EVERYTHING THAT YOU NEED TO KNOW

Includes a comprehensive guide to help you make the switch to electric cars

GOING ELECTRIC

VAUXHALL CORSA-E DRIVEN

ALSO

VW GOLF GTE

German plug-in hybrid brilliance

MINI ELECTRIC

Compact battery powered fun

MAZDA MX-30

The return of rear hinged doors

Many thanks to Vauxhall UK, MINI UK and Mazda UK for the loaning of cars for testing for this project.

Special thanks to Andrew Noakes for guidance throughout the creation of the Going Electric magazine.

GOING ELECTRIC

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NEWS

Image: Michael Fousert

MARKET SHARE OF EVS RISES

Words by **Joe Pepper**

The percentage of registered cars in the United Kingdom using electric power is increasing, with the market share of new cars with electric and hybrid drivetrains up by 18%, data from the Society of Motoring Manufacturers and Traders (SMMT) shows.

This sway in market share towards electric powered vehicles can be attributed to the "greenest choice of cars ever seen," according to Mike Hawes, SMMT Chief Excutive.

"If the UK is to remain competitive it must ensure it has an attractive framework for vehicle production and the supply chain," Hawes said.

"Accelerating zero emission car production is part of that, so while one in five models made in the UK this year is alternatively fuelled, we need to drive investment in charging infrastructure and the market to ensure we can deliver the net zero future society demands."

As of May, the market share of new cars that were petrol was 60% in 2020, but is as low as 49.2% in 2021, decreasing by 10.8% in the last year. Similarly, the market share of newly registered diesel cars has reduced by 8.1% in the last year down to 10.8%.

This time last year, battery electric vehicles made up just 4.3% of new cars on the road. At the same point in 2021, electric cars accounted for 7.5%, an increase of 3.2% since 2020.

Likewise, plug-in hybrid electric vehicles have increased their market share by 3.5%, and mild-hybrid petrol cars have increased their market share by 6.9% in the last 12 months.

By end of May 2020, inhibited by COVID-19 lockdown restrictions throughout the country, 22,054 battery electric cars had been sold. By May 2021, electric car sales had more than doubled to 54,051 cars.

Of the 462 models available to buy in the UK, now that showrooms have reopened, 32.9% are capable of outputting zero-emissions. With 44 battery electric cars and 75 plug-in hybrids on offer, the range of electric cars available is as wide as ever.

Car production is booming in comparison to last year, but is still down by 52.9% on 2019. In 2021, 127,469 fewer cars left factory gates in the UK than in the same period two years prior, largely due to pandemic-related supply shortage.

Image: SMMT

Words by **Joe Pepper**

NISSAN INVEST £1 BILLION IN EV HUB

Nissan is investing £1 billion into its Sunderland vehicle plant. £423 million will be invested in producing a brand new all-electric crossover to be made in the plant, as well as £450 million into the building of an Envision-AESC electric battery plant next door to the existing Sunderland plant.

£80 million is also to be spent on a renewable energy 'microgrid', that will ensure that the manufacturing park is powered by renewable sources.

The investment aims to see that Nissan's products "achieve carbon neutrality throughout their entire lifecycle", according to company CEO, Makoto Uchida. "This project will greatly accelerate our efforts in Europe to achieve carbon neutrality."

Prime Minister Boris Johnson says that Nissan's investment is a "major vote of confidence in the UK", and that it will "create hundreds of green jobs and boost British industry."

Words by **Joe Pepper**

MAZDA COMMIT TO ZERO EMISSIONS

Mazda is developing a new dedicated platform for electric vehicles, for use in a range of electric cars to be launched between 2025 and 2030, the company have announced.

Mazda's SkyActiv EV Scalable Architecture is a key part of the Japanese manufacturer's commitment to carbon neutrality by 2050, and is a part of Mazda's attempt to bring forward the electrification of the range of cars it has on sale.

Between 2022 and 2025, Mazda aim to launch five hybrid cars, five plug-in hybrids and three electric cars using their outstanding platform suitable for both combustion cars and electric vehicles. By 2030, the manufacturer intends to have a quarter of its range fully electrified, with the entirety of their range electrified in some form.

More details on Mazda's electric range will be revealed soon.

COMING SOON...

Words by **Joe Pepper**

BMW i4

BMW's new all-electric gran coupé arrives in the UK in November and is capable of 367 miles on a charge. Motors at the front and rear combine for 536bhp in the i4 M50 performance model, BMW's first all-electric M performance car. The i4 will be priced from £51,905 OTR.

Tesla Model Y

On sale in the USA for a year, Tesla's Model Y SUV is expected to arrive in the UK towards the end of 2021. The Standard Range model will launch even later from £26,000, with the Long Range model with an over 300 mile range and a 130mph top speed starting higher at £35,500 OTR.

Cupra Born

The Volkswagen ID-3's Spanish cousin is set to launch in the UK in August this year. The Cupra Born offers a choice of 45kWh, 58kWh and 77kWh batteries, with a 335 mile range from the largest. Based on ID-3 prices, the Cupra Born will likely start from around £32,000.

VAUXHALL CORSA-E

100kW Elite Nav

Words and photos by Joe Pepper

Have Vauxhall managed to translate one of the most popular cars in the country into an affordable electric masterpiece?

The UK's best-selling car of 2021 so far now has an all-electric model. Starting at £26,045 including the £2,500 plug-in car grant, the Vauxhall Corsa-e is the first electric model from the British manufacturer, who promise an electrified version of every model in their diverse range of cars by 2024.

