

STATE OF THE SWITCH



Measuring the
UK Transition to
Electric Transport

2021



New
AutoMotive

Introduction



We are going to see a revolution in how we travel in the UK during the 2020s as electric vehicles (EVs) increasingly replace vehicles powered by burning diesel and petrol.

This transition will take many years to complete and there will be a number of milestones along the way, notably the planned date for ending the sale of new petrol and diesel cars in 2030.

At New AutoMotive we are unashamedly in favour of this revolution taking place, and we hope that through our work we can help it to progress more quickly and smoothly than might otherwise be the case.

As we have worked to collect information about electric vehicles over the past year we have found that the data sources can be quite scattered and not always easy to interpret.

We thought it would be helpful if we create a summary of all of the relevant data that we have pulled together into a single report that provides a snapshot of the 'State of the Switch' in October 2021.

We will produce this report annually and to set out how the transition is progressing, any areas that are holding it back, or indeed accelerating it.

In this first report we will look at six different aspects of the switch - the ratio of electric to internal combustion miles travelled, the number of electric vehicles on UK roads, trends in new car sales, vehicle ownership costs, growth in the charging infrastructure, and public policy developments.

NB When we talk about EVs in this report we are only looking at cars. We recognise that there are shifts happening with other modes of transport that are also important and worth studying but these are outside the scope of our current work.

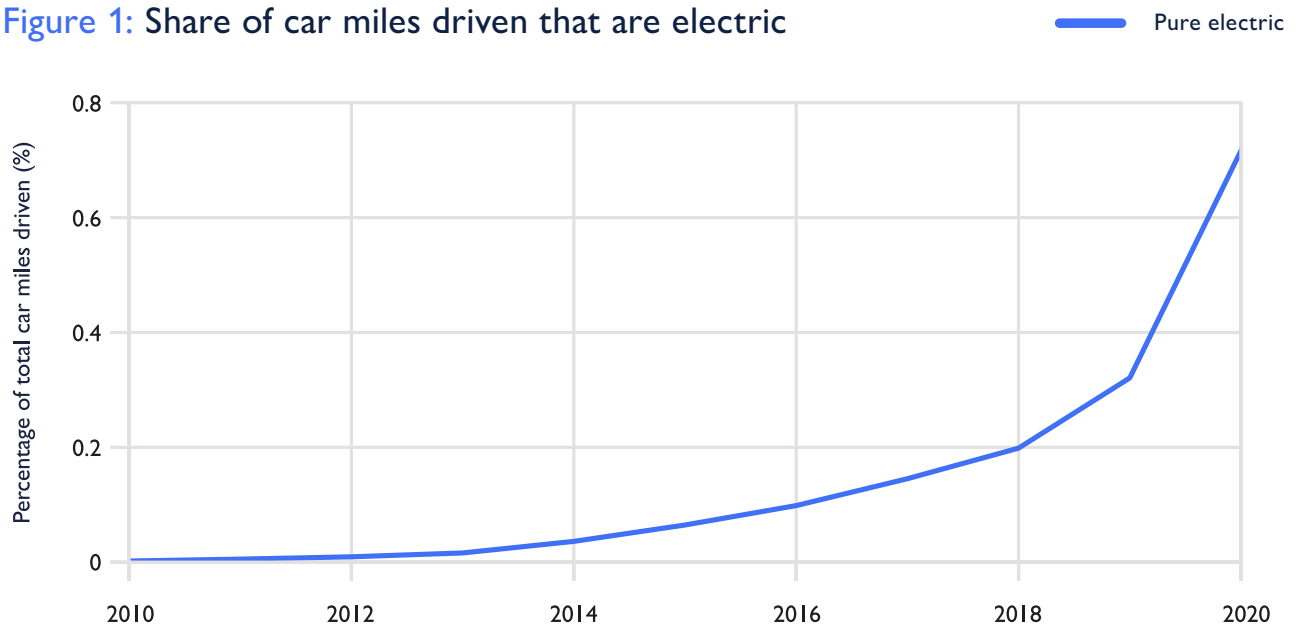
The New Automotive Index

The best measure of the transition to electrified road transport in the UK is the ratio of miles that are driven under an electric powertrain to miles driven under an internal combustion engine.

