

Wired for the Road

Living with an Electric Motorcycle

Sara Sloman

January 2026



The Royal Automobile Club Foundation for Motoring Ltd is a transport policy and research organisation which explores the economic, mobility, safety and environmental issues relating to roads and their users.

The Foundation publishes independent and authoritative research with which it promotes informed debate and advocates policy in the interest of the responsible motorist.

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About the author

Sara Sloman is dedicated to revolutionising the electric vehicle (EV) experience and advancing sustainable mobility. Sara is Chief Strategy Officer at Paythru, the EV payments company, with 20 years' experience in the sustainable transport sector, having led both public and private transport infrastructure projects. Sara is also a presenter and podcaster, sharing insights on EV adoption and sustainable transport through platforms including The EV Cafe and The EV Rally with the aim of engaging with a wide audience and fostering conversations around the future of mobility. Sara regularly features on the GREENFLEET "GF100 Most Influential" list (rising to #6 in 2025), and in 2023 was awarded Cox Automotive Woman of the Year Award.

With her partner, Sam Clarke, Sara achieved the 2025 Guinness World Record for the longest electric motorcycle journey on a single charge of 193 miles on a Verge TS Pro.



Disclaimer

In the description of life with an electric motorcycle in this document written for the RAC Foundation by Sara Sloman any errors are the author's responsibility.

Foreword

The genesis of this report was in addressing and possibly dispelling some of the issues and challenges that come with electric motorcycling by getting an account ‘from the saddle’. Sara Sloman has done just that in her account of life with various electric models. But behind this sits the question for policy-makers, namely what should they be doing in respect of motorcycling in pursuit of the overarching ambition to tackle, and cut, carbon emissions. How quickly can motorcycling realistically be weaned off its fossil-fuelled past and how important is doing so as part of the wider decarbonisation strategy?

When it comes to the decarbonisation of transport it is no surprise that the UK government has had a particular focus on road transport. Surface transport is the highest emitting sector (since it overtook electricity supply around 2015), and also the sector that has seen least reduction since 1990 - only 13% (other than aviation which is still growing), accounting for some 89% of the 111.8 Mt of carbon emitted by the domestic transport sector. Emissions from cars and vans, account for 78.5% of domestic road transport emissions.

Not only do cars account for a substantial proportion of tailpipe emissions, there is also a reasonably clear policy pathway for achieving carbon reductions through the promotion of battery-electric propulsion as the alternative to fossil-fuelled internal combustion engines. Hence initiatives such as the Zero Emission Vehicle mandate¹, and a cut-off date after which no new fossil-fuelled cars can be brought to market.

Other parts of the road transport sector are, for various reasons, some way behind cars on the way to a zero-tailpipe-emission future – whilst battery-electric technology has been developed to some extent for heavier vehicles (buses, coaches and lorries) it is as yet unclear whether the solution ultimately will include hydrogen or synthetic fuels for the heaviest vehicles routinely covering long distances.

At the other end of the scale are motorcycles – the term used in this report to cover powered-two-wheel vehicles subject to the rules requiring registration and licence holding for riders (i.e., excluding electric bicycles). Battery electric models have thus far been coming to the UK in small numbers (with a shade under 14,000 licensed in the UK as of 2025), mostly as options for the relatively low-powered segment of the motorcycling market as step-through mopeds and scooters (I first rode a battery-electric ‘scooter’ model at the Environmentally Friendly Vehicles conference in 2005 and thought it had the potential to be a useful urban run-around if the cost could be brought down).

How much should this be a concern for the policy-makers wrestling keen to force the pace of carbon reduction?

The analysis in this report reveals, firstly, that since motorcycling accounts for only a tiny fraction of overall domestic carbon emissions attention might be better targeted elsewhere. Second, though the manufacturers, working in a global marketplace, are some way from abandoning petrol-power, the developing market (specifically in China) suggests that more zero tailpipe models look set to

¹ <https://www.gov.uk/government/consultations/phasing-out-sales-of-new-petrol-and-diesel-cars-from-2030-and-supporting-the-zev-transition/outcome/phasing-out-sales-of-new-petrol-and-diesel-cars-from-2030-and-supporting-the-zev-transition-summary-of-responses-and-joint-government-response>

come to the UK market in future, particularly for the 'utility' segment of the market where cost and convenience are the key considerations for purchasers – a segment that accounts for a significant proportion of UK motorcycling.