As one of Britain's two most purchased cars, alongside the Ford Fiesta, it wouldn't be too far of a reach to suggest that the electric Corsa is the most important car this decade, and could massively help the country's transition to electric cars.

The Corsa-e has a convincing range of 205 miles (WLTP) from its 50kWh battery. Drive carefully in an urban setting and you could extend this range to as far as 250 miles. Even driving on the motorway you can get 155 miles out of the battery, more than the official ranges of both the MINI Electric (135 miles) and the Mazda MX-30 (120 miles).

The big battery and high range mean a longer charging time – a 7.4kW fast charger will take over seven hours to charge the Corsa-e from empty to full. Rapid charging points bring the charge time closer to 30 minutes, but only at charging points that support the Corsa-e's maximum charging power of 99kW. Most rapid chargers that you can find tend to be much closer to 43kW.

At first glance you might miss that the car is electric. The Corsa-e shares the same exterior styling as its petrol counterpart – a keener eye will notice minor differences in the front grilles and no exhaust to tell the two apart. Nothing futuristic, nothing silly, it just looks like a car.

A press of the start button presents just enough of the hum to let you know the car is ready. Once started, the Corsa-e has three different drive modes that you can choose from: eco, normal and sport.

Normal mode has the brisk acceleration that comes naturally from electric cars. The power application is smooth but still gives the sense of zippy acceleration.

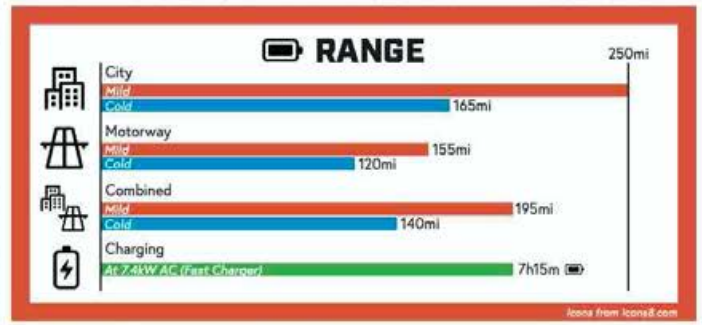
Eco mode takes the already smooth power application and extends it to the point of feeling like you're hardly accelerating at all. If you switch down from a higher mode, eco mode feels considerably slower, but still just about fast enough. If you aren't looking for a thrill you could very easily leave the car in eco mode the entire time and still be satisfied.

If fun is what you are after, sport mode is fast enough to tease you with some subtle G-forces, while accelerating from 0-62mph in just 8.1 seconds without skipping a beat.

Regardless of the drive mode that you are in, the Corsa-e handles quite nicely. The power steering makes the steering wheel feel as light as a feather and helps it feel smooth.

The suspension is well balanced and offers an enjoyable experience at speed on country roads or cruising at higher speeds comfortably, but

The interior keeps things basic, but is highly functional and very easy to use



The Corsa-e shares styling with the petrol Corsa, except for the missing exhaust

also sublime management of city roads. The Corsa-e can ease itself up to speed and back down again and again comfortably, particularly if you're gentle on the pedals.

While making easy work of both motorways and city settings, the latter is clearly the more suitable environment for the car – all it takes is a steep hill with the car out of sport mode to make the acceleration seem sluggish. Lane assist also provides valuable assistance on narrower roads but will fight against overly smooth lane changes in an unpredictable and frustrating way.

Inside the cabin itself, a large windshield allows for great visibility and a wide field of view, including vertically. Decent sized mirrors with blind spot indicators, an effective anti-glare rear-view mirror and a reversing camera with good trajectory prediction all allow for good spatial awareness when manoeuvring the car in tight spaces.

Sat in the car you'll notice a subtle interior layout. An analogue driver display is swapped for a 7-inch digital screen at the Elite Nav trim level, as well as upsizing the driver-angled touchscreen display on the dashboard to 10-inches. Climate controls are separate physical dials that sit just below the dashboard, set slightly inward away from the driver – far enough that you have to reach for them. Nothing about the cabin will particularly overwhelm you.

But the finish of the interior space is just fine. The cabin is effective and functional, but somewhat dull and lacking any real charm – you end up with a very similar interior in the £26,000 Corsa-e as you do in the petrol version that costs about £10,000 less. For that much money you'd like to see a little bit more.

Keeping the car charged is easy enough, with a regeneration monitor and a charge port compatible with rapid charging

Using public chargers can be confusing at first, but becomes like second nature

There's plenty of legroom and space in both the front and back rows. Three people can sit in the back of the car, with enough space to fit two adult passengers. The glovebox is quite narrow but fairly deep. Pair this with several other cubbies in the cabin and there's a reasonable amount of storage space – before the impressive 309L of boot space. Between the storage space, roomy seating and good range available, the Corsa-e will work very nicely as a small family car.

The central screen offers everything you'd expect from a modern car – a satnav, DAB radio and Apple CarPlay or Android Auto – but not a whole lot more. The touchscreen systems are easy to navigate but slightly less responsive than ideal. The computer is often one key press behind you when you're typing in a postcode.

"It wouldn't be too far of a reach to suggest that the electric Corsa is the most important car this decade"

Vauxhall's Power Orange paint allows for a striking appearance for the Corsa-e

The Corsa-e's interior is slightly dull in appearance, but has plentiful space and comfort to spare in the back row seats

The 'e' button just below the screen brings up information about the batteries and electric drivetrain. The kWh usage of the battery over the trip can be shown as a bar chart, or alternatively a diagram that demonstrates the 'flow' of electricity through the front wheels and the car.

