

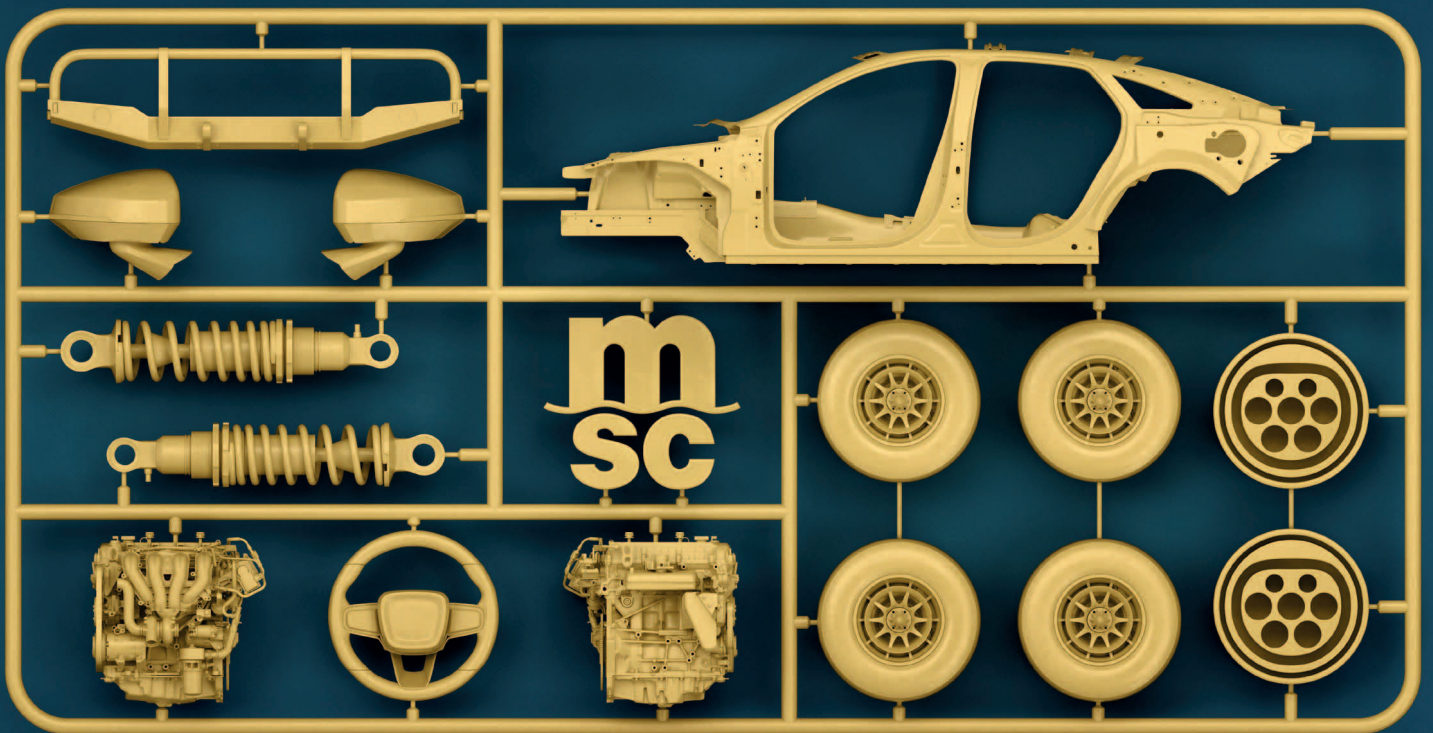
Automotive World MAGAZINE

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Are Western OEMs already
resigned to China's EV
leadership?



Tesla slashes Supercharger team | **EU** AI Act sets industry template |
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Are Western OEMs already resigned to China's EV leadership?

As China accelerates past its competition in the electric vehicle space, OEMs in the West may need to re-examine their priorities. By Will Girling

In early April 2024, [demand](#) for Xiaomi's US\$30,000 Speed Ultra 7 (SU7) quickly outstripped supply, netting 90,000 orders in 24 hours and creating a seven-month waitlist. Just prior to the launch, Chief Executive Lei Jun fired broadsides at leading US tech companies Tesla and Apple, declaring the SU7 would be superior to the former's Model 3 and claiming Xiaomi would succeed where the latter had [failed](#).

Xiaomi SU7



The rise of China's automotive industry to global prevalence in the electric vehicle (EV) era has been anticipated for several years. Recently, some major Western automakers have reacted to this increased competition with apparent resignation. Volkswagen Chief Executive Oliver Blume, for example, stated on 5 April that his company's EVs "cannot keep up" in China, and that setting "utopian goals" for market share will be avoided.

Mercedes-Benz, Stellantis, Volvo Cars, Ford, and GM are among those that acknowledge [demand for their EVs is slowing](#). Meanwhile, in a bid to protect their domestic industries, the EU is considering new tariffs on Chinese EVs, and the US is debating an outright import ban. As China consolidates its domestic market and looks further afield, how can Western players seek to improve their own EV offerings?

China: a major oversight?

Pedro Pacheco, Vice President of Research at Gartner's CIO Research Group, believes several Chinese automakers are now "clearly ahead" of many legacy Western brands in terms of vehicle software and battery EV tech. The 2023 Gartner Digital Automaker Index places Nio and Xpeng behind only Tesla. Despite this, he tells *Automotive World* that many legacy OEMs still see these shortcomings as consequential to the Chinese market only. "As a result, they are becoming more and more conformed to the inevitability of losing market share in that country."



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However, the risk of considering China an outlier unrepresentative of the wider global situation could prove to be a major oversight. “The real problem for these OEMs is their sluggishness in making fast progress in car software and electrification,” says Pacheco. As such, China may be merely the market where their products’ limitations are becoming extremely obvious.

European and US manufacturers can already observe some accelerated examples of this phenomenon in progress. Japanese automakers have [lost their competitive edge](#) in China by failing to meet the growing demand for EVs. Although this hesitancy may be [vindicated](#) in other markets in the near term, Pacheco considers China a model for how other countries will shift as the importance of software and e-

mobility grows. VW’s market share in the country is currently 14%—down from 18% in 2018—and Blume’s apparent lack of confidence could suggest this will erode even further by the end of 2024.

Waiting on affordability

At home, carmakers in Europe and the US are fighting tough [macroeconomic conditions](#) to maintain consumer appetite for EVs. Reversing the decelerating interest is arguably tied to manufacturing mass market models [profitably](#). However, the relative affordability of models like the Xiaomi SU7 and BYD Seagull (US\$10,000) also places China at the forefront of this mission. From all Western OEMs, only Tesla and Ford have announced any intention to release an EV cheaper than US\$30,000.

A March 2024 article by *Bloomberg* reported that Ford would release a US\$25,000 model in late 2026. This would fulfil comments made by Chief Executive Jim Farley the previous month that a small “skunkworks” team had been working on an affordable EV platform for at least two years. Meanwhile, on 5 April, Reuters claimed that Tesla was scrapping its ongoing plans for a US\$25,000 EV known as ‘Model 2’. Elon Musk publicly refuted the story on X and stated it was untrue.

Due to the reported similarities between this prospective mass market EV and Tesla’s upcoming robotaxi—scheduled to be announced on 8 August 2024—Pacheco believes the two could be linked. “Tesla might use the robotaxi as a halo model for

its entry-level car, which would be a good move.” However, it’s clear that the US industry is still largely striving for the economies of scale and production capability that China has already achieved. By the time it catches up, its competition may be further ahead still.

For the brands that already prioritise electrification and vehicle software, Pacheco predicts an “arms race”. On the other side, Western OEMs that continue to resist or otherwise neglect investment in these areas may face irrelevancy and a prospective [wave of automotive consolidation](#). “They will change their stance at a later stage when they realise how much global market share their conservative approach is losing them. But, nevertheless, at that point it may already be too late.”

Opening ceremony for Nio’s Smart Driving Technology Centre for Europe—Gartner places the OEM second only to Tesla in digital sophistication





Nio House in Oslo, Norway

Considering desirability

Balancing investment in new technology with the difficulty of making EVs pay off financially is the biggest challenge Western automakers face as they try to formulate a response to China. Following consecutive years of [high losses](#) for Model E, Ford Chief Financial Officer John Lawler told investors in March 2024 that the EV division would need to “stand on its own, or we are not going to move forward.” GM has also halted plans for an electric pick-up plant in Detroit.

Pacheco concedes that several legacy OEMs are understandably having second thoughts about continuing to funnel billions into products that are proving deleterious to their bottom line. “In this situation, they want to pivot to hybrids, but they’re missing the root cause of the problem: their EVs didn’t sell because they were not great products.” Indeed, Tesla’s Model Y, which starts at US\$44,630, was 2023’s best-selling passenger car

worldwide—1.15 million units, according to Statista. Although lack of affordability is undoubtedly a factor in weakening overall EV demand, the technology itself has broad appeal. Consumer desirability is, perhaps, too often neglected or underestimated by incumbents.

In this area, Western automakers can learn from China’s example. A June 2023 report by AlixPartners noted that Chinese companies’ success lies in identifying the specific technology and features customers want and then meeting that demand both quickly and affordably. Pacheco draws a similar conclusion: rather than hedge their bets, a focused dedication to EV development may be the only way to compete with China. “The lesson is that legacy OEMs can’t keep continuously pivoting their strategy; they must also deliver a great execution. Regulations entail that battery EVs are critical for the future, and OEMs that decide to backtrack now will only have a tougher time trying to increase their market share later.”



© Kodiak Robotics

An AI ecosystem will gradually reshape long-haul trucking

Although autonomous trucking is arguably the most visible deployment of AI in long-haul trucking, it's only one part of a larger ecosystem. By Will Girling

Artificial intelligence (AI) is poised to be one of the most disruptive technologies shaping modern long-haul trucking. Daniel Langkilde, Chief Executive and Co-founder of Kognic, which develops software for improving automated driving systems, tells *Automotive World* that the AI-defined sector is on course for “a significant upward curve in efficiency and total cost of ownership.”

Having worked with Kodiak Robotics, an autonomous truck (AT) developer for the long-haul sector, he suggests that the rewards of utilising AI are significant. These include an accelerated electrification shift, a valuable use case in the quest to realise fully autonomous vehicles (AVs), and ultimately increased payload capacity delivered with truck fleets that smaller and cheaper to run overall.

“It’s a very exciting time right now,” confirms Jeff Farrah, Chief Executive of the Autonomous Vehicle Industry Association, during the AI and the Future of Trucking webinar, part of *Automotive World’s* Future Truck North America 2024 online event. The event’s two other panellists—Michael Wiesinger, Vice President of Commercialisation at Kodiak, and Daniel Majewski, Head of Strategy R&D and System Solutions at ZF—broadly agree with this sentiment.

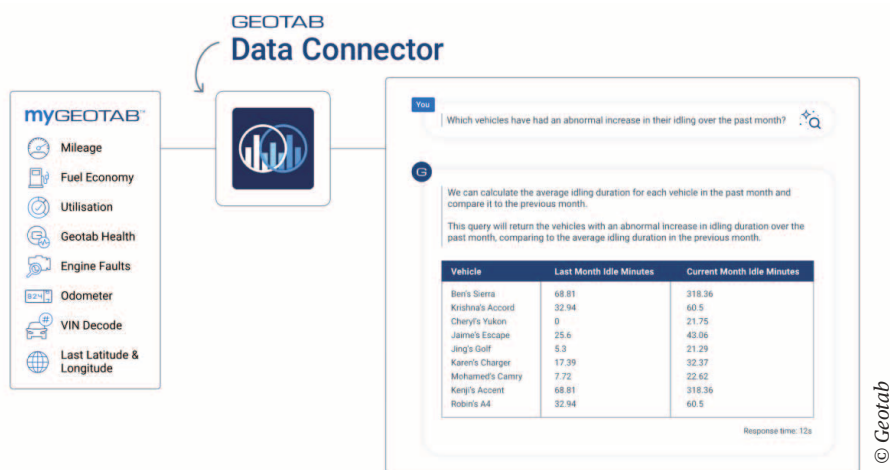
Significant strides have already been made in the effort to [automate road freight](#). Majewski adds that the journey to autonomous trucks (ATs) will involve several phases, with AI playing an incrementally larger role over time. “We need to keep adding features until one day we can eventually replace the whole driver. Until then, there is still a lot in front of us.”

Making sense of data

Although discussions around AI’s potential are not new, a greater understanding of its ability to unlock several avenues of new value is coming into focus. Valued at US\$2.3bn in 2022, the global automotive AI market is expected to reach US\$7bn by 2027 (CAGR 24%), according to MarketsandMarkets. In the [increasingly digital](#) road freight space, the high mileage of long-haul operations means data streams across an entire fleet will be voluminous. For Majewski, this is both an opportunity and a challenge: “We will be flooded with information, so it must be ingested, processed, and distributed in the right way.” AI, he believes, is the solution.