[The New AutoMotive Index](#) highlights the progress to be made in electrifying road transport in the UK. Every year, around 2,000,000 new cars are bought, and a similar number reach their end of life in the UK. Since there are 32 million cars on the road, it will take a long time to replace all of them with electric vehicles even when 100% of new car sales are fully electric.

In 2019, before the coronavirus pandemic, UK motorists drove 255 billion miles per year. As more electric vehicles are bought and more ICE vehicles are scrapped than bought, the percentage of these miles that are electric will increase.

Figure 1: Share of car miles driven that are electric



Source: New AutoMotive analysis of data from the DVLA, DVSA and Department for Transport

We estimate that in 2020 the total number of miles driven by pure electric cars was 1.65 billion and the total miles driven by ICE cars was 220.25 billion. This means the ICE-to-EV vehicle miles ratio is 134:1.¹

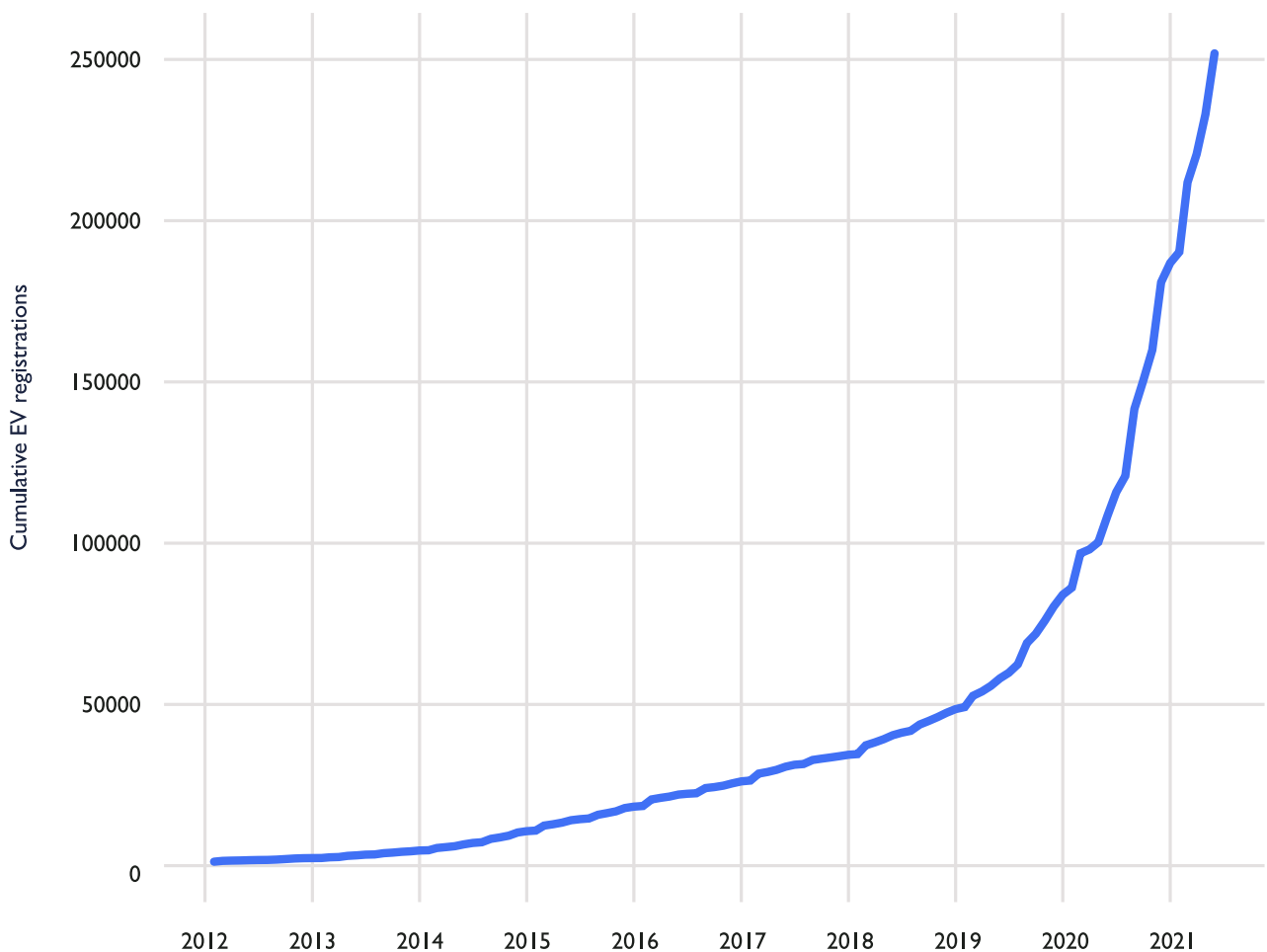
¹ Hybrid vehicles drive under electric power to varying degrees. We have not included miles driven by hybrids in the estimation of electric miles or ICE miles. We are exploring ways of doing this in the future.