While it's exciting to see that the car is regenerating or using power, once the novelty wears off you quickly realise that it doesn't tell you how much power is being used or recovered, just that it's either recovering or using power. Frankly, you'll very quickly be able to figure out when the car is regenerating without looking at the 'flow' display.

As a matter of fact, you can already see how much electricity the car is regenerating or using with a small bar on the driver's display. The bar is great for learning to drive the car in the most efficient way possible. It almost makes up for the driver display's digital speedometer not refreshing fast enough to keep up with the car's acceleration.

However, automatic lights and windshield wipers make the driver's life easier and work perfectly. Cruise control and speed limiters are simple to figure out and adjust. Best of all, any changes made with the steering wheel or stalks behind come with a pop-up on the driver's display that tells you what you've just changed.

Otherwise, driving the car is very basic. It doesn't feel needlessly futuristic or complicated. Anyone would be able to jump into the Corsa-e and easily take it to wherever they wanted to go – a majorly important factor when it comes to maintaining the popularity that the car has across the country.

But while the Corsa-e has everything that it needs to be as successful as it's combustion counterpart, the difference in price makes it difficult to consider. The reason that the Corsa-e works so well is its similarity to an already winning formula – it's a Corsa with an electric drivetrain. In the same way, it's a Corsa with a price-tag nearly £6,000 higher for the petrol version at the same trim level.

Is it worth spending the extra money? If what you want is a simple, practical car that can commute and do regular trips with ease while hardly having to think about what you're doing as the driver, the Corsa-e is absolutely worth it, and a brilliant way to go electric.

What isn't broken doesn't need fixing, and Vauxhall know that their winning formula is working just fine.

MINI ELECTRIC
135kW Level 3

Words and photos by Joe Pepper

How well have Mini managed to transfer the exciting driving feeling from their petrol cars into their new electric model?

Mini have stepped into the EV market with their fittingly named Mini Electric, positioned as a city car perfect for short distance running and starting at £25,100 including the £2,500 plug-in car grant from the government.

A smaller 32.6kWh battery will take the car 145 miles officially, but when focused on city driving can extend as far as 175 miles on a single charge. Using a 7.4kW fast charger, the Mini Electric's battery will charge from empty to full in a little over three hours – four hours faster than the 50kWh battery in the Vauxhall Corsa-e. So, while the Mini has less range, it's much more likely that a full charge will slot into a busy schedule.

For even faster charging, the Mini Electric supports three-phase rapid charging up to 49kW that allows for a 20-80% charge in half an hour.

Mini have kept the Electric's appearance in line with their other cars, using identical styling to the newest generation of petrol Mini models beside covering up the front grille and making use of questionably styled aerodynamic wheels on some trim levels. But have Mini managed to replicate the exciting driving feel that a petrol Mini gives you so much of with their new all-electric model?

Once you've pressed the bright yellow start button positioned right in the centre of the dashboard, below the 6.5-inch touchscreen (8.8-inches on the Level 3 trim), you'll have four different drive modes to choose from – which you can toggle through using one of the nicely tactile up/down switches by the start button.

'Mid' is what Mini calls their normal mode, which comes packed with power already. The second that you switch into 'sport' mode, you feel the jolt of extra power – you won't miss that the mode has changed, but the jump between the two can be disconcerting if you're on the move when you make the switch.

As you would expect, 'green' mode increases the efficiency and reduces the acceleration power. While this mode is just about fine for a leisurely drive, it feels disappointing to switch to in any environment and doesn't compel you to use it. The fourth mode is 'green+', which is the same as 'green' but turns the climate controls off to drag out a few more valuable miles from the battery.

While being range conscious is important when it comes to driving further between charges, the Mini Electric scores highest when you're not giving a care in the world about how far you're going to get.

The interior sits four in comfy leather seats, and features two glorious sunroofs to let the sunlight illuminate the car

You'll get from 0-62mph in 7.3 seconds which isn't any better than the petrol Minis before, but a convincing press of the accelerator will get you up to 30mph in what feels like an instant. The Mini genes are even more present when you throw the car into a sharp corner – the car feels stuck to the ground as you go round longer corners too. Even without a gearstick, you still get a thoroughly enjoyable drive.

One downside of the Mini's suspension is how stiff it feels on uneven roads. Though at low speeds, such as driving over speedbumps, the ride remains comfortable, when taking a country road at 60mph, you'll feel every bump below the wheels in quite an aggressive way. If you're looking for a nice comfortable cruise, you almost certainly won't get it from the Mini at higher speeds.

However, the biggest shock driving the Mini Electric comes when you take your foot from the accelerator for the first time to brake. Thanks to regenerative braking technology shared with BMW's electric cars, the energy regeneration effect when lifting is strong enough to slow down the car as if the driver is pressing the brake pedal themself.

This effect doesn't vary much between the 'green' and 'mid' modes but becomes more aggressive in sport – just enough to slow you down if you're coming up to a bend at 60mph. A certain finesse is missing, if you lift off the pedal too quickly the brake regeneration kicks in sharply. It feels like you're being jabbed in the back each time you lift.

The legroom in the back two seats leaves much to be desired, fitting four adults in the car will prove to be very difficult

The back of the car sports union flag brake light units, and opens up to reveal a boot with a surprising amount of space

A toggle on the dashboard will allow you to let the car coast instead, which frustratingly resets every time you turn the car on. But don't let the initial discomfort put you off of the regenerative braking, an hour or two is all the driving time needed to learn how to caress the accelerator pedal properly. Once mastered, the Mini Electric will get from 0-70mph and back to a stop again effortlessly, without any use of the brake pedal.