There are several areas in which AI can boost productivity. Access to more data not only builds a better understanding of the past and present but also enables predictions of the future. This could benefit vehicle R&D, improve maintenance schedules and truck lifecycles, and optimise route planning. AI could also provide an empirical foundation for more ambitious organisational transformation. In mid-2023, Geotab announced a generative AI-based solution—[Project G](#), a “data scientist in the pocket”—to provide fleet managers with quick and simple insights in a chat-style interface. The company believes this solution could provide the clarity necessary for implementing carriers’ electrification and decarbonisation strategies.

While AI might just be evolutionary for larger fleet operators, it could prove revolutionary for smaller ones. “Some of their transport management systems still rely on manual input,” says Wiesinger. By automating even



The AI-driven, chatbot style interaction of Geotab's Project G enables fleet managers to get quick answers to complicated questions

very basic systems, he suggests that companies are taking one step closer to achieving an automated ecosystem that may eventually extend from the back office to trucks on the road. "AI is going to change so many things; we all need to rethink the future of transportation."

The benefits of ATs

Improving road safety is [often cited](#) as a benefit of deploying AVs, and the panel likewise considers it foremost in AI's future relationship with trucking. "Of course, there are good human drivers, but an AT has a fundamentally different picture of what's going on," says Wiesinger. "The truck has cameras, LiDAR, and radar sensors constantly scanning the environment. That means it both knows what's happening and can predict what's going to happen." Being able to do so for an entire journey without fatigue or emotion, he adds, could raise the safety profile of trucking considerably.

This is not to say that deploying ATs safely in a long-haul context is easy. "The incoming mindset suggested that because of empty, straight roads and less complex driving

conditions, it would be easier than building AV solutions for consumer driving in urban areas. Turns out, it's not," Langkilde explains to *Automotive World*. A 'big rig' needs a sensing range greater than or equal to its stopping distance, but LiDAR sensors with 200-250m ranges don't suffice at high speeds carrying heavy loads. "However, by creating smarter and faster extrapolations of sensor fusion to fill the sensor range gap, AI can both feed and be fed the solution here."

The other significant benefit of AI for long-haul trucking is its capacity to alleviate ongoing driver shortages. There are currently more than three million industry vacancies globally, and that number is set to double by 2028, according to the International Road Transport Union. "Fleets can't grow today because they don't have the drivers," continues Wiesinger. "ATs could be huge for increasing utilisation, growing revenue, and making routing more efficient." In the US, Farrah indicates that official government data makes the necessity of AI apparent: "We need to be able to move 50% more freight by 2050 with fewer drivers. That's the real opportunity of autonomous trucking."

Considering the ecosystem

As ATs gradually become a reality, Wiesinger notes that OEMs are divided on whether they should simply provide carriers with the necessary technology or produce and essentially run autonomous fleets themselves. While believing that both approaches will continue over the coming years, and despite AI's ability to alter the status quo, he urges caution about cutting out logistics players with core competencies developed over years. The optimal business model may be more collaborative than it is disruptive. "The industry exists as it does today for a reason," warns Wiesinger.

From a US regulatory perspective, Farrah notes that continued close communication between the trucking sector and federal/state authorities on how ATs will fit into transport regulation is essential. To date, 24 states have adopted AV statutes: "You could run freight autonomously from Arizona to the shores of Florida and Georgia." However, the lack of a centralised body dedicated to the regulation of AI means that legislation is fragmented, and the disparity of political willpower regarding the issue means it is likely to remain so in the medium term. Majewski adds that AT trials are expected in Europe from 2024 through 2025, although the added legislative challenges of transporting between EU states could also delay a full long-haul rollout.

In the meantime, developers can continue exploring where AI can make the difference in both hub-to-hub and dock-to-dock logistics. Notably, the latter will require some automation in the warehouse as well.

Wiesinger states that Kodiak is working on this: "When an AT approaches a dock, it will enter a 'landing area' and stop. Humans on the ground will disconnect the trailer, and then an automated yard movement vehicle can take over." He predicts that this will feed into the wider re-evaluation of how people and AI interact in the freight cycle for the mutual benefit of both workers and operators.

“

We need to be able to move 50% more freight [in the US] by 2050 with fewer drivers. That's the real opportunity of autonomous trucking

Ultimately, AI's importance to long-haul trucking extends beyond any individual solution or application. Rather, it is an ecosystem of components that will gradually accumulate into a holistic value chain. By broadcasting AI's ability to solve real-world transport issues, the industry will earn stakeholder trust, and the technology can continue to scale successfully.

Stellantis' Carlos Tavares flexes his muscles in the US

Stellantis is experiencing strained relations with some of its US supplier base, but this may only be a sample of a wider problem. By Ian Henry

Stellantis' US operations, increasingly controlled from its Paris headquarters, are in dispute with at least two suppliers, which have been seeking price rises for the component they deliver to key Ram and Jeep production lines. Despite Stellantis' record financial results in 2023, it has been unwilling to grant suppliers price rises as they battle with their own rising costs. The disputes have reached the law courts—a recent case involving a transmissions gear and pinion producer, the private equity owned MacLean-Fogg, saw a Michigan judge rule in favour of the supplier, much to Stellantis' ire. MacLean-Fogg had reportedly asked

for a price rise of 26%, with Stellantis trying to force MacLean-Fogg to maintain deliveries despite the pricing dispute.

This comes after Stellantis introduced its 'no more claims' policy earlier this year to prevent suppliers winning price rises as inflation bites harder. Previously, Stellantis had partially won its court battles against Chinese interior supplier Yanfeng and German-based fasteners company Kamax; the suppliers were instructed by the court to keep supplying Stellantis while the cases were decided by the courts. In the MacLean-Fogg case, however, Stellantis was ordered to





pay “under protest”, with the court awarding MacLean-Fogg US\$1.4m—a sum that it claims not to have received. In mid-April, Stellantis reportedly paid just US\$100,000 to keep deliveries of gears and pinions flowing and the assembly lines working.

Stellantis and other OEMs in the US have agreed new UAW contracts, including increased labour rates, so it is not surprising that they are looking at their supply chains as a source of potential cost savings, or rather as sources of cost rise limitations. For now, gears and pinions are being delivered to the transmissions plant in Kokomo,

Indiana, which in turn supply the Ram 1500 pick-up, Jeep Wrangler, and Grand Cherokee, as well as more than a dozen other group models in North America. The earlier Kamax dispute had hit production at Toledo Assembly, which builds the Wrangler and Gladiator.

The legal battle will no doubt run for some time, with Stellantis standing firm and claiming it has provided suppliers with billions of dollars of support while arguing that contracts need to be enforced. On the other side, suppliers have long found Stellantis’ payment terms and price rise limitations to be too constraining, although to maintain



Suppliers in the US are wary that the real power at Stellantis now resides on the other side of the Atlantic

their businesses they have tended to accept the greater power of their customers. How long the evident asymmetry in automaker-supplier relations can continue is another matter.

To some extent this situation derives from OEMs deciding to largely single source and thereby losing the ability to ‘play’ one supplier off against another. Economies of scale will often mean a single supplier makes sense in terms of piece part prices, but when a given supplier gets into difficulty or demands a price increase that the automaker does not wish to countenance, this kind of conflict is not surprising.

According to Plante Moran’s North American Automotive OEM-Supplier Working Relations Index Study, Stellantis is the automaker ranked lowest by suppliers, leading to the disputes with MacLean-Fogg, Kamax, and others. Suppliers also claim that Stellantis’ decision-making regarding chosen suppliers, contract terms, and business conditions in general is made in Europe rather than in the US. The independence of the latter’s purchasing agents has been much reduced, and suppliers have complained that unlike at Ford and GM, where their purchasing contacts remain in Detroit, the real power at Stellantis now resides on the other side of the Atlantic.

[Single sourcing](#) is one thing and has its inherent risks, but refusing to grant price rises in the current economic climate is another. Through all these difficulties, OEMs need to maintain at least civil relations with suppliers, including those delivering the most basic parts. Resorting to legal action is unlikely to pave the way to sustainable good relations and neither will removing decision authority from Detroit. Stellantis will no doubt point to impressive financial results as justification for its policies, but whether conflictual relations with suppliers facing their own economic challenges, such as Kamax and MacLean-Fogg, is a sustainable way to continue is open to debate.

The dispute with Yanfeng is different: the company suffered a cyber attack in 2023 that disrupted supply to three Stellantis plants in Detroit and one in Mexico, hitting Jeep and Ram production. Stellantis' reaction was to claim US\$26m in damages (for lost production) and this dispute is also proceeding through the US legal system. It is understood that Yanfeng has continued to supply Stellantis throughout the dispute.

And it is not just in the US where Stellantis has supplier issues; stampings from Magnetto Automotive in Paris have stopped, and this has in turn temporarily halted production at the van plants at Hordain in France and Luton in the UK. The dispute arises from



union concerns that this work will be transferred to Poland. This may turn out to be a short-lived problem—Stellantis has suggested as much—but it may signal the start of wider problems. The vehicles made in Hordain and Luton will soon have a third production site, at Tofas in Turkey, which has significant pressings or stampings capacity of its own. Production of these or other parts may or may not switch to Poland, but Stellantis will surely look at lower cost production of some parts for the van programme in Turkey as production ramps up, drawing on Fiat's experience of the supply base as well as its own capacity. A new arena for supplier disputes could well develop, sooner rather than later.



EV's aren't dead, so why are we in mourning?

Jordan Brompton tackles common misconceptions about the state of the UK's EV industry

In January, the Society of Motor Manufacturers and Traders (SMMT) revealed that Britain's millionth battery electric car (BEV) had officially hit the roads, with new BEV registrations rising 21% year-on-year and new plug-in hybrid (PHEV) registrations up by 31.1%. Just

a few weeks later, the new car market recorded its best February for more than 20 years, with fleets and businesses firmly leading the charge.

Until the UK pushed back the 2030 gasoline and diesel ban, it had the strictest EV transition legislation in

the world. Despite the five-year delay, the UK's per capita EV uptake and public charge point rollout far outpaces most other markets. The UK is also home to some of the globe's leading charge point manufacturers and OEMs, making the country a world leader in EV technology exploration, trial and development.

BEVs and PHEVs now make up nearly a quarter of new vehicle registrations in the UK (23.7%)—almost double the share of diesel vehicles, with pure electric cars having a 16.5% market share in 2023. In 2016, just 0.4% all new vehicles registered were pure electric. This growth is, in part, testament to continued investment and development from vehicle manufacturers. Indeed, back in 2016, early EV adopters were restricted to just a handful of models, most of which were limited on range and didn't really stack up with their ICE-powered equivalents. Today, however, virtually every OEM has an EV range in its arsenal—all of which boast next-generation design, headline-grabbing range stats and pioneering in-car technology.

In 2035, the sale of all new gasoline and diesel vehicles will be stopped in the UK. By 2030, due to the government's zero emissions vehicle (ZEV) mandate, the UK will see 80% of new cars and 70% of new vans powered by an electric powertrain. By 2040, all new cars and vans sold in the UK will have to be entirely zero emissions 'at the tailpipe'. The country is, and has been for a while, on a good trajectory towards meeting its EV goals, spurred along by dropping prices, higher availability, the easing of automotive supply chains and OEMs now able to take full advantage of economies of scale.

So, what's the problem?

EV sales by private buyers fell by a quarter in January from the previous month and by a further 2.6% in February. At the same time, the House of Lords Committee released a statement suggesting that the UK was 'lagging behind' in its EV strategy, citing price and charging availability as the leading barriers to entry for many would-be consumers. But this assessment, alongside the recent

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Is the UK's transition to electrification really slowing, or is misinformation simply painting an inaccurate picture of the current landscape?

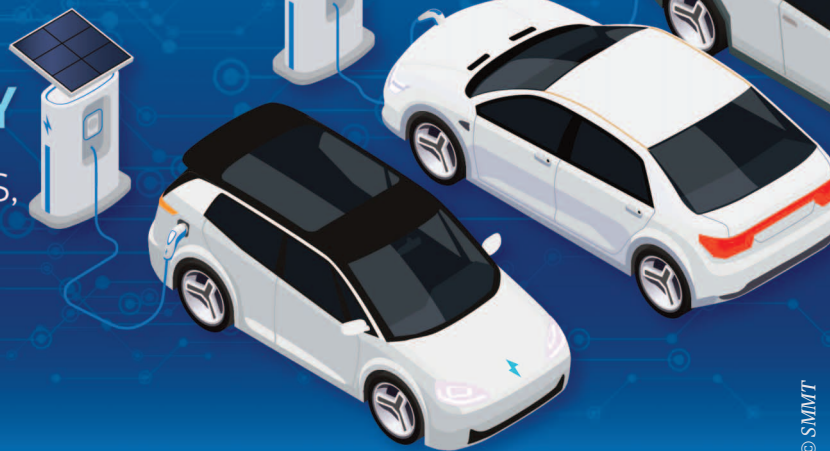
deluge of headline-grabbing statistics surrounding plummeting EV sales, doesn't tell the full story. Is the UK's transition to electrification really slowing, or is misinformation simply painting an inaccurate picture of the current landscape?

