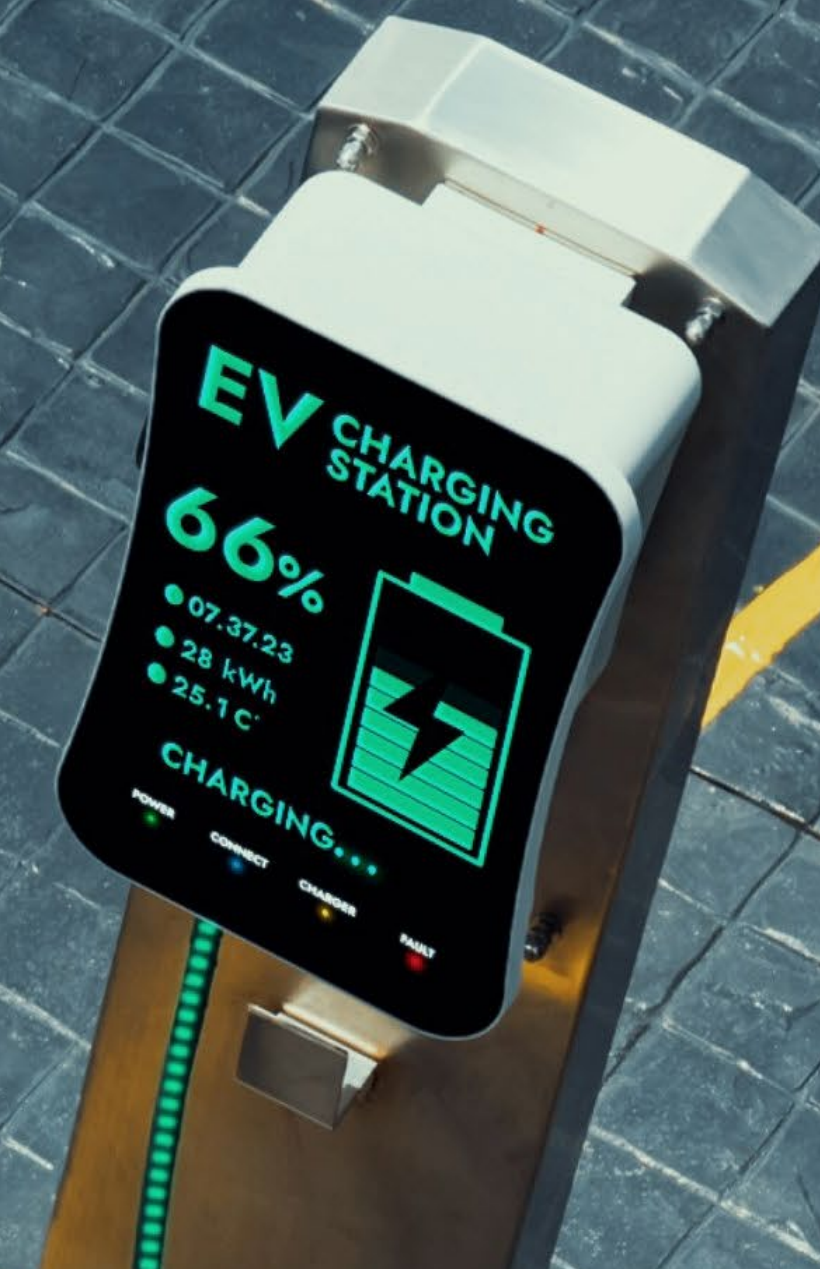




Sparking Change The Case for Delivering EV Battery Health Certificates

Table of Contents

3	Foreword
4	Introduction
5	State of play
6	Existing regulation
	<i>Barriers to the rollout of battery health certificates</i>
	<i>AVILOO case study</i>
9	Future of batteries and skills
10	Recommendations



Foreword



Tara Foley
AXA UK&I CEO

The transport sector is the largest contributor to the UK's total greenhouse gas emissions (28%), so its decarbonisation is critical to achieving the Government's net-zero target.¹ Cars and taxis account for 53% of total transport emissions, making it essential that we look to replace the 32 million internal combustion engine (ICE) vehicles in the UK with low-carbon alternatives and shift to cleaner road transport over the next decade.²

In 2023, AXA conducted research into the challenges affecting the supply and demand of electric vehicles (EVs) and proposed policy recommendations to foster the growth of the UK's EV market. One of our primary recommendations focused on bolstering the affordability of EVs by stimulating the second-hand market through the provision of battery health certificates at resale. Last year, we convened a roundtable of experts from across the motor industry to discuss battery health certificates, key aspects of their development and how industry and Government can work together to implement them.