On top of a fairly easy driving experience, the Mini's cabin is clean and high quality. The leather seats are comfortable, offer good support to your back and sides, and are just the right size to stop you from moving from side to side in the seats while taking tighter corners.

The narrow rectangular touchscreen display does seem somewhat shoehorned into the obnoxious circular frame that protrudes from the dashboard, wasting some of the space above the screen in the process. However, the space below is used efficiently – climate controls, including heated seats, and toggle switches for some vehicle settings are arranged neatly below. Each with space around it, allowing the driver to easily navigate the lower dashboard by touch while keeping their eyes focused on the road.

Every time you start the Mini Electric, a heads-up display rises from inside the dashboard to appear just above the steering wheel. Your current speed, the speed limit and directions if you've programmed the sat-nav are all projected onto the small display in a clear way. Importantly, the angle that the projection is pointed is adjustable through a range that is wide enough to cover drivers of all heights.

Behind the steering wheel sits an oval 5.5-inch digital display in the place of the instrument panels. It shows remaining range in miles and a bar displaying remaining charge, useful details like the time and temperature, as well as the electric equivalent of a rev meter – a bar spanning through 'charging', 'ready' and 'e-power' to show how inefficient you're being with the go pedal.

In what Mini would likely argue to be a design choice, but would more accurately be described as an oversight, the driver's display is uncovered from all sides. With the vast amount of light that the car lets in from its well-sized windows and brilliant pair of sunroofs, the display is left prone to suffering from sun-glare, often making it hard to read.

However, the addition of two sunroofs, one for each row of seats, is brilliant. The inside of the cabin is always naturally lit very well, which almost makes the Mini Electric's interior feel twice as spacious once all of the light has got into the car.

The car makes use of electric yellow details to add a splash of colour to the car and provide more customisation options

High quality materials finish off a luxury and particularly functional interior

"A convincing press of the accelerator will get you up to 30mph in what feels like an instant"

Unfortunately, the Mini needs all of the extra cabin space it can get. The driver and the passenger in the front row will likely find their elbows bumping. Tall drivers' heads may rub on the ceiling and even end up hurting after too many speedbumps. The worst offender is the back seats, which have even less space than the petrol Minis with the batteries being stored underneath the cabin.

The boot space matches that of the three-door petrol Mini hatchback at 211L. Plenty enough space for daily drives, but taking longer journeys or more people might require some considered packing to fit everything you need – there's certainly no left-over space inside the car to keep bags at your feet, and there are no compartments in the interior with any meaningful storage space for belongings.

Overall, as a short distance runner the Mini Electric is a perfectly viable choice. It's enjoyable and characteristic driving feel, quick charging time, and wide range of customisation options across three trim levels make the car an extremely competitive choice within the electric hatchback market.

If you're looking for an electric car to take you much further than your commute or a short trip, it becomes difficult to argue in favour of the Mini over the likes of Vauxhall's Corsa-e, which offers much more space and range for less money.

While the Corsa-e begins to blur the line between electric and petrol cars in terms of their range and practicality, the Mini Electric sits firmly as a high-performance small electric car – held back by some of the restrictions that electric power brings, like range. If a shorter range doesn't bother you, then by all means the Mini Electric is a wonderful electric car and a joy to drive.

The car shares Mini's regular styling

MAZDA MX-30
107kW Sport Lux

Words by Joe Pepper

Mazda's first all-electric car is bigger than you might expect. Is it an effective compact crossover or does range let it down?

Mazda's new all-electric MX-30 crossover skips the supermini step that many manufacturers take when venturing into electric cars, and jumps straight into a very competitive crossover market.

Starting at £26,045 including the £2,500 plug-in car grant and a free home charger, the MX-30's official range is just 124 miles. A conscious decision by Mazda, who say that small 35.5kWh batteries have a better CO2 footprint over their lifetime, and that their target market doesn't need more than 124 miles.

Within the short range, the MX-30 is an enjoyable drive. The handling is well tuned and feels reasonably sporty for a 1720kg crossover.

The acceleration is good enough for an electric car but lacks the initial acceleration burst of smaller electric cars, officially reaching 62mph from a standstill in 9.7 seconds.

For a compact crossover the seating position feels quite high, but the seats are very comfortable – seating position, including lumbar support, is electrically adjustable which makes it hard to go wrong.

The sat-nav and infotainment is controlled by a dial on the centre console and is displayed clearly on an 8.8-inch screen at the top of the dash. The systems are simple and provide ample information to the driver, including the remaining battery range both with and without climate controls running.

The climate controls are placed on a dedicated 7-inch touchscreen. While the trend of digital climate control displays is needless, Mazda's solution is elegant and makes the temperature and air conditioning easy to adjust – but you still have to look away from the road, annoyingly.

The car makes use of regenerative braking across five different settings that can be selected using two wheel-mounted paddles. The highest setting is nearly enough to bring the car to a stop without pressing the brake. The lowest setting will just coast, regenerating very little energy.

The car is better suited for urban settings, as it stops and starts very smoothly. Sizeable mirrors and wide front windows give good visibility all around the car while you navigate city streets. City driving can stretch the range closer to 150 miles.

What Mazda have taken away in range, they've made up for with style. A sleek exterior design is partnered with a stylish and luxury interior, with plenty of Japanese inspired Mazda charm – the steering wheel is near-identical to what you'd find in Mazda's MX-5 roadster, and some interior elements are finished with real cork, referencing Mazda's heritage as a cork manufacture 100 years ago. For a £26,000 car, the MX-30's cabin and upholstery feel suitably high quality.