1 MILLION EVs*

BRITAIN'S MILLIONTH EV IS REGISTERED IN JANUARY

WITH THE RIGHT GOVERNMENT POLICIES, WE COULD HAVE A MILLION MORE IN JUST TWO YEARS.

The UK registered its one millionth EV in January 2024



As far as doomsaying goes, the EV sector presents an easy target. It's a booming market that's really shaken up the automotive industry in recent years, attracting widespread support but also a crowd of hardcore sceptics who continue to challenge the sector's progress. This, alongside the most famous face in electrification—Elon Musk—never being too far away from a headline-grabbing story, means that it's a sector with just too much low hanging fruit for the media to ignore.

But it's also important to look at the UK economy as a whole. The private buyer EV market is certainly not the only sector that's struggling. The UK is in the midst of a drawn out period of stagnating economic growth, a cost of living crisis, and now an official recession. It's simply not pragmatic to single out one industry while the entire economy struggles. Indeed, private buyers have been a diminishing influence in the new car market over recent years, with recent SMMT data showing that they account for only around one in three new registrations, down from

around half of all new registrations within the last five years or so, with private new car registrations in 2023 recorded at their lowest level for 12 years.

Taking a further step back to the wider automotive industry, the global market for ICE vehicles peaked in 2017, according to BNEF, with 85.9 million sold globally and sales steadily declining since (including an expected major drop in 2020), to 69.1 million in 2022. These forecasts show that sales of ICE vehicle are expected never to return to pre-pandemic levels. Yet, in the same period, the sale of both BEVs and PHEVs shot up from just over a million to upwards of ten million.

This is where the crux of the problem in reporting on EV markets lies: EV sales and market share are up—the 2024 forecast from the SMMT is a 27% increase in EV (BEV and PHEV) registrations compared with 2023—and ICE sales and market share are down, but because fewer private buyers bought EVs in January and February (notoriously tight months

for middle-income earners), many media outlets have spelled this the end of EVs.

While the UK is behind initially estimated trajectories for the private buyers' market, businesses and leasing companies are buying up EVs in their droves, and many of these are ending up as essentially private cars by salary sacrifice schemes, which allow employees to lease an EV via salary deduction at very attractive rates. As has been the case for previous new technologies in the automotive space, from diesel engines to live traffic information systems, it's these groups who lead the charge by driving new sales. But where will these EVs all end up within the next handful of years? The answer, of course, is in the used car market.

The second hand EV market is where it's at

In 2023 there was a significant surge in used BEV sales, reaching a record high of 118,973 units and a 90.9% increase compared to 2022, and with PHEV's also increasing by 25.1%. At the time of writing, Auto Trader has 19,300 used EV listings, with options available as low as £1,800 (US\$2,290) for a Nissan Leaf, £10,900 for a Vauxhall Corsa-e, and £15,500 for a Tesla Model 3.

The influx and sheer availability of used EVs means UK drivers now have access to a much greater volume of quality, reliable, higher

range EVs than ever before. That's why private buyers are turning to the second hand market when making the switch to electric, and exactly what the industry needs to expand the EV ecosystem in the lead up to 2035.

The future's bright

EVs are certainly not dead, and while there has been a drop in private buyer adoption at the start of 2024, the growing popularity of new fleet and business EVs, as well as the growing used private buyers' market, has been more than enough to strengthen the industry.

Considering the slowdown seen across a variety of sectors in the UK, like property (Savills predicts that UK property prices will fall by 3% in 2024) and hospitality (with an average of ten closures of licensed premises per day in much of 2023 according to AlixPartners), EVs are actually doing rather well all things considered. When the economy is down, buyers are simply less likely to buy expensive things.

With continued government support, and more collaborations between companies across EV supply chains, the EV markets can weather the economic storm and get back on track towards its very bright long-term projections. As a country leading the charge in EV ecosystem technology development, the UK is well positioned to both maintain and strengthen its position as a pioneer of the transition to electric vehicles.

The opinions expressed here are those of the author and do not necessarily reflect the positions of Automotive World Ltd.

Jordan Brompton is Co-founder and CMO of myenergi

The AutomotiveWorld.com Comment column is open to automotive industry decision makers and influencers. If you would like to contribute a Comment article, please contact editorial@automotiveworld.com

AI tech developments outpace regulation

Regulations must ensure companies remain ethical in their use of AI without also stifling progress. By Megan Lampinen

The excitement and enthusiasm surrounding artificial intelligence (AI) has resulted in technology outpacing regulation. Some federal initiatives have been put forward in markets such as China, Europe, and the US, supported by industry frameworks like National Institute of Standards and Technology's AI Risk Management Framework and the Organisation for Economic Co-operation and Development's Framework for the Classification of Artificial Intelligence Systems. But, on the whole, existing AI legislation remains limited.

Europe is nearing agreement on one of the more significant proposals, the EU AI Act, which could set a template for other regions. In December 2023, the EU Parliament and Council reached a provisional agreement on the potentially landmark legislation, which aims to provide a framework for the development, deployment and use of AI systems within the bloc. "The AI Act is extremely useful and fulfils a major role in making sure that companies remain fair and ethical in the way they use AI," says Pedro Pacheco, a Vice President of Research in Gartner's CIO Research Group.





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Cerence's Chat Pro leverages a multitude of sources, including ChatGPT and LLMs

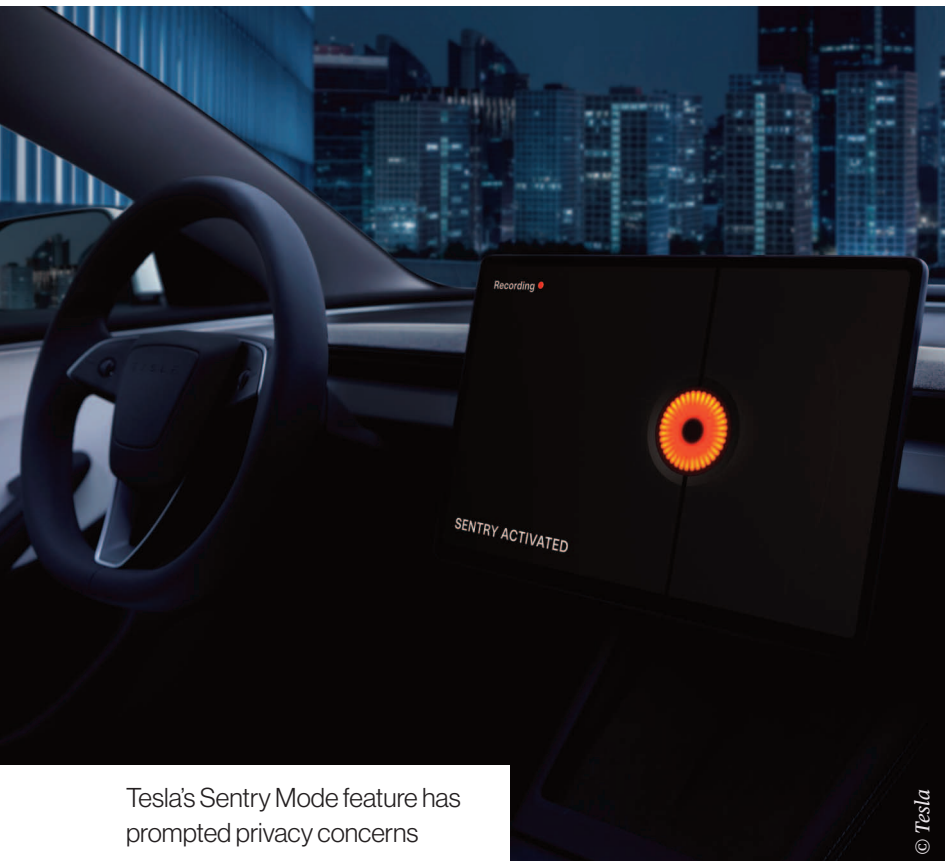
AI in Automotive

The global automotive AI market's value is expected to grow from US\$4.29bn in 2023 to US\$25.78bn by 2030, according to Next Move Strategy Consulting. The technology has applications across almost everything, from the design and production of vehicles to the provision of mobility products and services. One of the biggest concerns with any AI application is its potential risk to fundamental human rights.

Large language models (LLM) are a case in point. This type of AI

algorithm is becoming popular among automakers for infotainment applications, as it excels at understanding and generating human language. "When an application collects a lot of data, either because it is listening to what someone says or recording what they type, it needs to be clear what the automaker plans to do with that data and how it is handled," Pacheco explains. "Visibility and accountability are extremely important."

Among other things, the EU AI Act imposes legally binding rules requiring companies to notify



Tesla's Sentry Mode feature has prompted privacy concerns

consumers when they are interacting with a chatbot, biometric categorisation, or emotion recognition systems. It also requires them to label AI-generated content. In general, the Act focuses on mitigating harm in areas where using AI poses the biggest risk: healthcare, education, border surveillance, and public services. As of now, it does not specifically apply to the automotive sector. That doesn't mean it's not an important guideline for the industry, though.

"Even if automotive companies are not included in the final version of regulation, I would still recommend that they follow its guidance for one particular reason," Pacheco tells *Automotive World*. "If they start doing things that are not in line with the regulation, that will alert the regulators, which will then make compliance mandatory. For now, it's serving as a word of warning."

Indirect impact

The general expectation is that AI regulation will be incorporated into the vehicle homologation process. "Homologation is the de facto process for enforcing regulation around development and sale of the vehicle," he notes. "It already encompasses several software features. The homologation process will simply be a way for the AI Act to be enforced."

The German Association of the Automotive Industry (VDA) certainly thinks so, noting in a statement: "Although the car industry is exempt from the AI Act, the regulations are to be incorporated into the EU regulation for the approval of motor vehicles in the future." The VDA's current concern is lack of clarity, and it warns: "There is great uncertainty if the regulatory framework is not precisely defined. We therefore call on the actors involved in legislation to come to a clear and speedy agreement."

Other regulations indirectly impact AI applications in vehicles, such as the EU Data Act. "Data is the fuel of AI, and if a company doesn't have the right data, then it cannot develop AI," says Pacheco. Privacy laws also indirectly touch on AI, and this includes the General Data Protection Regulation (GDPR). "There have already been concerns in some countries with existing systems embedded in numerous vehicles," observes Pacheco.

One such example is 360-degree camera vision, which can record anything happening around the vehicle. Tesla's Sentry Mode uses cameras and computer vision to detect and record suspicious activity around the vehicle when it is parked

and locked. Certain regulators were concerned about what this means in terms of privacy. “Someone might simply walk past the car and have absolutely nothing to do with it, but still the camera will film them because they came too close,” Pacheco points out. Tesla was forced to provide a warning to passers-by: Sentry Mode pulses the headlights, sounds the alarm, and displays a message on the touchscreen indicating that the cameras may be recording.

“More governments may express similar concerns as more cars adopt similar systems,” he predicts. “In the future, we may see them start putting in regulations to limit the ability of those systems.”

Race for AI leadership

The promise of AI is game-changing, and the country or region that leads could reap huge rewards. In the global fight for AI supremacy, China and the US are emerging as the main contenders. Europe doesn’t want to be discounted in this race, but is the EU AI Act a step in the right direction?

VDA President Hildegard Müller is concerned that it will stifle innovation and economic opportunity for the region. “The possibilities and development opportunities that AI offers should be more thoroughly considered in the legislative process,” he warns. “With the present draft, Europe threatens to become entangled in red tape and to slow down domestic industry in a globally intensified competition.”

With any sort of regulation, there’s a balance to be found. “It’s important to make sure that companies don’t do

bad things with AI, but you need to ensure that in a way that won’t stop progress,” suggests Pacheco. “Otherwise, Europe will be totally out of contention in this AI race.”

“

The question here is not whether there will or won’t be more regulation on AI, but how it will be done

Looking ahead, he expects the US and China to put forward more regulation targeting AI, but traditionally both countries have been “more focused on speed of technological development.” A flexible approach to testing and piloting has been one of the main reasons why they are leading the push towards autonomous driving at the moment.

“The question here is not whether there will or won’t be more regulation on AI, but how it will be done,” Pacheco clarifies. “Europe tends to be more conservative. Who is right and who is wrong will surely be a major discussion, and everyone will have an opinion. But what’s undeniable is that there is a balance in protecting citizens and technological progress. How to find the right balance is the big question.”

What is the true value of partial automation systems?

Some automotive industry safety analysts believe partial vehicle automation brings no safety benefits, yet investment is set to continue. By Will Girling



The [bad press](#) experienced by fully autonomous (SAE Level 4) robotaxis has made developers aware that the industry needs a [cultural reassessment](#) to continue drawing in investors and customers. Meanwhile, the global market for advanced driver assistance systems (ADAS) is expected to follow a steady upward trajectory. By 2029, Statista forecasts that it will reach US\$125.4bn, up 116% from its 2024 valuation.