Despite the rapid evolution of technology in this space, the second-hand EV market only represented 2.5% of the total second-hand market in 2024, in contrast to the 73% of people who said they would be willing to buy a used EV.^{3,4} For many, purchasing a used ICE car is second nature, as mileage serves as a key indicator of the vehicle's condition, longevity and, ultimately, price. This practice also instils confidence for insurers when assessing the risks and costs associated with these vehicles. However, it is important to note that there are huge differences between ICE vehicles and their electric counterparts, meaning they can't be compared 'like for like'.

Research has identified battery health concerns as the primary barrier to unlocking the used EV market, with 62% of those who said they wouldn't buy a used EV citing it as

the reason why.⁵ Our roundtable experts made it clear that there are a wide range of differences in EV battery types between manufacturers, and even models. AXA believes that introducing standardised battery health certificates is a workable and effective solution to this issue. These certificates, showing the 'state of health' of an EV battery compared to its new condition, would ensure accurate pricing of EVs in the second-hand market, where the battery can represent 30–40% of the total vehicle cost, and provide customers with a reliable benchmark for assessing the value of these vehicles.⁶

AXA is dedicated to supporting our customers' transition to lower carbon transport. As an insurer, mitigating the impact of climate change is an essential requirement to continue safeguarding our customers in the future.

That's why we welcome the Government's commitment to "support buyers of second-hand electric vehicles through standardising the information supplied on the condition of batteries".⁷ AXA believes that the most effective way of delivering on this commitment is through standardised battery health certificates, which will provide greater transparency for consumers when buying second-hand EVs in the short term. Longer term, implementing regulations that require vehicle manufacturers to provide users with real-time details of their EV's battery health will address this issue for the future generation of EVs on the roads.

Introduction

Last year, AXA assembled experts from across the EV and motor industry to delve further into the concept of battery health certificates and notable barriers to their rollout. Participants included representatives from ChargeUK, Public First, Institute of the Motor Industry (IMI), National Grid, The Association of British Insurers (ABI), and Tesla.

The discussions primarily revolved around the progress that has been made via the United Nations (UN) Global Technical Regulation (GTR) 22, which regulates aspects of the design and construction of EVs, the materials used, and the measures taken to ensure safety. Within GTR 22, there are requirements on manufacturers to provide the user with the state of health reading of the EV battery, either in-vehicle or via an app.⁸ It is important to note that this regulation would only apply to new EVs once implemented by each national Government, not to EVs already on our roads.

There has been progress on several of the issues raised as barriers to adopting EVs in a [previous report published by AXA](#). For example, the availability of charging infrastructure is often cited as an issue, but there has been clear advancement on this, reducing ‘range anxiety’ and the ability to utilise EVs as a main form of transport. There has been a 164% increase in the total number of chargepoints in the UK since 2021 to over 74,000, with the UK Government pledging to make 300,000 public chargers available by 2030, although significant progress still needs to be made in order to meet this target.^{9,10}

Our polling, in partnership with Stack Data Strategy, found the two most important factors to consumers when considering buying a second-hand EV are the price of the vehicle, and its

long-term battery health, at 66% and 52% respectively. The issue around affordability of EVs remains. In the UK, the average price of a new EV is over £50,000 and only one in three used EVs cost under £20,000 according to the Government.¹¹ However, only 10% of people polled said they would be willing to pay over £20,000 for a second-hand EV. The EV’s battery is the biggest component of this cost, making up between 30-40% of the total.¹² In order to make these vehicles more affordable, the second-hand market needs support to be able to thrive, and eventually bring down the cost of EVs for consumers. Battery health testing is a critical solution to this.

Whilst several battery health testing services are available, there is a clear misconception of battery health and charge, which in turn is leading to consumer confusion:

- Battery health – condition of an EV battery compared to a brand-new battery.
- Battery charge – capacity for the battery retaining its charge.

There is a need to educate consumers, so they feel comfortable with the differences between batteries used in EVs and ICE vehicles. For example, an EV battery health test is different to normal battery testing undertaken by mechanics and garages for ICE vehicles. Clear communication about these differences and the need for specialist equipment specifically for these technical and high voltage vehicles is critical. In addition, there are differences between EV batteries themselves, with the various manufacturers using a range of batteries and operating systems. Participants in our roundtable noted that it’s similar to ‘comparing apples with oranges’.