BEVs on UK Roads

The number EVs on UK roads is growing exponentially according analysis of data from the Driver and Vehicle Licensing Agency (DVLA)'s vehicle licensing database.

Figure 2: Cumulative EV registrations in the UK



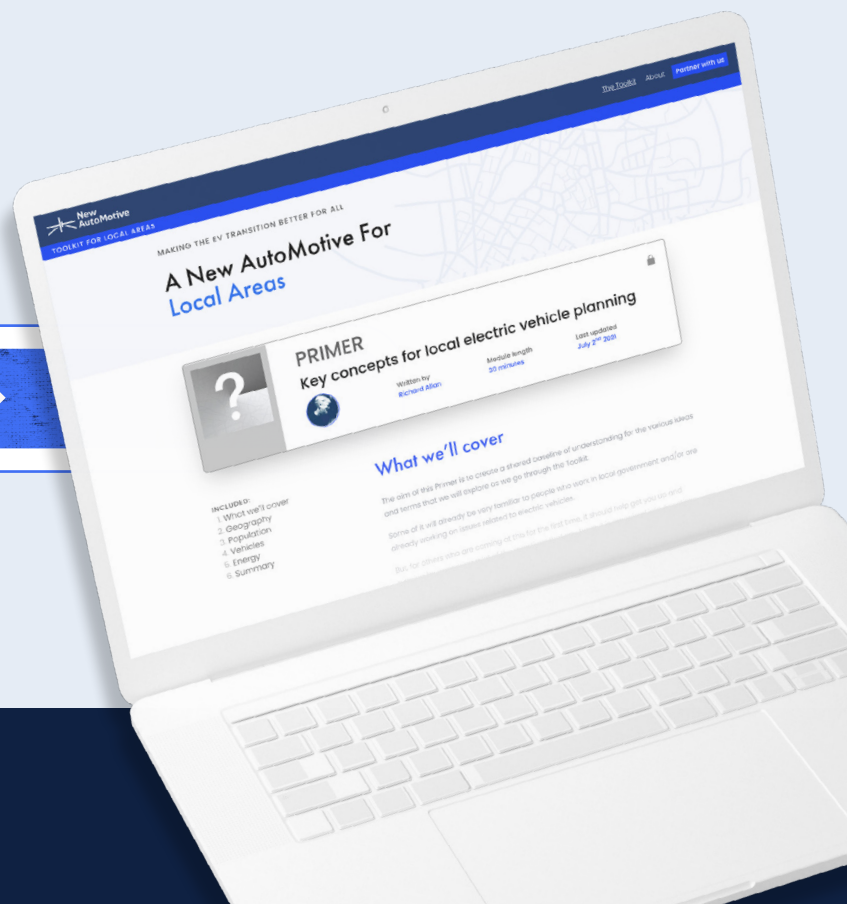
Source: New AutoMotive analysis of data from DVLA



The rapid growth in the number of EVs has partly been driven by Tesla's entry into the UK market, but also by the rapidly growing number of EVs on offer, as manufacturers race to secure a share of this new market segment. While the number of EVs on UK roads cannot always grow at the current rate, we predict continued strong growth following a typical model for the adoption of a new technology.

The raw data is less useful for understanding where EVs are actually located because many new vehicles are leased and so registered to the place where the leasing company has its HQ, rather than where they are being used. A number of organisations are looking at ways to understand local EV usage more accurately for planning purposes. New Automotive is building a [local toolkit](#) to share information about these developments.