At the other end of the motorcycling market it may yet be the case that the development of options for the heaviest, long-haul vehicles might lead to creation of synthetic, sustainable fuels that offer viable alternatives for higher-powered motorcycles, where minimising vehicle weight and providing an extended range matter more. Though even here, as Sara relates, there are electric models coming through that might increasingly appeal to motorcycling enthusiasts.

While the picture warrants being kept under review, the overall message that emerges is that there's no need for policymakers to panic. Meantime motorcyclists willing to give electric bikes a try might just be pleasantly surprised – I was.



Steve Gooding

Steve Gooding
Director, RAC Foundation

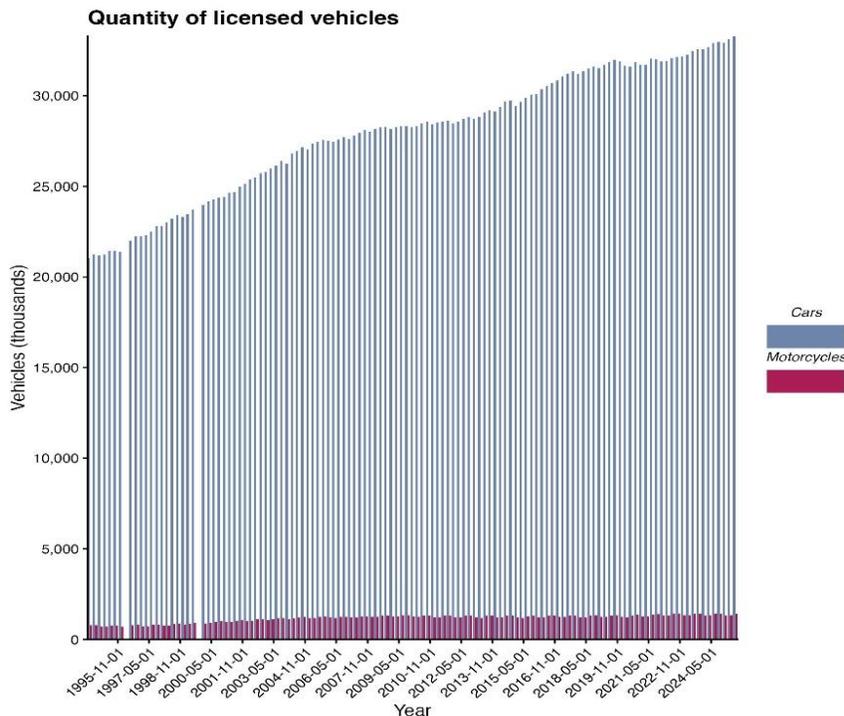
Motorcycling in the UK

Department for Transport statistics show that motorcycles only account for c. 3.3% of licensed road vehicles in Great Britain, compared to c.82% for cars².

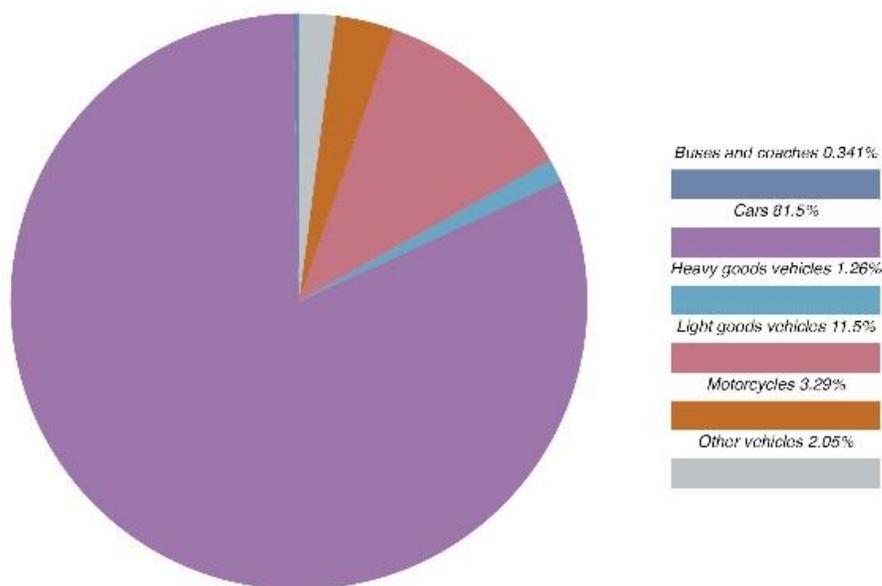
The number of licensed cars has been increasing significantly over the last 30 years (up by 11.8 million from the 21.5 million licensed in 1995).