With a significantly less complicated technological challenge to overcome, several legacy automakers are iterating Level 2 (partial automation) systems.

These include General Motors (Super Cruise), Ford (BlueCruise), and Tesla (Autopilot). Since 2020, performance assessment programme Euro NCAP has provided consumers with graded safety information on the assisted driving tech available on the market.

However, the actual safety of partial driving automation systems is disputed. In a March 2024 announcement, the US nonprofit Insurance Institute for Highway Safety (IIHS) introduced its own ratings system. In a blow to the claims that ADAS could be a tool for safer roads, the IIHS found that only 7% of those it tested were deemed “acceptable.”

	Partial automation safeguard ratings							
	Overall rating	Driver monitoring	Attention reminders	Emergency procedures	Driver involvement			Safety features
					Lane change	ACC resume	Cooperative steering	
Lexus Teammate with Advanced Drive 2022-24 Lexus LS	A	M	G	A	G	A	G	G
General Motors Super Cruise 2023-24 GMC Sierra	M	P	G	G	P	A	P	G
Nissan ProPILOT Assist with Navi-link 2023-24 Nissan Ariya	M	M	A	M	G	G	G	A
BMW Active Driving Assistant Pro 2023-24 BMW X1	P	M	P	A	G	P	G	A
Ford BlueCruise 2021-24 Ford Mustang Mach-E	P	A	G	M	G	M	G	P
Ford Adaptive Cruise Control with Stop & Go and Lane Centering Assist 2021-24 Ford Mustang Mach-E	P	A	G	M	G	G	G	P
Genesis Highway Driving Assist 2 2023-24 Genesis G90	P	P	P	P	G	M	G	P
Genesis Smart Cruise Control/Lane Following Assist 2023-24 Genesis G90	P	P	P	P	G	G	G	P
Lexus Dynamic Radar Cruise Control with Lane Tracing Assist 2022-24 Lexus LS	P	P	P	P	G	G	G	M
Mercedes-Benz Active Distance Assist DISTRONIC with Active Steering Assist 2022-23 Mercedes-Benz C-Class	P	M	P	A	G	G	G	P
Nissan ProPILOT Assist 2.0 2023-24 Nissan Ariya	P	P	A	M	G	G	G	G
Tesla Autopilot, Version 2023.7.10 2021-23 Tesla Model 3	P	P	P	A	G	P	P	P
Tesla Full Self-Driving (Beta), Version 2023.7.10 2021-23 Tesla Model 3	P	P	A	A	P	P	P	P
Volvo Pilot Assist 2022-24 Volvo S90	P	P	P	M	G	G	G	P

G Good
 A Acceptable
 M Marginal
 P Poor

Worrying results

According to the IIHS, a robust partial automation system has eight components. Four are positive: it must monitor the driver's gaze and hand position, use multiple driver alerts that escalate in intensity, include a fail-safe procedure that prevents further automation during a fault, and conduct lane changes only when prompted or confirmed by the driver. The other four are negative: adaptive cruise control must not automatically resume after a long break, lane centring should not discourage steering wheel input, and automation features can neither be engaged without the driver wearing a seatbelt nor with AEB and lane departure prevention disabled.

“

This development towards highly automated driving will become a key factor for customers in major regional markets

The IIHS' first batch of safeguard ratings featured 14 systems from leading manufacturers like Mercedes-Benz, Tesla, Volvo, Nissan, and Lexus. Each aspect was rated on a four-level scale—good, acceptable, marginal, and poor. By the organisation's criteria, no system attained a 'good' rating. Only Lexus' Teammate with Advanced Drive scored an 'acceptable' overall rating, while GM's Super Cruise and Nissan's

Pro Pilot were only 'marginal'. The rest were considered 'poor', with Tesla Full Self Driving and Volvo Pilot Assist bottom of the pack.

When the results were announced, David Harkey, President of the IIHS, called the rapid emergence of apparently unsafe ADAS systems “worrying” and concluded there is “little evidence” that they make driving safer in their present form.

Becoming essential

Despite the IIHS' relatively damning verdict, some companies are undeterred in their championing of automated driving (AD) features. In fact, Volkswagen—which did not have a system tested by IIHS—announced an intensified partnership with AD tech company Mobileye shortly after the ratings results were released. “We do believe that advanced AD functions will become an essential feature for customers in all major regions,” Michael Steiner, Head of R&D at VW, explains to *Automotive World*.

Based on current market trends, he anticipates that new mobility and transport services utilising AD in some form will reach “a significant size and business impact” over the next ten years. This correlates with January 2023 analysis by McKinsey & Co, which predicts ADAS and AD technology will cumulatively generate US\$300-400bn for the passenger car market by 2035. Assuming this comes to pass, Steiner adds, “This will offer VW considerable opportunities, and that is why we're pushing forwards.” He does not reveal what specific new AD functions customers can expect in the near future, stating only that VW is “diligently working” on their development.



2022 Lexus LS 500h—the OEM's Teammate is the only partial automation system to receive an 'acceptable' rating from the IIHS

In the IIHS report, it is notable that Harkey caveated that each of the systems tested performed well in at least one aspect of safety. This gives hope that Level 2 functionalities could be improved over time with relative ease, perhaps with individual software patches. However, Steiner prefers a more holistic approach from the onset: rather than a collection of features or elements, the best product should function as a comprehensive whole—from sensors to software and the driver interface.

A question of value

If partial automation does not currently improve safety, where does its actual value lie? VW Chief Executive Oliver Blume remains convinced that AD functions “will significantly boost convenience and safety” in the long term. The Group anticipates that working with Mobileye on its new E3 1.2 and 2.0 software architectures will enable the rapid deployment of AD across its premium model portfolios—Audi, Bentley, Lamborghini, and Porsche. Its roadmap is to eventually progress from Level 2 to Level 4 with a stack developed totally in-house.

However, at a wider industry level, there’s still plenty of work to do on Level 2 before Level 3 or 4 should receive greater attention. In 2022, the US National Highway Traffic Safety Administration found that 367 crashes were attributable to ADAS between July 2021 and May 2022. At this stage, then, partial automation may have more prospective than demonstrative value. With regulatory bodies now scrutinising existing AD technology in ways that weren’t anticipated at their conceptual R&D stage, the onus is on automakers to validate and justify their ongoing spend.

For Steiner, doing so at VW is an integral investment in the brand’s future. “Our customers will be able and will want to choose whether to steer their vehicles themselves or to let their vehicles drive in certain situations and areas. By 2035, this development towards highly automated driving will become a key factor for customers in major regional markets, especially in the premium-oriented segments.” Today, the kinks in ‘hands off, eyes on’ automation may still need to be ironed out. Once they are, he concludes that working towards ‘hands off, eyes off’ AD will become essential.



Will Tesla's Supercharger layoffs damage EV adoption?

The mass firing of Tesla's Supercharger team raises questions of financial upside and how it may impact consumer confidence in EVs.

By Stewart Burnett



© Tesla

The widespread availability of reliable public chargers will play a crucial role in enabling the success of electric vehicles (EVs). Standardisation of charger type is an important step towards ensuring this becomes a reality. Two competing charging standards have gained traction over the last decade: the Combined Charging Standard (CCS) and Tesla's proprietary North American Charging Standard (NACS). Significant progress towards standardisation has been made over the last 18 months, with all major automakers consolidating around NACS. In May 2023, Ford announced it would use the standard for its EVs starting in 2025. The last major holdout was Stellantis, which finally adopted it in February 2024.

The leading automaker in deploying NACS chargers is Tesla through its Supercharger

Network. At the time of writing, the network consists of more than 25,000 charging ports in the US and 55,000 worldwide. The company had been pushing its internal teams to ramp up the deployment of charging stations, with approximately 70,000 expected worldwide by the end of 2024.

These plans have changed abruptly. On 30 April, it was reported that the automaker had fired Rebecca Tinucci, Senior Director of Charging Infrastructure, alongside nearly all of the 500 employees responsible for operating and maintaining the system. Contractors and automakers were "blindsided" by the news, according to *Bloomberg*, with many unsure as to where their existing partnerships with Tesla on the charging network now stood. So, what compelled this decision, and what could it mean for the future deployment of NACS chargers?

An unpredictable actor

The Supercharger team wipe out came one week after a lukewarm Tesla earnings report: an 8.7% year-on-year drop in first-quarter revenue and a 674% drop in free cash flow to negative US\$2.5bn. Chief Executive Elon Musk subsequently announced plans to cut 10% of the automaker's workforce in April 2024. In an internal memo leaked by tech industry publication *The Information* that same month, Musk stated that going forward, Tesla will need to be "absolutely hardcore about headcount and cost reduction."

While the news has taken some by surprise, others believe the decision is typical of Musk. "It's important to recognise that this is not the first time that he has done something unpredictable, and it frequently turns out to be extremely misguided," says



The Supercharger Network is widely regarded as the “gold standard” for EV charging

© Tesla

Katherine Garcia, Clean Transportation for All Campaign Director at environmental nonprofit Sierra Club. As a result of the decision, there is near-universal tension about what happens next. Many automakers have already told their customers they will soon be able to use the Supercharger Network, and it is no longer clear whether this remains the case.

“Musk has a history of executing massive layoffs if he feels pressure to achieve or maintain profitability,” states Karl Brauer, Executive Analyst at iSeeCars. As an example, he cites the acquisition of Twitter and the subsequent firing of 80% of the company’s staff, including those responsible for moderating inappropriate content. While Brauer

highlights that Twitter (now X) defied expectations and remains “intact”, the lack of moderation has nevertheless contributed towards advertising revenues falling from US\$4.73bn in 2022 to US\$2.5bn in 2023.

Brauer also acknowledges that, at present, the mass firings do not make financial sense. Serving as the US’ primary charging network, in his view, “sounds like an excellent business model.” BloombergNEF estimated in April 2024 that the automaker could generate US\$7.4bn in revenue and US\$740m in profit from its charging network by 2030. Meanwhile, Musk’s litigious battle to receive US\$56bn in compensation for his leadership of Tesla—likely far more costly than any potential losses from the charging network—remains ongoing.

Consumer confidence

While the business case for firing those responsible for Tesla’s Supercharger Network faces some degree of scrutiny, there is agreement that it will diminish consumer confidence in EVs. “I own a Tesla, and it’s not because of the car itself,” remarks Dunstan Power, Managing Director of charging consultancy Versinetic. “It’s because of the Supercharger network, which gives me confidence that I can drive anywhere in the UK.” This, in his opinion, is Tesla’s greatest strength and the most important thing it alone can offer in an increasingly competitive EV market. The layoffs could give consumers the impression the automaker is no longer convinced there is a future in passenger EVs as it looks towards robotaxis for a new source of revenue.

The day following the layoffs, Ross Gerber, President and Chief Executive of investment management firm Gerber Kawasaki, issued a public statement expressing his dismay and characterising the Supercharger network as the “key piece for mass adoption of EVs.” No other charging operator has been able to match Tesla on reliability: a 2023 US consumer survey conducted by analytics firm JD Power revealed that while 21% of drivers had encountered a faulty CCS charger in the last 12 months, only 4% had experienced issues with a Tesla-made NACS charger.

Musk has acknowledged that the layoffs will likely have a “slowing” effect on future charger deployment. Garcia highlights that the timing of the decision is highly peculiar, given that automakers have come together to “elevate” NACS, and the US government is currently awarding grants for the deployment of new charging infrastructure. “With a more limited team, NACS deployment will inevitably slow down unless other automakers and companies step in to fill in those gaps.”

Brauer believes the layoffs are potentially indicative of a deeper problem with the EV business model. He remarks that it is unlikely Musk would make such a financial play unless he had thoroughly assessed the numbers and concluded the investment was no longer worthwhile. “If even the Supercharger Network can’t be profitable in the long run, then the business model for EVs and their required infrastructure looks quite bleak.”

Such pessimism may not be shared by other companies in the charging space that are currently looking to

ramp up their operations—and their partnerships with Tesla. BP announced on 10 May 2024 that it plans to invest a further US\$1bn expanding its charging network using NACS. Following the layoffs, the energy giant is also looking to acquire a number of existing Supercharger stations.

“

Musk has a history of executing massive layoffs if he feels pressure to achieve or maintain profitability

Whether or not Tesla’s own network continues to grow at the same rate as before, Garcia concludes, the news has not diminished other automakers’ confidence about aligning around NACS. There is a consensus that the Supercharger news is unlikely to instil confidence among consumers about the state of EV charging. However, this can be reversed, provided other players in the charging space successfully ramp up their own efforts, both in terms of charger deployment and bringing reliability up to par with the “gold standard” of the Supercharger Network.