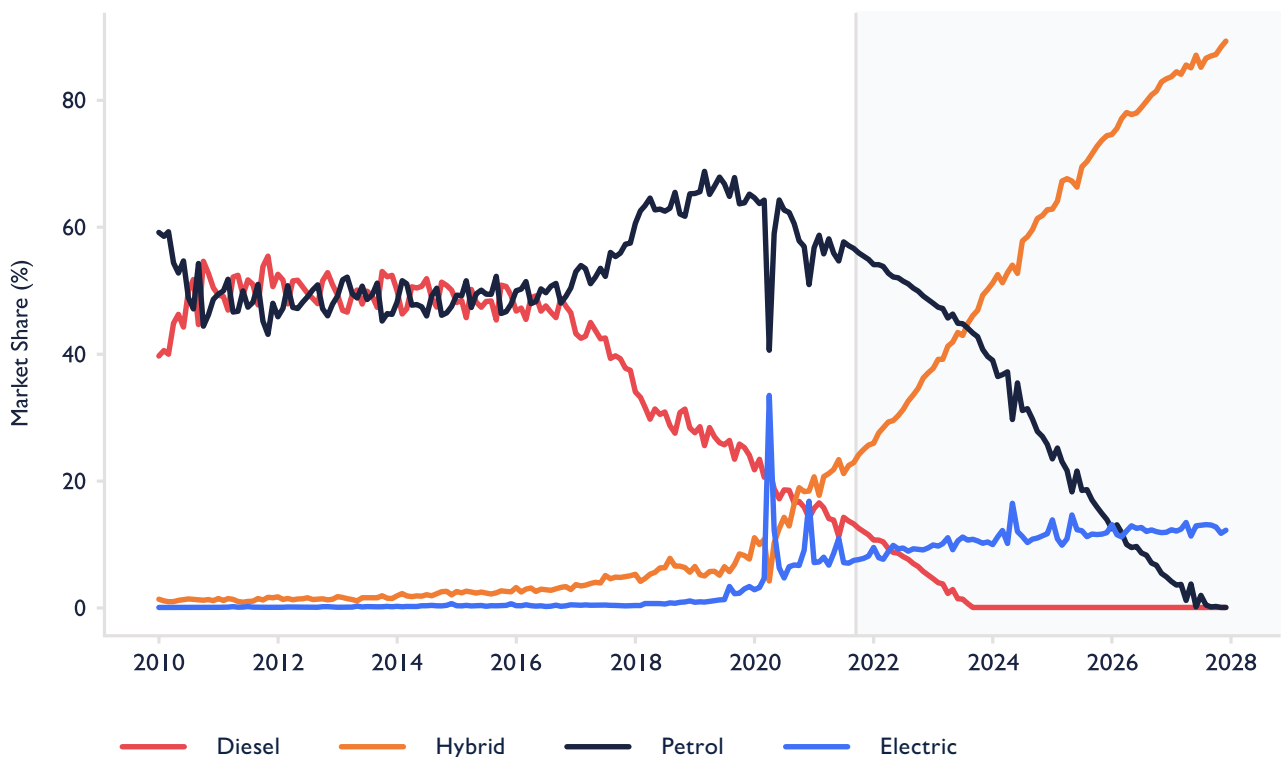
VISIT LOCAL TOOLKIT →



New Car Sales in the UK

At the end of the EV transition, the UK car market should be stable at 100% fully zero emissions (likely fully electric) sales. Since 2016, the UK car market has been in transition. After years of relative stability with petrol and diesel cars accounting for roughly half of the market each, the popularity of diesel has collapsed, and the petrol share of the market is starting to decline, too.

Figure 3: Historic and forecast UK new car market share



Source: New AutoMotive analysis of data from the Department for Transport.

“Based on current trends, hybrids would come to dominate the market with as much as a 70-80% share by 2027.”



**DIESEL
DECLINE**

The most dramatic story of the last 4 years of change in the UK car market has been the abandonment of diesel cars among UK motorists. This decline started around 2017, coinciding with the VW diesel emissions scandal and growing awareness over high levels of air pollution.

Petrol cars have been the primary beneficiary of the collapse in diesel sales, and have recent years accounted for around two-thirds of all new cars. However, there has also been a growth in sales of hybrid vehicles. In recent years, petrol's dominance of the market appears to have started to slip, with customers switching primarily to hybrid vehicles, but also to fully electric vehicles.



Our modelling looks at the direction of current trends, and generates market share forecasts.