MOT tests can also cause confusion amongst consumers. Experts at the roundtable said the public often assume an MOT tests the health of an EV battery as well as vehicle safety and roadworthiness, but this is not the case. An MOT only tests the roadworthiness of the vehicle at that exact point in time. This results in many EV owners having no clarity of their battery’s health, or an unfamiliarity to the importance of that metric. This in turn creates issues when looking to resell the vehicle, or when their warranty comes to an end, as they are no longer covered by the manufacturer’s guarantee.

Challenges to EV rollout



Range of the vehicles



Charging infrastructure available



Technical expertise to fix and maintain these vehicles



No standardised solution to determine market value when reselling



Affordability of vehicles

State of Play

UK



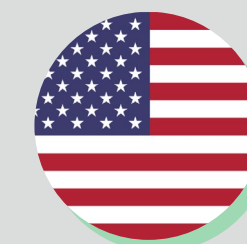
- Whilst the EV resell market is growing in the UK, it only represented 2.5% of the total market in 2024.¹³
- In 2024, new EVs accounted for just under 20% of all new car registrations in the UK.¹⁴
- The cost of switching to an EV is higher in the UK than many other markets.¹⁵
- As of February 2025, the UK Government is currently exploring options for the implementation of GTR 22, but no concrete plans have been outlined.

EU



- In 2024, 13% of all new EV registrations were in the EU.¹⁶
- Adopted the GTR 22 into 'Euro 7' regulations in April 2024.¹⁷

USA



- In 2024, 11% of all new EV registrations were in the US.¹⁸
- The US Government is considering adopting GTR 22 into national legislation, but there are no concrete plans as of February 2025.¹⁹

China



- In 2024, 64% of all new EV registrations were in China.²⁰
- EVs are more accessible to consumers due to cheaper cost and widespread 'battery swap' models, whereby the battery of the EV is separated from the car body and can be 'swapped' for a fully charged battery. The battery operation company will monitor, maintain, and manage the battery centrally.^{21,22}

Aside from the EU, South Korea and Japan are also in the process of implementing the UN's GTR 22 into their national legislations.

Existing regulation

Current UK regulations of EVs and their batteries cover a wide range of aspects, including vehicle safety, emissions, and charging infrastructure. These regulations largely mirror those of the EU. However, post-Brexit there has been an effort to implement various initiatives that promote the adoption of EVs. These largely focus on charging infrastructure and grants rather than promoting policy changes to encourage the second-hand EV market, in order to ultimately make these vehicles more affordable and accessible to customers.

In terms of EV battery resilience, there has been specific regulation to mandate that EVs, and their batteries, must have warranties of eight years, or 100,000 miles.²³ However, this does not support an owner in monitoring the vehicle's battery health and performance.

The UN's GTR 22 outlines minimum battery performance requirements for the battery state of health. The requirements are based on years of collaborative work with manufacturers and seek to create standardisation across the industry for new vehicles.

These regulations are global but require national governments to adopt them into their respective legislations. The EU Commission intends to adopt the proposal into regulation 'Euro 7'. Once implemented, expected in 2027, the EU regulations will enable drivers to see the range, energy, and overall state of health of their battery in real-time. However, it will only apply to new vehicles from the date of implementation, and not to existing EVs on the road. Currently, the UK Government has no known plans to adopt GTR 22, which industry experts who participated in our roundtable said would leave the UK deviating from the global standard for new EVs. This may leave us falling further behind on the transition to EVs compared to global counterparts.

This leaves an opportunity for the UK to lead the way to develop standardised testing for existing EVs, whilst simultaneously implementing the UN's GTR 22 to cover new EVs and future-proof consumer confidence in EV batteries.



Barriers to the rollout of battery health certificates

At AXA, we believe that the introduction of standardised battery health certificates will enable customers to make informed decisions about the battery health and range of their vehicles, or a second-hand vehicle that they want to buy. This boosts consumer confidence in the market, which is stagnant compared to ICE vehicles due to the uncertainty in the resell market.

There are several barriers to the delivery of battery health testing and certificates which will require clear guidance from the Government to prevent rollout of these methods from stalling.

