TRENDS 2023

SPECIAL REPORT BY NICK GIBBS

Why it might be time for optimism on self driving

WE'RE IN A slump right now when it comes to industry and consumer expectations of autonomous driving. That's the verdict of Kyle Vogt, head of the General Motors-backed autonomous driving company Cruise. "There's this pendulum that swings back and forth between extreme optimism and extreme pessimism. And I think we're more on the extreme pessimism side right now," he told investors at a recent conference.

Burned by the days of extreme optimism – for example, in 2020, Elon Musk claimed his company Tesla would have "one million robotaxis by the end of the year" – we are all understandably cautious when car companies promise imminent full autonomy. But Vogt says our pessimism is also now an illusion. "I think people are going to be caught off-guard by how quickly AVs [autonomous vehicles] go from the first ride that you've taken to available pretty much everywhere," he said.

Cruise is spending big – half a billion dollars between April and June alone – to roll out robotaxis, initially in the US. Cruise already offers limited driverless taxi rides in San Francisco and will add Austin and Phoenix by the end of the year. By 2025, says Vogt, Cruise will be selling autonomous cars to private customers and turning over a billion US dollars a year.

Is that another over-promised autonomous deadline that's going to whizz past us, drivers waving glumly from behind the still very present steering wheel? It's hard to say, but from our standpoint and those of the more hard-headed analysts, autonomy is slowly emerging from what analyst firm Gartner calls the "trough of disillusionment" up onto the "slope of enlightenment".

Cruise is testing purpose-built Origin Shuttle

So what will that path look like? There will be three main routes to full autonomy. One is being taken by the likes of Cruise and will involve initially the lucky few hailing robotaxis in select, weather-friendly cities mostly in the US and China. This group includes Waymo and Argo AI in the US and, in China, Baidu (which secured the country's first driverless taxi licence back in August), AutoX and Deeproute.ai. Expect Apple when it finally launches a car to join this side of the industry and build robotaxis.

> "BY 2025, CRUISE WILL BE TURNING OVER A BILLION US DOLLARS EVERY YEAR"

The second route harnesses the ever-growing powers of advanced driving systems, the ones that are becoming increasingly common on everyday cars. The same tech that nudges errant drivers back in the lane or keeps cars a set distance in front is being beefed up to reach level three, where drivers can take their hands off the wheel but must be prepared to take back control.

This has been rolled out in a limited programme by Honda in Japan and in Europe by Mercedes with the new S-Class and EQS. Mercedes' so-called Drive Pilot takes over at speeds below 37mph on

motorways and costs from €5000 (£4450) on the S-Class and €7430 (£6600) on the EQS. Mercedes is starting to ship cars with the system now in Germany, the first country to approve the system. The UK has also said it will allow cars with level-three ALKS (automatic lane keeping systems), although has banned drivers from focusing on anything other than the car's in-dash screen. No system has been given UK type approval yet.

The steep cost of specifying Mercedes' Drive Pilot is due to the extra tech needed (see box). For a lot less (unless you're a Tesla owner), drivers in the US and China can specify something that's semi-officially called level two-plus, which is hands off, eyes on. That means the driver still has to pay attention to the road ahead but can take their hands off the wheel. Level two-plus is essentially what Tesla operates under in the US, but has the cheek to call it FSD, for full self-driving.

However, Ford's BlueCruise and General Motors' rival Super Cruise have more safety systems in place, including an eye tracker making sure you're paying attention and a limit to the types of road you can use it on.

Ford, for example, claims that 65,000 drivers are using BlueCruise in the US, with 15,000 receiving it through over-the-air updates.

Ford charges $600 (£555) for a three-year subscription to BlueCruise in the US, and we can expect similar here when – or if – it's allowed in Europe. BMW has also promised 'address-to-address' level two-plus capability on 'Neue Klasse' electric vehicles from 2025.

The third route to autonomy, meanwhile, lies in unmanned, low-speed applications, either confined to non-public areas such as ports, factories or depots, or small enough that they pose no specific danger to road users or pedestrians. These include the Starship delivery robots in use in Milton Keynes and Northampton, the Estonian capital Tallinn and a handful of US university campuses. The company claimed to have made three million autonomous deliveries up to February this year.