Based on current trends, hybrids would come to dominate the market with as much as a 70-80% share by 2027.

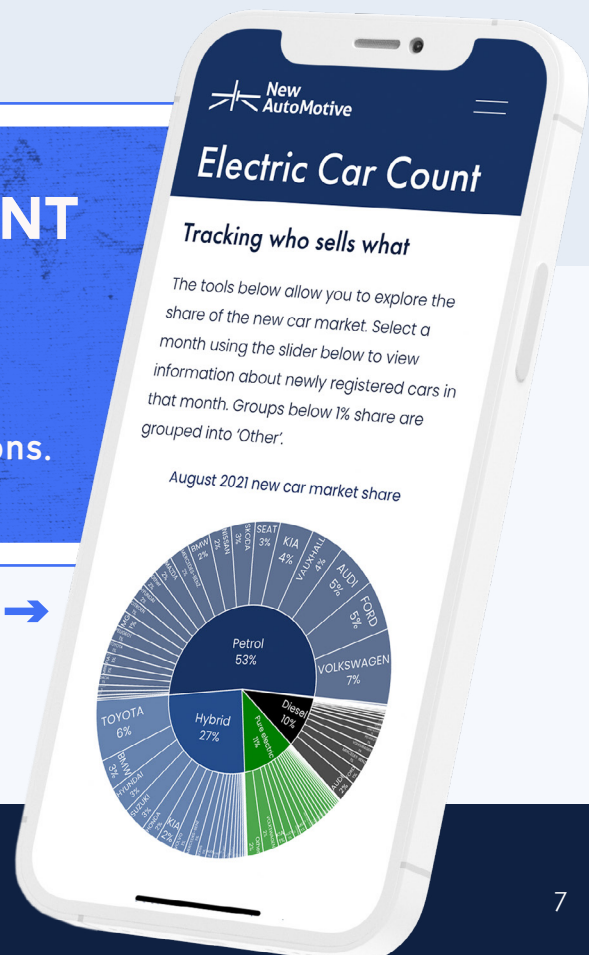
We expect there to be developments that move some potential hybrid buyers over to BEVs, notably reductions in BEV purchase prices and policy interventions like a ZEV mandate. But these figures show how the popularity of hybrids is one of the key issues facing the UK's switch to electric vehicles.

The proposed ban of new hybrid sales from 2035 will also have an impact on the market in the late 2020's, accelerating the shift from hybrids to BEVs with this effect kicking in earlier if the date is brought forward.

ELECTRIC CAR COUNT

We track new car sales data in New AutoMotive's Electric Car Count: a comprehensive, up-to-date and free overview of the new UK car registrations.

[CLICK TO VISIT](#) →



EV Price Competitiveness

One of the biggest and least well understood benefits of switching to an electric vehicle is the dramatic reduction in running costs. Electric vehicles are far more efficient than ICE vehicles, and in the UK electricity is much cheaper than petrol or diesel. We estimate that the typical UK motorist will save around £700 per year in fuel costs as a result of switching to an electric car.



Figure 4: Estimated average annual petrol and diesel spend, based on annual mileage and pump prices



Source: New AutoMotive analysis of data from the Department for Transport.



EV PRICES FALLING

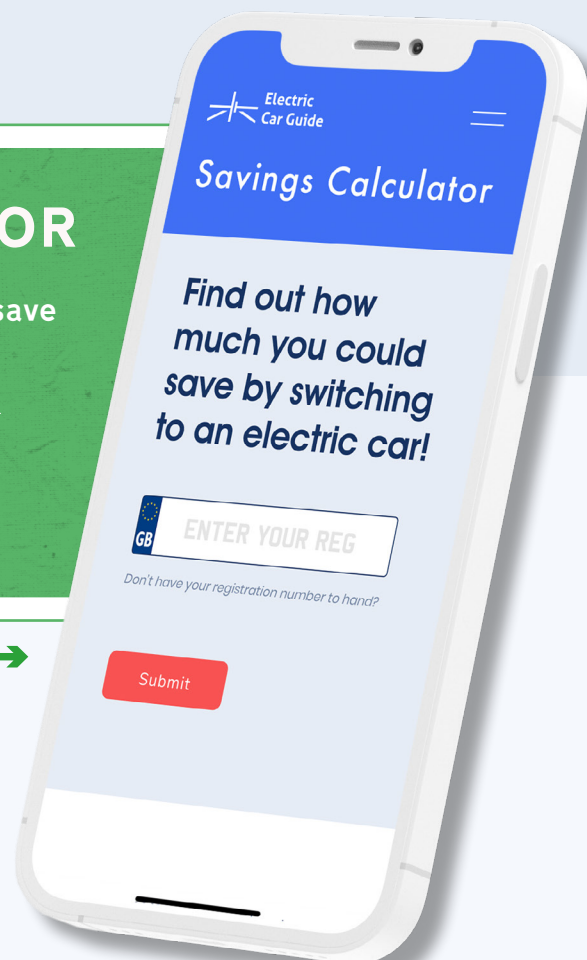
Rising pump prices in 2021 have pushed up motorists' fuel bills, despite a fall in annual mileage due to increased home working. We estimate that, during the coronavirus pandemic, annual mileage has fallen by around 1,000 miles. The rise in pump prices will be felt keenly if miles start rising once again after the pandemic, and could take annual fuel costs back to 2012 levels.