Cost

Currently, whilst uptake increases across the UK, battery health certificates are likely to be produced at a cost to the owner or driver of an EV. Battery health certificates that are currently available in the UK and European market cost around £99.²⁴ At AXA, we are acutely aware of the rising cost pressures on motorists, but the value of these certificates should not be underestimated. They are critical in instilling consumer confidence and ensuring the accurate pricing of EVs, both for consumers and leasing companies, as well as helping to stimulate the second-hand EV market.

Standardisation of certificates

Participants at our roundtable were conscious that different EV batteries operate in slightly different ways, with variations in components used, along with differences in manufacturers' software from EV to EV. To avoid a scenario that compares

'apples to oranges', guidelines should be shared by the Government to set the standards of what a battery health test should include, what measurements are taken as part of this testing, and how the results are communicated via a battery health certificate.

When developing these standards, the Government should consult with industry, to ensure that battery health certificates provide an accurate picture of an EV's battery health, and that different manufacturers' EVs can be compared by consumers using these certificates.

Delivery of battery health testing

Once standards are agreed by Government and industry, the means of delivering battery health certificates needs to be considered. Some battery health certificates already available on the European market can either be undertaken through at-home testing by an EV owner, or via a garage at the time of an MOT, service, or repair. The latter provides a quicker testing service, as well as an opportunity for local garage networks to upskill and diversify their service offerings in order to prepare for a future with more EVs on the road.

Ownership of testing rollout also needs to be addressed. If battery health testing becomes compulsory when selling an EV, guidelines should be clear on whether this should be undertaken by the buyer or seller, and whether rollout of these tests should be centrally managed by the Government. AXA urges the Government to set out clear guidance when developing

standards for battery testing. This will ensure that all parts of the supply and demand chain are clear on what their responsibilities are, and how to access battery health testing to capitalise on the growth opportunity that battery health certificates can bring.

In Switzerland, AXA undertook a trial, partnering with AVILOO to provide customers, for a fee, the opportunity to assess the battery health of their EV. The resulting certificate indicates the battery's percentage capability and its implications for the vehicle's range. In the UK, AXA is considering how it can implement battery health certificates in its existing product offering.



AVILOO

Austrian company AVILOO is a global leader in battery diagnostics that has developed the most comprehensive test currently on the market. The test measures the exact state of battery health as a percentage compared to new condition and can be used for electric vehicles, including electric buses and trucks.

AVILOO gives customers two options for installation; a home test which customers can complete themselves, offering instructions for self-installation and uninstallation, or certified garage 'flash' testing, which takes no more than three minutes to complete.

The AVILOO box connects to the battery via the onboard diagnostics port, then the customer drives the vehicle on a full charge. AVILOO then provides a battery health certificate, including the implications of the battery health on the range of the vehicle. For flash tests, these can be undertaken at the garage, with no need for the EV to be driven at all.



The future of batteries and skills

In the last 10 years, the technology and components of EV batteries have changed drastically. The roundtable participants outlined we are now at a point where the technology is changing and evolving on a weekly basis. Manufacturers are continually improving battery efficiency, increasing range, and enhancing charging capabilities. Additionally, innovations in autonomous driving, connectivity and sustainability are shaping the future of EVs more widely.

- Range – Average battery range for new EVs reaches almost 300 miles, a 42% increase since 2020.²⁵
- Charging infrastructure – Charging is now available at 97% of motorway service stations, with more than 800 rapid, or ultra-rapid chargers in these locations.²⁶
- Charging technology – Technology that could charge EV batteries in as little as 10 minutes, without the need for battery overhauls, could be rolled out in the next few years.²⁷

China is further ahead than other nations in both the development of EV technology, and uptake of EVs – with the number of new EV registrations in China growing by 35% in 2023.²⁸

This is largely due to local advancements in battery technology after heavy private sector investment, paired with government incentives, over the last decade. Whilst it's important to note the differences between the UK and Chinese markets both in terms of size and consumer behaviours, it does highlight the need for increased investment in homegrown battery capability. Investment is also needed throughout the entire EV supply