The stumbling block for autonomous cars remains the last 5% or so of non-predictable events that threaten to scupper the reputation of self-driving accuracy with one fatal mistake.

One way to tackle these 'edge' cases is the approach China is taking to invest in road infrastructure that helps out the car by providing access to information from fixed cameras or lidar sensors – for example, on tricky junctions or in wet weather.

That's happening right now in China, a country that plans to invest $300 billion (£277bn) between now and 2040 on what's described as 'vehicle infrastructure cooperation', the research arm of UBS bank forecast in a recent report.

"Vehicle infrastructure cooperation should drive faster autonomous implementation as it removes vehicle-side technological bottlenecks," said the report.

The idea initially would be to create autonomous-ready highways that provide enough support to help guide first trucks and then eventually cars.

On those highways with the maximum level of autonomous guidance, China is planning to install, per kilometre, 50 cameras, 20 lidars, 20 millimetre-wave radars, 10 intelligent roadside units (with mobile connectivity) and four oxygen sensors, predicts UBS, with the aim of commercial adoption from around 2026.

Once driverless trucks are viable, even if depot-to-depot rather than door-to-door, then haulage companies will be prepared to pay the road charges needed to claw back some of the state investment needed, given the savings on driver wages (roughly a quarter of truck logistics costs).

We might not need outside help, even from the latest high-definition maps, Vogt said at the September conference. "We've cracked the code on that and eliminated the need for maps that are perfectly up to date," he said, claiming Cruise's cars can now handle a new traffic light not included in its on-board mapping.

What we do need to be mindful of, however, is that companies that exist purely to roll out fully autonomous software or vehicles are funded entirely by those who buy into the dream that autonomy will unlock gushing new revenue streams. As such, they need to keep the dream alive and the optimism flowing.

The routes that already are generating revenue, over and above a handful of daily robotaxi rides in sunny west coast US cities, could show a clearer path. So in fact it's probably Mercedes' level-three Drive Pilot, with its myriad sensors but hamstrung in red tape doled out by wary legislators, that probably gives a better view of the long grind ahead.

AV TECH REMAINS A COSTLY ADD-ON FOR TODAY'S CARS

Mercedes Drive Pilot programme 'takes the wheel' under 37mph on motorways

Why is Mercedes' Drive Pilot system so expensive? Because it needs a lidar sensor and redundancy built into the steering, braking and electrical systems in case of failure.

It then needs a camera in the rear window and microphones to listen out for sirens. It also comes with a water sensor in a wheel arch to check for rain (at which point it hands back to the driver). There's a more powerful GPS system, too. For the moment, this remains a technology for the rich.

SPECIAL REPORT BY NICK GIBBS

Does China hold the key to cheaper EV batteries?

The rising cost of already expensive raw materials for batteries is forcing Western car makers to reappraise a cheaper chemistry that relies on Chinese expertise at the expense of Korean and other Asian battery players.

The growth of lithium iron phosphate (LFP) from its initial core market of electric commercial vehicles into premium EVs made by the likes of Tesla is causing Western brands to rethink their bets on the more energy-dense – but costlier – nickel-based NMC (nickel manganese cobalt) or NCA (nickel cobalt aluminium oxide) chemistry.

Some Western brands – Renault, for example – have ruled out LFP altogether. We forecast, however, that subsequent battery announcements from car makers are going to bring the iron-based chemistry into the mix for medium-range EVs as costs are ever more closely scrutinised. The soaring cost of nickel in particular will force car makers to seek alternatives.

The cost advantage of LFP was revealed in a teardown by the bank UBS and P3 Automotive of two leading LFP battery packs: the CATL-supplied unit in the standard-range Tesla Model 3 and the BYD 'Blade' battery. Both BYD and CATL are Chinese.

The bank concluded in its subsequent report that the CATL pack was the global battery cost leader at a cell price of $131 (£121) per kilowatt hour, while the BYD Blade LFP battery cost wasn't far behind at $134 (£124) per kWh.

With battery packs accounting for up to one-third of the materials bill of a modern EV, the 9% saving of LFP versus a high-density NMC 811 cell that UBS analysed previously is huge. The cost savings impressed the bank so much that it raised its estimate of LFP's global share from 15% to 40% by 2030.