Cupra doubles down on design, but moves beyond cars

It turns out, cars are just the start of Cupra's design obsession, writes Megan Lampinen



Cupra has never shied away from bold design, even—perhaps especially—when it proves polarising. From the start, the company has positioned itself unapologetically as a design-driven brand for people who love to drive. Now it's taking that design obsession into new realms outside of automotive with the standalone design house Cupra Design. This new business unit will oversee the existing lifestyle merchandise range but also work with a wide range of other companies from various industries as a design consultant. The stated ambition of Cupra Design is “to become the go-to place for those who want bold, unconventional designs, no matter their product or project.”

It's a risky move, potentially consuming valuable resources with little ROI at a time when investment demands in the core automotive product are soaring. But it's also

much in line with Cupra's brand positioning and could prove an additional spur to the current sales momentum the brand is enjoying with its existing line-up.

The next chapter

Cupra is riding a wave of growth in its home region of Europe, where first quarter sales are up more than 21% year-on-year, and its Formentor grabbed the title of bestselling crossover SUV. Both the Formentor and the Leon, central to Cupra's positioning and success, have been refreshed and are poised to arrive at dealerships later in May 2024. The brand is also advancing its global ambitions and confirmed a US launch by the end of the decade. It's now time for the next chapter in its story.

“Design is in all we do, see, and feel,” Design Director Jorge Diez told attendees at a media event in Madrid.



“Our obsession with design is part of our nature.” As Chief Executive Wayne Griffiths put it: “Design is the red thread that goes through everything we do. It’s in our DNA: it’s not just our cars but also in the way we behave, the way we dress, the places we work.” The new Design house intends to work with companies that share the same brand values and incorporate a little of that Cupra DNA into their own products. “We only collaborate with people that share the same spirit and push boundaries like us,” added Diez.

At the Madrid event, the new Formentor and Leon shared the spotlight with sustainable jewellery brand MAM and Barcelona lighting design studio Marset. The former is working with Cupra to create a line of products including a ring and

“Welcome to the Tribe” bracelets. The products are made from ruthenium and copper, which Cupra also uses in its vehicle designs. Marset showed off a Dipping Light that “shares Cupra’s aesthetics values of being refined and sophisticated, yet emotional and unconventional.”

You know it’s Cupra

From the start, Cupra has presented itself a different breed of automaker. From the language it uses for its fans—ranging from “band of believers” to “Tribe”—to the informal first name only C-Suite introductions and distinct sartorial style at public events, it’s clear Cupra wants to defy conventions. With that mentality, why should a carmaker stop at just cars?

Jorge Diez at the Madrid launch of the new Cupra Formentor





The Cupra City Garage Madrid features a multidisciplinary showroom, a restaurant and an auditorium along with an immersive reality space called the Mad Room by B-Lab

“From our Cupra City Garages to our clothes collection, stands, offices and events like this, every corner and detail reflects Cupra’s unique aesthetics,” asserted Head of Cupra Design Francesca Sangalli. “You can see a design, and without it being a car, you know it’s Cupra.”

Griffiths echoed this sentiment, describing Cupra as “more than just a car; it’s an expression of our obsession, an attitude, passion amplified.” Could it be profits amplified as well? The design house itself offers an alternative revenue stream, though management is not disclosing any financial targets or projections at this stage. It also doubles down on the brand’s

design-centric positioning. Griffiths described the formation of this new business as “the most important venture to date beyond Cupra car brand.”

As much of the industry turns its focus to sustainability, autonomous driving, software-defined vehicles and shared mobility, Cupra is making its own priorities very clear. “We don’t copy others, we don’t follow rules,” declared Diez. “We don’t try to look for perfection or please anyone...It is crucial to have your eyes always open. To be curious and explore new territories. You need to know the limits and to break them. It is also important to know who you are not. You like it or you don’t. We are Cupra.”

US changes Mexico's stance on Chinese OEMs

With US trade tariffs on Chinese-made vehicles seemingly inevitable, Mexico's role in the ongoing trade debate is an open question. By Ian Henry

Under pressure from the US authorities, Mexico has withdrawn offers of incentives to Chinese electric vehicle (EV) manufacturers to set up in the country. Moreover, meetings between the Mexican government and Chinese OEMs have reportedly, for now at least, ended. In January 2024, BYD was apparently the last Chinese company to have a meeting with Mexican government officials regarding locating a factory there.

Around 20 Chinese car brands are sold in Mexico, holding around a 30% market share. However, other than JAC, a truck maker, there is no Chinese vehicle production in the country itself. The prospect of Chinese production in Mexico is something the US authorities are keen to avoid; they fear a flood of imports of Chinese products assembled in Mexico with very low levels of local or regional content. Such practice would technically be in breach of the existing US-

Mexico-Canada (USMCA) trade agreement that mandates certain levels of regional local content for tariff-free sales across the USMCA borders.

The Office of the United States Trade Representative (USTR) regards Mexico as potentially offering a backdoor route for Chinese automakers into the US. Imports from outside the USMCA pay a modest 2.5% tariff on arrival in the US, but Chinese vehicles have faced an additional 25% tariff since the Trump administration.

Politicians from both the Democrat and Republican parties have spoken of significantly higher tariffs on Chinese vehicles being applied, with Trump himself and Republican Senator Josh Hawley suggesting 100% tariffs on Mexican made Chinese brands on top of existing rates. Three Democrat senators, two from Michigan and one from Ohio, have also urged the Biden administration to raise tariffs on Chinese vehicles. Whoever wins the November presidential election, it is reasonable to expect not just restrictions on Chinese vehicles but also more pro-US industrial policies, whether in favour of EVs (in accordance with Biden's Inflation Reduction Act) or in favour of internal combustion engine vehicles (as supported in Trump's rhetoric). Mexican vehicle production, and especially its compliance with USMCA rules, will come under increasing scrutiny.



BYD Dolphin and Seal—the automaker’s plans for a 150,000 units per annum Hungarian plant could telegraph its ambitions for Mexico

This scrutiny will also likely include Tesla. Elon Musk has been encouraging local suppliers for a Tesla factory in China to come to Mexico, where the automaker plans to build cars in the near future. Tesla’s planned factory in Nueva Leon has been awarded Mexican government support of US\$153m. The North American content or value added of a Chinese company’s parts supplied to Tesla will likely come under close scrutiny of the US authorities.

Undoubtedly, this scrutiny will intensify over the next couple of years in the lead up to 2026 discussions on the extension to the USMCA deal. July of that year is when the deal could be extended for 16 more years, and Mexico will be especially wary of the US’ leverage at this point, especially if there is a second Trump presidency. The Biden administration has even expressed fears that Chinese vehicles, made in Mexico or in China, could be used to harvest data on US consumers, although this has not stopped US sales of the Buick Envision,

made in China for several years, seemingly without issue.

Meanwhile, BYD has reportedly said that any Mexican factory it opens will be for the local market, but it is unlikely that Mexican demand alone would support a facility of the size BYD would want to establish. In Hungary, the automaker will open a plant with an initial capacity of 150,000 units per annum, and this could indicate its target for Mexico.

Similar concerns would also apply to other Chinese brands looking at opening factories in the country. Whether Mexican-made Chinese brand vehicles end up in the US or not, Mexican factories would need an export role, as the domestic market alone would not justify the cost of building them. It is a question of where Chinese brands would export from Mexico. The EU-Mexico trade deal would make the EU a possible tariff-free market should Chinese OEMs not extract the local support they would likely want from European governments. Such

an agreement would depend on meeting origin of content rules in Mexico itself. BYD has already decided on a European plant—in Hungary—while Chery will start production in Spain in the near future. Meanwhile SAIC, Dongfeng, and Great Wall (which is reportedly looking at Mexican production) have yet to decide where their potential European plants will be located. They may also supply Europe from Mexico if European incentives do not meet their expectations.

US government policy, notably the incentive heavy IRA programme, has already diverted some investment in EVs and battery production from Europe to the US. Other aspects of US policy will now play a significant role in what the Chinese OEMs decide to do in Mexico, and this could in turn have wider implications if access to the US market for Chinese vehicle brands is prevented. Chinese-made Teslas, Buicks, and iPhones are acceptable, but Mexican-made Chinese branded cars are most definitely not on the US administration’s wish list.



Images © Xpeng

Xpeng Aeroht optimistic about the timeline for flying cars

With deliveries of its flying cars set for 2025 in China, Xpeng Aeroht believes they could soon become a dominant mode of transport.

By Will Girling

While flying cars have long been the domain of fantasy, the reality could arrive sooner

than many anticipate. Electric vertical take-off and landing aircraft (eVTOLs) are set to play an increasingly important role in the [future of mobility](#) from the 2030s onwards, though few manufacturers have announced concrete plans to combine them with road vehicles.

In January 2024, Xpeng Aeroht, an affiliate of Xpeng Motors, announced that it was preparing its first mass producible flying car model, the Land Aircraft Carrier. The final design has yet to be confirmed, although the company announced that it would be a six-wheeler pick-up model for private ownership market, accommodating four to five passengers and featuring an “extender-range hybrid power system”.

Chinese pre-orders will be accepted in Q4 2024, with suggested pricing between US\$170,000 and US\$200,000. Deliveries are expected to commence the following year. Until then, Wang Tan, Co-Founder and Vice President of Xpeng Aeroht, explains to

Automotive World that eVTOLs’ place in global mobility must be carefully shaped by the sector’s innovators.

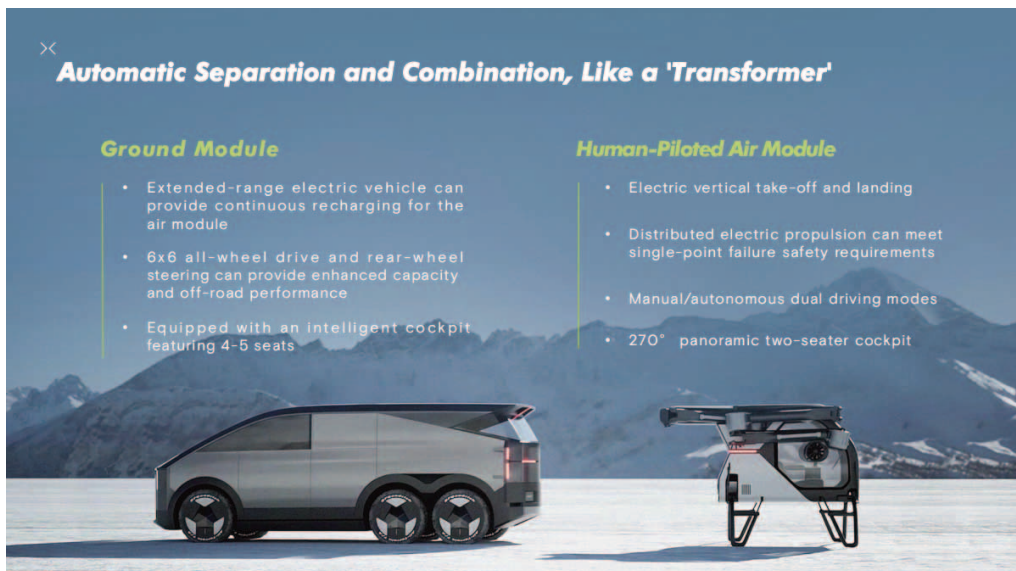
Three-dimensional transport

According to Tan, flying cars align with a global transportation market that increasingly demands greater levels of efficiency and convenience. “As a technology company at heart, we strongly believe that the future is now. Xpeng is dedicated to the research and development of the safest intelligent electric flying car and solutions in the field of 3D transportation.” As such, it is jockeying for leadership.

Globally, start-ups encompassing everything from [eVTOL racing](#) to [ride-sharing](#) have emerged, with both car and aircraft manufacturers entering the field. Tan believes this demonstrates the market’s wide appeal. While conceding that China’s domestic flying car industry remains in its infancy, he dubs it a “blue ocean opportunity”. Electric air taxi firm EHang secured type certification from the Civil Aviation Administration



Xpeng Aeroht's Land Aircraft Carrier in ground mode



of China (CAAC) in October 2023—the first in the world to achieve such a milestone. This confirmed that the company’s vehicle (EH216-S) satisfied the safety and airworthiness requirements necessary to conduct commercial passenger operations.

In 2020, Morgan Stanley forecast that global urban air mobility will become a US\$1.5tr industry by 2040. By using “the logic of the automotive market”, Tan states that Xpeng Aeroht has developed its own predictions for a potential timeline: by 2025, manufacturers will explore and demonstrate applications for flying cars; by 2030, they can start achieving scale within key applications; and by 2040, flying cars “will become the dominant mode of transportation, and the nature of human-centric mobility will become three-dimensional.”

Safe design

Tan’s forecast is notably optimistic at a time when players in neither the US nor Europe have yet developed a profitable business model for eVTOLs. Indeed, he caveats that the technology’s actual progress “may be

earlier or later than estimated, influenced by various factors.”