Over the same period while the total number of licensed motorcycles has nearly

doubled, in numbers the increase of c.0.7 million only takes the total to 1.4 million, with most of the increase having been in the decade to 2005.

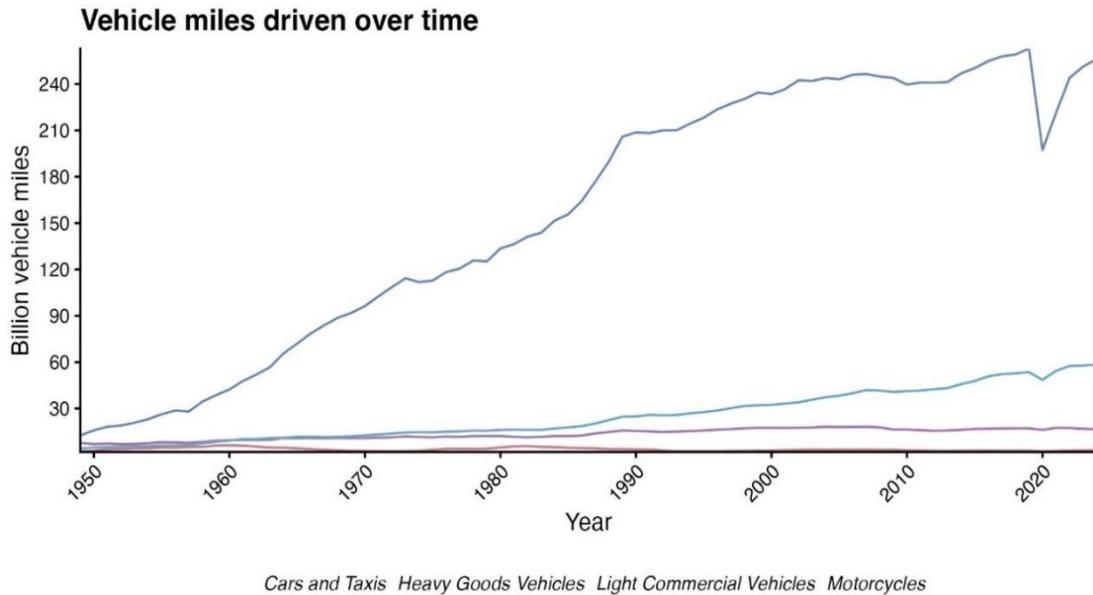


Licensed vehicles by vehicle type
2024

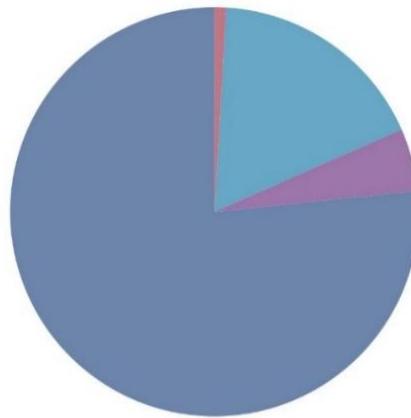


² VEH0101 table from the Department for Transport vehicle statistics <https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-tables>

Of course, what matters for carbon emissions is not just the number of vehicles but the number of miles driven/ridden which in turn drives the volume of emissions. Looking at vehicle miles a similar picture emerges, with motorcycles accounting for less than 1% of driven miles (3 billion in Great Britain in 2024, up from 2.3 billion in 1995³), and barely exceeding 1% of motor vehicles miles in any year since the 1990s.