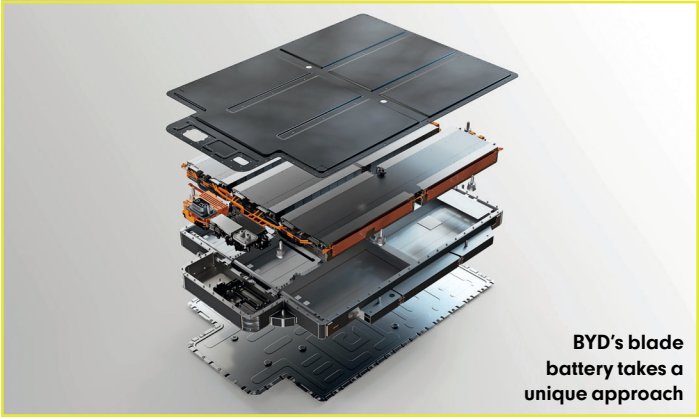
> "BATTERY PACKS ACCOUNT FOR UP TO ONE THIRD OF A MODERN EV'S MATERIAL BILL"

Tesla's commitment to LFP and its acceptance among buyers will be comforting to those car brands that might fear a consumer rejection of a chemistry with a lingering whiff of the commercial vehicle about it.

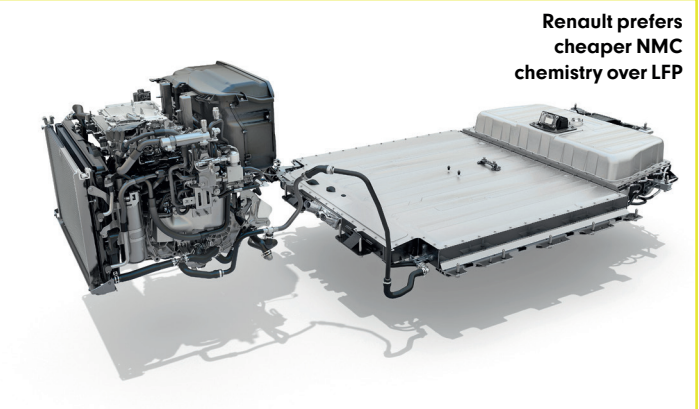
UBS estimates that 90% of Model 3s from the company's Shanghai facility use the CATL battery, including for export to Europe, with the Model Y now using the same battery for China sales, too. Tesla is also expected to use the BYD Blade LFP battery in its Model Y built in Berlin, Germany.

Tesla, however, doesn't advertise that its standard-range Model 3 and Model Y use LFP batteries, and there's little reason to flag it up. It doesn't even give a kWh figure (UBS reports that this is now 62kWh after a recent upgrade). Buyers instead note the claimed 374 miles on a single charge for the Model 3 and compare it favourably against rivals, which often use the more expensive NMC chemistry.

Chinese premium-angled electric brands



BYD's blade battery takes a unique approach



Renault prefers cheaper NMC chemistry over LFP

such as Nio and Xpeng have embraced LFP just as enthusiastically as their role model Tesla and now we're starting to see Western brands follow suit.

Before this summer, the main proponent of LFP in Europe was the Volkswagen Group, which bought the single-largest stake in Chinese battery maker Gotion and said it would use the company's LFP chemistry in the "cost-sensible entry segment". No VW EV has yet to use the chemistry.

However, we expect VW to significantly change its position from this narrow usage if it can see similar cost savings as Gotion's (much bigger) rivals have unlocked.

VW is one of the few with a path to European supply of the cheaper chemistry. In June, Gotion inaugurated its forthcoming plant in Gottingen, Germany, scheduled for production starting in September 2023. VW and Gotion are also working on a plant in Salzgitter, Germany, due in 2025.

ALL EYES ON THE NICKEL PRICE

The nickel price is likely to be the deciding factor on cost competitiveness for LFP versus NCM: at UBS's predicted long-term nickel price of $18.7 per kilogram, NCM batteries win.
But iron batteries are the cost winner with nickel price above $25 per kg.