Climbing into the cabin can be a challenge for passengers as the back doors are rear-hinged and cannot be opened without the partnering front door being open. There isn't a lot of leg room, and the rear head room is meagre for adult passengers.

As for storage, the boot isn't deep, but is spacious in length and width, and would be apt space for packing for a family holiday at 366L. Fold down the back-row seats, which go completely flat, and all of a sudden you have a tremendous amount of storage space in the car.

But once again the issue returns to range. While the MX-30 has the perfect storage and seating space for a family to go on holiday, once you've loaded up the car with bags and people and hit the motorway, you might be lucky to get 80 miles before having to stop to charge.

While the MX-30 is perfect for commuting and short trips, the range seriously restricts your options for journeys. For £26,000, there are very few other options for electric crossovers, and in that aspect the MX-30 does a stellar job.

But with a range shorter than both the Corsa-e (that has similar space), and the MINI Electric (which is much more fun), it can't convincingly be said that the MX-30 is a brilliant choice – but if Mazda decide to add the option of a larger battery, make sure to come and check back then.

The MX-30 sports a sleek, aerodynamic body shape to maximise efficiency

"A stylish and luxury interior, with plenty of Japanese inspired Mazda charm"

Real cork finishes some components inside of the stylish interior, with the back row accessible by rear hinged doors

A well finished, luxury interior space

VW GOLF
GTE Plug-In Hybrid

Words by Joe Pepper
Photos by Oliver McConnell

Does electric power hold the Volkswagen back, or does it truly let the Golf shine?

Press the Volkswagen badge above the front bumper and you'll reveal that this £33,400 Golf GTE can be charged by its nose. While the car doesn't support three-phase rapid charging, its 8.7kWh battery is plenty enough to let you take the Golf 25 miles on a charge.

With an electric only range like that, you can completely ignore the base 1.4L engine during the daily commute. That's not a bad thing either, as running without the electric power is slightly underwhelming – while you could still get 55mpg on a motorway, the engine feels somewhat unrefined and like it struggles to rev properly without help from the 77kW electric motor. Running on battery power most of the time comes with the added perk of finding yourself dailying the car for two months before finding yourself needing to refill the fuel tank.

The Golf GTE starts to come into its own when you put the two together. The 'GTE' mode, that's the sporty mode, uses both the full grunt of the engine and the added power from the electric motor to leave you with all the power that you could possibly ask for. Combine a convincing straight line speed with decent handling around corners – but not quite as sweet as the Golf GTI due to the GTEs added weight – and you get reasonable performance for the amount of money you're paying.

The GTE Advance comes with what VW call the 'Active Info Display' for the digital instrument panel. All of the information you could possibly need is available with copious customisation of arrangement of the information on the driver's display – so much so that you can get lost in the system like a maze just trying to get things back to how you like them.

The interior is comfortable and is exactly what you would expect for a hatchback in this price bracket. High quality, functional and spacious. The boot space is just fine at 272L of space. Okay for regular use, but doesn't leave you with quite enough space if you're packing big boxes.

Near-unlimited information on screens

"You can ignore the base 1.4L engine during the daily commute"

Overall the Golf GTE is a very well executed plug-in hybrid with a reasonable price tag, if not a little steep in comparison to its combustion counterparts, just like any other fully-electric car. For all out performance for money, the Golf GTI remains the better choice with a lower price and weight, but for an all round daily runner with low fuel costs, the Golf GTE is brilliant.

FORD FIESTA
EcoBoost Hybrid

Words and photos by Joe Pepper

How does the hybrid system in the Ford live up to the all-electric powertrains?

Another one of the country's favourite cars has electricity coursing through its veins – the Ford Fiesta 1.0L EcoBoost Hybrid starts from £18,515, and offers an easy pathway into electric motoring.

Great performance and practicality make it clear why they have always been so popular, but the biggest win for this Fiesta is the phenomenal hybrid system fitted to the car. Ford have fine-tuned every aspect of the hybrid systems to be as useful, efficient and natural as possible.

On acceleration, electric power adds a nice burst of speed when you get into second gear – not as much as you get from all-electric cars. The car also feeds electric power into the acceleration when you need it most.

As you lift, the power regeneration through brake dragging is perfect. Down hills the car drags the brakes just the right amount to keep your speed constant while regenerating. On a flat road, you'll slow down at the perfect rate to seamlessly keep within a lowering speed limit.

The difference between driving modes is next to unnoticeable, even in 'eco' mode you can't drive just on electric power. The hybrid system helps bring the petrol usage down to around 50mpg, or even better. The car doesn't need to be plugged in and recovers battery power through braking and regular running.

The car has countless quality of life features – brilliant ergonomics in the cabin, including the gearstick for the six-speed manual gearbox. An 8-inch infotainment screen compatible with Apple CarPlay. Even the option for a wireless charge point for your phone.

The driver's display can be toggled through six displays with one switch but will always keep an analogue speedometer and rev meter visible. Pair this with tactile buttons for temperature controls and you're left with no distractions from the road. Although, if you're not planning on using CarPlay, the infotainment system on the dashboard is a bit outdated and basic. The cabin has deep and wide storage spaces to add to 292L of boot space, and rear seats have reasonable legroom for a hatchback to add to the all-round respectable practicality of the Fiesta.