At present, a range of fiscal incentives are on offer to encourage drivers to switch to an EV, including government grants and tax exemptions. While the price of EVs is falling, the upfront purchase price is still high. But with the introduction of a ZEV mandate (see section 6 below) and falling component costs, we anticipate that EVs will become increasingly financially attractive for motorists.

SAVINGS CALCULATOR

Drivers can see how much they might save by switching to an EV using the [ElectricCar.Guide Savings Calculator](#). This provides an individual calculation using a database of information about vehicles and their annual mileage.

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Charging Infrastructure

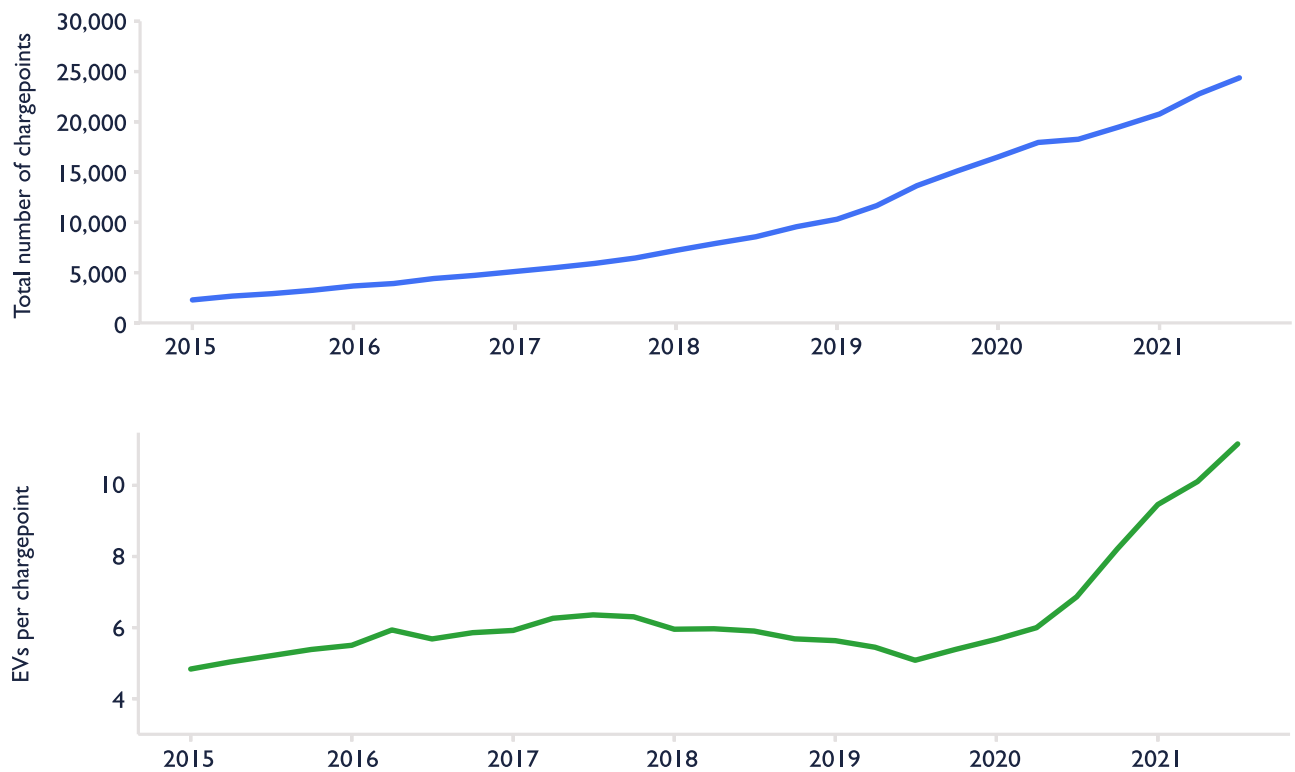
For most people, charging an EV is simpler and easier than refuelling at a petrol station. The majority of people will be able to charge their EV at home, conveniently and cheaply (the government estimate for England is that two-thirds of households have driveways).