Source: UBS

NCM'S DENSITY ADVANTAGE

A difference in cathode crystal structure means that NCM can store a greater amount of lithium relative to LFP cathodes.

Ford will use LFP batteries in its EVs from 2023 - claiming 10%-plus cost reduction

VW rival Stellantis has so far only said it would roll out an 'iron-manganese' battery pack in 2024, without indicating who would supply it. Mercedes, meanwhile, promised last year it would "vary chemistries depending on customer needs in different markets". However, CATL's recent announcement that it will build a factory in Hungary could mean LFP production for Mercedes, the plant's primary customer.

The most dramatic conversion to the new chemistry after Tesla among Western car makers so far is that of Ford, which announced it would source LFP batteries from CATL for use in its EVs starting with the Mach-E next year. Ford has praised its cost efficiency, claiming a 10-15% cost reduction over nickel-based chemistries. Ford CEO Jim Farley also noted China's control of the chemistry. "It's a very significant advantage for them. All the IP [intellectual property] is there," Farley told the bank Bernstein's annual conference in June.

Aside from cost, there are other reasons to choose LFP. Its chemistry makes it less susceptible to thermal runaway events (ie catching fire) compared with NCM batteries and it also better withstands repeat rapid charging.

There are problems with LFP, however. Those choosing it will become reliant on Chinese companies and supply chains, which we believe will worry all car makers after the painful lesson of recent months not to rely on a single region for crucial parts.

LFP is also a heavier chemistry, which throws up issues surrounding the car's weight (although CO2 output from the car itself is no longer a concern). LFP is less energy dense too, meaning that for cars it's mostly confined to cheaper, shorter-range variants.

> "LFP IS LESS SUSCEPTIBLE TO THERMAL RUNAWAY EVENTS"

Tesla, ironically, managed to make it work because its battery packaging for the Model 3 and Model Y was less efficient than rivals with dedicated electric platforms, meaning it had more room to install a decent-sized LFP pack (although not enough to launch a long-range LFP model).

VW's MEB platform, for example, might be too efficiently packaged in terms of its battery space to provide an LFP alternative with sufficient range for a European market, with UBS estimating that the 370 litres of available battery pack space can accommodate only a 57kWh LFP battery system. VW has promised MEB cars with LFP packs for China.

Finally, LFP's cost advantage could evaporate if nickel prices fall back from their current elevated heights, especially if LFP takes off as predicted. Next-generation nickel-based batteries could overtake LFP in the future on a cost/range basis, meaning car makers will need to engineer pack systems that are chemistry-agnostic. This will allow them to be super-flexible to take advantage of the most cost-effective chemistry in a manner shown by Tesla.

SPECIAL REPORT BY NICK GIBBS

How features-on-demand are reshaping retail

LIKE IT OR NOT, the car industry is moving to a features-on-demand business model. Harnessing the car's increasing ability to connect remotely, this will allow manufacturers to tap into potentially highly profitable new revenue streams.

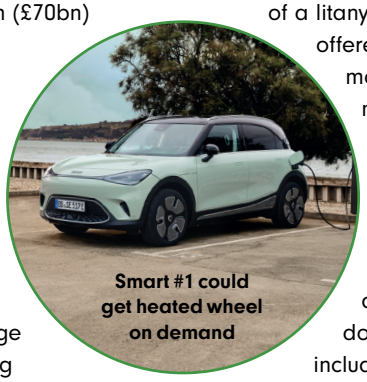
The 'software-defined' car of the future will build on the already growing capability of many models to add options well after they've left the showroom.

In a short few years, the controversy over BMW's decision to charge for heated seats will be forgotten amid an array of choices available to new car buyers. What isn't clear yet is customers' appetite to add a raft of new subscription charges on top of those we already accrue in everyday life.

Car companies and those suppliers who are facilitating this fundamental shift are salivating at the thought of the money to be made. Stellantis has said it thinks that by growing its fleet of connected cars from 12 million now to 34 million by 2030, it will generate around €20 billion (£70bn) of additional revenue.

The Volkswagen Group, meanwhile, has spoken of "a significant revenue pool" from software-based business by 2030.