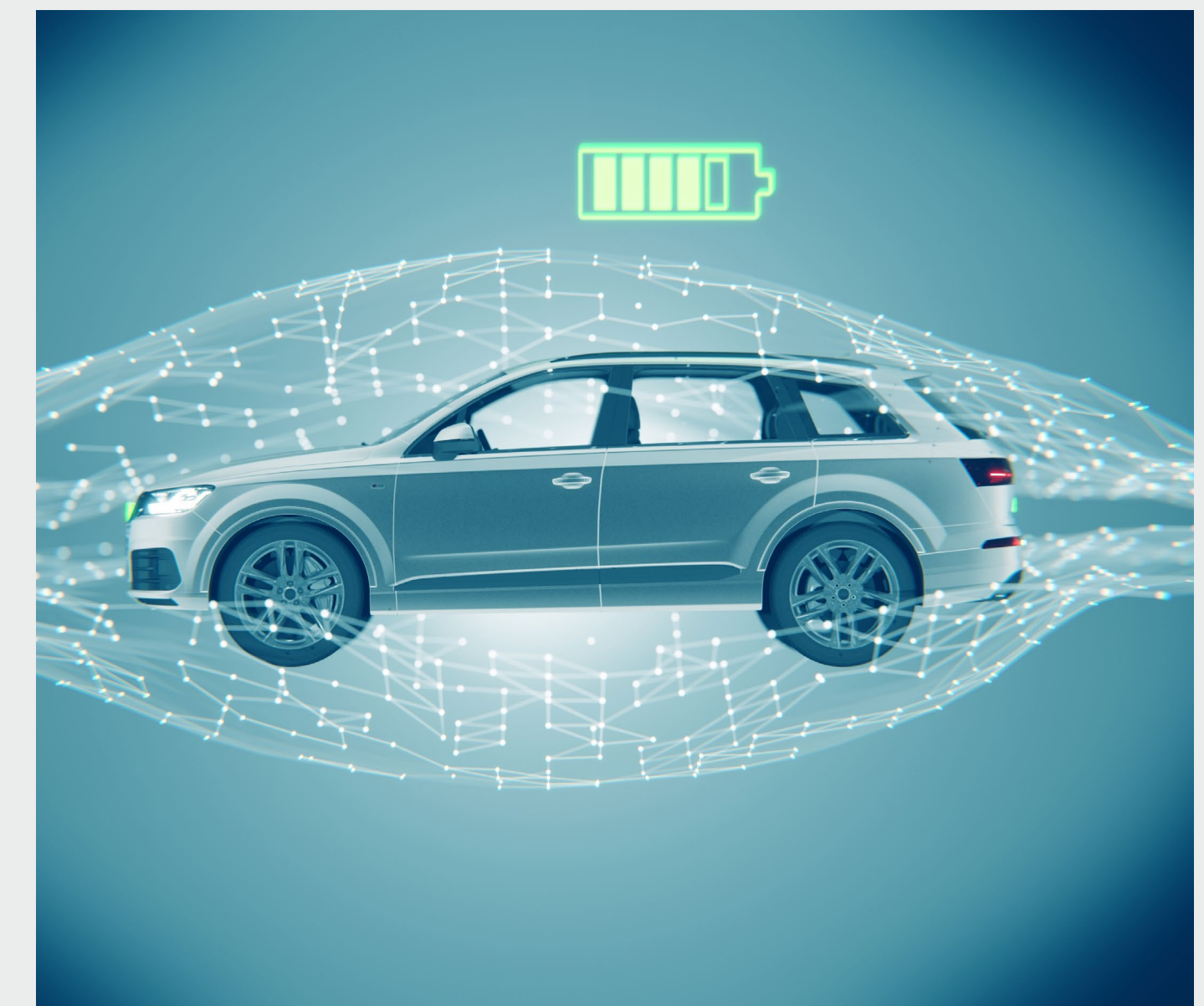
chain to continue stimulating the EV market and increase the rate of adoption in the UK. Recent investment and funding such as the Faraday Battery Challenge and commitments to create gigafactories across the country are extremely welcome.^{29,30} However, AXA is calling for further public-private investment into advanced manufacturing facilities to stimulate the sector and make the Government's 2030 vision to have a globally competitive battery supply chain a reality in order to future-proof the EV sector.³¹

There is also a strong need for continued investment in skills across both the supply and demand chain, to be able to keep up the pace with these technological changes and battery advancements.

Previous research by AXA shows that less than 10% of the automotive workforce is currently qualified to work on and repair EVs.³² Without urgent action, the UK will face a serious shortfall of 35,700 technicians by 2035³³, with a growing need for mechanics to be qualified to work on EVs as we see sales and uptake of EVs increase year on year.

