

# Automotive World MAGAZINE

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 Nasdaq

 VINFAST

## VinFast CEO “prepared to take risks” for EV success

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Ford dials back battery investment | Volvo helps truckers find chargers |  
SEAT steers R&D towards clean and connected

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*Cover image courtesy of VinFast*



# VinFast CEO “prepared to take risks” for EV success

The electric vehicle start-up is expanding across Europe and North America and bringing battery tech in-house.

By Megan Lampinen

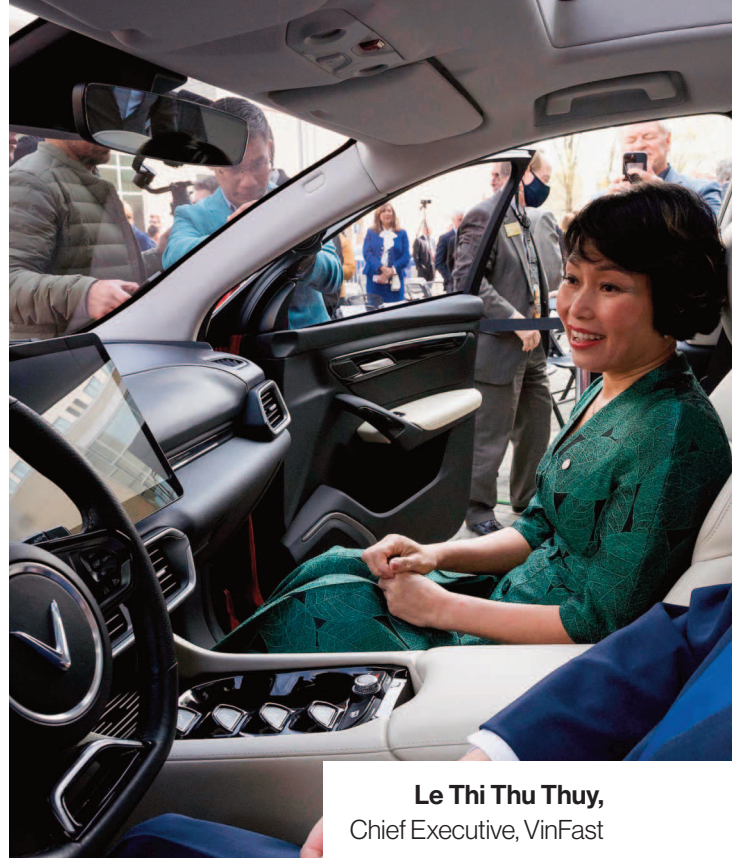
The move to electrification is opening the global playing field to new players, all keen to secure a foothold in what promises to be a booming market. Vietnam's VinFast is only six years old, but its growth journey has been rapid. Backed by the deep pockets of Vingroup, Vietnam's largest private conglomerate, its sights are set on the global stage.

The company began manufacturing cars in 2018 but switched to an all-electric strategy in 2022. Today, it offers several electric cars, a number of e-scooters, and an electric bus. Sales volumes are still small at just 11,315 for the first half of 2023, but its ambitions are big, with the stated aim of becoming a global smart electric car company. It is already building plants and opening dealerships in key markets across North America and Europe. VinFast Chief Executive Le Thi Thu Thuy (also known as Madame Thuy), tells *Automotive World* that its momentum has been driven by an enterprising mindset, which she intends to maintain moving forward.

"We are a mature start-up," she says. "Our entrepreneurial spirit has driven us to pursue our growth plans proactively and resolutely. It's prepared us to face challenges and take risks to achieve success and has played an important role in our development."

## Where next?

That development is only starting. Governments in Europe and North America have outlined roadmaps to ban the sale of internal combustion engine (ICE) vehicles, and both regions are on VinFast's radar. For



**Le Thi Thu Thuy,**  
Chief Executive, VinFast

now, its global expansion is predominately focussed on the US, Canada, France, Germany and the Netherlands. To assist with its entry, the company has brought in senior management from established players like Tesla, BMW, Porsche, Toyota and Nissan.

A milestone was celebrated in April 2023 when VinFast started trading on Nasdaq, with an equity value of over US\$23bn. Madam Thuy believes this will help the company in realising its regional expansion targets. "Becoming a US-listed company is an important milestone and shows our capability, transparency and potential," she elaborates. "It also opens access to the capital markets when necessary."

In July, the company broke ground at its new electric vehicle (EV) manufacturing facility in the US, and by the end of 2024, VinFast expects to be selling vehicles from hundreds of US sales points. In Europe the aim is for around 50 dealerships.



VinFast is the largest Vietnamese company listed on the US stock market by market capitalisation

Despite the investments and the expertise on hand, this small Vietnamese brand may still struggle to make itself heard in the well-established markets of North America and Europe. That's a risk worth taking, and the company remains confident it has plenty to offer consumers here. "VinFast is the sole EV manufacturer with a complete EV line-up covering all popular segments from minicars to full-size SUVs, meeting the diverse preferences and financial needs of many customer groups," Madam Thuy states.

Customers may also be won over by the option to lease the EV's battery; they can also take comfort from the ten-year/125,000-mile warranty on its vehicles and the ten-year warranty for the battery.

Among other benefits, she flags the company's cost advantages thanks to competitive labour and production

costs and high localisation rates. The automaker is also proud of its in-vehicle technology. The VF 8 and VF 9, for instance, offer such features as ambient lighting, heated seats and steering wheel, and advanced driver assistance systems like traffic jam assist, highway assist, lane keeping assist, lane warning, driver monitoring and forward collision warning. Its supplier partners include global heavy hitters like Pininfarina, ZF, Durr, Bosch, ABB, Faurecia, Dassault, and Google.

Despite the array of features, some of the brand's early US reviews have been particularly critical. Headlines have ranged from "Critics Agree: The VinFast VF 8 is very, very bad" to "Don't buy the 2023 VF 8 City Edition". But Madam Thuy takes a pragmatic approach, noting: "We constantly seek out customer feedback and continuously improve



The VinFast VF 6 will enter production in 2024 and was previously shown at CES and the Paris Motor Show

product quality and performance. EVs are a technology product, and shortcomings or inconveniences can occur after extensive use or real-world situations. Therefore, it's common for EV software to be updated regularly to provide a better customer experience.”

## Technology development

Expanding into new regions and scaling production comes at a cost. Luckily for VinFast, it has a generous and supportive parent in the Vingroup. In October 2023, the Chairman of the Vingroup—one of the wealthiest individuals in Vietnam—Pham Nhat Vuong, donated the conglomerate's shares in VinES Energy Solutions to the automaker. The move is designed to improve VinFast's in-house battery expertise

and includes not only VinES' IP on battery cells and packs but also its manufacturing facilities, partnerships and supplier contracts. It's too early to say where this will lead, but Madam Thuy hints at future battery technology developments, adding: “EV is a fast-paced industry. We relentlessly innovate to improve product quality and enhance vehicle performance, technology and driving range. Our R&D department constantly researches and develops new technologies.”

Vingroup's Chairman has also promised to make US\$2.5bn in funding available to the automaker in the form of loans and grants. “With the support of Vingroup, we are well positioned to deliver on our mission to help create a more sustainable future for everyone,” emphasises Madam Thuy. “VinFast will soon have more interesting information to share.”



# More Volkswagen job cuts loom: will it be enough?

Failure to successfully develop a viable platform for its new EVs reinforces problematic legacy financial problems, writes Ian Henry

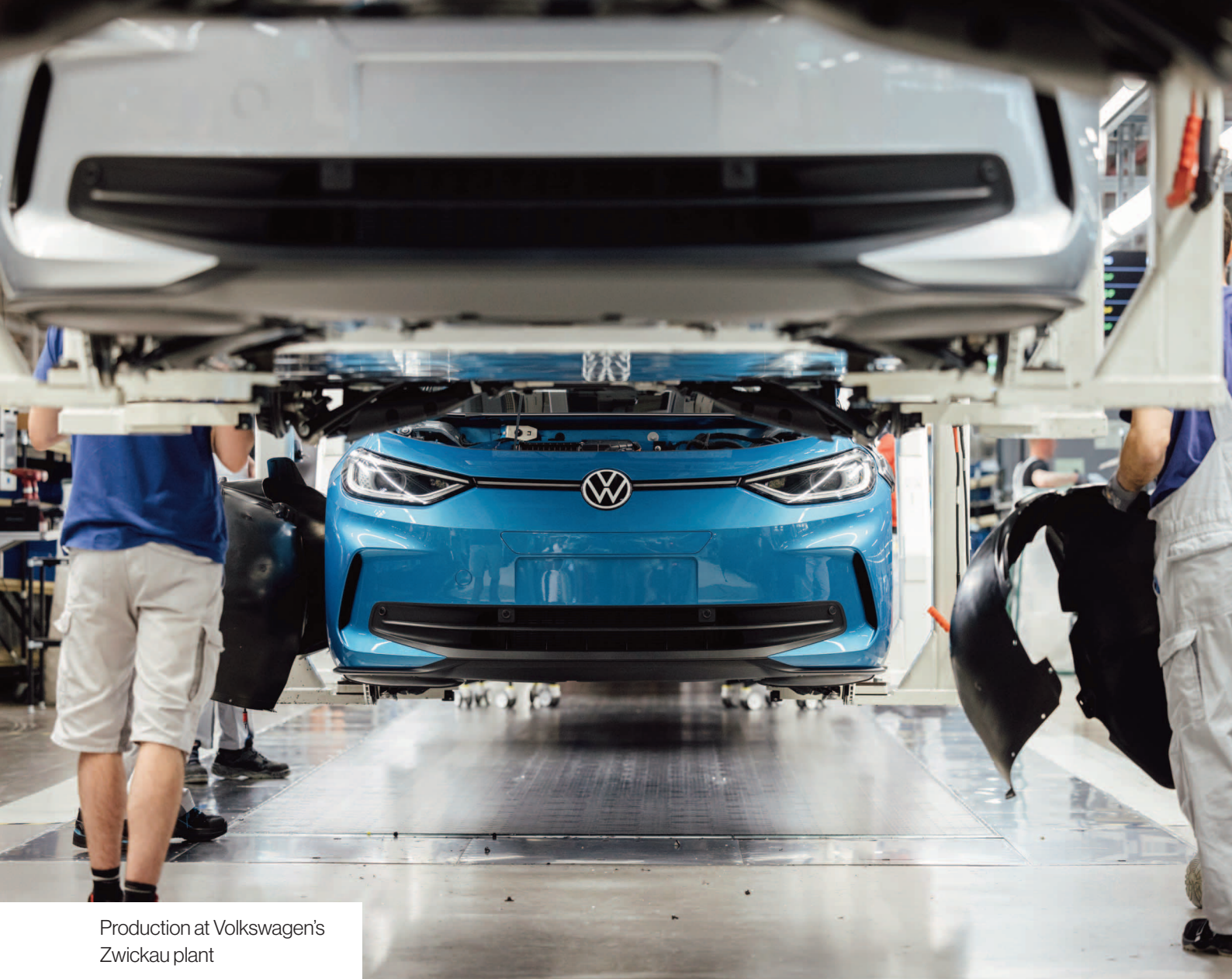


**T**hey say that there are only two certainties in life: death and taxes. But the auto industry can surely add a third, that it is only a matter of time before Volkswagen announces it is planning several thousand more job cuts. In November 2016, when the group employed 600,000 worldwide, it announced plans to cut 30,000 jobs (5% of total employment), 23,000 of them in Germany. Those cuts were scheduled to take five years to be complete. In 2021, another 5,000 job cuts were announced, taking until 2023 to be complete. Now, as 2023 comes to an end, more reports have emerged on further job cuts, although numbers have not been released, yet. Despite the above cuts (and there have been many other examples of cuts in the intervening period), total employment at the end of 2022 was officially just under 676,000. During 2022, the now departed Chief Executive Herbert Diess claimed that the group had at least 30,000 excess staff among its then 290,000 employees in Germany alone.

The group is now planning a €10bn (US\$11bn) cost-cutting programme through to 2025. The head of the Volkswagen brand, Thomas Schaefer, reportedly told the union at the end of November 2023 that the brand was not making enough profit to fund the transition to electric vehicles (EVs). He cited excess costs in administration functions, factories which were not productive enough and an overall cost base which is higher than the competition. Lower than anticipated EV orders have not helped, and the consistent problems at the Cariad software unit charged with designing the underlying software architecture for all Volkswagen group vehicles have contributed to severe delays in several programme launches.