Tesla has famously done very well by charging customers for its FSD assisted driving package (standing for Full Self Driving but actually providing only Level 2+ autonomy), which now costs $15,000 (£13,300) to download in the US. BMW's controversial 'downloadable' heated seats cost £15 a month if available or £350 for 'unlimited' use. The heating system is of course installed on the production line but needs to be activated remotely. It's just one of a litany of features and services offered by BMW for its latest models, many of which are merely data-driven, such as a year of speed-camera alerts for £25. Many come with a month's free trial.



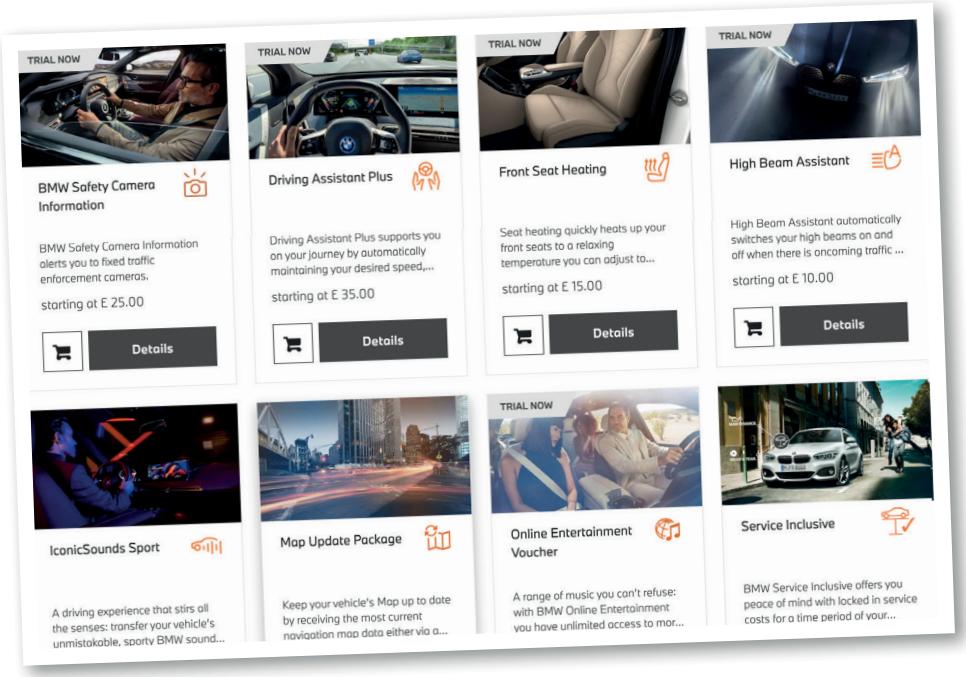
Smart #1 could get heated wheel on demand

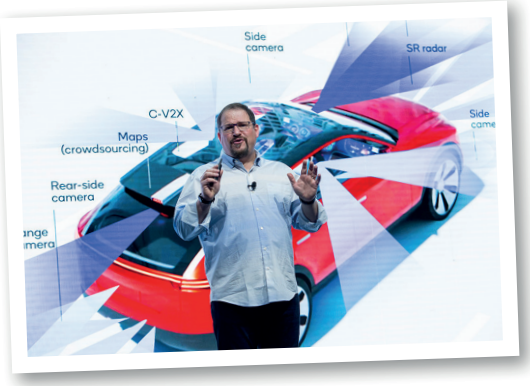
Mercedes is also offering similar downloadable features, including a tracking feature to locate your car (if it's stolen) for £139 for a year, whereas Polestar is charging around £1000 for an extra 67bhp slug of power in the four-wheel-drive version of its 2 electric saloon. And Smart is investigating whether to offer a heated steering wheel via subscription on its new #1 electric SUV.

The appeal to the manufacturer isn't just the ability to generate revenue from a car long after it has left the showroom and maybe even from the second and third owner. It can also streamline manufacturing and theoretically reduce the difference between each model on the production line to a handful of variants, down from thousands. Less complexity equals less time lost and more productivity.