Miles driven by vehicle type 2024



Cars and Taxis 76.6% Heavy Goods Vehicles 4.97% Light Commercial Vehicles 17.5% Motorcycles 0.898%

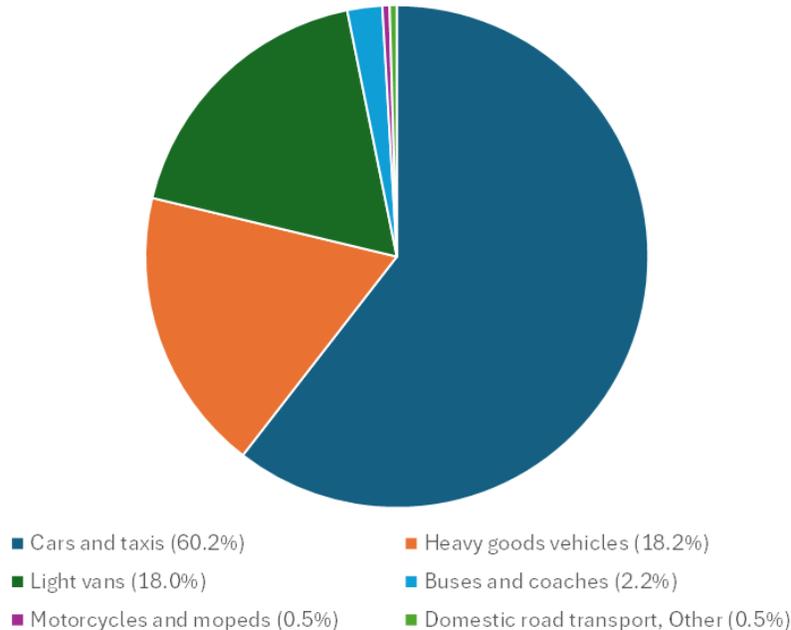
Source: Department for Transport vehicle statistics
<https://www.gov.uk/government/statistical-data-sets/vehicle-licensing-statistics-data-tables>

³ Source: Department for Transport road traffic statistics <https://www.gov.uk/government/collections/road-traffic-statistics>

Motorcycling carbon emissions

Motorcycle miles account for an extremely small proportion of domestic road transport emissions as the chart below shows⁴.

Transport Statistics GB: Million tonnes of greenhouse gas (CO₂ equivalent) ENV0201a
Motorised 2-wheelers= About 0.5% of road transport emissions



The motorcycle market

There are many ways the UK motorcycling market can be subdivided, but for the purposes of considering carbon emissions the simplest would be to distinguish between mopeds and scooters (smaller, less powerful, usually of ‘step-through’ design, ‘utility’ vehicles) and motorcycles (generally higher powered, larger vehicles) – see examples overleaf.

The distinction is relevant both because mopeds and scooters already offer good fuel economy, typically approaching 100 mpg or more, and because this segment is also potentially easier to transition to electric propulsion, with riders in search of cheap convenient transport, generally making shorter trips and more likely to be able to park off-road in front-gardens or side alleys inaccessible to cars but thus allowing for home charging.

Insofar as mopeds and scooters offer far better fuel economy than most cars there are carbon and road congestion reasons for encouraging their use, but these have to be viewed against other

⁴ Data from ENV0201a: Greenhouse gas emissions (million tonnes of carbon dioxide equivalent) by transport mode, by source: United Kingdom, 1990 to 2023 (Last updated: 24 April 2025)
<https://assets.publishing.service.gov.uk/media/68010bc20b24153af1e7c723/env0201.ods>

alternatives (such as road legal electrically boosted bicycles) and in the context of road safety, with motorcycling accounting for a disproportionate number of casualties.

Although the numbers are small data from the MCIA indicates that scooters and mopeds account for around 17% of all motorcycles, of which just over 4% are electric, compared to around 1% for the parc total.



Data from the MCIA suggests that while sales in the Asia Pacific region equate to a total market of c. 15 million motorcycles (of all types) per annum UK sales account for around 100k (less than 0.006% of global sales). This is important because it suggests the Asia Pacific markets will have a significant impact on the development of future generations of motorcycle, particularly for those less powerful (cheaper) step-through style vehicles that lend themselves to alternative propulsion. Developments in Asia and in Africa suggest that ‘battery swap’ options – where the rider can simply swap their depleted battery for a fully charged one at a ‘swap-station’ - might also have a role to play (since the size and weight of battery needed for a relatively low-powered, low range motorcycle is manageable for the average rider).

In short the future shape of the UK motorcycle parc in terms of vehicle design and powertrain is very far from clear. How far electric motorcycling will penetrate the market will depend hugely on factors such as cost and convenience, and that looks set to improve on both fronts as battery technology itself develops.

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Wired for the road – the experience

Living with an electric motorcycle



There's a new game I like to play - spot the electric motorcycle.

They are here on our roads, whirring motors alongside the beloved petrol engines of 'traditional' bikes. Just usually featuring with a rider without ear plugs, and a cheeky acceleration at the lights.