The powerful German unions have, unsurprisingly, called on the company to stand by an earlier agreement not to cut jobs before 2029, suggesting that cost cuts had to come from elsewhere in the company. A senior personnel executive has said that cost savings would indeed come mainly from areas other than job cuts, although some Volkswagen executives have suggested that the ageing of its workforce could help, with people retiring and not being replaced. Whether that will be enough remains to be seen. And, as much as the company would like to cut jobs, it actually has a pressing need for more staff to grow the EV business and indeed create new businesses, such as the new Scout EV pick-up business, the development of which is likely to be outsourced to Magna Steyr. This could avoid taking on more full-time employees at Volkswagen, but the investment funds for this will still be needed.



Production at Volkswagen's Zwickau plant

The Cariad software unit will almost certainly see job cuts; this problematic unit was created when Diess decided that having each brand in the group developing its own software platform for EVs was uneconomic. Instead he decided a centralised software unit was a better use of resources. That may have been a good idea in theory, but in practice it has not worked out well. The first programme supposed to benefit from this was the ID.3, but thousands of ID.3s were stockpiled at locations around Germany when glitches in the software were discovered after the vehicles had been built. These all needed software updates before they

could be delivered to customers; but many early ID.3 drivers still reported software issues.

New management was appointed at Cariad, and Mobileye was brought on board as a partner to address the autonomous driving element of the software platform. In October 2023, ahead of the current cost-cutting reports, 2,000 job cuts were announced at Cariad (out of 6,500 employed in Germany). How helpful this will be is a moot point, because at the same time it was announced that the new electric Audi Q6 e-tron and Porsche Macan (both of which had been delayed several times) would be

delayed a further 16-18 weeks, and neither will now arrive before March 2024 at the earliest. These will use version 1.2 of the Cariad software; by 2025, version 2.0 had been due, and this was supposed to underpin all new EVs from that point. However, this version is now reportedly “being completely redeveloped”. What that will mean for the EVs due from 2025 is not clear.

And as if this was enough, the new SSP (Scalable Systems Platform) architecture which is due to underpin new vehicles, including the planned flagship Trinity programme, is also being “largely rethought”. Around €1.5bn has already been committed to Trinity, but most of this would now appear to be likely to be written off. The company has also decided not to proceed with a brand-new factory to build Trinity vehicles; instead the first vehicles under the Trinity programme will be made at Zwickau. To accommodate this, vehicles currently made at Zwickau will be made at other Volkswagen factories. More than 2,000 jobs are likely to go at Zwickau as production declines ahead of the transition to Trinity vehicles.

Volkswagen undoubtedly faces many challenges and undoubtedly further job cuts will take place. It is also still dealing with financial consequences of the emissions scandal. The company’s failure to successfully develop a viable platform for its new EVs reinforces the problematic legacy financial problems from the recent past. The idea of a centralised

software company, Cariad, may well have been a good idea at the time, but it has not worked out. Similarly, the all-new SSP/Trinity programme, with autonomous vehicle technology at its heart, has also been problematic at best. The billions invested in Cariad and SSP/Trinity have not solved the many problems

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As much as the company would like to cut jobs, it actually has a pressing need for more staff to grow the EV business and indeed create new businesses

Volkswagen faces. How much longer it can continue to haemorrhage cash without a more root-and-branch restructuring is worth asking; or, more radically perhaps, can Volkswagen continue as it is, with so many brands, so many factories, and very different demands from its core European, Chinese and US markets? Perhaps it is time for a break-up?

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*The opinions expressed here are those of the author and do not necessarily reflect the positions of Automotive World Ltd. Ian Henry is Director of AutoAnalysis, an independent automotive research and consulting company based in London. 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](mailto:editorial@automotiveworld.com)*

# Autonomous trucks are taking off in China—is Europe next?

Autonomous driving capabilities offer the solutions to some of the biggest challenges facing European truck OEMs and logistics companies, writes Julian Ma

**E**xpectations for autonomous vehicles have been recalibrated over the last few years, with a shift in predictions for the arrival of fully driverless technology and the high interest rate environment impacting a number of players in the global market. In China, however, there has been a renaissance in a particular market segment: L3 and L2+ autonomous heavy-duty trucks. Companies have already racked up millions of kilometers of accident-free driving across China with some

of the biggest names in logistics, representing the most extensive mass production and commercial usage of L3 autonomous heavy-duty trucks on public roads anywhere in the world.

These are more than just technology trials—they are part of rational business decisions made by some of the most profit margin-focused companies in the world. There are a few major reasons why we are seeing this early adoption occur in China, and why Europe may not be far behind.

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## Staying focused on L3, building towards L4

Some autonomous vehicle companies have struggled in the recent economic environment because they focused on prototypes and fully driverless trucks, rather than L3 products that can be commercially viable much sooner.

Despite fundamental optimism about the exciting advances in autonomous driving technology, it is important to explore building a viable L3 product

first, before committing to L4. In addition, autonomous truck technology companies must not only get buy-in from VC investors, but also OEMs and logistics companies to ensure the best possible outcome for the business.

## Mastering mass production

OEMs understand the complexity and cost pressures of heavy-duty truck manufacturing better than anyone. In addition to developing great

autonomous driving software, leaders in this space will need to also develop expertise on the integration of software and hardware. The truck, not the autonomous driving system, is the ultimate end product, and that means the teams developing autonomous truck systems need be intimately familiar with vehicle design, chassis engineering and electrical systems.

OEMs and logistics companies are more likely to be persuaded by a product that can be manufactured at scale, to solve their commercial challenges, rather than a one-off prototype.

## Delivering commercial benefits

Logistics is a highly competitive low-margin business. Freight and express companies in China won't procure a new vehicle just because it's technologically advanced; it needs to make business sense and give them an edge against their competitors.

One unique feature of China's logistics industry is that many companies typically assign two drivers to each truck for line-haul routes. This allows the drivers to take shifts driving, minimising fatigue and ensuring safety while meeting tight shipping schedules. Because L3 and L2+ autonomous trucks are much less physically and mentally exhausting for drivers, companies have been able to shift to one driver per truck on the same routes, generating significant labor savings.

Fuel savings are another major benefit, with these autonomous driving systems being able to unlock significant reductions across large

fleets. This is especially important for logistics companies that typically have net margins no greater than 5%.

## Europe's pressing need for truck automation

China may have a lead in terms of real-world L3 and L2+ autonomous truck deployment, but other regions are likely to be close behind. Europe is a prime candidate. According to the IRU, the continent's driver shortage is "spiralling out of control", with 30% of current drivers set to retire by 2026.

While the two-driver system is not as common in Europe, logistics companies can still benefit from L3 and L2+ autonomous driving technology by transitioning full-fledged drivers to safety operators who enjoy a much safer and very comfortable experience co-piloting with the autonomous driving system. And fuel-saving algorithms will ensure that they get maximum efficiency regardless of the experience level of the safety operator. These cost savings can help a trucking and logistics sector that continues to contend with the significant inflationary pressure in European economies.

ESG considerations are also likely to play a major role in driving adoption in Europe. According to a report on ESG challenges for the auto industry published by Deloitte Germany earlier in 2023, climate change represents the leading risk to companies in the sector and sustainability is an increasingly important consideration in procurement decisions. OEMs, logistics companies, and fleet managers face ESG pressures from

regulators, employees, and civil society. To satisfy these constituencies, OEMs and fleet operators must show that they are embracing advanced technology to curb emissions.

Electrified heavy-duty trucks have yet to be commercialised on a large scale, but the proven fuel efficiency advantages of L3 and L2+ autonomous driving technology can be leveraged by Europe's freight and express fleets in the near-term to help contribute towards the continent's ambitious emissions reduction goals.

Another key ESG factor is employee welfare, particularly in a trucking sector beset by labor shortages. As manpower in the sector is strained in the years to come, it is crucial to reduce the physiological and psychological burden on drivers to protect their health and wellbeing. First-of-their-kind real-world studies in China show that the L3 and L2+ autonomous driving technology currently being deployed on the nation's highways accomplishes this by reducing both physical and mental stress on truck operators.

## Highly transferable technology

The good news for European OEMs and fleet operators is that the L3 and L2+ autonomous driving systems for heavy-duty trucks now being honed on China's highways are highly transferable to new geographies.

Given the cadence of OEM new model development and vehicle procurement in the logistics

industry, it is critical for autonomous driving solutions to be highly adaptable to new truck models in a short period of time. This is already happening in China, with autonomous technology being adapted to a range of truck models in just nine to 12 months.

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The L3 and L2+ autonomous driving systems for heavy-duty trucks now being honed on China's highways are highly transferable to new geographies

Autonomous driving capabilities offer the solutions to some of the biggest challenges facing European truck OEMs and logistics companies today, and the requisite technology is already available for commercial deployment. What is needed to make these solutions a reality, as in China, will be autonomous tech companies with a willingness to roll up their sleeves to work with OEMs on hardware and manufacturing.

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*About the author: Julian Ma is founder and CEO of Inceptio Technology*

A futuristic SEAT car interior is shown, featuring a glowing steering wheel with the SEAT logo, a digital dashboard displaying '74.5 POWER' and '120 MPH', and a large, illuminated SEAT logo on the center console. The background shows a dark, mountainous landscape under a blue sky.

# Inside SEAT's R&D roadmap: electric and connected

Werner Tietz, Executive Vice President of R&D, offers a glimpse of the technologies that could shape the future of Cupra and SEAT



**L**ooming environmental targets, the rise of the software-defined car and rapidly evolving consumer preferences are pushing the automotive industry into uncharted territory. For most players, that means pouring investment into research and development (R&D). Europe's automotive R&D investment stood at €59.1bn (US\$64.5bn) a year in 2021. According to the European Automobile Manufacturers Association, that positions the EU as the world's largest investor in auto sector innovation, comfortably ahead of Japan (€31.7bn), the US (€22.4bn) and China (€14.3bn).

Volkswagen Group is Europe's largest automaker, and has a budget to match. In fiscal year 2022, R&D costs at the Volkswagen Group's Automotive Division's rose 21.3% year-on-year to €18.9bn, accounting for 8.1% of sales revenue. SEAT SA is a relatively small part of the wider VW Group, but it has bold ambitions of becoming a global player. The job of overseeing its R&D efforts falls to VW Group veteran Werner Tietz. As Executive Vice President of R&D for both the SEAT and Cupra brands, the pressure is on to prepare for what promises to be a radically new mobility paradigm.

### **What does future-proofing look like under your watch?**

Future-proofing means increasing our vehicles' range and efficiency in all dimensions, including energy consumption and aerodynamics. It means ensuring an up-to-date performance in terms of sporty driving and electronics, such as a software-driven in-vehicle experience and seamless connection to a smartphone.



### **How is SEAT working towards the vision of the software-defined vehicle?**

Much of our focus is on smartphone integration. People are now used to CarPlay, and we want to integrate that even more. We want all the common smartphones currently on the market to be seamlessly integrated into the vehicle. With the car connected to the internet, drivers can access more information about their surroundings, such as places of interest and restaurant offerings. Customers can choose what they want to be informed of. As cars become more autonomous, users can spend more time looking around and receiving information.

### **Do you have your eye on any potential technology game-changers?**

The biggest game changer in the next couple of years will be on the battery side. Today we see about an 8-10% improvement in electric vehicle (EV) range every year, but in the next five to ten years we will see a step change. By that time, you can choose to have



**Werner Tietz,**  
Executive Vice President of R&D,  
SEAT and Cupra

a huge range, like 700, 800, 900 kilometres, or to improve the weight of the car. My dream is always a lightweight sports car and for something like the Cupra DarkRebel you probably don't need a huge range; you need more fun. I would invest in the weight reduction.

**What sort of developments can we expect around innovative lightweight material?**

The most important thing on the materials side is sustainability. A large portion of our innovation budget goes into sustainability and finding substitute materials. We are exploiting opportunities in plastics and metals, including green steel.

**What technology will bring about this step-change in batteries: solid-state or something else?**

Judging by the press announcements, everyone is working on battery chemistry. Chemistry is not about increasing or doubling the range, it's

more about reducing the cost. Solid-state is one option but there are also other options on the chemistry side. A lot of work is going on in both directions.

**SEAT is not pushing hard on full EVs at the moment, but Cupra is heading in that direction. Would Cupra ever look to play a more active role in terms of charging infrastructure?**

We offer support for our customers if they want to install home charging, but when it comes to public charging infrastructure in general that is a Volkswagen Group-wide initiative. You will not see a public charger with Cupra stamp on it but you can have one at home.

**Porsche has been exploring e-fuels. Is that something that could work for SEAT?**

The biggest industries for e-fuel will be shipping and aircraft. SEAT is not relying on e-fuels, as our future strategy is headed in the direction of EVs. However, e-fuel is the easiest way to quickly make the existing vehicle fleet sustainable. You cannot replace all the cars in the world [with electric] in the next 15 or 20 years. This could also be a good solution for heritage cars—if e-fuels means we don't need to scrap these, it helps with sustainability. E-fuels also represent a good way to store and transport energy produced in areas with a good supply of green energy.