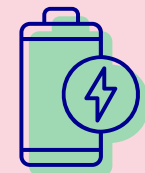
In addition, experts within the EV industry have noted that existing mechanics are willing to support the transition but require training of around five days³⁴ to be able to safely work on EVs. This training costs around £1,800³⁵ plus the loss of productivity. Whilst on paper this appears accessible, there was consensus from participants in our previous roundtable that in the context of staff shortages, repair backlogs, and previous changes to the Government's 2030 net zero target,³⁶ there is little to no incentive for mechanics to invest in such training.

This creates a vacuum of skill in the UK that inhibits the rollout of EVs, and certainly stifles consumer confidence when investing in these vehicles as the lack of available experts may put some buyers off purchasing either a new or used EV. However, local garage networks could be a solution to deliver battery health testing, either as an add on to an MOT, service, or as a standalone service for customers. With the stimulation of the second-hand market through battery health certificates, there will be further pressure on local garage networks to be able to work on EVs when needed.

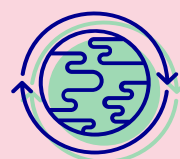


Policy Recommendations

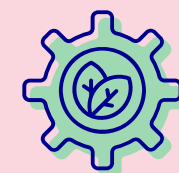
Our polling found 61% of people who do not drive an EV, and have no plans to purchase one, cite the high cost of EVs are the main deterrent. It's evident the development of a comprehensive, cross-governmental strategy is urgently required to bolster the UK's second-hand EV market. This will be crucial in resolving concerns on battery health and longevity, and the urgent need to address the climate emergency. We are keen to support the Government with our expertise, and we recommend that:



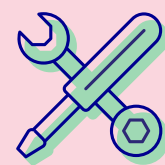
- Guidelines should be published to support standardised battery health testing, providing consistency in battery health certificates for existing EVs to help stimulate the second-hand market. AXA stands ready to help industry and the Government develop these standardised certificates, ensuring they are consumer-focused and accessible to those with no technical knowledge. Rollout of battery health certificates will be most effective when accompanied by a Government-led communications campaign to educate consumers on the transition to owning an EV, which as an insurer we are happy to support.



- The UK Government should adopt the UN's GTR 22 to ensure international consistency on battery health. It should also bring forward legislation as soon as possible to implement this regulation which would cover all new EVs.



- Garages and repair networks should look at methods of delivering battery health testing for EVs, including the opportunity to provide battery health certificates as an add-on to MOT or services. These encounters are often the only point at which many consumers access garages on an annual basis. Broadening the service offering to battery health testing could provide an additional source of income for garages.



- The Government should invest in technicians' skills to support garages being able to safely work on and test EVs. Previous research from AXA shows a skill shortage of 37,500 workers. AXA urges the Government to reposition the 'full expensing' scheme to include net-zero training and welcomes the commitment to reform the Apprenticeship Levy to allow garages to flexibly use the new Growth and Skills Levy to upskill technicians so they can safely work on EVs. This will help garages to justify the costs of training and improve the availability of mechanics who can work on EVs, including delivering battery health testing.