An ergonomically great cabin space

"The biggest win for this Fiesta is the phenomenal hybrid system"

While there's very little in this 1.0L Fiesta hybrid that's lifechanging, it gets none of the basics wrong. For less than £20,000 you can get a great car with an even better hybrid system – it's a fantastic stepping stone into electric motoring.

Words and photos by **Joe Pepper**

CHARGING & RANGE

Charging is key to running an electric car, how do you do it and what does it cost?

You can plug your car into a wall socket at home, but this can take around 24 hours to charge an electric car with a large battery.

For a quicker charge, a wallbox charger can be hard-wired into a home's power supply and wall-mounted outside in a location close to the car's parking space. Generally, the company that you buy the wallbox from will arrange for a home installation visit as part of the cost.

Different wallbox chargers are available for installation depending on your needs and budget, varying by power rating and charger connection type. Most common are 7kW fast chargers, costing around £300 to install, and charging most electric cars in around three to seven hours. Basic 3kW slow chargers can be installed for just over £100 but won't provide charging times much faster than a three-pin plug socket.

Higher power rated charging points can be installed at home, but 11kW, 22kW and upwards require a three-phase power supply, which is very rarely found in homes and is very expensive to upgrade a home with.

Across the UK, there are over 23,000 charging points at over 15,000 different locations in public, allowing for 40,857 electric cars to be charging at a single time, according to the Zap-Map database.

Most public chargers are fast chargers rated between 7kW and 22kW, and can charge cars to 80% in three to five hours – these are often found in supermarket car parks.

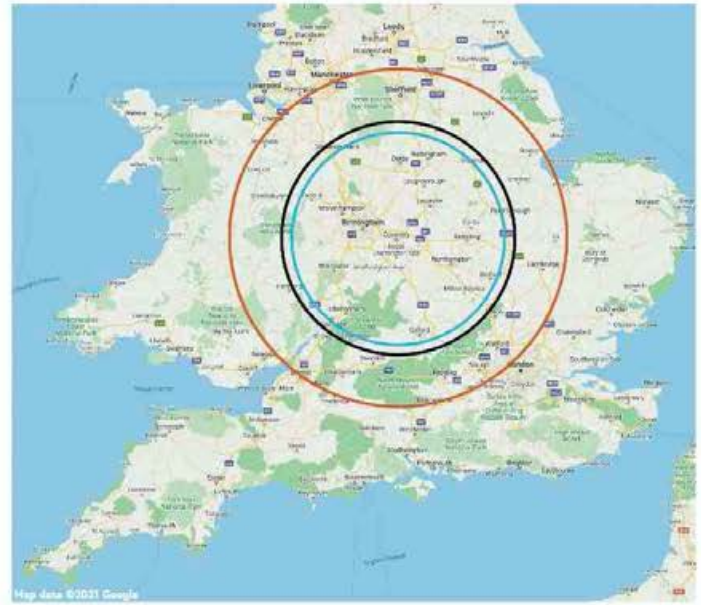
For faster charging, rapid chargers (rated at over 43kW) can often be found at motorway service stations, or petrol stations with chargers. These 43kW+ chargers can charge electric cars to 80% capacity in under an hour, as fast as 20 minutes for cars with smaller batteries.

Charging a car at a public charge point is not free of charge, but it is much cheaper than filling a petrol or diesel car. Pod Point rapid chargers fitted at Tesco stores in the UK cost 24p per kWh of charge. Charging the Corsa-e's 45kWh battery – the largest battery of the three tested in this magazine – would cost less than £9 for a full charge and take not much longer than half an hour.

Chargers lock in place when cars lock

SAVE MONEY WITH AN EV

A study by Nottingham Trent University and the University of Aberdeen found that over an average expected mileage of a car of 11,362km per year, fuelling a petrol car would cost £602. For the same distance, an electric car would need about 1552kWh – charging that much at home is estimated to cost £186. **Leaving electricity costing 69.1% less compared to petrol**, before any charging point installation costs.



How far you can get (and back) with the three Going Electric tested electric cars

There are often concerns about the range that electric cars are capable of, particularly in comparison to petrol or diesel cars. But there are plenty of ways that you can maximise the range of an electric car.

The efficiency of electric cars rapidly decreases once you've reached speeds of over 50mph – one of the key reasons that continuous motorway driving can lead to a significantly shorter battery range than driving in the city. Keeping to speed limits and minimising driving times on motorways can help minimise the range loss. If the majority of driving you do is on the motorway, electric cars may not yet be the right choice for you.

Many electric cars, such as the Corsa-e, feature an 'eco mode' that changes the way that the car drives to maximise the energy efficiency of the car. This sort of setting may increase the regenerative braking effect in the car and may slow the rate at which the car accelerates. Using these eco modes can improve an electric car's range drastically.

Help the car maximise the regenerative braking effect – if the driver stomps hard on the brakes, the car will have to use their regular friction brakes for safety, instead of being able to utilise the regenerative braking systems that are in place. Attempt to anticipate when you'll need to brake, brake early with less strength and for a longer time to allow the regenerative braking systems to recover energy to put back into the battery packs. Try it – it's a much more satisfying way of driving the electric cars.

Be considerate when using the air conditioning and heating systems, as they draw power from the same batteries that the car uses to drive.

According to a survey by the UK's Department for Transport, the average commute distance by car in the United Kingdom is 9.9 miles. With all three of the electric cars tested in Going Electric – as well as the electric-only range of the Golf GTE hybrid – most of the country would be able to make it to work and back on a single charge.

Corsa-e: Orange / 195mi
The Vauxhall's mighty range can get you out of the country – all the way from Coventry to Wales and back on a single charge.