**What sort of potential do you see for hydrogen fuel cell or hydrogen internal combustion engine (ICE)?**

I am always open to all technologies. Based on the knowledge I have today, hydrogen ICE or fuel cell in the



The DarkRebel concept pushes the boundaries of what is possible

passenger car segment makes no sense because of the efficiency. If you provide electricity to charge the car, then the battery is the better solution. For light-duty vehicles and above, hydrogen might be the right solution.

**How much battery tech transfer is there today between your electric urban mopeds under the MÓ brand and your Cupra EVs?**

The battery technology is more or less the same and we will take that further. In the future, we want to use the same base cells for scooters and cars. We are also exploring the potential of a micro car, which at some point could be SEAT's entry into the electrified world. In the US, you see rich kids driving around their neighbourhoods with golf carts, so this sort of vehicle is already quite

common. There could be real potential from a sexy electric micro four-wheeler.

**Battery swap is already popular with electric scooters. What about on four-wheelers?**

I think it's possible on micro cars. Some competitors are working on that for passenger cars, and we are carefully looking at it. The downside of swapping is that you have to build the car to accommodate it. You cannot adapt the battery to the needs of the car, so you have to work with common batteries. There are many restrictions. If the charging infrastructure is there and the charging times are going down, there is no need to swap the batteries. But the future can prove me wrong, so we have to be open to that discussion.

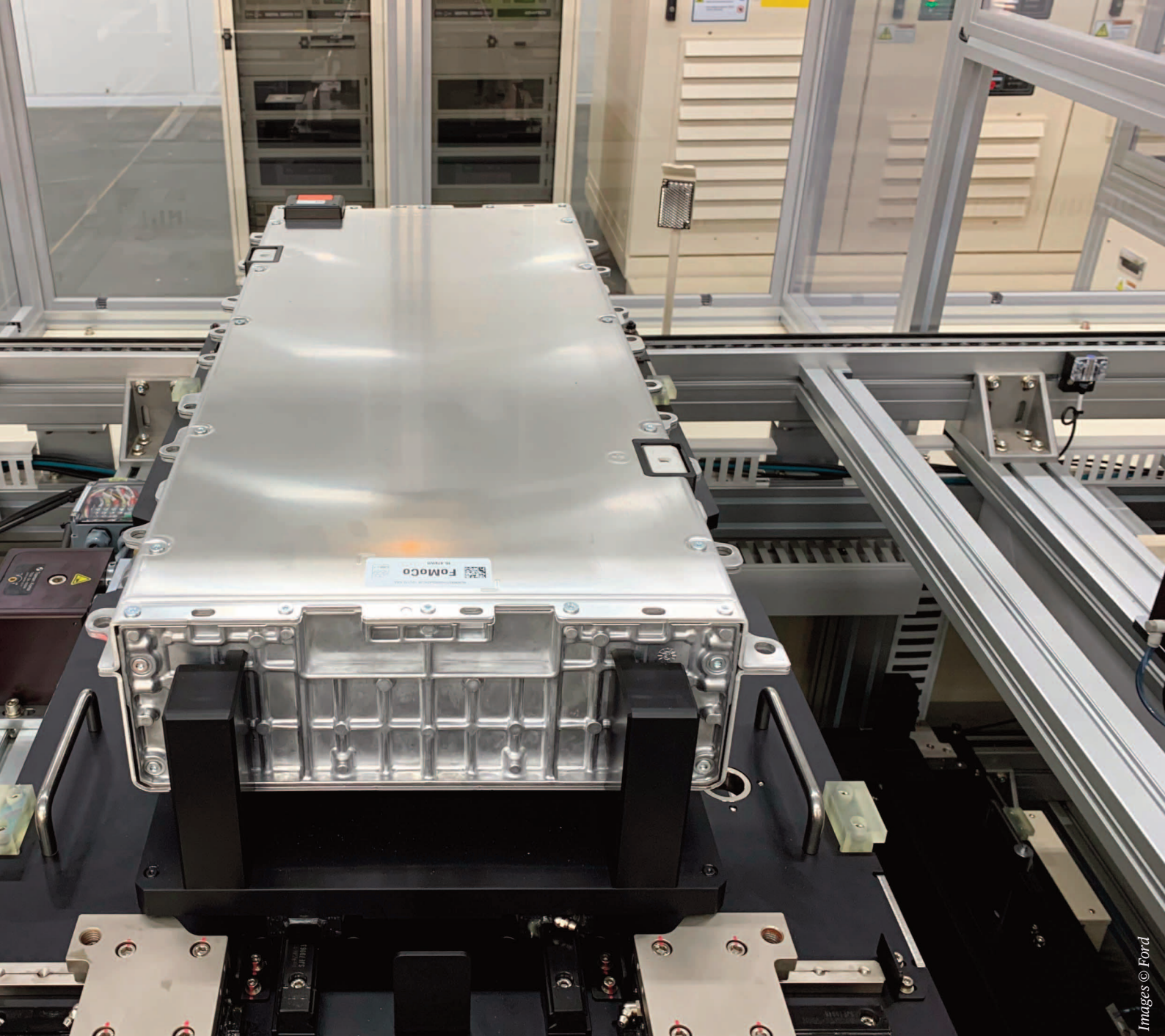
# As EV sales slow, Ford cuts back on battery investment

The switch to EVs will not stop, nor will it be cancelled; but it will be slower and much more expensive than originally expected. By Ian Henry



**T**he rush to build battery cell plants in Europe to meet growing demand has accelerated through 2023, with every sign that this will continue in 2024 and beyond. The key driver is the phase-out of internal combustion engine (ICE) car sales across Europe by 2035. And throughout this period, OEMs will find their ability to sell ICE powered cars severely constrained by rules such as the UK's zero emissions vehicle mandate (ZEV) or EU rules requiring a steady reduction in CO2 emissions by each OEM's sales mix.

But while the move to electric vehicles (EVs) is pretty much unstoppable in cars, in LCVs the situation is different. And at Ford, plans to build a new battery plant in Turkey for the Transit van (and a new Volkswagen van which will be made there too) have been cancelled. Ford had been planning a cell factory in Turkey in conjunction with Koc (its local partner which runs the Ford Otosan factory where the Transit is made) and Korean battery company LG Energy Solution (LGES). But in November, Koc announced it was



Images © Ford

pulling out of the project which was due to create one of the biggest cell plants in Europe. It would certainly have been the biggest such plant in Turkey, with an investment of over US\$2bn and about 45GWh capacity per year. Electric Transits will still be made in Turkey, but they will use batteries sourced from elsewhere in Europe, from one of the other sites which Ford is establishing with LGES, most likely in Poland; last year LGES announced it was doubling battery cell production capacity in Poland. Back in February, plans for

the factory were described as “on track” and the idea at that time was to build a facility capable of making battery cells for up to 500,000 vehicles a year which would represent the majority of the capacity in Turkey which Ford will have for making Transits, along with the Volkswagen Transporter which Ford will build in a joint venture arrangement. Some diesel Transits will continue to be made well into 2030s anyway, because the switch to EVs in vans is due to be completed later than in cars and because the



Ford expects annual energy demand for its vehicles will be up to 140 GWh annually in North America and up to 240 GWh globally

Transit will also be shipped to non-European markets where ICE sales will be allowed in greater proportions for longer than in Europe.

It is worth noting that at around the same time as the Turkish investment was cancelled (or merely postponed according to some reports), Ford also announced it would cut back its plans a new battery plant in Michigan which it was planning to build with Chinese battery company, CATL. Construction of this plant had been subject to criticism because of the Chinese company's involvement and the negative view of investment from China across the US, especially because the Inflation Reduction Act (IRA) will effectively provide subsidies to a Chinese company, albeit indirectly when consumers buy vehicles with batteries from this factory.

Construction had already been paused for a couple of months, but it has restarted, and Ford still intends to source LFP battery cells from this

site by 2026. Originally the Michigan plant was due to have 35GWh capacity year, employing 2,500; this has been cut to 20GWh capacity and only 1,700 jobs. Investment in the plant will fall from US\$3.5bn to US\$2bn. This cutback in investment is part of a plan which Ford announced earlier in the year to cut or at least delay around US\$12bn of investment in EVs. As well as reducing investment in Michigan, another battery facility planned for Kentucky has been cancelled entirely. Ford has cited a mixture of rising labour costs and slower than originally expected demand for EVs as the reasons for the US cutbacks; the same reasons, especially regarding slower than expected demand, also apply in Europe.

Overall, Ford is expecting to lose around US\$4.5bn in its EV business in 2023, highlighting the scale of the risk or exposure which vehicle manufacturers face in a market which will grow over time, but which is clearly not growing at the rate which

had been expected. At the start of 2023, Ford had been very bullish regarding its EV and battery investments, especially in the US; it has however become progressively more cautious through the year. In fact, warning signs had been there for some time; in 2022, it had rowed back on plans for EV production in its Valencia factory in Spain. While EVs will be made there, the timing for such investment has been put back and remains to be confirmed; it is still assumed that the Kuga will switch to a US-based platform and go fully electric in the near future, and that a second EV will be made in Spain too, possibly a European version of the Mustang Mach E.

It is the timing which has slipped it would appear, with Ford likely to suffer a further reduction in its European market share. It has already ended production of the Mondeo, S-Max and Galaxy in Spain, and will stop producing the still popular Focus in early 2025; none of these will be directly replaced and the Saarlouis plant which has made the Focus since launch will close, with Ford still hoping to sell the factory, possibly to a Chinese company.

Earlier in the year [we had commented on the financial challenges](#) which the switch to EVs was giving Ford; the cutbacks in battery production in Turkey and Michigan bring these challenges to life in a very specific way. The switch to EVs will not stop, nor will it be cancelled; but it will be slower and

much more expensive than originally expected; moreover, Ford is unlikely to be the last company making cutbacks or adjusting plans as outlined here.

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At around the same time as the Turkish investment was cancelled... Ford also announced it would cut back its plans a new battery plant in Michigan

Confirming Ford's reticence to develop battery making capacity, the company more recently told its suppliers that production plans for the F150 Lightning electric model will be half original plans. In late 2022, Ford planned to make 150,000 of the electric F150 a year, or around 3,200 a week; now it is planning to make just 1,600 a week, attributing this fall to 'changing market conditions'. It is surely only a matter of time before another company announces something similar.

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*The opinions expressed here are those of the author and do not necessarily reflect the positions of Automotive World Ltd. Ian Henry is Director of AutoAnalysis, an independent automotive research and consulting company based in London. 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](mailto:editorial@automotiveworld.com)*

# Additive manufacturing case study: flexible and precise

Additive manufacturing is opening up new lines of business and supporting increased productivity. By Jordi Priu and Borja Batlle

**M**obility has always been an industry of evolution, and the past 75 years have brought many advancements. More recently, COVID and its resulting supply chain challenges have supercharged the speed of change, and as a result, the automotive industry is moving at a more rapid pace than ever before.