In order to secure a prominent market position, proving flying cars’ safety to regulatory authorities will be key. The Land Aircraft Carrier features a six-axis, six-rotor configuration featuring two reversible ducts. In the event of up to two rotors failing while in flight mode, the flight control system can make adjustments in milliseconds to keep the vehicle stable. Additionally, a multi-parachute deployment system can be safely deployed at just 50m altitude—significantly lower than the industry standard 200m.

Xpeng Aeroht is not the only company to develop a viable flying car concept—US manufacturer Aska intends to produce a network of its own vehicle (Aska A5) for shared mobility applications by 2026. However, while the latter’s flying apparatus is on display at all times, Xpeng Aeroht’s innovative automated modular deployment system keeps its rotors neatly concealed in the vehicle body when used on the road. This sleeker appearance could prove advantageous in marketing flying cars to its target audience.

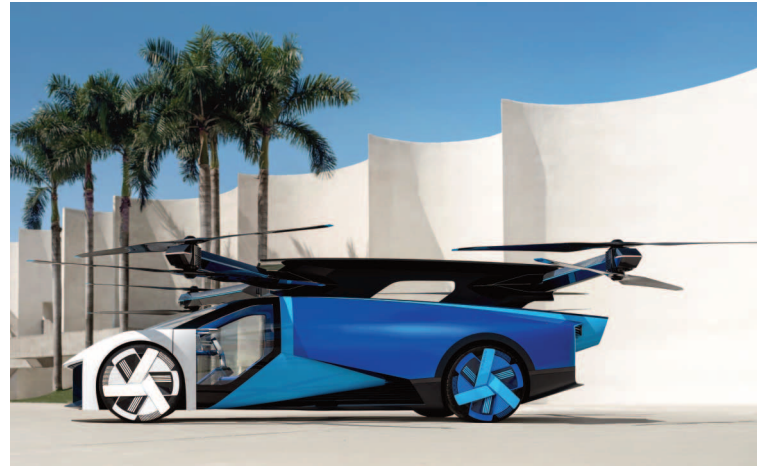
For now, the company will primarily focus on products designed, developed, and manufactured for the private user market. In 2022, it unveiled the design for its eVTOL Flying Car—a supercar model with a foldable flight system—which has yet to enter production. However, the company will also be exploring opportunities for business use cases, such as emergency rescue and scenic tourism: “We have received demand orders in this regard,” adds Tan. This may explain why Xpeng Aeroht has decided to release the more rugged and diverse Land Aircraft Carrier first.

Flying cars: when, not if

Defining the exact certification required for operating flying cars remains an unresolved question for the segment, and one which is likely to restrict their appeal. For land travel, Tan confirms to *Automotive World* that drivers need only a standard passenger car licence. For flight mode, a pilot licence will be required, and Xpeng Aeroht is trying to make acquisition as easy as possible: “Obtaining the corresponding flying licence will be simpler than a conventional one.” The company’s aircraft will support both automatic and manual driving modes, which he claims will make it “very simple and easy” to fly. “We are coordinating with regulatory authorities to confirm the type and certification process of the flying car’s necessary licence.”

As Xpeng Aeroht continues to develop and scale its product offerings, he anticipates a smoother procedure for bringing them to market quickly. “During the R&D

process, the company will gain corresponding procedures for conducting test flights. During mass production and delivery, a product



A concept image for Xpeng Aeroht's eVTOL Flying Car in flight mode

airworthiness certificate will be issued, allowing for normal use and flight.” At the time of writing, Tan confirms that the company is in communication with relevant departments of the CAAC as part of its preparation to formally submit an airworthiness application.

Since Tan believes that both sales and demand for flying cars will be initially concentrated in China, which already has a regulatory head start on other regions, this is where Xpeng Aeroht will initially focus its product development. “However, we are a globally oriented company, and in the future, we will have corresponding plans for international expansion.” With rival urban air mobility markets like [Singapore](#) in close proximity, an innovation race in Asia could accelerate during the second half of the 2020s. Now more than ever, the emergence of flying cars looks more a question of ‘when’ not ‘if’.



UAE makes a play for multimodal AV leadership at DriftX 2024

At DriftX 2024, the UAE embarked on a series of partnerships intended to make it first to realise autonomous driving at scale.

By Stewart Burnett

The mobility landscape is being shaken up by artificial intelligence (AI). Ignazio Dentici, Vice President of Global E-mobility and Automotive, Manufacturing Intelligence Division, Hexagon, told *Automotive World* in April 2024 that an “AI revolution” is [currently unfolding](#) in the auto industry. Areas of disruption include vehicle design and how [logistics companies manage their load](#).

Perhaps the most transformative use, however, is enabling autonomous driving (AD) and associated technologies like advanced driver-assist systems (ADAS). While integral to the control of an autonomous vehicle (AV), AI is also an important tool for training these systems and helping them interpret the range of inputs that come from geospatial positioning, on-vehicle sensors, and other objects in their environment (V2X).

Several regions are making a play for leadership in AVs. In April 2024, Tesla’s Elon Musk held exploratory

talks with Chinese ride-hailing app Baidu to enable Full Self-Driving technology in the latter's tentative robotaxi service. Another country making a leadership play is the United Arab Emirates (UAE), which held its inaugural DriftX conference on 25 and 26 April 2024 on the theme of enabling self-driving technologies across multiple modes of transport, including road vehicles and electric vertical take-off and landing aircraft (eVTOLs).

In addition to promoting public-private partnerships with the national and municipal government, the event also served to introduce and normalise AD technologies to the general public. So, by these metrics, was it a success?

Tech positivity

Attended by almost two dozen companies in the automotive, eVTOL, maritime and AI sectors, DriftX 2024 brought several fields of expertise together to network, discuss strategies, and discover potential partnerships. Mohamed Ali Al Shorafa, Chairman of the Department of Municipalities and Transport (DMT) of the UAE, stated that such initiatives are part of a wider "holistic objective for the Abu Dhabi government."

"We're driven by partnerships, and these will make the autonomous wave go even faster," remarked Hasan Al Hosani, Chief Executive at automotive AI firm Bayanat, title sponsor of DriftX 2024, to *Automotive World*. "To be exploring that with all these companies and seeing them come together under one umbrella has been really amazing." Twelve memorandums of understanding

(MoUs) and agreements were signed by local and global players during the conference.

One example is Bayanat's partnership with South Korean AD firm Autonomous a2z to combine their respective expertise in developing AD technologies. This partnership was kickstarted with a live demonstration of a vehicle 7,000km away in South Korea, which was safely tele-operated from Bayanat Plaza, intended to showcase to both industry and the general public how fast and reliable automotive cloud servers were becoming.

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We're driven by partnerships, and these will make the autonomous wave go even faster

Another multilateral MoU was between eVTOL firm Joby Aviation and three government departments: the DMT, the Abu Dhabi Council of Economic Development, and the Abu Dhabi Department of Culture and Tourism. This partnership intends to lay the groundwork for Joby Aviation to establish and scale air taxi services in Abu Dhabi and across the region. "The UAE is really forward-leaning on technology and keen to explore how



Joby Aviation's FAA Precision eVTOL on display at DriftX 2024

government can partner with private industry to accelerate adoption and deployment,” said Eric Allison, Chief Product Officer, Joby Aviation, to *Automotive World*. The first deployment of a Joby aircraft is expected in 2025.

The road to flying robotaxis

While AD in road vehicles was a prominent feature of DriftX, more attention was given to eVTOLs. “The UAE offers a unique opportunity for this industry to realise these crafts,” said Adam Goldstein, Chief Executive of Archer Aviation. “The whole ecosystem here has been excited about bringing eVTOLs to market, and it is our mission to operate in the UAE as soon as possible.” He noted the ease by which the firm has been able to embark on partnerships across the region, looking at aspects of operations including the

component sourcing, final assembly, and maintenance.

It was subsequently announced in a panel by Aqeel Ahmed Al Zarouni, Assistant Director General, Department of Aviation Safety Affairs, that the UAE issued its first approval for a vertiport, located on Yas Island in Abu Dhabi for construction in 2025. “This technology was seen as something futuristic, but now it is a reality that is happening,” he stated.

A recurring sentiment at the event was that the deployment of eVTOLs could potentially be undermined by a lack of available pilots. In 2023, flight training provider CAE forecast a need for 284,000 new general aviation pilots by 2032, with a potential shortage of up to 50,000 by 2025 alone. “Where do we get all of these pilots from? It’s a big concern for us,” Jürgen Greil, Founder and Chief Executive of FlyNow Aviation, told *Automotive World*. However, he

proposed a solution: “We intend to fly automatically with no pilot onboard.” In addition to removing around 100kg in payload from a given craft, Greil emphasised, this could also help significantly reduce total cost of ownership. It should be noted, however, that initial deployments of eVTOLs in the region will not be autonomous.

Don't crash and burn

The UAE government has taken steps to regulate the nascent AD industry, including provisions on necessary licences and permits and who is liable in the event of a crash. However, comprehensive technical, safety, and security standards have yet to be articulated. While DriftX was designed to generate excitement and trust in the technology, the event also revealed how premature it might be.

During a live demonstration, Korean aviation firm V-Space's single-passenger V-Speeder V2 experienced a flight control issue and spun out, ultimately crashing into the nearby ocean. On the one hand, Rani Plaut, Chief Executive and Co-founder of personal eVTOL company Air (which did not attend DriftX), believes this is due to V-Space scaling up a drone to accommodate a human payload without properly adapting the design. On the other, he highlighted the importance of not pushing the boundaries of the end user's limited trust. “We only need one fatal crash to damage this entire industry. Putting fully AD on top of eVTOL is only increasing anxiety levels.”

Indeed, one of the key functions of the DriftX event was to introduce and normalise multimodal AD to the general public, with roughly 8,000

attendees across its two-day duration. On the whole, however, Bayanat was pleased with the public reaction. “I was very excited to see how people were reacting to smart mobility. There's a diversity in age here,” says Al Hosani. “When you see an autonomous car driving around, or a drone, you can grab people's attention and bring them on board.”

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When you see an autonomous car driving around, or a drone, you can grab people's attention and bring them on board

He also offered a concession: for the foreseeable future, it is more likely and “practical” that the UAE utilises ADAS at scale than full AD. This will still minimise accidents, he emphasised, while paving the way for widespread AVs in the future. At the time of writing, the UAE intends to deploy only 4,000 AVs on the roads by 2030, a small fraction of the region's 3.5 million total parc. Ultimately, Bayanat concluded that the UAE's mission was not only to bring this technology to market but to show the world how to integrate it safely.



ESG requirements spotlight complexity of EV supply chain

From recycling and circularity to regulations and economic development, Tim Hotz explores the complexities of creating a sustainable EV battery supply chain

The urgent need to combat climate change has spurred global efforts to transition away from fossil fuels towards clean energy solutions. Electric vehicles (EVs) represent a crucial component of this transition, offering the promise of reduced carbon emissions and improved air quality. However, the widespread adoption of EVs presents its own set of challenges, particularly in securing a sustainable supply chain for the critical minerals required in battery production.

Central to the proliferation of EVs are advanced battery technologies, which rely on a range of critical minerals. Compared to traditional internal combustion engine (ICE) vehicles, EVs require significantly larger quantities of minerals, particularly for their battery systems. For example, a typical battery electric vehicle (BEV) necessitates six times the mineral input compared to a conventional ICE car.

The two predominant battery cathode technologies, Lithium-Nickel-Cobalt-Manganese-Oxides (NCM) and Lithium-Iron-Phosphates (LFP), rely heavily on minerals such as lithium, nickel, cobalt, and natural or synthetic graphite. These minerals are essential for enhancing battery performance, energy density, and overall efficiency.

Supply chain risks and challenges

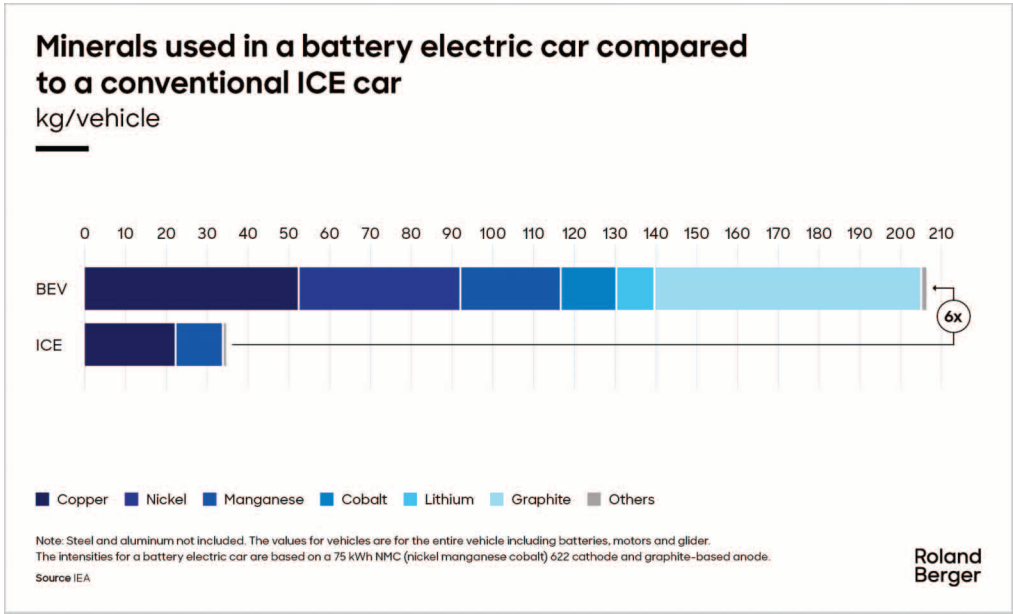
While the transition to EVs offers environmental benefits, it also presents significant supply chain risks and challenges. The global concentration of critical mineral reserves and mining operations raises

concerns about supply availability, price volatility, and geopolitical instability. Additionally, the extraction and processing of these minerals can entail significant sustainability risks.