The connection with the customer changes too. "The relationship between the owner of the car is with the dealership right now," Cristiano Amon, CEO of chip maker Qualcomm, said at a recent investor conference. "But for the first time, the car companies have an opportunity to have a direct relationship with the car owner in real time." Qualcomm is one of the new

BMW offers an array of post-purchase safety and comfort upgrades via infotainment screen





Cristiano Amon: "Car companies can have a real-time relationship with customers"

automotive suppliers diversifying from consumer tech (in this case smartphones) to address the chronic lack of digital smarts in the car industry. By installing its powerful system on chip (SoC) in the car and layering over software that can remotely connect to all manner of features in the car, from seats to cameras, it's dragging the car into the modern era.

As you might expect, Qualcomm is promising untold wealth in return. "We believe some of those new business models are going to generate as much earnings for the auto companies as the profit from selling the car in the first place," Amon said.

Car companies are getting excited about the possibilities, including revolutionising the used-car industry. The opportunity to completely upgrade the car to run the latest software and offer brand-new features would boost residuals to the point car companies themselves see themselves participating in a way they haven't really so far – particularly when it comes to electric cars, which can be optimised in ways simply not available to ICE cars. Adding a lifetime subscription to heated seats and boosting power by 50bhp costs nothing to the car maker and is as simple as clicking a button but might add £500 to the used car price.

"We're convinced EV and connectivity will be the key enabler of the used car business," said João Leandro, CEO of Group Renault's Mobilize Financial Services, the division tasked with looking for opportunities in this space.

The definition of a used car is also changing as flexible subscription models shorten the possible customer time with the car. In this model, cars are required to be as adaptable as possible to encompass the needs of many drivers. For example, a company might charge more per month for a car with ADAS semi-autonomous capabilities or turn that off if the customer doesn't want to pay the extra. "By moving from a cyclical business to a subscription-based model, we increase the potential to obtain recurring revenues from software sales and services," Volvo said in its most recent annual report.

The size of the opportunity is debatable, however. Not all car makers think they can monetise via subscription what buyers have been used to paying for up front or have come to expect from smartphone updates. It might be that all the nice-to-have upgrades should just be used to grow the warm feelings customers have about a brand.

"The internet-of-things connection, pre-conditioning your house, opening the garage without pushing a button and all those magical things that should happen in your car are going to make people's lives better," said Ford CEO Jim Farley in June. "But I don't think most of that is chargeable."

What could be chargeable is smart assisted driving, Farley said. As the levels of autonomy grow, the benefit to customers to take their hands off the wheel and do something else could be extremely valuable. It's also extremely expensive to install the sensors and high-definition maps, which is why the Volkswagen Group has spoken about ordering it up for specific journeys rather than paying for it flat out.

Car companies without the brass neck of Tesla are also realising they can't just offer one car with one sensor set-up that can be expected to tackle all the situations in a Level 2+ or Level 3 autonomous driving situation once activated online. It may be great for simplified production, but the sheer scale of hardware needed precludes the maker from offering cheaper versions.

Chinese Tesla rival Xpeng offered its XPilot ADAS suite on demand across all models but changed its mind on the new G9 electric SUV to offer a higher-spec model with smarter, built-in semi-autonomous ADAS features. Essentially, the company went back to the old-school method of adding functionality on the production line that the customer paid for up front.

Of course, the dream of having services and features on demand falls apart if a car maker can't devise ones that people think are worth paying for – or ones that Google and Apple already offer on people's phones, such as Apple's Parked Car feature. The road to the true software-defined car is still long, but many in the industry have no trouble visualising the pot of gold at the end.

"COMPANIES ARE EXCITED ABOUT THE POSSIBILITIES FOR USED CARS"