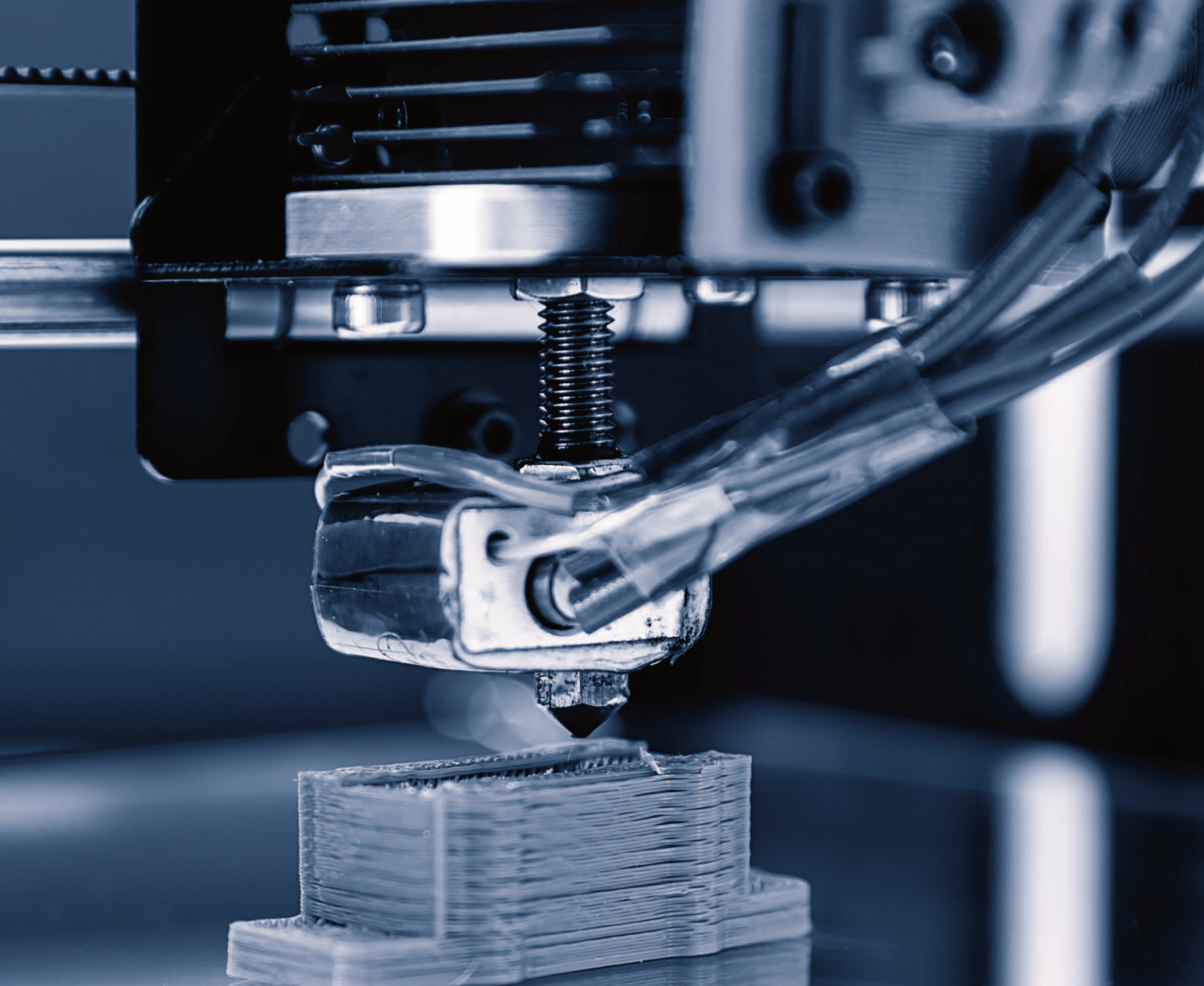
Today, mobility is centred around energy and sustainability. While consumers and society continue to demand lower emissions, the electric vehicle (EV) industry will keep growing. However, we believe EVs will never make up more than 50-60% of

the overall market. The infrastructure around EV is still not there, and it is only a matter of time until other sustainability ‘champions’ emerge, such as hydrogen-based technologies.

## Unlocking additive manufacturing’s potential

To keep up with this trend of transformation and re-invention in mobility, suppliers need to be flexible and ready to meet the demanding timelines and budgets thrown at them by automotive





OEMs. Technologies like additive manufacturing (AM) can help suppliers shorten lead times and keep up with the frequently changing manufacturing forecasts from the OEMs.

AM gives suppliers the opportunity to be as flexible as possible to meet these changing market needs. It helps to accelerate processes, vastly cutting down component delivery time to weeks rather than months—and in some cases, even on-demand. Having that ‘red button’ to push is a real selling point around the power of AM. Compatible simulation software also allows

manufacturers to understand how their parts will perform inside an engine before they even print them.

## **Optimal applications for success**

As with any technology, AM is better suited to some tasks than others. For example, we’ve found it ideally suited to producing jigs, tools, and other individual and highly specialised parts. Given its overall flexibility during the design and manufacturing process, AM can support a significant reduction in part development from start to finish. It also enables parts to



How might additive manufacturing help suppliers position for future mobility challenges?

be produced to check the quality, and fixtures can be designed and created without having to machine anything.

To ensure certain applications are well suited to the technology and that users are getting the most value from AM, it is essential to understand its challenges and limitations as well as its strengths. Ultimately, it needs to support the end goal—to be able to design, print, process and sell parts.

Ensuring 3D printed components and fixtures are the correct weight to pass a vibration test is one example of challenge that needs to be overcome to meet this aim. Designing new control tools and washers to help reduce the costs and timings associated with new projects is another. Being able to print and validate them to simulate assembly and mounting during production means companies can offer a real advantage—especially in cases where fixtures can be designed and printed in only a matter of a few weeks.

As an example, in our Romanian factory we produce a fixture for checking rubber sleeves. We used a Markforged X7 3D printer to create an

internal mechanism inside the fixture with a worm gear. Thanks to the high-precision build, the fixture is able to check the maximum deviation of 1.0mm at the tube ends. This activity, which determines the precision for finding a part's tolerance, has saved 60% of the total time for the cycle. Moreover, these sorts of mechanisms cannot be incorporated using traditional methods. It is only with composite fixtures produced using AM processes that these results are possible.

There is a great deal of value in helping customers identify the areas in their value chain where AM has the greatest potential. Engaging specialised engineering teams, coupled with the best additive manufacturing technology to analyse designs can help companies to achieve optimal results.

## Finding the right partner

To complement fixture machining processes like the example described above, it is important to select the right AM partner. The hardware itself is only one part of the equation. It's also important to find a printer that can create strong, lightweight parts using materials suitable for the automotive industry. Education is also essential, so finding a partner than can provide support as the company learns to create the right designs for the right applications, and enhance its understanding of the machine, the technology and what it can do, is pivotal.

Before deciding which provider to work with, it is also important to analyse the options and carry out tests. Ease of use, precision and versatility are all essential



© MMM

Manufactura Moderna de Metales (MMM) has found numerous advantages to 3D printing

elements the right 3D printer should provide—as is its ability to reduce the end-to-end time for developing parts. Preventative maintenance should also remain top of mind when it comes to printing parts. The accuracy of the printing systems and specific DfAM (Design for Additive Manufacturing) strategies will always help to ensure strong results, including high precision rates with minimal deviations.

For Manufactura Moderna de Metales (MMM), it is ADDiVAL—together with Markforged—that ticked all of these boxes. Its X7 printer has proved to be versatile in helping produce high-precision and extremely strong parts in a short period of time. Originally, the printer was used to manufacture prototypes of components. Today, it is used to design and produce the final components directly in the factory, due to its ability to create continuous fibre reinforcement during the manufacturing process. We have also recently added the Metal X printer to our AM technology portfolio.

## The future is here

When it comes to mobility, we find ourselves in a new era of innovation and implementation. The overall flexibility and precision of AM is opening up new lines of business, as well as helping to support increased productivity and part size for component manufacturers in the automotive sector.

While there is still progress to be made in accelerating the use of more sustainable materials, the industry is focused on making parts smaller, more efficient and with less waste. As such, we will continue to see new and specialised opportunities for AM across the globe. Manufacturers will not only build tools for internal use, but we'll also see increasing volumes of parts being built on-demand for end-use applications, further accelerating the speed of change and innovation in an ever-evolving industry.

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*The opinions expressed here are those of the author and do not necessarily reflect the positions of Automotive World Ltd. Jordi Priu is Chief Executive of Manufactura Moderna de Metales (MMM) and Borja Batlle is General Manager of ADDiVAL*

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# Hydrogen ecosystems accelerate fuel cell truck development

Quantron believes that providing Ford Trucks with a hydrogen ecosystem can help level the playing field for fuel cell truck development.  
By Will Girling

**B**attery electric is rapidly gaining favour in the debate over the future of heavy-duty vehicles, with manufacturers like Volvo Trucks and Scania already offering such models. Its position as an immediately available technology for phasing out diesel fleets makes it attractive over alternative zero emission powertrains.

However, even those who champion batteries for [short haul](#) acknowledge that hydrogen fuel cells offer a compelling performance profile for long haul use cases. Some advocate [augmenting primary battery systems with a fuel cell](#) to provide an operational range boost. Others, such as e-mobility platform provider Quantron, remain convinced

that trucks primarily powered with hydrogen have a more immediate future.

Fundamentally, the company believes both batteries and fuel cells have their place. However, for some applications, hydrogen simply presents a more attractive zero-emission transport option. “In Europe, battery electric is not the solution for longer routes—we don’t have the charging network for trucks, let alone hyper charging, which the grid is not ready for,” explains Chief Executive Michael Perschke. “Hydrogen has an edge if certain conditions are met: long distance, heavy energy requirements like cooling trucks, and high uptime.”

## Geopolitics boost hydrogen

The promise of hydrogen is that it could allow trucks to be refuelled faster, carry heavier loads, and drive further than battery electric models. Despite this, the fuel is beset by one significant challenge: scaling up the hydrogen economy. Perschke concedes that this is complicated by a ‘chicken or egg’ situation—carriers will only purchase vehicles if the support infrastructure exists, but there is little incentive to invest in refuelling stations if there are no vehicles to use them. “We’re probably where Elon Musk was in 2010 with the Tesla Model S, trying to work out where the cars would actually charge.”



Quantron's QHM FCEV AERO 44-1000 truck has a range spec of more than 700km (435 miles) and takes less than 20 minutes to refuel

However, geopolitical events could alter the situation favourably. “Europe got a wakeup call on 24 February 2022 [the start of the Russia-Ukraine war] that cheap gas is no longer a solution,” he states. “We need alternatives, and that has put hydrogen more at the centre of attention than before.” Indeed, UK-based refuelling station developer Element 2 [previously told \*Automotive World\*](#) that the conflict’s effect on oil prices was shrinking the production cost gap between diesel and hydrogen significantly. By Q4 2022, the latter was the only fuel type (including electricity) dropping in price.

Today, Perschke believes the hydrogen economy has shifted from “experimental and exotic” to a serious energy contender. “Across Europe, 30 production hubs supported by the European Commission will go online in up to four years,” he says. Furthermore, investments from [Big Oil](#) and

regulations such as the [US Inflation Reduction Act](#) are illustrating the route by which hydrogen refuelling infrastructure worldwide could reach maturity much sooner than initially expected.

## A hydrogen ecosystem

With close to 50% of a truck’s TCO amounting to energy costs, Perschke tells *Automotive World* that bringing hydrogen to parity with diesel will remove one of the largest barriers to adoption. Combined with the rapidly shrinking capex of fuel cells—he claims a trajectory of €1,200 (US\$1,294) per kWh in 2023 to around €200 by 2030—the trucking industry could soon reach an inflection point. The economics of switching to hydrogen might finally match the regulatory impulse to achieve net zero. However, this is only one piece of the puzzle.

The modern agenda of a truck maker, states Perschke, primarily centres around vehicle emissions (Euro 7), digital technology (cyber security and autonomous driving), and electrification. As diesel fleets are gradually phased out through the 2030s, manufacturers not among the market leaders will likely find their resources stretched in various directions, particularly those with product lines that must suit a variety of transport use cases. “If they want to join the upper quadrant, why not take a bypass: an accelerator?” As such, Quantron believes the hydrogen transition can be streamlined by providing a complete ecosystem to companies seeking to make the change.

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When the market pulls,  
the players will join

In November 2023, the company signed a letter of intent (LOI) with Ford Trucks to jointly develop H2-powered vehicles based on the OEM’s F-Max model. The unit is part of Ford Otosan, a manufacturer for the EMEA market jointly owned by Ford Motors and Turkish conglomerate Koc Holding. “Ford chose us because we already have the supplier ecosystem and vehicles on the road,” says Perschke. Quantron’s own heavy fuel cell truck (QHM FCEV) was unveiled in September 2022. Through its

Quantron-as-a-Service (QaaS) ecosystem, it will supply fuel cell and tank integration, an in-house developed high-power battery, e-axle, energy management, and optimised aerodynamics. QaaS also includes clean energy supply solutions and financial services.

Even at a very early stage in the collaboration, Ford has benefited from Quantron’s R&D and technical expertise. A key part of the company’s design is placing the battery mid-frame, enabled by the e-axle, which creates more space for hydrogen tanks to the side of the chassis and avoids a backpack structure behind the cabin. “Ford tried to create its own H2-powered prototype, but it did what everyone else does and placed the tanks behind the cabin. The downside of that in Europe is you either need to ask for excess length permission or can’t use a standard-length trailer,” he explains. Placing tanks on the side not only mitigates this issue but also produces a more stable centre of gravity.

## Creating fast followers

Quantron’s ready-made ecosystem allows manufacturers to maximise gains from resources while minimising expenditure—an essential benefit at an uncertain time in the industry. “We allow Ford to learn in a limited risk environment,” adds Perschke. Benefits could include enhanced staff knowledge from the collaboration, jointly developed IP, and the option to license proprietary technologies.

Looking ahead, the mixed progress of truck makers makes it unlikely that the incorporation of fuel cell commercial



vehicles will be an overnight transition. Volvo Trucks is a notable example of an advanced manufacturer with a product line that includes both a battery electric truck and a hydrogen fuel cell prototype. Quantron's aim, says Perschke, is not to overtake technology leaders but to level the playing field by allowing OEMs like Ford to become 'fast followers.' "Partnering with us means they can leapfrog the competition. So, if releasing a hydrogen truck is on their agenda for around 2030, Quantron can get it on the road in 2025/26."