I am a cruisy rider, I have zero ambition for the race track, but I am committed to riding in all weathers, through traffic, along coastal roads (and up Welsh hills!). My passion for electric bikes stems from the ability to reduce congestion while still feeling inspired by the ride and where the road takes me. There's a joy for me in the silence, I love the instant torque, the heads turning when I pass.

But electric motorcycling is not without its moments...

A couple of winters ago I joined my petrol riding friends for a 100+ mile ride through the Cotswolds. It was freezing, I was the least experienced rider and the roads were very muddy from the farmers getting their animals ready for winter. I was excited - I was loving the curiosity, the questions and the comparisons we all made. The conversation wasn't without its scepticism, but I wanted to prove that my electric bike wasn't just for the shorter city jaunts or a buzzy little kids bike - it is massive, heavy and just as powerful as theirs.

We went to The Oily Rag near Gloucester, via the Cotswold Gateway Centre. The best bit? My friends all needed to stop for petrol, and I did not. THANKFULLY! Because back in 2022 my bike only had AC charging - I couldn't have asked them to wait a full three

hours for me to recharge. I've bought an inordinate amount of coffees in Monmouth during my time recharging, on my way to Wales, often hanging around at the Dragon Network AC chargers.

That said, those days are gone already, with AC bikes that charge as fast as 12kW or more, and more DC capable bikes coming to showrooms making me feel like they are the ones to watch.



I am about to buy my third full-licence electric motorcycle. Over the years I have ridden the Zero DSR, Zero SR, Maeving RM1, Maeving RM2, Livewire One, Livewire S2 and the Livewire del Mar, the astounding Verge TS Pro, as well as petrol bikes like the Bonneville 1200, and a handful of smaller Hondas, Kawasakis and Suzukis. I was the classic 'moped teenager', and ran my 50cc into the ground. I remember my eyelashes freezing in the winter fog and the tiny engine spluttering on the dark Wiltshire lanes.

You might not know me, yet. I've been in the EV industry a long time and I am proud of the awards I have obtained for my services to the EV charging infrastructure development and how I put the driver (rider!) first. I am also a proud co-Director of The EV Cafe, host of The EV Rally and Chief Strategy Officer at EV charging payments company, Paythru.



I am not exactly a wallflower on social media – EVs are my career and my passion. Needless to say I spend all day every day talking about EV. Interestingly, I end up having much the same conversation with petrol car drivers as with petrol bike riders. Both want to talk about range, charging speed, cost per mile. And the sound. They worry about depreciation, and what happens if it all goes wrong.

Firstly, I assure them that just like any vehicle if it goes wrong, you call your breakdown team. Sounds obvious, but you're not isolated any more than you would be on petrol or diesel. And like all your vehicles, you need a dealer and workshop you trust. I adore Two70 in Swindon - Matthew Drew and his network host social rides, have a fab workshop and it is

a pleasure to go there for a tune up. I recommend wearing blinkers though, there are far too many tempting bikes in there!



Don't just take my word for it. The manufacturers are proud to put their bikes through their paces. My partner, Sam Clarke, and I achieved the 2025 Guinness World Record for the longest journey on a single charge, right here in the UK. We used normal roads, obeyed all speed limits and chose a nippy March day for the challenge. The Verge TS Pro felt so stable for me, it so suited to my riding style - lovely low centre of gravity and the 'Tron' style rear wheel is undeniably eye-catching.



I was never in doubt that it would make it and, sure enough, we achieved over 190 miles (which didn't surprise the Verge engineers). Our ride sent social media thunderclaps around the globe and back to my inbox.

Engineers know that motorcyclists talk about balance, weight distribution, torque, control, sound and feel, so the extra matters for EVs are range and recharge speed. Electric bikes change all those dynamics in ways that take some getting used to though - and that is one of the reasons I actually prefer electric. No clutch, no gears to think about at lights. For me it becomes more about the focus, the position, the road and less worrying (panicking) about my right foot and my left hand.

Going back to that winter group ride, I experienced a mathematical epiphany.

Anyone who knows about EVs knows they are a total cost of ownership game. Tot up the ticket price, the running costs, and the resale/residual value before you judge. On that winter ride I chatted with other riders on our headsets as we rode about the cost per mile we were running up. I was somewhere between 1p and 2p, charging on the 3-pin plug supplied with the bike before I came out.