Xpeng went back to traditional model with new G9

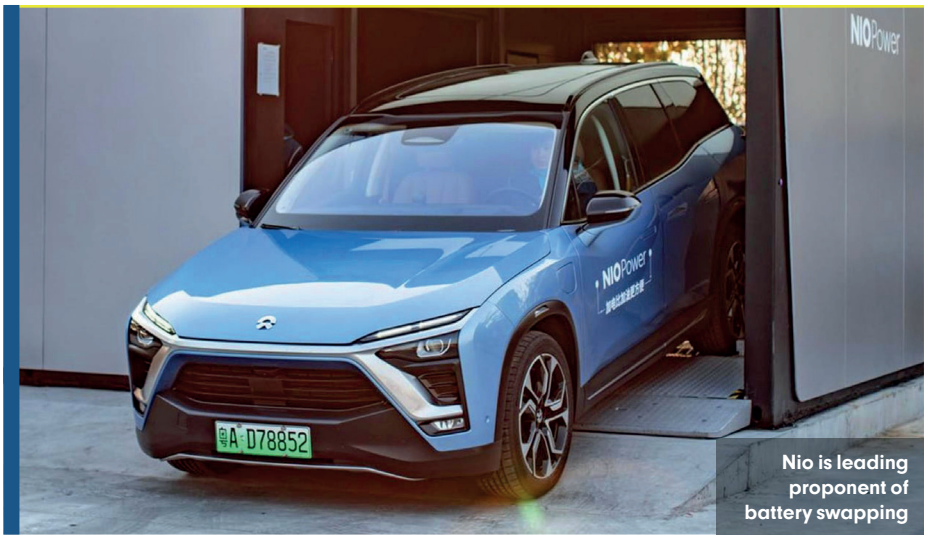
SPECIAL REPORT BY NICK GIBBS

Could battery swapping solve infrastructure woes?

THE TOPIC OF EV battery-swapping will be hotly debated across Europe in the next few years. We believe the technology offers a practical solution with, crucially, the strong possibility of returns for investors for certain use cases.

The push so far into Europe has mainly come from Chinese players, which are at the forefront of battery-swapping. Two approaches have emerged. The first, employed by Tesla rival Nio, is to create a VIP charging experience that it believes complements its premium status.

Nio builds all its cars using a common structure that allows owners of all models to swap batteries at the company's brand-specific stations in about five minutes, giving a vastly better charging experience than plugging and waiting. In terms of benefits to the owner, it eclipses Tesla's Supercharger network in that the process is much quicker (if there are no queues). It doesn't even require the driver to exit the car.



Nio is leading proponent of battery swapping

Fleet-focused EVs could benefit from quicker top-up times

As of the end of July, Nio had installed 1047 swap stations and claimed to have surpassed 10 million battery swaps. Of those stations, just one was built outside China: in Lier, southern Norway. Nio is planning 20 in total in Norway and aims to have two built in Germany by the end of the year to underpin its market launch there. Nio has said it intends to build 4000 battery swap stations by 2025, including 1000 outside China.

However, the business case for Nio looks shaky. We found figures from the company detailing costs of $772,000 (£588,000) to build a swap station in China – including the batteries, site leasing (etc) – compared with $309,112 for a bank of chargers. To make its strategy work, Nio would need a strong network of swap stations to satisfy customer demand for longer journeys, while accounting for the fact that most owners in Europe would usually charge at home.

Therefore, we believe the company needs to licence its technology to other manufacturers to make a good business case, which will be hard, given that most potential customers will be locked into long-term platform strategies of their own.

The second use case for battery swapping – and the one we believe will gain the most traction – is supporting electric business vehicles driving predictable routes without sufficient downtime for a full recharge.

Again, China is looking to make in-roads here. One battery-swapping trial building momentum focuses on taxis in Berlin. Now into its third year, it is run by a Chinese-German joint venture called InfraDianba, using swap technology from specialist Aulton Dianba and EVs from MG, owned by China's SAIC. The trial is now at the point that InfraDianba is ready to build a swap station at Berlin Airport, on the forecourt of a petrol station owned by France's TotalEnergies, which will operate it from completion in mid-2023.

The company has the backing of Berlin's taxi fleet, which wants support in switching 4000 cars to EVs with battery-swapping

technology. Aulton claims it can change a 50kWh battery in just 20 seconds.

This is a smarter use of the technology: as legislation forces Europe's car parc to go electric, competition for public chargers will climb. Directing high-use vehicles such as taxis and delivery vans away from chargers and into dedicated swap stations will benefit all EV owners, while the regular throughput should generate reliable income for the swap station's operator.

Taxi drivers and companies are also more brand agnostic. For example, the MG 5 SW EV estate is becoming popular with taxi drivers, who like it for its balance of range, space and cost. Aulton says it has licensed its technology to 16 Chinese car brands, and although few might become household names in Europe, they could do good business exporting models with the battery-swap tech for taxi fleets.