As the transition to zero emission powertrains continues, some manufacturers are drawing lines in the sand on what technology will receive the bulk of their R&D spend. Despite the company previously announcing that fuel cell development was ongoing, MAN Trucks & Bus' Chief Executive Alexander Vlaskamp told Der Standard in June 2023 that hydrogen is "too expensive" to occupy a

significant portion of the market. MAN will instead focus primarily on battery electric vehicles, which he believes will comprise the majority of transport fleets. However, if the economics of hydrogen powertrains were to improve rapidly, this could ultimately have a destabilising effect in the sector, with fast followers claiming a larger share of the market from currently leading OEMs that champion batteries.

Perschke does not pretend to know exactly when such a moment will arrive. For now, Quantron is content to do the "heavy lifting" that will enable others to join the transition. "The hydrogen fuel cell-powered truck niche is still fairly small for the big, established players," he acknowledges. "It's where electric cars were in 2010/15. The wakeup call came when Tesla, BYD, and Formula E really took off, and suddenly everyone jumped on the bandwagon. When the market pulls, the players will join."

# Crucial questions for navigating automotive technology partnerships

**Mike Walters explores questions that OEMs, finance institutions, leasing companies, and mobility service providers must consider when exploring prospective vendor relationships**

**I**n the automotive technology landscape, evaluating new commercial off-the-shelf (COTS) solutions is a formidable task. Sector convergence, multimodal mobility, subscriptions, MaaS, and advancements in robotics and artificial intelligence (AI) have added complexity to the already complicated software environment. Recent years have witnessed a surge in fintech and established vendors offering versatile COTS solutions, promising modularity, rich functionalities, omnichannel capabilities, and customisable support for lending, leasing, rental, and mobility services.

Amid this abundance of choices, selecting the right vendors and platforms is daunting. To navigate this, an exploration of six crucial domains within a comprehensive evaluation framework is essential. These areas are often overlooked but are vital for assessing product, implementation, transition, and service management capabilities.

## **How will the solution land?**

One of the most common pitfalls organisations encounter when implementing new technology is assuming that the software alone will miraculously reshape their entire business. In reality, this rarely, if ever, happens. To



achieve successful outcomes, it's essential to understand that implementing new solutions goes beyond merely installing software.

Typically, the success of new solutions hinges on a broader transformation, encompassing changes to the operating model, as well as the adoption of new processes and procedures. Equally important is the need to prepare existing staff not only to operate the new software but also to embrace new ways of working within the organisation. In essence, it adheres to the timeless mantra: People, Process, Technology.

Therefore, at the outset, it is essential to consider how the introduction of the solution will drive transformation within the organisation. What repercussions will it have on the business, and how must the business adapt to fully unlock the value of this investment?

These are aspects that the vendor is unlikely to address comprehensively. Therefore, it's critical to establish an internal client-side team responsible for managing organisational change and acting as the liaison with the vendor. The formation of this team should ideally precede the selection process, ensuring it takes full ownership of the success outcomes from the very beginning.

## **Assessing product and service coverage—unveiling real-world capabilities**

COTS vendors often claim their solutions can handle a broad array of products including loans, leasing (for both personal and business use), and

various rental options. They also tout their ability to support emerging mobility services including flexible subscriptions, car-sharing, and car-pooling. However, these assertions require rigorous scrutiny.

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**Platforms offering true flexibility, modularity, and support for diverse asset portfolios and complex business models are exceptionally rare**

It's crucial to determine whether these solutions genuinely possess the touted 'hybrid' product support capabilities. Mere configuration abilities differ markedly from effectively supporting complex downstream processes. Vendors should substantiate their claims with evidence of successful implementation within major automotive enterprises.

In the global market, platforms offering true flexibility, modularity, and support for diverse asset portfolios and complex business models are exceptionally rare. Many

COTS vendors, especially those traditionally focused on retail finance, are struggling to adapt to sector convergence, subscription models, and pay-on-use mobility. To assess this capacity accurately, thorough evaluation scenarios and use cases covering the end-to-end lifecycle should be scrutinised during detailed ‘deep-dive’ solution review sessions.

## **Will I work with the vendor ‘A team’?**

Software vendors often introduce their project teams, who will implement components or platform solutions, late into the decision-making process. Often, the vendor may only introduce project resources once selection decisions and implementation planning have commenced, but this is much too late. The difference between a vendor’s ‘A’ team and their ‘B’ or ‘C’ teams can be substantial in terms of capability and knowledge. Therefore, this can significantly affect project speed and the quality of the end result.

Hence, it’s imperative for automotive companies to assess the vendor’s team’s skills, experience and track record up front. Are they experienced with the product? Have they implemented the solution in a similar environment? Is this their first automotive project? Are ‘A team’ resources already committed elsewhere?

It pays to be direct and open with the prospective vendor to ensure you are dealing with the ‘A team’, rather than the inexperienced. So, it’s reasonable to request an introduction to the project team to ask about their experience and proposed role/allocation model for the project, and by asking for their names, you can review their experience on LinkedIn. This is a reasonable and logical step to ensure an optimal organisation and resource model for your project.

## **What is the implementation starting point?**

In recent years, auto finance software providers have recognised the benefits of offering ‘out of the box’ reference setups for client projects. These setups typically include various elements such as tax regulations, product structures, and pre-configured interfaces. Vendors also provide standard digital tools for self-service. However, the quality and reusability of these reference setups can vary.

Automotive companies should carefully assess the relevance of the reference configuration to their project, potential reuse opportunities, and detailed specifications. It’s essential to determine whether the reference setup will genuinely accelerate project

timelines or if it’s more of a superficial vendor claim that will not ultimately deliver significant project benefits.

End-user configuration—myth or reality?

In the past decade, there has been a growing demand for software providers to offer flexible solutions with sophisticated end-user configuration capabilities. Flexibility and agility are vital for rapid organisational adaptation and innovation. Evaluating a system’s capacity to allow trained internal users to quickly adjust critical product elements, pricing, workflows, and user interfaces without external vendor intervention is key.

End-user configuration promotes self-sufficiency and reduces the need for costly software development or customisation by vendors, resulting in a lower total cost of ownership (TCO). However, it’s important to note that not all vendors deliver on their claims regarding end-user configuration. Therefore, automotive companies should investigate the actual depth and sophistication of these capability claims.

This includes assessing skill requirements, complexity, available tools and templates, the vendor’s track record, and tangible case studies demonstrating the real-world benefits of end-user configuration.

## Prioritise service excellence

In many evaluation and selection projects, the focus tends to be heavily on product features, architecture, and implementation, often neglecting the critical aspects of a vendor's service transition and service operations capabilities. To establish enduring and successful partnerships, automotive companies should dig deeper into scalability/reliability, security and service operations.

For instance, they should evaluate how easily the platform can scale during peak and quiet times, whether it's automated or manual, and its cost implications. It's important to examine how the vendor manages capacity, considering business forecasts and load testing. They should also clarify the security responsibilities between the client and the vendor, and understand the process for ensuring security compliance during onboarding, offboarding, and transitions. Check if the vendor maintains a software bill of materials and manages security for third-party services and vendors. In terms of service operations, they should ask about the process and timelines for introducing changes into production. Evaluate the level of observability for

performance enhancement. Inquire about the automation of build, test, and deployment pipelines. Understand the backlog prioritisation process, including non-functional aspects, and the client's involvement. By delving into these service-related aspects, automotive companies can build stronger, long-lasting partnerships with their vendors.

mobility providers make informed decisions when navigating the complex automotive technology ecosystem. By understanding the true capabilities and commitments of their prospective vendors, they can build successful, long-lasting technology relationships.

As the automotive industry hurtles into an era of

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Technology partnerships can make or break an organisation

## Forging resilient technology partnerships

In a landscape where technology partnerships can make or break an organisation, asking these six crucial questions will help OEMs, finance institutions, leasing companies, and

unprecedented change and innovation, organisations that ask these questions and engage with prospective vendors with clarity and foresight will not merely survive, they will thrive. They'll be the ones who drive the future of mobility, setting new standards, and delivering unparalleled experiences to increasingly demanding retail and fleet consumers.

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# Could electrification boost pick-up popularity in Europe?

Although pick-ups are popular in the US and APAC, electrification could be the key for growing the segment in Europe. By Will Girling

**E**ven before COVID-19, the global pick-up market was showing signs of struggle. Sales peaked in 2018 at 4.3 million and have been broadly stagnating ever since, according to Statista. The online data platform projects that 3.6 million pick-ups will be sold worldwide in 2023.

Nonetheless, a September 2023 report from Fortune Business Insights (FBI) forecasts that the global pick-up market's value will grow 51% through 2030 to US\$299.98bn, a CAGR of 5.3%. The US is driving the majority (62.5%) of this growth, followed by countries in Asia-Pacific such as Thailand, China, and Japan.

The European market, notes FBI, maintains a far greater preference for SUVs instead, the global market for which proved comparatively more resilient during the pandemic and could [grow up to 600% by 2030](#). But could new marketing strategies and the global push for electrification help revitalise pick-up manufacturers' fortunes in the region?

## From work to lifestyle

Alan Able, Managing Director of Isuzu UK, tells *Automotive World* that the popularity of pick-ups will centre on their evolution from light commercial vehicles (LCVs) manufactured specifically for work into comfortable lifestyle vehicles. The former reputation, he suggests, is no longer true: "They are extremely capable and versatile." With improved style, SUV-like creature comforts, and a wide range of customisation options, owners can tailor their vehicles to meet their specific needs and tastes.

"The modern pick-up truck is no longer confined to its utilitarian roots but instead appeals to a wide audience of consumers looking for a truck that can work hard and play hard." Technological advancements, adds Able, have also made pick-ups safer and more fuel efficient and environmentally friendly than ever before. For consumers in some regions, these characteristics are already demonstrating a strong appeal.

CNBC reported that the Ford F-Series, Chevrolet Silverado, and the Ram 1500—all pick-up models—were the US' top three vehicles by sales volume for 2022. Similarly, the Isuzu D-Max and Toyota Hilux were the two biggest-selling vehicles in Thailand, the world's second-largest pick-up market. In contrast, official figures show that Germany's top three models were a hatchback (VW Golf) and two SUVs (Tiguan and T-roc). Indeed, pick-ups did not feature in the country's top ten at all, nor in France's nor the UK's. Clearly, growing the market's popularity in Europe will be an uphill challenge.

## Changing perceptions

In the first instance, Able states that Isuzu is focused on reshaping customer preconceptions about pick-ups. "Moving away from the utilitarian image of pick-ups to a lifestyle-oriented brand perception requires consistent messaging and marketing efforts." To this end, the automaker is emphasising customer engagement, product innovation and value to ensure its vehicles secure and maintain their appeal for target demographics.

In the UK market, the customer spectrum extends from farmers and fleet operators to urban professionals and weekend adventurers. In particular, Able believes that the OEM's D-Max range has the versatility, reliability, comfort, and spaciousness to successfully appeal to these disparate demographics. The range features five models, covering business (Utility), adventure (V-Cross and AT35), and all-purpose (DL-20 and DL-40).

“We continually analyse market trends, customer feedback, and emerging technologies to ensure that our offerings align with evolving preferences,” he says. Importantly, in an increasingly diversified automotive market, Isuzu will continue to carve out and build up the pick-up niche exclusively. “With a constant influx of new competitors and challenger brands, we stay ahead of the curve by being experts in the field of pick-ups and pick-ups alone.”

While improved marketing could improve pick-up sales in Europe to an extent, the issue of fuel economy—

approximately nine litres of fuel per 100km, according to the UK Department of Transportation—presents a larger challenge. With the average passenger car consuming only six litres per 100km, this may partially explain pick-ups' relative unpopularity with consumers in Europe compared to the US, where gasoline is cheaper. However, the global push for industry electrification could ultimately flip the narrative to pick-ups' advantage.

## EVs change the game?

Bans on the sale of new light internal combustion engine (ICE) vehicles in both the EU and UK will kick in by 2035. As the consumer mindset recalibrates from fuel efficiency to battery range, current generation electric pick-ups could present an attractive purchase alternative to SUVs.

The Ford F-150 Lightning, currently popular in the US, is capable of driving 240-320 miles on a single charge (depending on spec),

The Isuzu D-Max V-Cross: the OEM believes its vehicles can appeal to both commercial and lifestyle customers





The FCEV Hilux could form an important study in the adaptation of LCVs to meet fleet operators' zero-emission goals (Photo: RKP Photography)

exceeding the global EV average of 211 miles. Although it won't reach Europe until early 2024, when it will debut in Norway, the Lightning's capabilities demonstrate that electric powertrains could reorient the public's perception of pick-ups from 'gas guzzlers' to practical lifestyle vehicles in the new era.