Endnotes

- 1 [Transport and environment statistics: 2023 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/transport-and-environment-statistics-2023)
- 2 [Greenhouse gas emissions, UK - Office for National Statistics](https://www.gov.uk/government/statistics/greenhouse-gas-emissions-uk)
- 3 [Used car market up as EV sales reach record levels - SMMT](https://www.smm.co.uk/press-releases/used-car-market-up-as-ev-sales-reach-record-levels)
- 4 [The-Key-To-Unlocking-Net-Zero.pdf \(greenfinanceinstitute.com\)](https://www.greenfinanceinstitute.com/the-key-to-unlocking-net-zero)
- 5 [The-Key-To-Unlocking-Net-Zero.pdf \(greenfinanceinstitute.com\)](https://www.greenfinanceinstitute.com/the-key-to-unlocking-net-zero)
- 6 [Lithium iron phosphate \(LFP\) batteries in EV cars: Everything you need to know \(chargelab.co\)](https://www.chargelab.co.uk/lithium-iron-phosphate-lfp-batteries-in-ev-cars-everything-you-need-to-know)
- 7 [Change – The Labour Party](https://www.labourparty.org.uk/2024/05/20/change-the-labour-party)
- 8 [UN GTR No.22 \(In-vehicle Battery Durability for Electrified Vehicles\) | UNECE](https://www.unece.org/transport/automotive/ev/2022/05/20/un-gtr-no-22-in-vehicle-battery-durability-for-electrified-vehicles)
- 9 [EV charging statistics 2024 - Zapmap \(zap-map.com\)](https://www.zapmap.com/ev-charging-statistics-2024)
- 10 [Tenfold expansion in chargepoints by 2030 as government drives EV revolution - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/tenfold-expansion-in-chargepoints-by-2030-as-government-drives-ev-revolution)
- 11 <https://www.gov.uk/government/news/industry-encouraged-to-shape-uk-transition-to-zero-emission-vehicles>
- 12 [The 2040 outlook for EV battery manufacturing | McKinsey](https://www.mckinsey.com/industries/automotive-and-transportation/our-insights/the-2040-outlook-for-ev-battery-manufacturing)
- 13 [Used car market up as EV sales reach record levels - SMMT](https://www.smm.co.uk/press-releases/used-car-market-up-as-ev-sales-reach-record-levels)
- 14 <https://media.smm.co.uk/december-2024-new-car-registrations/>
- 15 [https://impact.economist.com/sustainability/project/the-rev-index/executive-summary/](https://www.economist.com/sustainability/project/the-rev-index/executive-summary)
- 16 <https://www.epma.com/acea-2024/>
- 17 <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32024R1257>
- 18 <https://www.marketwatch.com/guides/insurance-services/electric-vehicle-statistics-2024>
- 19 <https://globalautoregs.com/agendas/11463?show=report>
- 20 <https://www.reuters.com/business/autos-transportation/global-electric-vehicle-sales-up-25-record-2024-2025-01-14/>
- 21 [China's EV strategy of going small and cheap to pay big dividends in Asia | Reuters](https://www.reuters.com/business/autos-transportation/china-ev-strategy-going-small-and-cheap-to-pay-big-dividends-asia-2024-01-14/)
- 22 [China's Battery Swap National Standard Set to Go into Effect on November 1, 2021 | Equal-Ocean](https://www.equal-ocean.com/news/china-battery-swap-national-standard-set-to-go-into-effect-on-november-1-2021)
- 23 [The Vehicle Emissions Trading Schemes Order 2023 \(legislation.gov.uk\)](https://www.legislation.gov.uk/uksi/2023/1212/made)
- 24 [AVILOO Battery Test - Battery Diagnostics UK](https://www.aviloo.co.uk/battery-test)
- 25 [Britain's new car market boosted by battery electric vehicle choice - SMMT](https://www.smm.co.uk/press-releases/britain-s-new-car-market-boosted-by-battery-electric-vehicle-choice)
- 26 [Electric vehicles: costs, charging and infrastructure - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/electric-vehicles-costs-charging-and-infrastructure)
- 27 [Exclusive: UK firm's radical tech can charge an EV in 10 minutes | Autocar](https://www.autocar.co.uk/news/uk-exclusive/uk-firm-radical-tech-can-charge-an-ev-in-10-minutes)
- 28 [Trends in electric cars – Global EV Outlook 2024 – Analysis - IEA](https://www.iea.org/publications/freemove/trends-in-electric-cars)
- 29 [Electric vehicles: costs, charging and infrastructure - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/statistics/electric-vehicles-costs-charging-and-infrastructure)
- 30 [Tata Group to invest over £4 billion in UK gigafactory creating thousands of jobs - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/news/tata-group-to-invest-over-4-billion-in-uk-gigafactory-creating-thousands-of-jobs)
- 31 [UK battery strategy \(HTML version\) - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/uk-battery-strategy)
- 32 [Supercharging the UK's Supply and Demand of Electric Vehicles – AXA](https://www.axa.com/uk/insights/supercharging-the-uk-s-supply-and-demand-of-electric-vehicles)
- 33 [https://tide.theimi.org.uk/industry-latest/news/2026-marks-cross-roads-ev-skills-gap](https://www.theimi.org.uk/industry-latest/news/2026-marks-cross-roads-ev-skills-gap)
- 34 [https://techttopics.co.uk/product/electric-vehicle-and-hybrid-training-course-bootcamp3/](https://www.techttopics.co.uk/product/electric-vehicle-and-hybrid-training-course-bootcamp3/)
- 35 [https://techttopics.co.uk/product/electric-vehicle-and-hybrid-training-course-bootcamp3/](https://www.techttopics.co.uk/product/electric-vehicle-and-hybrid-training-course-bootcamp3/)
- 36 The new Government have however committed to reverting to the 2030 target.



Contact:

AXA UK Public Affairs

ukpublicaffairs@axa-uk.co.uk