Specific mineral challenges

Lithium is the key component in all lithium-ion batteries, and its extraction can present several environmental challenges. The primary sources of lithium are brine and spodumene ore. In regions such as South America and Australia, lithium extraction from brine sources can contribute to water scarcity, as the process requires significant water usage. Additionally, the extraction of lithium from spodumene ore can result in soil degradation, air and noise pollution, and negative biodiversity impacts. Efforts to mitigate these risks include implementing water recycling and conservation measures. Potential alternatives to traditional lithium extraction methods include direct lithium extraction technologies and the development of new lithium sources, such as geothermal brines and seawater. These alternatives offer the potential for more efficient, sustainable, and economically viable lithium extraction practices.

Nickel is essential for enhancing the energy density and stability of lithium-ion batteries, but its extraction and processing can pose equally significant challenges. Most of the nickel production comes from laterite or sulphide ore, with significant reserves located in Indonesia, Australia, and Brazil. Nickel mining activities have led in the past to significant air and water



Minerals used in electric cars compared to conventional cars

pollution, habitat destruction, and conflicts with local communities. Deep-sea tailings disposal, a common practice in nickel mining, has raised concerns about its environmental impact on marine ecosystems. Solutions to address these challenges include adopting more sustainable mining practices, reducing reliance on deep-sea tailings disposal, and enhancing environmental monitoring and regulation.

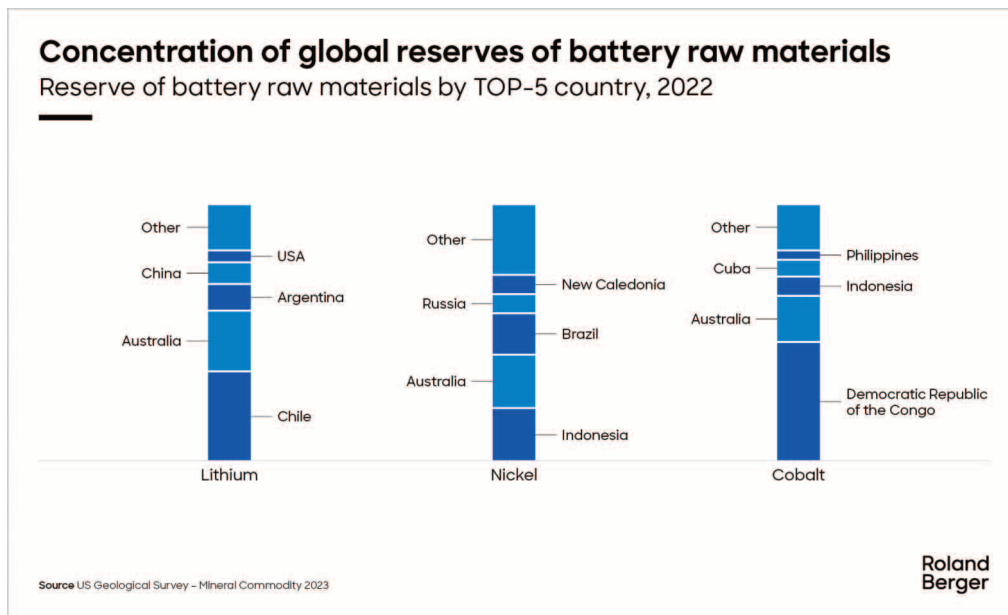
Cobalt plays a critical role in stabilising lithium-ion batteries, but its extraction is especially associated with water pollution and water depletion. Various scientific studies and reports by civil society have shown that the waters in the vicinity of cobalt mines were heavily polluted with heavy metals and acids in the past. Efforts to address this challenge include implementation of environmental policies (e.g., closed water loops without waste water discharge) and improving traceability and transparency in the cobalt supply chain. In addition, the cobalt content is expected to be gradually reduced with the coming battery cell generations and a shift towards

batteries with a high nickel content and LFP batteries.

Regulatory initiatives

Recognising the need for greater transparency and sustainability in battery production, the European Union has adopted regulations aimed at improving supply chain practices. Producers and importers selling batteries in the EU must implement due diligence policies concerning the raw materials lithium, nickel, cobalt, and graphite. For social and environmental risk categories such as air, water and soil pollution, damages to biodiversity as well as human and labour rights need to be considered. Additionally supply chain transparency needs to be ensured through disclosing information on the country of origin of raw materials and the suppliers involved.

The EU regulation’s strict due diligence requirements for OEMs and battery producers will have a significant impact on ESG efforts in the upstream value chain and could



Concentration of global reserves of battery raw materials

promote exploration of alternative sources and more sustainable refining processes. ESG compliance is destined to become a baseline expectation, potentially prompting the valuation of materials with reduced environmental footprints at a premium. Mining and processing methods that have high environmental impacts (e.g., high CO₂ emissions or deep-sea tailings) will no longer be acceptable. Non-compliant players therefore risk exclusion from the EU market and could face greater difficulties in raising capital for new projects or project expansions.

Moreover, the EU mandates the usage of secondary materials through minimum recycled material requirements for every battery sold within the bloc. Commencing in 2031, EV batteries must include at least the following proportions of recycled content: cobalt 16%, nickel 6%, and lithium 6%. Subsequently, from 2036 onward, these proportions are set to increase to cobalt 26%, nickel 15%, and lithium 12%.

The ESG requirements imposed by the EU might also have a knock-on effect on other EV markets such as the US, where current regulatory pressure on supply chain transparency is focused more on localising and reducing dependence on China.

Towards a more sustainable future

Creating a sustainable EV and battery supply chain requires concerted efforts from governments, industry stakeholders, and civil society. While EVs offer a promising pathway towards decarbonising transportation, addressing the challenges associated with critical mineral supply chains is essential for ensuring the long-term sustainability of the transition. By adopting responsible sourcing practices, implementing robust regulatory frameworks, and fostering collaboration across sectors, players can navigate the complexities of the EV revolution and accelerate towards a cleaner, more sustainable future.

About the author: Tim Hotz is Principal at Roland Berger

Battery recycling trumps second-life in economic argument

Recyclate mandates and battery price drops to create massive market for recyclers. By Megan Lampinen



As the electric vehicle (EV) parc grows and ages, the question of what to do with an end-of-life EV battery becomes more pressing. The two options today are to pass it on to a second-life application, usually in some form of energy storage, or to recycle it. The markets for both offer promising growth potential, but they are certainly not equal.

IDTechEx forecasts that the second-life EV battery market will be worth US\$7bn by 2033, with Fairfield Market Research projecting a slightly more bullish US\$9bn by the end of 2030. Those projections pale in comparison to recycling. McKinsey describes the potential value creation for EV battery recycling as “massive” and estimates the market value at US\$95bn by 2040. So, why the huge gap?

Economics

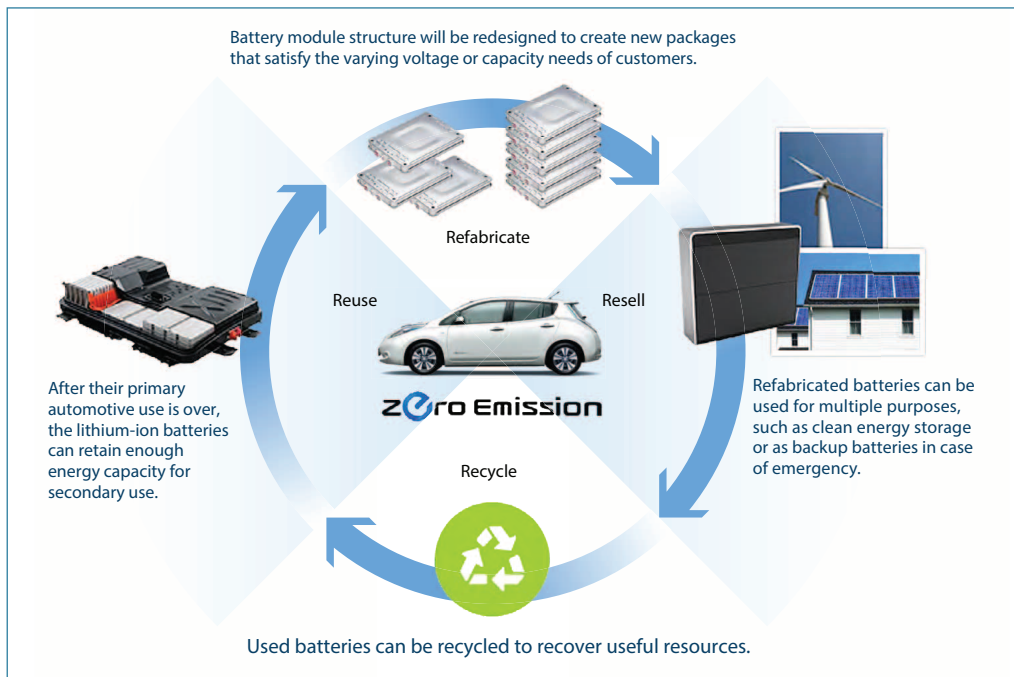
“Second-life use of batteries has been technically demonstrated to be entirely feasible,” explains David Greenwood, Director for Industrial Engagement and Chief Executive of the High Value Manufacturing Catapult at WMG, an academic department at the University of Warwick and a UK hub for battery research. WMG has run programmes taking ten-year-old EV batteries with 60-80% remaining useful state of health and converted them for second-life application. The projects confirmed that these batteries could serve in a more benign environment, working less hard than they would in a vehicle, for another five to ten years.

The core of the challenge is more economic than technical. Part of that is down to the rapidly declining cost

of new batteries. Chemistries like lithium-iron phosphate and sodium-ion promise a particularly affordable battery in the future, with Greenwood estimating prices dropping as low as US\$50/kWh. By the end of 2023, lithium-iron phosphate packs were averaging about US\$130/kWh, according to BloombergNEF. “By the time all the engineering work has been done to prove these second-life batteries are safe and usable, the cost to a manufacturer of a stationary energy storage system will not be much lower than the cost of brand-new cells from the market that will outlast them,” he explains.

Mandates

At the same time, mandates around recycled content in new batteries will create a huge demand for these materials. By 2030, Europe will require that all new batteries contain a minimum share of recovered cobalt (12%), lead (85%), lithium (4%), and nickel (4%), rising to 20% for cobalt, 10% for lithium and 12% for nickel—lead remains the same—five years later. The US doesn’t face the same government mandate, but there are similar aspirations to increase recycling. The Department of Energy has spoken of the need to create a battery ecosystem that can recover 90% of spent lithium batteries by 2030. The restrictions around the federal EV tax credit also serve as incentive to buy domestically recycled material; the credit is limited to cars with batteries that include a minimum amount of critical minerals that were mined, processed, or recycled in the US or by a free-trade partner. Environmental groups have been pushing for more formal requirements.



© Nissan

Nissan is just one of the many companies exploring second-life options for EV batteries

Regardless of what emerges in the US, Europe’s mandate alone will be enough to create a massive demand for recycled battery materials. The new mandate will also coincide with growing uptake across the EV market, and growing production volumes. “We will find that the materials in those batteries at the end of the vehicle’s life are worth more to a battery manufacturer than they are to a second-life application,” says Greenwood. “Essentially, the battery’s worth more as a box of materials than it is as a battery.”

Interestingly, recycling older batteries could prove the most lucrative. Some of these units had a much greater quantity of rare earth metals than more modern iterations. “In the nickel cobalt manganese batteries from ten years ago, about one-third of the content of the cathode material was cobalt,” he points out. Nowadays that’s typically less than 5%. “That means that for

every [older generation] end-of-life battery that we recycle, you can build six new ones from the cobalt that you recover from it. From an environmental perspective you may be better off recycling the materials in the battery into a much more competent battery going forward, rather than keeping an old technology running for a longer period of time.”