Isuzu is aware of both the necessity and opportunity afforded by electrification. "With the pressure coming from Europe, such as the Norwegian electric vehicle (EV) policy's 2025 zero emissions goal, we are making consistent efforts with our expert product development team to develop alternative powertrain Isuzu vehicles," states Abel. Accordingly, the automaker announced in August 2023 that a Thailand-produced, battery-powered pick-up will join the D-Max range from 2025. Its initial launch is also expected to be in Norway, where EV penetration currently stands at 80%.

The scope for zero emission pick-ups also extends to hydrogen powertrain technology. For example, Toyota is engaging a consortium of partners in the UK to develop the first fuel cell powered version of its Hilux. If successful, the project's promise of vehicle performance and uptime comparable to ICE could help bring pick-ups to the forefront of both private ownership and LCV applications simultaneously—two markets Abel believes the segment is adequately geared to serve.

As the segment continues to develop, he concludes that competition will become fierce as OEMs seek to capitalise on the emerging opportunities. Pick-up brands will face the dual challenge of not only persuading European customers away from SUVs but also defining their vehicles' value proposition as distinct from other new entrants.

# Cloud has a “pivotal role” in smarter, cleaner production

Although a number of digital technologies will play a role in smart manufacturing, Microsoft suggests that cloud will ultimately shape it. By Will Girling



Images © Mercedes-Benz

**A**lthough the [future of automotive manufacturing](#) will undoubtedly require OEMs to invest in digital technology, an abundance of new tools—from digital twin to AI and robotic automation—can obscure the optimal starting point. In addition to standard goals such as cost reduction, process optimisation, and risk management, new metrics like carbon emissions must be considered. In a steadily more complicated

space, cloud is emerging as the lynchpin of an entirely new production process.

By deploying IoT devices along assembly lines, automakers can gather data from machines and upload it to a centralised monitoring platform in real-time. This not only affords them greater oversight but also enables remote monitoring and remediation to minimise downtime, AI-driven quality control, and supply chain security.

“The ultimate goal of a cloud strategy is to seamlessly interconnect data, people, devices and processes together, ushering in a new era of transparency and end-to-end visibility, both across the factory floor and beyond,” says Richard King, Head of Manufacturing and Aerospace at Microsoft UK. “As we continue to weather a turbulent socioeconomic landscape into 2024, having visibility across the entire supply chain, from planning,





procurement to inventory and transportation will be crucial to minimising disruption.”

## Core principles

Despite the power of cloud, King emphasises that the unique requirements of each automaker will make its deployment far from a one-size-fits-all solution. The size of a facility, the maturity of existing IT infrastructure, and core business objectives are all

differentiating factors. However, there are still two fundamental principles that should underpin any cloud strategy.

“Foremost among these considerations is security,” he states. The cloud provider a company selects must adhere to both internal security needs and industry-specific regulatory compliance standards. “This is especially critical for larger organisations navigating complex cloud environments, encompassing

both on premise and off premise resources.”

Secondly, automakers must take a long-term perspective on the change they are introducing. Rather than a ‘one and done’ adjustment, King states that cloud strategies require flexibility and scalability. Even if a prospective provider can meet today’s requirements, it must also adapt to evolving market needs and business priorities. In particular, manufacturers will need to be agile as they monitor



Mercedes-Benz is among the automakers using Microsoft Cloud to gain valuable new insights into their digital production ecosystem

regulations and try to chart the trajectory of electric vehicles from [early adopters to the mainstream](#).

## Standardising data

Perhaps the greatest challenge an OEM could face when implementing a cloud strategy is the creation of unwieldy hybrid and multi-cloud environments. King relates that this generally stems from retaining and combining several legacy IT systems, which may be unavoidable due to business priorities or organisational particularities. This can make it difficult to act on the data streams unlocked. Microsoft has subsequently become experienced in helping automakers navigate this complexity.

In addition to assisting the digital transformations of Audi, Daimler, Porsche, Volvo and ZF, King highlights an October 2022 collaboration with Mercedes-Benz that “significantly transformed its operations.” The

project involved connecting 30 passenger car plants worldwide to Microsoft Cloud through the Mercedes-Benz Operations 360 (MO360) Data Platform.

The MO360 Data Platform is standardised by Microsoft Azure to achieve flexible cloud computing that Mercedes-Benz can leverage to turn production data into actionable insights. Doing so, he claims, has boosted transparency and predictability across the automaker’s digital production and supply chain. Not only can the company run AI analytics on a global scale, but it can also remain compliant and secure according to each facility’s regional requirements.

“By moving to Microsoft Cloud, Mercedes-Benz is able to gain a birds-eye view over its entire digital production ecosystem—from identifying any potential supply chain disruptions to dynamic production resource prioritisation,” King

explains. “This has led to substantial improvements in efficiency, resilience and sustainability, marking a significant advancement in its operations.” The OEM projects 20% productivity gains in its passenger car production by 2025 and is also using data analytics to reduce its factories’ energy and water consumption. It aims to be carbon neutral by 2039.

## The cusp of an extraordinary era

For King, the primacy of cloud for the future of automotive manufacturing is clear. “Investing in cloud represents one of the most effective ways for OEMs to future-proof their long-term business strategy,” he states. “Fundamentally, only cloud can provide the scalability and flexibility that allows organisations to optimise their IT spend and agility—the critical building blocks for long-term success.” Mitigating the need for expensive on-site hardware, software, and maintenance can help automakers save costs in the short term, while AI analytics can reveal previously unknown areas for process optimisation in the long term.

As with Mercedes-Benz, King believes this can play a “pivotal role” in steering the industry towards a net-zero future, particularly in light of increasing requirements for [emissions reporting](#). “With a fully connected data infrastructure, OEMs can integrate predictive technologies, including AI, robotic process automation, and smart sensors to better monitor emissions data.” Transmitted to a “carbon measurement dashboard”, this data would allow factory managers to see what is hindering emissions goals

across an assembly line, which will be essential if desired scope 3 reductions are to be achieved.

AI and machine learning combined with high band 5G, he continues, will be revolutionary for the prediction, diagnosis, and remediation of production disruptions. From issues in the plant to external factors such as adverse weather conditions and geopolitical events, King states that the industry “stands on the cusp of an extraordinary era” for smart factories. However, by themselves, these technologies merely have potential. It is cloud, he concludes, that unlocks that potential.

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The potential for AI-powered efficiency has yet to fully unleash

“We are still at the very beginning of this transformative journey. The potential for AI-powered efficiency has yet to fully unleash. There is a real opportunity for automotive manufacturers to make strategic investments in digitisation and cloud migration now.” Doing so may be the optimal method for harnessing the burgeoning AI revolution and gaining a competitive edge in a highly dynamic landscape.



# Volvo plugs gap in e-truck charging services

The move to electric opens new opportunities around transport charging services, and Volvo Trucks is moving in quickly. By Megan Lampinen

**E**urope's trucking industry is slowly but surely heading towards a zero-emission future. The likes of Volvo, Daimler, and Traton Group each anticipate that fuel cell or battery electric models will account for at least half of their new truck sales by 2030. Charging infrastructure is pivotal to this transition, not just in terms of the number of stations but also their accessibility.

Volvo Trucks is pushing hard on a zero-emission vision and wants to ensure that charging concerns don't stymie momentum. It recently launched a digital service to help truckers find and access charging public charging stations for heavy electric vehicles. Volvo Trucks President Roger Alm described it as "a real breakthrough for the electrification of heavy transport."

## What's available?

"There is nothing like this on the market at the moment," says Henrik Engdahl, Customer Charging Manager at Volvo Trucks. "Drivers have been struggling to find chargers because there are very few around." The service promises not only reliable information about charger location but also an assurance of a fair market price with no hidden fees.

Speaking to *Automotive World* earlier in 2023, [Alm highlighted the customer feedback](#) he's had on this front: "When I speak to our customers, it is clear they want peace of mind and have many questions around route planning, battery optimisation and finance. To support them we are creating many new services. With electromobility, our business will move from only



**Roger Alm**  
President, Volvo Trucks

selling trucks to selling complete services."

While Volvo offers its own range of electric trucks and is investing in charging infrastructure across Europe, the service will work with all vehicle brands and stations that are suitable for heavy trucks. The idea here is that what's good for the wider e-mobility market is also good for Volvo. "The primary purpose is to make sure that as many people as possible can go electric," Engdahl tells *Automotive World*. "The chargers in our service are a great choice, but we will not limit the display of stations in our tools. We show whatever we know is appropriate for heavy-duty vehicles."



The new service from Volvo Trucks makes it easy for haulers to find and access charging stations

Volvo has been running a pilot with the new technology, using electric vehicle (EV) chargers it controls, in its home market of Sweden, and that's also where the service launched in October. Additional markets will follow in Europe and other parts of the world. Sweden is expected to open around 130 charging stations between 2023 and 2024, operated by several different players. Volvo Trucks is just one of several partners involved in the initiative. As part of its Milence joint venture, Volvo Group

and partners Traton and Daimler also aim to establish 1,700 high-capacity public truck charging points across Europe by 2027.

“Following recent investment, Sweden will have one of the largest charging networks for trucks, so it makes sense to start there,” says Engdahl. “But momentum is also now building in Germany, Norway, Denmark, France and the Netherlands. There are many more locations of interest.”

The service itself is free, and users can pay for charging using the new platform. In the future, Volvo intends to add a function that will allow drivers to reserve a charging time as well. “It’s super-critical for our customers to have a reservation functionality, but it’s equally critical for those owning the charging station,” he explains. “It means they can improve the usage of the equipment that they have installed.”

## A prerequisite

With this new offering, Volvo wants to incorporate EV-specific insights into the range of normal truck operations, and the functionality is embedded in Volvo Connect. This fleet management system serves as the gateway to Volvo Trucks’ digital services, giving fleets access to tools for monitoring vehicle performance, planning maintenance and improving productivity. “Driving or planning to drive electric trucks involves a few more steps,” Engdahl says. “That includes simulating how far you can drive and if you want to charge along the way.”

As with all of Volvo’s digital services, development took place in-house and offers another angle from which to maintain control of the driver experience. While development inevitably entails expense, the automaker believes it is pivotal to the electric truck market’s—and its own—long-term success. “Services like this are a prerequisite for building the heavy-duty electric market,” emphasises Engdahl. “The vehicles we sell are



The Tuve plant in Gothenburg carries out series production of Volvo’s heaviest electric trucks

tools for making an income, and if you have the possibility to charge a bit during the day, then you can significantly increase the trips you can complete.”

Connected services in general are poised to play a bigger role for commercial vehicle players like Volvo, and electrification further opens the door for potential offerings. With the possibility to more accurately plan journeys and minimise administration, this could prove a real attraction for fleets in the move towards decarbonised transportation.



# Is human-assisted autonomy the future of yard trucking?

Combining self-driving software with teleoperations could provide a succinct solution for some of yard trucking's most pressing challenges. By Will Girling



**T**he suspension of robotaxi operator Cruise's entire fleet by the California DMV in October 2023 reinforced [two key industry takeaways](#) on autonomous vehicles. First, safety will always be paramount. Second, due to its reduced level of route complexity, logistics is one of the most promising areas of deployment for self-driving systems.

In September 2023, autonomous truck software developer Fernride secured US\$50m in a Series A funding for its new vision of yard trucking. Through an approach that combines autonomous systems with human-assisted teleoperations, it believes the new technology can be introduced to logistics seamlessly and effectively.

With [bold new ideas](#) already permeating global supply chains, Hendrik Kramer, Chief Executive and Co-Founder at Fernride, explains how autonomous solutions could act as a springboard for future transformation.

### **What do you consider to be the primary challenges of trucking today?**

There are two megatrends touching every single trucking use case. First is a lack of drivers—in Europe, we have a 400,000 deficit that will reach two million by 2026. Second, the shift from diesel to electric needs to happen as soon as possible. Diesel trucks are responsible for 39% of the EU's greenhouse gas emissions. Therefore, the overall transformation needs to be from manual and diesel trucks to autonomous and electric.



**Hendrik Kramer,**  
Chief Executive and Co-Founder, Fernride

### **Why did Fernride opt to develop solutions for yard trucking specifically?**

We didn't want to focus on a use case where you need to promise a lot of future gains, but rather something that works now. Because charging infrastructure can be easily installed on site and the routes are slower and less complex, yard trucking is well suited for both electrification and automation.

### **What is Fernride's approach for enabling autonomous trucking?**

An ecosystem of key vehicle automation technologies already existed prior to Fernride, so we didn't have to vertically integrate LiDAR, cameras, or other sensor hardware. We take off-the-shelf components and retrofit trucks with them.

Then, we offer a turnkey solution for switching from manual/diesel trucks to automated/electric. Our API can interface with the logistics, yard and warehouse management software

that customers are already using to create tasks that trucks can then execute autonomously. The software stack we developed in-house can facilitate both autonomous and teleoperated driving. Obviously, this type of enterprise software requires training not only for drivers who want to be teleoperators but also fleet managers.