The 100 miles cost me around £1.50 but more like £12 for the others in petrol. They argued that their bikes were a fraction of the price to buy and they can repair and maintain themselves. I pointed out my resale value was high, and there is virtually no maintenance... no oil, no clutch, no filters, less brake wear and depending on what drivetrain your bike has less messing about with chain lubrication too.

My experience is that electric bikes are cheaper to maintain and much easier to live with. Plus I've sold both my previous bikes for a fab price.

On that note of planning for costs: insurance. In general I'd say that insurance firms in the EV space are catching up. But some companies are still nervous and some simply won't engage.

When I first started riding, I nearly fell off my chair at the price of motorcycle insurance. In fairness, as far as insurance triggers go I think I set off all the red flag alarms. I was a recently divorced, nearly 40-year-old woman living alone with no off-street parking and a very powerful £16,000 electric bike that was brand new to the market. It was not surprising to find my first-year premium was almost £2,000, and I had to arrange it through a bespoke insurer. Even finding an insurer who would help was touch and go back in 2022. Thanks Lexham!

By my third year, the premium had fallen to £417, which is less than half what I pay for my car and is now the sort of price on offer from mainstream insurers. This matches my experience with EV cars too, where the insurance premiums that used to be eye-watering have been getting better for me lately.

But for all the cold logic of cost-per-mile calculations hands down - without a doubt - it's the noise, smell and feel of a petrol bike that remain the bigger talking points. The passion piece. We have die-hard petrol fans in motorcycling as well as the automotive world and I am not here to say we should give up on one and opt for the other - in an ideal world I would have lots of bikes! N+1 and all that. But I do want to log an important aspect on

the debate of petrol vs electric - the convenience of refuelling and the charging speeds.



Most electric motorcycles I've studied use AC charging through a Type 2 connector at speeds somewhere between 3 and 7 kilowatts (even less on a 3-pin plug). Some like the gorgeous (did I mention GORGEOUS) Maeving are designed so you take the battery out to charge, or, better still, swap for one you've already charged. This is fine for home or workplace charging (the Maeving concept would see the battery being plugged in next to your desk at work, back up to 100% for your trip home) but I am impatient and on a long ride I tend to stop every 90mins or so to get the blood back into my feet and hands, which means I want to top up quickly - in fifteen minutes - and go. Currently that's not on the cards.



Bikes don't get special treatment at Motorway Service Areas

I also love a big bike. Something about them just excites me. Big bikes eat big miles and that generally means motorway riding and motorway service areas for recharging. I don't shy away from the motorway and the performance of the Zero in terms of energy consumption was barely affected when I used it to go to Marlborough on a frosty January day - taking the M5 then the M4 it performed in a consistently impressive way offering a 160 mile range (though I confess riding at 60-65mph is a sweet spot for me). My experience is somewhat different to that of my very experienced and, frankly, throttle-heavy friend - a well over six-foot, ex-military, lifelong biker whose motorway riding style meant his range was affected much more, meaning he would have had to use the MSA rapid chargers at the next opportunity.

Bikes don't get special treatment at Motorway Service Areas. Riders are encouraged to use the EV bays the same as a Van or a Car and, of course, pay the same (my maths still tells me I'm achieving 1.5 - 2p per mile, even on motorway miles). But it's not the price so much as the rate of charge that's at issue here. A DC charger, even with 350kW capabilities, would still only 'give' an electric bike 15-20kWs, because the bike itself and its ability to accept charge is the limiting factor. Three phase AC (as on the 22kW chargers) offers a better experience for AC bikes, but this is currently found in pubs, car parks and hotels, not motorway services.