Where houses do not have driveways or private parking at which the installation of charging stations is possible, motorists rely on public charging infrastructure. This could be destination charging, such as on-street charge points, workplace or supermarket charging stations, or en-route - usually rapid - charging stations or hubs.

The UK needs to have enough charge points to keep up with a growing number of electric vehicles that rely on them. Analysis by Transport & Environment has suggested that the UK will require 230,000-280,000 public charging devices by 2035, and the EU recommends that there should not be more than 10 EVs per charge point.

In 2020, the UK installed around 10,000 public charge points, and as of July 2021, the UK had over 24,000 public charging stations including over 4,000 rapid chargers mostly sited along the strategic road network. The UK's progress in installing rapid chargers means that drivers are never more than 25 miles from a charging station on an A road or motorway.

Figure 5: Chargepoint growth & EVs per chargepoint in the UK



Source: New AutoMotive analysis of data from the DVLA and Department for Transport.

As EV sales have grown strongly in recent years, charging device installation has struggled to keep pace, even with significant uplifts in the absolute number of chargepoints. The number of EVs per chargepoint now exceeds 10 and this is an indicator that should remain an area of focus as both EV purchases and chargepoint installations grow over the next few years.

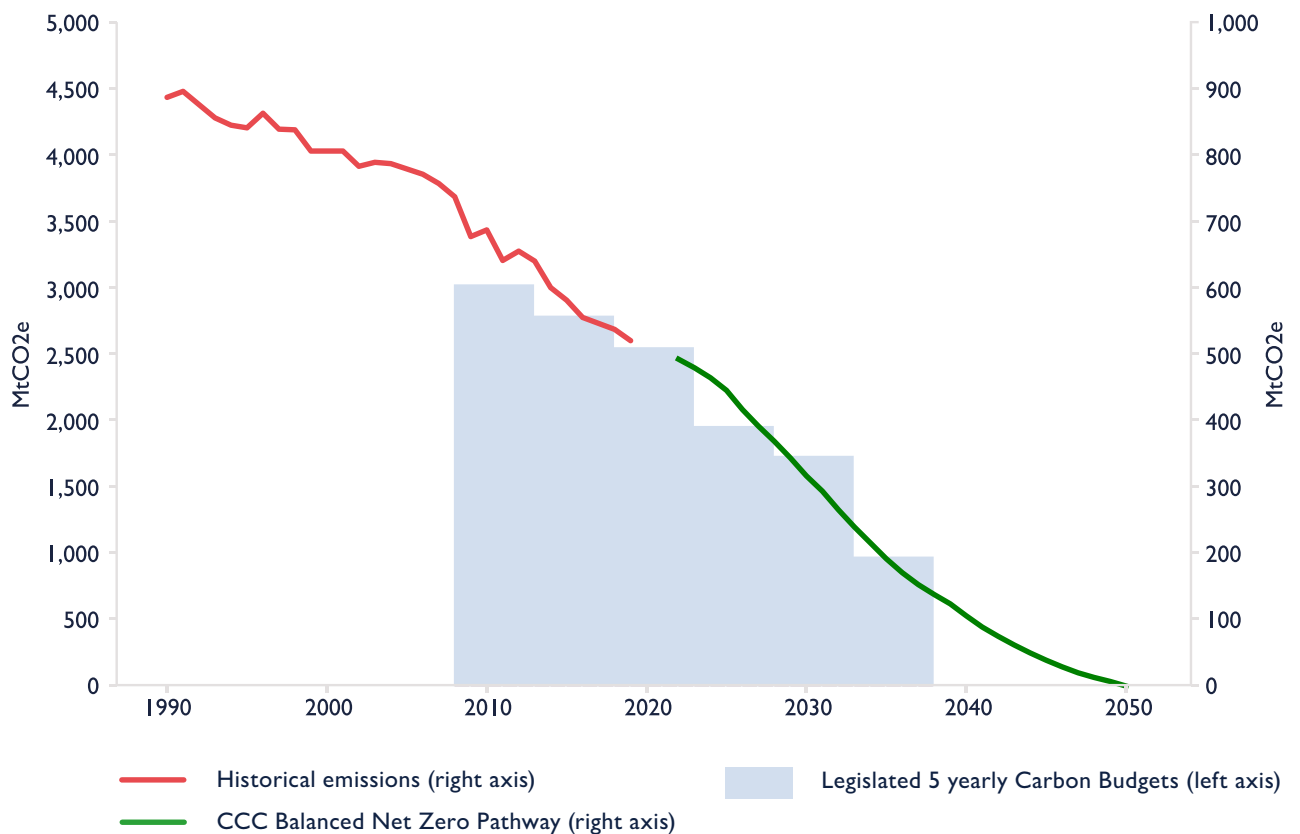
We should note that most EVs in use today are owned by people who have the ability to charge at home and the takeup of government grants shows that installations of domestic private chargers track closely with purchases of EVs. But access to public chargepoints will become increasingly important as EVs are adopted by people without driveways, and as those with domestic chargers use their EVs to travel further from home.



