol and diesel vehicle, and with less moving parts there is often lower maintenance costs with electric engines.

#### • Better for the local environment

Emissions from road vehicles such as Nitrogen Dioxide  $(NO_p)$  and small particulate matter also adversely affect local air quality, which can have a disproportionally negative effect on more vulnerable groups in society. Electric vehicles produce zero emissions from the exhaust and reduced levels of particulate matter. However, particulate matter is still produced by wear and tear of tyres and brakes.

#### • Choice of cars

The choice of different electric vehicles on offer in the market is continuously rising with more manufacturing companies offering their own individual models.

# Charging

If you have a driveway (or somewhere off road to park), then the cheapest way to charge your electric vehicle is at home. You can invest in a chargepoint on your property, where you can take advantage of cheaper energy tariffs overnight. Away from the home, the amount of chargepoints across the UK is increasing daily. There are a mixture of points at destinations, such as supermarkets, service stations and pubs, as well as onstreet, in car parks and at workplaces.

There are various "speeds" of charging, defined by ranges of kW.

Low speed - Under 3.7kW. Very few charge point units will dispense at low speed.

**Standard charge point** units (3.7 kW to less than 8 kW) are best used for overnight charging and can take between 6 - 12 hours to charge from empty to full charge.

**Fast charge point** units (8kW to 49kW) can be found in car parks, on street and workplace charging as they take 2–7 hours for a pure-EV to charge fully depending on the battery size of the car.

**Rapid charge point** units (50kW – 149kW) and **Ultra rapid units** (150 kW and over) are the quickest way to recharge a vehicle, typically recharging a vehicle to 80% in around 30 minutes. However, rapid charge points are expensive to install and use, but they're a great way to top up during long journeys. Typically found in motorway service car parks, petrol stations, larger shopping centres and supermarkets.

To see where all the publicly available chargepoints are in Swindon and further afield, we recommend Zap-Map, available as an app or website: www.zap-map.com/live/



# **Myths and Facts**

#### There are many misconceptions about electric vehicles.

#### 1. Electric vehicles (EVs) are expensive

New EVs do cost more to buy outright, but in many cases, have a lower cost over 4 years. Not only is off-peak electricity cheaper than fuel, there are fewer moving parts to go wrong or need replacing. The road tax VED is currently zero on all electric cars. This will change from April 2025, but until then, hundreds of pounds can be saved compared to non-electric cars. The cost price of electric cars is also getting cheaper due to reduced production costs.

#### 2. EVs do not have the battery range to travel as far as people need

99% of car journeys in England are under 100 miles, which means most drivers needs are easily met by an EV. Battery technology is constantly improving and the average range is now over 200 miles on a single charge. For long journeys, it is recommended that drivers take breaks, and most service stations now provide rapid EV chargers.

#### $\ensuremath{\mathfrak{S}}.$ The electricity grid won't be able to handle the increase in EVs

It's important to remember that the shift to EVs is happening gradually – not overnight. Renewable energy sources are constantly being developed to supply us with greener electricity, and the electricity grid is constantly 'evolving' to be better equipped to handle it. Not all EVs will need to be charged at the same time, spreading the demand on the grid. EV friendly home energy tariffs also reward owners for charging at night when demand on the grid is low.

#### 4. There will eventually be lots of EV batteries going into landfill

The lithium ion technology in our mobile phones is not dissimilar to those in an electric vehicle, but what's different is that EVs have effective power management systems that guard the long-term health of their batteries. Most manufacturers are offering battery warranties of eight years, or around 100,000 miles, but they could actually last longer than that and indeed outlive the car itself. Even if a battery became no longer fit for use in the car, as it can either be recycled or given a second life as an energy storage unit for homes or businesses.

#### 5. Building an EV generates more greenhouse gas emissions than it saves

A new battery-electric car has just a third of the lifetime greenhouse gas emissions of an equivalent new petrol car, even when taking into account battery production and disposal. EVs are getting progressively cleaner as electricity generation decarbonises.

### **Further EV resources**

There are a number of sources of further information should you wish to know more about the public charging network or information and help for becoming an electric vehicle owner:

The Swindon Travel Choices webpage includes information on the current network and new installations. www.swindontravelchoices.co.uk/electric-vehicles/

**Energy Saving Trust** is an organisation which provides information and services to help people save energy. The Energy Saving Trust administers a number of electric vehicle incentives, and has a wealth of independent information. www.energysavingtrust.org.uk/advice/electric-vehicles/

Southwest EV Owners Group are a group of local owners who are keen to share their advice and enthusiasm with others. Their website has a forum and the group have regular "meets". www.southwestevownersgroup.uk/

Zap-Map is the most comprehensive map of all public charging points across the UK, and it also has a large amount of useful information about electric vehicles. www.zap-map.com/