### **Why is teleoperation useful for improving yard logistics?**

That's our USP: a human-assisted approach to autonomous driving with a backup driver ready to assist the vehicles. The teleoperation

component is important for operators wanting to achieve 100% uptime.

### **Does this mean that your solution currently has limited autonomous driving capability?**

For the majority of their routes, the trucks will be SAE Level 4. When difficult edge cases that might cause the stack to be overwhelmed arise, such as vehicles trying to navigate a new construction site that wasn't there yesterday, the truck will stop. At that point, a teleoperator can either tell it to proceed autonomously or take control themselves. The beauty

Fernride's human-assisted autonomy solution has already been deployed in sites for HHLA, Volkswagen and DB Schenker





Using teleoperators, Fernride claims it can safely control autonomous trucks in difficult terrain and teach the system to operate independently

of our solution is that the data from these edge cases can then be fed back to the autonomous system. That means it gets better every year we operate and with every truck we add.

In terms of scaling up the technology, we intend to incrementally increase the autonomous capability of our software over the years. The plan is to achieve a ratio of one teleoperator for every 20 trucks.

### **Have customers been receptive to this combination?**

Fernride has strategically selected the biggest enterprise customers for the logistics space in our home market, Germany. For example, we have a deployment with Hamburger Hafen und Logistik (HHLA) at its terminal in Tallinn, Estonia. We have already successfully integrated and automated its daily truck operations, as well as similar deployments for a production plant at Volkswagen Wolfsburg and a customer site at DB Schenker.

### **How could Fernride's solution ultimately help resolve some of the biggest challenges in logistics today?**

Our solutions work in three ways: promoting sustainability by encouraging the switch from diesel to electric trucks, improving worker safety by taking people out of the hazardous environments in which these vehicles operate, and enhancing cost efficiency through increased productivity. Therefore, customers can effectively do more with fewer resources.

When we started the company in 2019, supply chain disruptions were becoming the topic of the time. Everyone was experiencing what it meant for supermarkets to have empty shelves, not be able to get medicine, and wait 20 months for a car to be delivered. From our perspective, this will only be the start if the trucking industry, the backbone of supply chains, doesn't fix these fundamental problems.

# Where next for in-vehicle networking?

**Ethernet is the backbone of the zonal architecture, which together pave the way for the software-defined vehicle. By Megan Lampinen**

**T**he rise of the software-defined car is rewriting in-vehicle networking strategies. Developers are turning from a domain architecture that groups vehicle systems by functions to a zonal approach. Here, different zones in the vehicle take responsibility for devices installed in a particular section. Each zone is connected to a zonal controller, located in close proximity to the devices it controls. Overall, the approach is designed to reduce complexity and slash the number of wires, also cutting costs and weight.

## **Ethernet end-to-end**

In 2022, an automotive Tier 1 supplier surveyed 25 of the leading automakers in the world and found that 96% intend to move to a zonal approach by 2029. This list includes such big names as Audi, Byton, Honda, Mazda, JLR, Tesla, Ford, Volvo and many more. “This is clearly where the market is moving, and ethernet is the baseline for it,” says Amir Bar-Niv, Vice President of Marketing for Marvell’s Automotive Business Unit. Marvell is an in-vehicle networking supplier jockeying for a leadership position in the ethernet wave.

Ethernet allows faster data transfer over the in-vehicle network between ECUs, sensors, actuators and other devices, as well as when connecting to the internet or remote OEM servers. “Each zone has an ethernet switch that connects to all the local agents of the different domains in that



zone,” explains Bar-Niv. “From there it’s a single-pair thin ethernet cable that runs at very high speed, aggregating all the traffic from these agents. The backbone of the system is pure ethernet, and that makes the cable harness much simpler.”

The capability that ethernet provides is essential for the subscription-based services and over-the-air updates at the heart of the software-defined vehicles. Ethernet is also expected to take on data from camera feeds. Cameras in the car today are still connected with proprietary technology because historically ethernet didn’t have enough bandwidth to support their uncompressed video. But with ethernet now running at ten gigabits/second, and soon up to 25 gbps, it has enough bandwidth to run uncompressed video.

With vast amounts of data running through an ethernet backbone, the bandwidth of the network needs to be very high. Other challenges come in minimising network latency and ensuring functional safety requirements. “This has introduced very big challenges, but we were able to solve all of them,” Bar-Niv says.

## Big business

MarketsandMarkets predicts that revenue in the global automotive ethernet market will grow from US\$1.8bn in 2020 to US\$5.6bn by the end of 2026, and Marvell wants a significant slice of that. In fact, it expects to be the largest supplier of

semiconductor products for the in-vehicle network in the market. It claims to be the fastest-growing by far at the moment and is riding on a wave of market growth.

need,” he adds. Today it has design wins with 40 OEMs.

But with ethernet poised for such growth ahead, competition is likely to heat up. For this

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The capability that ethernet provides is essential for the subscription-based services and over-the-air updates at the heart of the software-defined vehicles

Looking ahead, Bar-Niv expects the number of ethernet ports in a car “will rise dramatically.” Based on data from Strategy Analytics and its own predictions, Marvell anticipates a 29% CAGR in shipments of automotive ethernet ports between 2018 and 2026. The more ports in a car, the more products sold and revenue earned for Marvell.

The company provides ethernet physical layer (PHY) transceivers, which convert the digital signal from all the different entities into the cable, and the switches that serve the domain architecture, along with zonal and central switches for the zonal architecture. It has also integrated PHYs into some of those switches to help reduce costs. “We are a one-stop-shop for all the in-vehicle network components that our customers

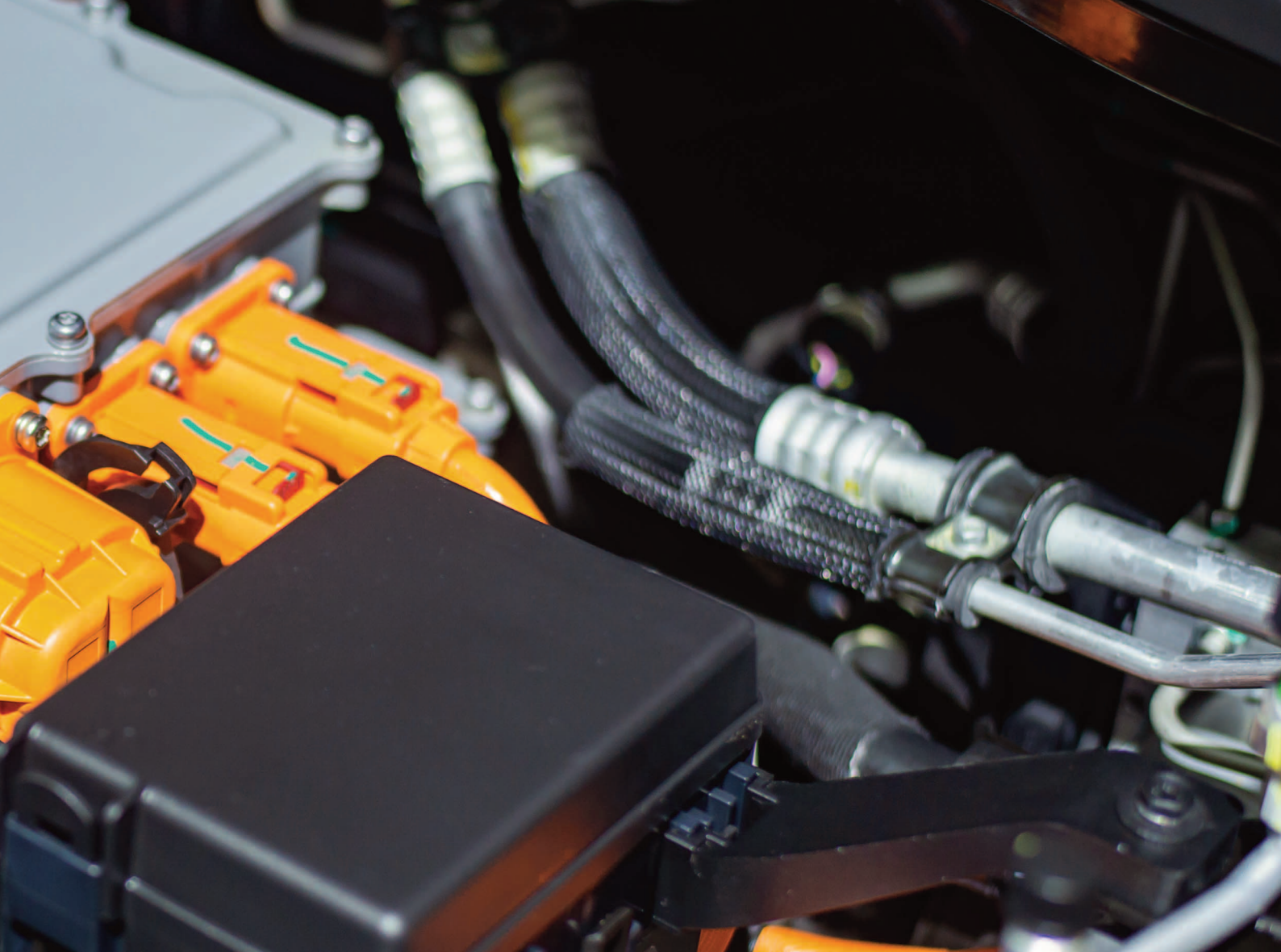
particular supplier, the quality of its products gives it a solid edge. With more than 150 million parts shipped to date, it claims a defective parts per million (DPPM) rate of less than one. It’s also reliable. “Through the tough supply situation over the past two years, we never took down any line of any customer,” says Bar-Niv.

The automotive industry’s approach to in-vehicle networking has evolved rapidly in a relatively short time. “I would visit an OEM ethernet team five years ago, and it would consist of two or three guys,” he notes. “The rest of the company didn’t know how to spell ‘ethernet’.” But investments have poured in, and as of now, many of those OEM ethernet teams have grown to 40 or 50 people. “Ethernet in the car is a done deal,” he emphasises.



# How can garages future-proof for EVs?

James Lett shares his view on what is needed to ensure independent garages are best prepared for the electric future



**T**he growth of electric and hybrid vehicles is shifting the automotive industry on its axis. Changes in regulations and fluctuating consumer attitudes are contributing to both challenges and opportunities for the repair and maintenance sector. With some markets facing a looming ban on selling combustion engine cars, garages cannot rest on their laurels. The next few years represent an opportunity for garages to prepare for the electric vehicle (EV) revolution, and they should use this time to re-train and adapt for the future.

But the responsibility cannot just rest on the garages. To ensure each part of the automotive ecosystem is ready, we need cross-industry collaboration

as EVs become the norm. This is important because it means vehicle technicians are equipped with the essential skills to be able to perform services both safely and effectively on EVs.

## The volatile market for EVs today

The UK's recent decision to delay net zero targets has added to what is already a complex landscape for EVs, causing confusion for drivers who may be considering the shift to electric. Ongoing government announcements will deepen this fog, not only for adoption rates but also blurring the lines for garages to prepare at scale.



Garages must invest in tools and talent

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Announcements surrounding COP 28 and the Autumn Statement hint at forthcoming changes, but a key question remains: will they only explore the top-level macro-requirements, or will they be lending concrete support and direction for independent garages?

The growth of EV infrastructure and buying rates are increasing regardless, especially since the UK car industry must reach its initial targets for EV sales or risk a £15,000 (US\$18,500) fine for each vehicle. To be able to welcome EVs and hybrids into garages full-time, there are two primary hurdles to overcome: talent and tools.

## The vehicle technician's skills gap

One of the most pressing challenges on the road to preparing garages for the EV revolution is the widening skills gap to repair EVs. The reasons behind this are varied, but technicians are being left without the specialist training they need. This is not because of their own shortcomings, rather it's the

underlying challenges that independent workshops are facing such as the cost of tools, lack of governmental support to fund training and lack of time for training due to less technicians entering the industry.

Although EVs work in a similar way to combustion engine vehicles, shutting down and handling high-voltage batteries requires specialist training to safely operate on. Hybrids are a greater challenge as the combination of both combustion and electric systems are even more complex. This means specialist skills are required—and there needs to be greater support for garages to fulfil the needs of EVs and hybrids.

Vacancies across the automotive sector are decreasing but remain 34% higher than the average across all other industries, according to The Institute of the Motor Industry (IMI). This trend is driven in part by economic pressures alongside rising operational costs. In addition, the IMI warns of a significant skills shortfall. Its estimations predict a gap of 4,500 qualified EV technicians by 2029. And this is expected to dramatically grow, reaching 16,000 by 2032.