Policy Trends

In 2019, the UK passed legislation setting a target to reduce its territorial CO2 emissions to net zero no later than 2050, with subsequent legislation establishing interim targets mandating a 78% reduction in the UK's carbon emissions by the late 2030s.

Figure 6: UK progress against Carbon Budgets



Source: New AutoMotive analysis of data from the Committee on Climate Change.



The UK's recent emissions reductions have largely been driven by emissions reductions in the power sector, while emissions in transport have remained static (until the coronavirus pandemic hit). To meet future emissions reductions targets, the UK government will have to introduce new policies that tackle carbon emissions from other sectors. Since transport is the largest single emitting sector of the UK economy, with cars making up the majority of transport emissions, it is an area that Ministers are increasingly focused on.

The UK currently has a range of fiscal incentives to encourage motorists to buy an EV. The plug-in car grant offers a cash grant for those buying a new electric vehicle, EVs benefit from exemptions from Vehicle Excise Duty (VED), London's Congestion Charge, cheaper residents' parking in many cities, as well as lower running costs.

Rapidly rising EV sales mean that direct grants for EVs are becoming increasingly expensive. Ministers are therefore consulting on a new system to encourage EV purchasing: a California-style Zero Emission Vehicle Mandate ([ZEV Mandate](#)). This system consists of a requirement for each manufacturer to sell a particular number of EVs each year, backed up with a system of tradable credits to create a market in transport decarbonisation, which should further reduce the upfront costs of EVs with no costs to the public finances. The Department for Transport will announce further details further this year.

Closing Remarks



The shift to EVs is a change that is going to happen, not just because we need it to happen for environmental reasons, but because it involves moving to a better technology than the one being replaced.

EVs are already cheaper to run and maintain than their internal combustion equivalents, and over the next few years they will become cheaper to manufacture and purchase as well.

Anyone who has driven an EV will testify to them being a more pleasant way to travel with many advantages over petrol and diesel vehicles, and we can expect them to become even more capable over time.

But, while the end state seems inevitable with EVs becoming the obvious choice for most people wanting to get around in the UK, there are a lot of variables affecting when and how we will get there.

One of the trends that we highlight in this report is the growing market share for hybrid cars. While this does show the intent of buyers to move away from vehicles that only run on fossil fuels, these are not zero emissions vehicles. We will need to look carefully at whether the shift to hybrids helps or hinders the eventual and necessary shift to purely electric vehicles.

We hope that these regular State of The Switch reports, along with our other publications throughout the year, will be useful to all those who are working on this important societal shift, helping to make it as fast and fair as possible.

Contact

For further information about New Automotive or to partner with us on upcoming research, please get in touch below:

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