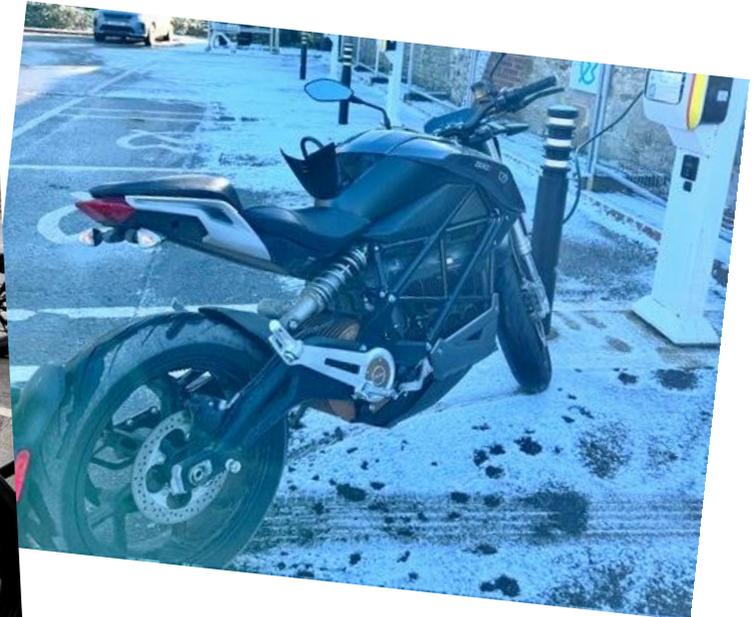
Mind you, I recharged a Livewire One I'd been riding and was well on my way in less than 30 minutes at a motorway charger recently – not far off the time it takes for a comfort break when you're togged up in winter biking gear.



Some models, such as the Verge TS Pro, Livewire and Energica offer DC fast charging, which can restore 80 per cent of a battery in around twenty minutes to half-an-hour.

Once this rate and model of recharging becomes more common it will transform what is possible for my dreamy touring ambitions. Campsites haven't generally started offering AC charging much yet, nor have hotels, but Airbnbs are getting wise, and often community centres have AC charging too. As I am often riding solo, I do feel I need to have a careful think about the AC charging available at the destination. DC would take that away for me.

Meantime while as an EV car driver I welcome the rapid growth we are seeing in the number of public chargepoints (not without their challenges – see my LinkedIn posts) I'd say that there's work to be done on the viability and convenience of EV charging for motorcycles that the government needs to have in mind if and when it decides to draw



down the curtain on petrol engines altogether, as it is doing for cars

The motorcycle media isn't exactly overloaded with promising pieces about electric motorbikes, but we are proud to say the Verge Guinness World Record got global coverage both in digital and in print. The bike shows in 2026 are set to reveal tons of exciting, improved models coming to market soon. It feels like every day I get sent information about the next major release expected for the UK market and the top hitter keeps being the Honda WN7 "a full-sized electric motorcycle supporting DC fast charging via a CCS2 socket, capable of restoring 20–80 per cent charge in around 30 minutes". That's more like it!

I can't help thinking personal styling and taste will continue to be a major factor for us motorcyclists. Bikes are so emotive - we love them. We have to! They are our trusted steed, our mental health buddy, our open road ticket to freedom.



Triumph TE-1 prototype on display at Cenex 2025

The electric bikes you see today may not be to your taste, but it is a sign to me of the way things are moving that the mainstream brands are all joining in, and competition will bring choice. There's already quite a selection of smaller bikes to be had, and, of course, those also tend to be the ones that qualify for the government grant to knock up to £500 from the purchase price.

Before long I'm confident that we'll start to see better range, faster charging, lower pricing (maybe an extended government grant) and more thoughtful design for everyday riders, not just early adopters or experienced riders.

I've never liked a quirky vehicle, but I do have styling preferences: I like a bike that fits me, suits me and makes me feel that I am riding it, not that it is dictating the ride to me!

Truth is I am in love with electric motorcycles. I think about them constantly, I Google them far too often, I even have dreams about them and turn green with envy when I see any motorcyclists out enjoying themselves when I am driving or ferrying family in my massive EV car.

My next purchase needs to tick all the boxes. But, because electric bikes hold their value so well, I am willing to look for one in the expensive (for bikes) £20,000 bracket that has a 15–17kWh battery pack and DC fast-charging capability.

It needs that low centre of gravity that makes riding effortless, the fast acceleration that makes me smile, and the kind of suspension that lets me cruise my beloved Welsh lanes, Cotswold hills, and Dorset coastal roads without feeling every bump or getting buffeted by the wind (I am scared of the wind, more than ice or snow!) I ask for simple things:

somewhere to put my gloves and a disc lock, perhaps a Type 2 cable just in case. A relatively low stand-over height, a solid kickstand, and bright headlights for night rides.

And yes, I have one final diva demand: heated grips. I have deteriorating Raynaud's, and I dream of heated pads alongside the inner thighs where the fuel tank used to be.

All that might sound like a lot to ask, but I had a wish list for electric cars ten years ago and now look at what's on offer.

I am in this for the long haul. Come with me.





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