An economic knife edge

The scenario that Greenwood paints suggests recycling will become an incredibly lucrative business, but that’s down to the mandate. The business case for recycling without that kind of regulatory stick can be challenging. For some processes, it is more expensive to use recycled materials than it is to use virgin material. “One of the reasons to introduce the requirement to use recycle is to force that market, and

to make sure there is a demand,” he adds.

While the market potential of recycling is bigger than that of second-life applications, that doesn't mean these will disappear. “There are plenty of companies that have set off down the second-life path, and there are applications where it still makes sense,” he notes. “It's on an economic knife edge at the moment.” The new recycling regulations haven't yet come into force, but once they do, the situation could begin to change, and markets that make sense now may not make sense by the end of the decade.

R&D

Nothing stands still in the battery space for long, and even the best forecasts contain an element of uncertainty. The research taking place today at institutions like WMG could send the industry on a slightly different trajectory or introduce new priorities in the wider battery strategy.

“So far, the industry has been focussing on one type of battery to solve all automotive requirements, but now we're starting to see more specialisation: different types of batteries for different types of applications,” he says. For example, WMG is working on chemistries with a very high nickel content and solid-state batteries for use in premium vehicles or long-distance trucks. At the same time, there's growing interest in more affordable, lower-range battery chemistries for mass market EV models. “As charging infrastructure improves, there will



WMG's EV battery recycling research facility

be more demand for these cost-effective alternatives,” Greenwood adds.

He's particularly interested in sodium-ion batteries, which tackle sustainability not just in terms of recovering end-of-life materials but also what goes into the battery in the first place. WMG has active research programmes working to develop this. It also operates a battery recycling research facility. “We have people in the labs recovering lithium, nickel, manganese, cobalt, and other materials from end-of-life batteries, and we're working with companies to industrialise the processes that we're developing,” Greenwood says.

With potential for a game-changing chemistry or a revolutionary new recycling process on the horizon, the true value of the EV battery recycling industry remains in flux. What's clear is that the segment is attracting investment and interest. The route to a truly sustainable battery ecosystem may not be straightforward, but the hope is that it is indeed circular.

What's guiding the evolution of Bosch's Mobility business?

AI underpins Bosch's automotive roadmap, writes Megan Lampinen

Robert Bosch has been shaping the automotive industry with innovative technology for more than a century. Its product portfolio has come a long way since the magneto, which revolutionised vehicle ignition systems in the late 19th century. So too has its investment strategy. The company's Mobility business remains active in powertrain systems today but has also expanded into connectivity, automated driving, battery electric propulsion and hydrogen storage. All these technology areas are evolving rapidly and devouring huge investments in terms of finances and manpower. In today's increasingly challenging economic environment, backing the wrong technology could prove disastrous for even the most diversified businesses.

"Whether from a social or an ecological standpoint, our environment is not an easy one," Chief Executive Stefan Hartung told media at Bosch's April 2024 press conference. Pointing to political, economic, and environmental pressures impacting all areas of business, he cautioned that job cuts would be inevitable. Many of those are directly related to the company's internal combustion engine (ICE) business. "The end of ICE in new European vehicles is approaching, but we can't simply make up for every job lost as a result with new technologies," Hartung said. "Fewer jobs for gasoline and diesel, more jobs for electromobility and hydrogen—there likely isn't enough time for the two sides of this equation to balance out."



Images © Bosch

The company is putting in huge efforts to retrain workers. As part of its People Acquisition Campus and Mission to Move programmes, it has reskilled almost 3,000 people from within the powertrain business for new positions. The two programmes are now being extended to the entire Mobility business sector.

The training effort represents a huge commitment to new mobility and recognition of new skillset requirements, but there are complications on the horizon. Electric vehicle (EV) uptake has been slower than expected in many pivotal markets. As Hartung pointed out: “We continue to see great opportunities for growth, but some markets are developing too slowly. That’s the case for electromobility . . .

Climate action requires sustained investment from government, companies, and individuals. It’s expensive—that’s clearer than ever.”

Against such a backdrop, where will Bosch double down its efforts and where may it pull back in the months ahead?

The game changers

For Markus Heyn, Member of the Bosch board of management and Chairman of Bosch Mobility, there are a handful of high priority areas for the business. “There is not just one game-changing technology,” he told *Automotive World*. “We are pursuing further development in the field of electrification quite extensively.



AI is deployed in numerous features, including smart parking

Highly automated driving is also a very important field, and we have made some progress here.” Heyn also flagged vehicle computers and vehicle motion management as particularly important technology areas for the company. Perhaps the most impactful of all will be artificial intelligence (AI). This was highlighted by not only Heyn but also several other members of the Bosch board of management at the press event. “Data was previously regarded as the new oil,” Hartung told attendees. “AI will be the new oil.”

AI has a role to play across pretty much all of Bosch’s Mobility investment areas. For instance, the Bosch smart parking feature relies on AI cameras for reliable information about potential parking spaces. While sensors record available spaces, the

AI evaluates their appropriateness based on traffic conditions, seasonality, other vehicles in the area that may be searching for parking, and other trends.

Generative AI is being harnessed for Bosch’s breakdown service chatbot, which boasts a user satisfaction rate of 98%. AI is also playing a big role in the way various Bosch products are developed and produced, rapidly advancing factory efficiency and quality inspection. Tanja Rückert, Bosch’s management board member responsible for digital business and services, likened AI to the invention of the computer in terms of its potential to disrupt. “Every working method we have, every job, will change because of it,” she told *Automotive World*.



Manufacturing of Fuel Cell Power Module (FCPM) in the Feuerbach plant

Near-term targets

Another key focus area for Bosch is hydrogen, and the company anticipates that its sales with hydrogen technology could reach €5bn (US\$5.3bn) by 2030, driven primarily by fuel cell trucks in China. “China will likely be the leading market for the time being,” said Hartung. “We don’t expect to see major growth in Europe or North America until the next decade.”

India was also pegged as a potential market for hydrogen, and the first vehicles to feature Bosch’s hydrogen ICE injection technology are expected to hit the roads later this year. The country is generally on Bosch’s radar. “No automotive market in the world will grow as quickly as India,” asserted Heyn. “We expect this to be a huge and interesting market.” That applies not only to automotive sales but also talent recruitment

While Bosch is bracing for a stagnation of the global new vehicle market in 2024, it is pushing ahead with 30 new commercial projects for EVs this year. “E-mobility is coming,” the Chief Executive stated. “It is only

a question how quickly it arrives in various regions.” Bosch expects that 70% of new cars in Europe will be all electric by 2030. In China and North America, that figure will be closer to 50%, with a hefty proportion of hybrids. Since hybrids rely on an ICE, that means continued business opportunity for Bosch’s supporting product line.

The complicated play of ICE, battery electric, and hydrogen is reflective of the wider positioning of the automotive industry at the moment. “Bosch stands at a crossroads, where the opportunities and challenges of transformation converge,” asserted Hartung. Whether that’s new propulsion technology, connected features, autonomous driving or AI, a new paradigm is emerging while the old one continues to play out. Like any transformation it will involve difficulties—in this case likely job cuts, cost reductions, and new skill acquisition—but it also involves a very clear purpose. The challenge now is to maintain a balance between profitability and financial strength while continuing to support investment into future growth.

How is new mobility reshaping the legal landscape?

Dykema's 2024 Automotive Trends Report takes a deep dive into the most pressing legal trends for automotive players. By Megan Lampinen



Developments around artificial intelligence (AI), electric vehicles (EVs), and autonomous driving are shaping the legal landscape for automotive companies. From protecting new technology advances to determining liability in AI systems, automakers and suppliers could find themselves in litigation for any number of reasons. Navigating this rapidly evolving terrain is becoming increasingly tricky.

According to Dykema's 2024 Automotive Trends Report, the main areas of concern at the moment are autonomous vehicles (AVs), cyber security and data privacy, EVs, risk and litigation, government policy, intellectual property (IP), government investigations and compliance, supply chain, financial distress and bankruptcy, labour and employment, antitrust, and dealerships. The report, the second in Dykema's series, reflects feedback from a select group of industry leaders and decision-makers on the legal trends most likely to impact the automotive space in 2024 and beyond.

Automation and electrification

Concerns about electric, autonomous, and ADAS litigation are on the rise, flagged as a top category by 51% of respondents in 2023 and 63% in 2024.

"This year we see an increased concern about potential legal ramifications stemming from product liability cases, which can lead to class actions, IP litigation, and increased government regulation," says Laura Baucus, Director of Dykema's

Automotive practice. "With an AV, who should be responsible for an incident? Do you blame the technology or the driver?"

The leading concern within AVs was increased lawsuits around autonomous and ADAS technology, followed by new laws regulating the development and operation of AVs, and then changes in determining responsibility for AV incidents. "There's no new standard for product liability litigation that applies solely to AVs," Baucus tells *Automotive World*. Dykema handled several high-exposure product liability cases during 2023, and in all of them the jury ruled in favour of the vehicle manufacturer.

The report also flagged high levels of concern around cyber security in AVs and the collection and protection of electronic data. "In all sorts of vehicles, autonomous or not, a lot of personal data can be collected. The regulations governing this vary by state in the US, and then again in the European Union," she explains. "With so many different types of regulations, not all of which are consistent, it can be a minefield."

Product liability is also one of the top concerns within EVs this year, particularly around battery fires and home charging. But even more pressing concerns are supply chain disruptions and the availability of battery raw materials. Looking ahead, Dykema expects increased litigation around supply contracts and more pressure for sustainable and ethical sourcing. "Raw material costs rose dramatically from 2022 and into 2023 and were coupled by high transportation and labour costs," notes Baucus. "The vast majority of automotive industry contracts are



Who is at fault when a driverless vehicle crashes?

fixed price and can extend for several years. If there is a cost concern, both the supplier and the customer will be looking at the contract very closely to see if there is any way that increased pricing relief can be secured.”

From regulation to retail, AI to IP

Regulation and policy also have potential legal implications for automotive players, with study respondents particularly concerned about stricter fuel economy standards from the National Highway Traffic Safety Administration and greenhouse gas emissions standards from the Environmental Protection Agency. “Our clients expect greater enforcement and government investigation on these two types of issues,” she explains. “Given our experience with this industry, we agree.”

Another hot topic is AI, including the impact of AI-generated technologies on IP strategies and the industry’s growing reliance on AI for vehicle navigation. Companies developing AI applications for all use cases will need to protect their algorithms and

data as trade secrets, but that’s no easy feat in an age of constant data exchange. Dykema advises that developers put in place robust measures around trade secret protection and stringent cyber security protocols.

“The legal implications from AI are pretty broad,” says Baucus. “AI could be obtaining information from a wide variety of sources. On top of that there are concerns around cyber security and data privacy breaches if the information is released.”

Other potential areas of legal concern flagged by respondents include online retail, specifically state regulation or the prohibition of manufacturer involvement in online sales. Globally, automakers are maturing their online offerings, but the US has a wide variety of state statutes that regulate how vehicle sales can occur. “The issue of online sales has crept up over the past four to five years,” she points out. “It’s a US-specific issue. The question is whether that can work or if there will be another method to sell vehicles other than the standard dealership network that exists today.”

Respondents are also growing more concerned about various antitrust issues. In 2023, just 7% of survey respondents expected antitrust scrutiny to shift more toward labour practices. In the 2024 study, that number grew to 38%. Non-compete agreements, including no-poach and wage-fixing agreements, are coming under increased scrutiny by regulators and lawmakers. Feedback also unveiled growing concerns with merger enforcement and review, with 35% of respondents expecting the process to play a major role in 2024, up from 19% in 2023.

“There has been an increasingly aggressive pre-merger review process by the government,” explains Baucus. “The problem is that there’s not a lot of clarity in what they’re looking for, so it can really hold up a potential combination or sale.”

Universal advice

All the topics explored in the report and raised by the respondents could result in substantial government investigation or litigation. But part of today’s concerns with EVs and AVs, suggests Baucus, is only because they are new technologies: “There’s not a large body of caselaw where courts have looked at the regulations or examined the issues. They’re challenging because people in the industry are doing their best to make sure they’re operating appropriately in a new area.”

This particular study reflects the views of US respondents, and while many of those views tie in with wider trends, some are more market specific. “You do not see as many supply chain disputes in other markets,” she notes. “They may have different types of

contracts with different options to secure additional funding or other relief. Cyber security and data privacy vary dramatically depending on the country, as does government policy. But the practical risk with EVs, AVs, and new technologies, and making sure you have best practices to protect yourself from litigation, are the same regardless of jurisdiction or country.”

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We see an increased concern about potential legal ramifications stemming from product liability cases, which can lead to class actions, IP litigation, and increased government regulation

The broader mobility industry is evolving rapidly, as is the technology behind it. In this landscape, Baucus offers the following advice: “Whether you’re looking to minimise risk, enforce your contracts, sell the company, or defend against government investigation, start on the front end with the contracting process to ensure you have the appropriate safeguards. That can help in many of the instances where issues develop later. The second piece is full transparency where appropriate. This will save time and money later.”