Mini Electric: Black / 135mi
A return trip to Oxford from Coventry is easy, and you could get to London on one charge if you don't need to get back too.

Mazda MX-30: Blue / 120mi
You could make it anywhere in the midlands knowing that you have enough power to get home on a single charge in the Mazda.

This is a key reason why electric cars have shorter ranges in extreme temperatures, as they have to use more energy to adjust the the cabin to a comfortable temperature. Some cars, like the Mini Electric, tell you the remaining range of the car with temperature controls turned off.

Other smaller factors can help with maximising the range of your electric car too: make sure your tyres are well inflated – flatter tyres will waste energy and decrease the efficiency of the car. Make sure there is no heavy luggage in the car that isn't needed, as a heavier car will take more energy to drive – electric cars are already heavy enough, as the batteries weigh a lot. Aerodynamic efficiency is important to the range of an electric car – make sure there are no roof racks, boxes, or bars left attached to the roof of the car once they are no longer needed.

Words and photos by **Joe Pepper**

ELECTRIC CAR LAWS

Whether you're planning on going electric or not, these UK laws are important to know before you consider buying your next car

The UK Government provides a grant to car dealerships and manufacturers that allows car buyers to get a discount on the price of brand new low-emission vehicles.

The plug-in car grant covers 35% of the cost of the new cars, up to a maximum of £2,500. As there are no serious contenders for electric cars under £7,000, the plug-in car grant will almost always be the full amount. When buying electric cars new, the discount is automatic and car dealers will include the value of the grant in the car's price when buying the car.

To be eligible for the plug-in car grant, a car must produce less than 50g/km of CO_2 emissions, be able to travel 70 miles on a single charge using only the electric power of the car, and cost no more than £35,000 based on recommended retail price.

The plug-in car grant was first introduced in 2011, with the UK Government handing out £1.3 billion of funding ever since then to go towards 285,000 new electric cars.

The grant originally covered up to £5,000 towards low-emission cars costing up to £50,000 but has since been reduced to £2,500 on cars costing up to £35,000 – the Government say this is to better reflect the range of affordable electric cars on offer across the UK.

The Government also subsidises up to 75% of the cost of, or £350 towards the cost of installing a charger at home through the Electric Vehicle Homecharge Scheme (EVHS). This only includes small charge points at domestic addresses and must be installed by charge point installers authorised by the Government.

Petrol and Diesel Ban

From 2030, you will no longer be able to buy brand new petrol or diesel only cars. You will still be able to buy new hybrid cars, but only those that are capable of covering a yet to be defined 'significant distance' in zero-emission modes.

From 2035, all new cars and vans will have to be fully zero emission at the exhaust. The ban of combustion vehicles has been brought forward by five years from 2040, as experts have indicated that 2040 would be too late for the UK to achieve its target of emitting virtually zero carbon by the year 2050.

Since autumn 2020, electric cars have been eligible to have green number plates fitted to easily identify zero-emission vehicles. Once zero-emission cars can benefit from cheaper parking or free-entry into zero-emission zones, the plates will help identify a driver's eligibility.

Green zero-emission number plate

Image: American Public Power Association

Words by **Joe Pepper**

RENEWABLE ENERGY

How effective is the UK's renewable energy network, and how much of the country's energy is 'clean' according an an expert?

Aiming to be three-quarters of the way to net zero emissions by 2050, the use of renewable energy sources is key to the UK Government's sustainability plans, according to renewables expert and engineer, Ryan Gee.

"We're going in the right direction for carbon neutral production," Gee says. "With the current power needs and the country's growth, we won't see anything even close to carbon neutral by 2050 – unless we have a major push for renewable sources."

Gee says that it's "not impossible", but "highly improbable" for the UK to transition to using purely renewable energy over the next few decades.

"The UK has that high of an energy demand that we have to buy energy from other countries – namely Germany, who is powering our grid during peak energy usage."

The renewable engineer explains that installation of renewable sources isn't easy, and that the two main factors are cost and efficiency. "Take solar panels, for example. Depending on the materials used, you're looking at between 15-22% of energy that is generated being usable," Gee says. "At the higher end, you can get up to 42% efficiency, but those solar panels start becoming extremely expensive."

Space becomes a big issue with wind power, Gee explains. "Wind turbines are huge – you need almost a square mile to house a decent wind farm. We just don't have the space to dedicate to industrial wind farms."

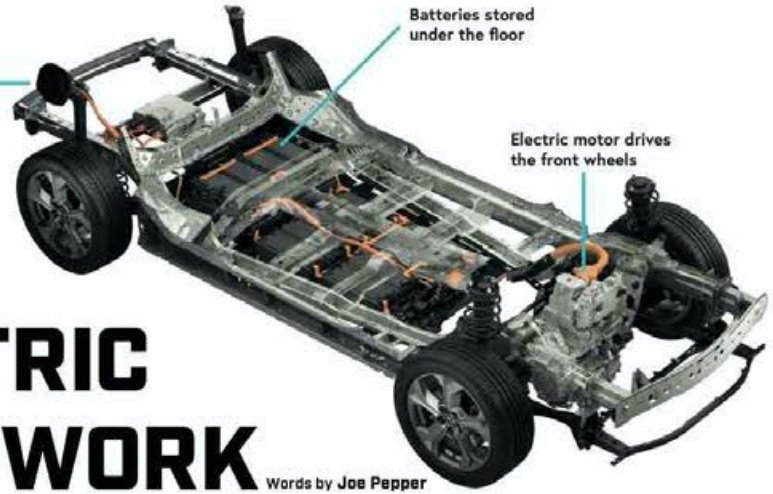
Gee indicates that without further major investment, the Government are doing "as much as they feasibly can do", and that the incentives for electric cars and renewables on a domestic scale are very good.