We see an aging mechanic workforce contributing to this, alongside the perception that working with your hands is not a desirable career path nowadays. Despite this, efforts to attract apprentices to the automotive industry have grown, with job postings increasing significantly. Advertising for apprentices in automotive retail has continued to grow since 2020, with job postings more than doubling since 2021, according to the IMI.



This current shortage of routine tasks leaves little time for upskilling. While workshop software tools can increase the efficiency of current operations, the consensus is clear. Training needs to be more readily available for new and seasoned technicians, and the responsibility cannot be solely on the workshops in themselves to action this.

## Concerns around investment in EV-specific tools

EV repairs can be a challenge for smaller garages because of their heavier reliance on software compared to combustion engine vehicles. The cost of equipping workshops with EV-related equipment is a key roadblock, as consumer worries around their own EV transition is reflected in the unpredictability of the return of investment for garages to purchase these specialist tools.

As technology within vehicles continues to evolve, the software designed to support mechanics and vehicle technicians is also progressing. Autodata, for instance, provides information on the specific tools that are required across a number of jobs to quicken the pace of servicing and repair. While software can streamline current operations, it's clear that more solid measures are needed to help independent garages proactively prepare today for the changes that lie ahead.

## The collective responsibility

Collaboration between educational institutions, industry associations, and garages themselves is vital to ensure that a qualified workforce is ready to meet the growing demand for EV servicing and repairs. It's the only way to ensure that vehicle technicians have the essential training they need to provide services safely and effectively.

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Shutting down and handling high-voltage batteries requires specialist training

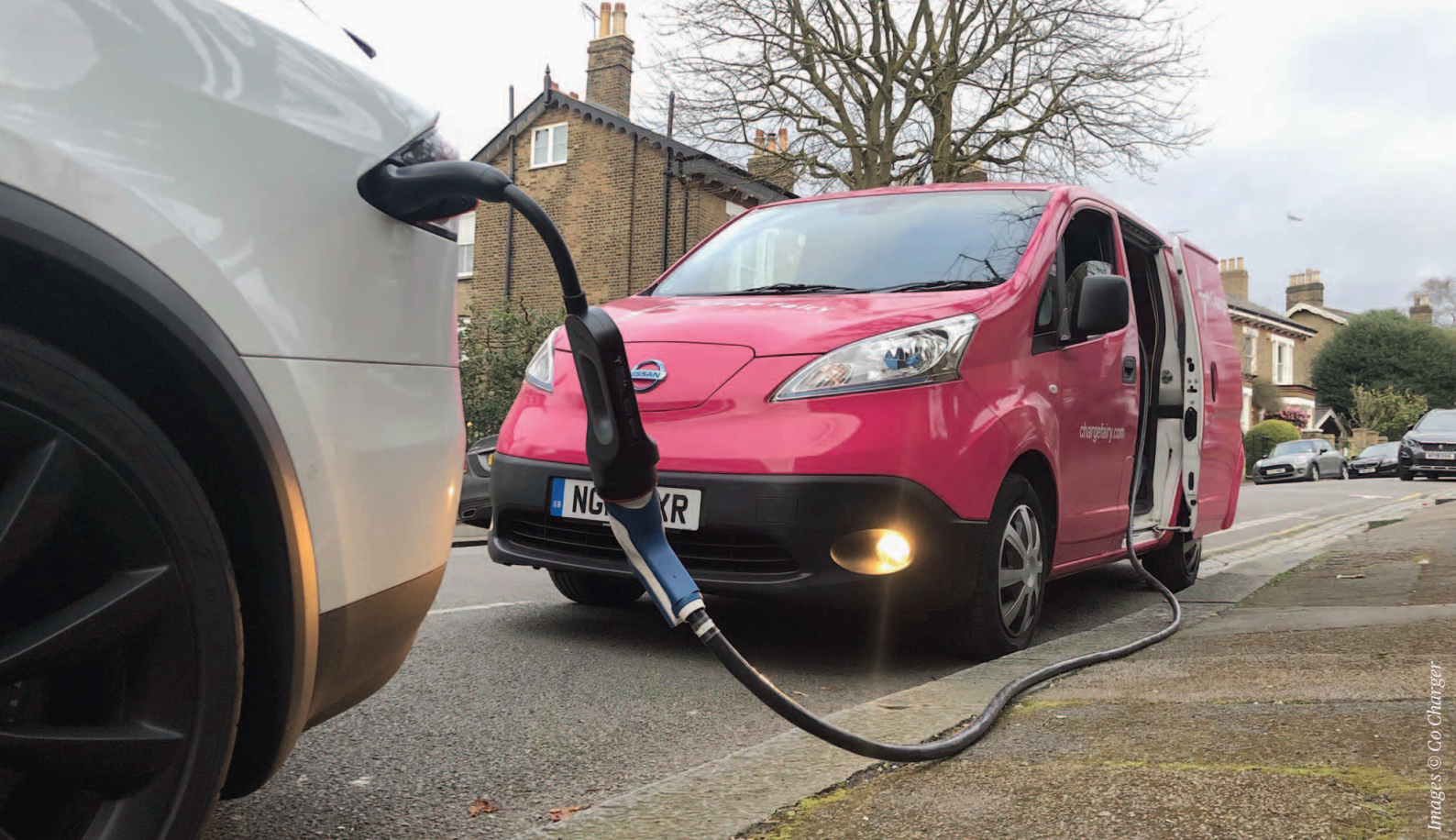
While manufacturers design their vehicles with serviceability in mind, garages must keep pace with the rapidly advancing technology underneath the surface. Governments can lend crucial support by setting standards and providing incentives for training and infrastructure development, with the synergy of these efforts equipping garages with the knowledge and tools necessary to thrive.

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# Is charger sharing the key to increasing EV adoption?

**A lack of off-street parking is a major barrier for many looking to embrace EVs, but charger sharing platforms could offer a solution. By Stewart Burnett**

One of the more notable trends to have emerged concurrently with the onset of electrification is the rise of the sharing economy. A major example is electric vehicle (EV) sharing, which provides consumers with an alternative to the often high upfront costs of ownership. Madrid has three all-electric sharing platforms with a fleet size north of 600: Zity, Emov and Share Now. The latter company also has an 800-vehicle fleet in Paris. Greg Fairbotham, Chief Executive of EV sharing platform Zoom EV, told *Automotive World* back in July 2023 that sharing economies can help ease cost burdens and increase the overall utilisation of products.

Applied on a broader scale, the same principles could also help resolve some of the other concerns drivers might have about embracing EVs, such as the inability to charge at home due to lack of off-street parking. Resolving this issue could have a significant effect on adoption—the Intergovernmental Panel on Climate Change has observed a strong correlation between EV ownership and access to home charging in Germany, with 80% of all EV owners also having off-street parking.

However, more than a third of German homes have no allocated parking spaces whatsoever, and this same problem is found elsewhere in Europe. In the UK, 44% of all homes are unsuitable for EV charging, according to 2023 data from Lloyds Bank. UK-based sharing platform Co Charger is modelling a solution to this issue, connecting thousands of drivers without access to home chargers to those in their neighbourhood who do and are willing to share.

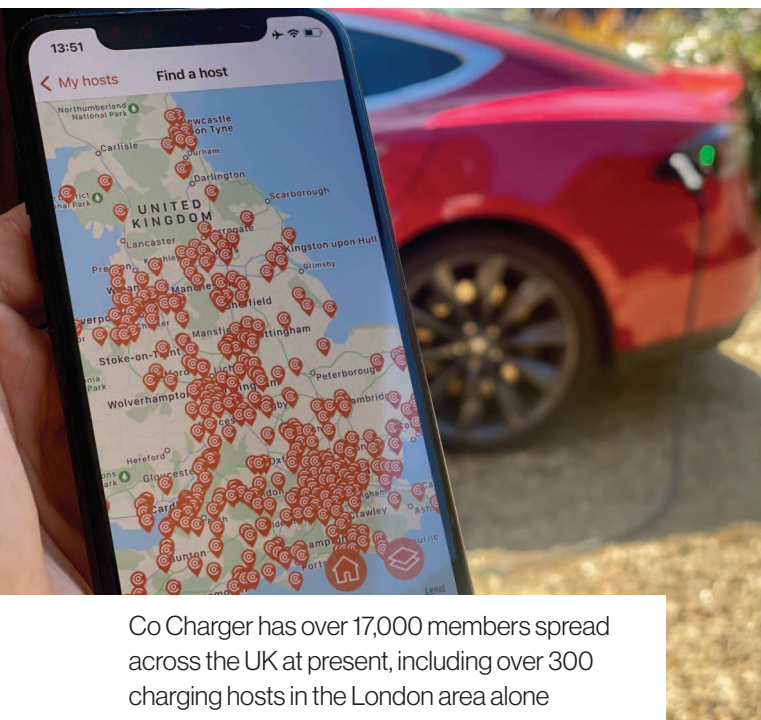
## Public is not an option

Joel Teague, Chief Executive at Co Charger, believes the wrong approach has been taken by legislators to tackle the issue of charging. “There are costly plans being made on the incorrect assumption that people without off-street parking would just buy EVs and use public chargers,” he remarks to *Automotive World*. “It’s a ten-figure error.”

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Charging point app ZapMap’s annual survey has consistently reported that around 84% of all EV charging in the UK happens at home, despite charging infrastructure expanding significantly year-on-year. People who cannot charge at home, Teague argues, are significantly less likely to buy an EV because the running costs need to offset the cost of ownership.



Co Charger has over 17,000 members spread across the UK at present, including over 300 charging hosts in the London area alone

Co Charger has seen the number of registered users on its platform rise substantially over the course of the last year, with total users surpassing 17,095 (including 5,246 charging hosts) in the week commencing 6 November 2023—a 39% increase from November 2022.

This is due in part to its ongoing partnerships, one of which is with renewable energy company Octopus Electric Vehicles. “It visits companies and makes a proposition for an EV package to the staff—salary sacrifice, huge tax breaks, free home chargers, the whole works,” Teague explains. “But without Co-Charger, the ones without driveways tend not to say ‘yes’.”

## Facilitating shared mobility

Uber has proven to be another important partnership for Co Charger. Indeed, Teague reports that almost half of the company’s recent

charging sessions have been with shared mobility drivers. He further observes that one Uber driver has already booked out sessions with the same charging host until April 2024. Shared charging has strong value in this market segment, primarily because it helps to shorten a long and strenuous working day for drivers.

“That person has to work a long day to get by and might not have off-street parking” Teague observes. “So, they go to a public charge point and wait for hours, get home at 2am, only to wake up at 6am and do it all again.” With Co Charger, they can simply book a charger in their neighbourhood and leave it there overnight.

For London Uber drivers, the 2023 expansion of London’s Ultra Low Emission Zone (ULEZ) is a compounding factor. If a vehicle does not meet its emissions standards, then the driver must pay £12.50 (US\$15.26) per day to travel inside it.

## Dispelling concerns

In order for the platform to grow, however, it must work to overcome the concerns of prospective users. Teague highlights that improper use and property damage are significant barriers from a host’s perspective. While the concern is understandable, he emphasises that it is not reflected in reality. “Following thousands of sessions, we have never had a proper dispute or a report of damage,” he states.

The process of making a booking is straightforward. First a user must register on the platform as a ‘chargee’. If somebody in their neighbourhood has shared out their

charger, they can link them to their account and make a request to use the charger at a designated time slot. The host then has the option to either accept or decline the request.

There are several anti-gaming measures built into the app. For example, the renter must take pictures of the car dashboard to verify the amount of charge they received. However, Teague asserts that Co Charger's community-oriented business model is more important in preventing disputes. While it does not enforce rules against destination charging, it strongly encourages that its platform be used as a solution for base charging on a local basis.

"If somebody's from out of town and will never use your charger again, then concern is understandable," he explains. "But if it's your neighbour and the only reason they bought an EV is because they know they can use your charger, they are not going to annoy you."

Teague is confident that attitudes will change as people realise the benefits of a sharing economy. Charging hosts are free to set their own prices (although the default profit margin is 20%), as well as a 10% allowance for energy used during the charging process that does not end up in the battery (transfer loss). For renters, the platform's charging costs come in around 28% cheaper on average than slow public chargers and 48% cheaper than the fastest.

Overall, Co Charger believes its value proposition is strong for charging hosts, renters and prospective EV owners alike, and that this is reflected in the platform's steady growth. While acknowledging that direct

comparison with public charging providers is "unfair", Teague highlights that Co Charger has become the second largest charging network in the UK at the time of writing. "They are building out the infrastructure, but we keep catching up—we will be the biggest network in 2024," he claims.

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If Co Charger's approach works in the UK, then it could be made to work in Europe and other regions. "The beauty of the Co Charger model is that it can work right around the world," Teague concludes. "It's quick and cheap to deploy and offers huge benefits, so we are actively looking to partner with governments and companies in other markets to deliver those benefits overseas."