"When used correctly, a domestic solar array can circumvent 80% of a household's energy requirements," says Gee. "On an average three or four person house, you'd likely be getting a 4kW system. These cost about £5000, but will save you about £1000 on electricity over a year. Most households don't use all of the electricity that is generated, and you can sell the rest of that back to the grid for between 3p and 5.5p per kWh, depending on energy provider."

On average, domestic solar arrays will pay for themselves in about nine to ten years' time, Gee says.

"For now though, to continue advancing towards carbon neutrality, the UK's aim needs to be improving the efficiency and cost of renewable sources on an industrial scale."

"Used correctly, a domestic solar array can circumvent 80% of a houshold's energy needs"



HOW ELECTRIC CARS WORK

Words by **Joe Pepper**

For the curious: a simple explanation about what happens while you're driving

While traditional internal combustion engine cars run using either petrol or diesel, electric cars make use of batteries to power the motors with electricity.

The electric motor drives the car's wheels, acting as an electric engine. The motor is fed with electrical energy and converts it into mechanical energy, which can then be fed to the wheels. Most electric car transmissions are single ratio, which means there is only one gear.

Electric cars have an electric control unit – a key component that decides how much power to send from the batteries to the electric motor. If electricity was sent to the motors in a simple on/off manner, driving the car would be impossible.

The electric control unit drip feeds power to the electric motor thousands of times every second, depending on the position of the accelerator, to emulate the smoother feeling of driving a normal car. While electric cars are manufactured to feel smooth in acceleration, they generally accelerate quickly in comparison to traditional combustion engine cars because the torque, or rotational power that drives the wheels, is available instantly after putting your foot down.

The torque for petrol and diesel cars is applied by pulling a mixture of fuel and air into the engine and exploding it. This means that the speed that the torque is available is limited by how fast the air can be pulled in as the engine is working. This is not a limiting factor for electric cars as all the energy used for the motors is stored onboard the cars in the form of electrically charged battery packs – the reason why electric cars are known for their fast acceleration in comparison to most petrol and diesel cars.

The batteries in most electric cars are lithium ion batteries – just like the ones in your mobile phone, but bigger. Plugging in electric cars by their on-board chargers sends electric energy to the batteries to be stored for later use by the car.

What is regenerative braking?

Electric cars can recover some of the energy that is normally lost in braking through heat and friction, and feed it back into the main battery of the car in order to increase its range. This works as the electric motors in electric cars can rotate both ways. One direction drives the wheels and moves the car, and the other direction recharges the battery.

When you lift your foot off the accelerator pedal and onto the brake, the motor swaps directions and starts to put energy back into the battery. This gives the sensation of the car slowing down as soon as you lift off the accelerator – it will feel like the brakes are dragging a little bit.

Most electric cars can let you customise how pronounced this effect is, and in some more extreme cases, you can effectively drive the car with just one pedal – the regenerative braking effect can be strong enough to bring the car completely to a stop, while regenerating energy for the battery packs to be used later.

The Corsa-e's braking display

GOING ELECTRIC EDITOR'S COLUMN

Words and photos by **Joe Pepper**

Electric cars are rapidly improving in practicality and range, but how much fun can electric cars actually be?

Discussions about electric cars almost always gravitate back to one of two topics. It's either "they don't have very good range" or "they sound a bit rubbish", but that misses out one of the most important things to me. *Are they fun to drive?*

Having driven a range of electric cars for this issue of Going Electric, I can tell you that the answer to that question is, as you may well expect, "it depends".

Enjoyment is entirely subjective, but one of the biggest thrills of driving a car often comes from operating a satisfying gearbox and feeling the gears engage as you thrust the gearstick from side to side. With electric cars you get none of that, meaning that they need to make up the enjoyment elsewhere.

Some cars don't fill that void quite as much as you would like, leaving them a little less engaging to drive – such as the Corsa-e, which is a breeze to drive but lacks character. Some, like the Mini Electric, have the sporty handling and nimble feeling to bring back the sense that it is your inputs that are driving the car.

Fortunately, one thing that all electric cars have on their side is the quicker access to torque, which is what makes the cars feel fast on acceleration. Combine that feeling with the great handling of a car like the Mini, and yes, you absolutely can have fun in an electric car. But it's still just not quite the same.

There's something else missing – the senses. The things that make you feel a little giddy and like a child again. The vibrations through the gearstick and steering wheel that make you feel connected to the road – the lack of a gearstick and intense power steering take those away. The lack of an engine grumble takes some sensory feedback away too.

These senses are the difference between playing with a car's party tricks for a quick laugh, such as accelerating to 40mph in an electric car faster than you can snap your fingers – which does get old after doing it nine or ten times – and driving a car being an utterly fantastic and rewarding experience.

Mazda refer to it as "Jinba Ittai", or the sense of oneness between the driver and the car. It's something that the Japanese company pride themselves on and use as one of their key design principles. See the thing is, they've absolutely nailed what it means to design a car to just be good fun with their MX-5 roadster. Unbeatable in that regard.

I've not yet found an electric car that quite has that "Jinba Ittai" feeling – but I've certainly been given hope that it will be done not too far in the future.

"There's something else missing – the senses. The things that make you feel a little bit like a child again"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