Another possibility is that taxi finance companies could import these converted cars from China and then bundle the cost of the car, the battery lease and swaps into one monthly payment for owner-operators.

Another company investing in the technology in China is battery company CATL, which is launching a service called Evogo that claims to swap batteries in less than a minute. It has signed up Chinese car maker FAW, which will install the technology in a new MPV.

And Geely (owner of LEVC, Lotus, Polestar and Volvo) last year announced plans to open 5000 swap stations globally.

Chinese cities such as Wuhan are already encouraging ride-hail fleets to use battery-swapping and are incentivising the construction of swap stations.

China is drafting a national battery-swap compatibility standard for passenger and commercial vehicles. A July meeting of the drafting group was attended by 160 experts from 40 institutions and companies, including the National Technical Committee of Auto Standardisation, battery company CATL said.

There are wider benefits to swap stations. InfraDianba is also talking about the ability to use battery capacity in the swap stations – up to 60x50kWh (3000kWh) in its biggest stations – as energy storage, which could give it a second source of income selling electricity back to the grid at peak times, providing it can balance the needs of its vehicle customers.

Vans are another good usage case. In Japan, a joint-venture company comprising Daihatsu, Isuzu, Suzuki and Toyota, called the Commercial Japan Partnership Technologies Corporation (CJPT), has teamed up with logistics company Yamamoto Transport to research swappable 'cartridge' batteries.

The new research cites a number of advantages of using swappable batteries. For example, spare batteries can be timed to charge when electricity is cheap, renewably generated or both. All advocates of battery-swapping cite the benefits of slow charging versus rapid charging to preserve a battery's health, which is possible when they're not attached to the vehicle and needed right away.

Another advantage cited by Japan's CJPT is the ability to match the size of the battery to the particular use case of a commercial vehicle. For instance, city delivery trucks may need fewer cartridges than those on longer delivery routes.

Meanwhile, Nio has said it will offer different chemistries in its swappable batteries: a customer who doesn't need a super-long range can opt for a cheaper subscription to lease iron-based LFP batteries while retaining the option to rent a more energy-dense battery for long journeys.

We think the advantages of battery-swapping and China's determination to make it succeed – on a state level, rather than just a company level – will mean Europe is certain to embrace battery-swapping in some form.

However, we don't believe European manufacturers will adopt it for the majority of their future EVs, given the high expenditure needed and the likely reluctance to adapt platforms to accept mainly Chinese battery-swapping standards.

Battery technologies and structures are changing at such a rate that few car makers would want to be tied to a system limiting their ability to innovate and create economies of scale within a vehicle platform.

Moreover, swapping becomes less of an issue for private drivers who mainly charge at home or at work – who generally have less need of rapid chargers – as charging speeds climb.

But for lower-tech EVs for business use, powered by cheaper battery chemistries, battery-swapping has a future. InfraDianba envisages a zero-emissions future in which forecourts are repurposed with a mix of swap stations, chargers and hydrogen pumps. Further in the future, it foresees second-hand and commercial EVs being equipped with swappable batteries.

With widespread adoption reducing barriers to entry, there's strong reason to think this could be our electric future.

WHO OWNS THE BATTERIES?

Nio's flagship ET7 will get 150kWh battery

To use Nio's swapping system owners need to lease the battery from Nio for the equivalent of £175 a month for the 100kWh battery in Norway (90kWh usable from swap stations). That cuts the cost of the car by the equivalent of around £7500 and gives two free swaps a month. The cheaper option is the forthcoming 75kWh battery which can be swapped in with no changes, or there's a 150kWh version in the pipeline that will fit newer models such as the brand's Mercedes EQS-rivalling ET7 saloon.

SPECIAL REPORT BY NICK GIBBS

Is there still a future for plug-in hybrid cars?

WE ALL KNOW plug-in hybrids (PHEVs) are a stop-gap solution, but what is their future in the medium term across Europe?

Recent sales figures say PHEVs are already on the slide as momentum from battery-electric vehicles takes over. Sales across Europe were down 12% in the first six months of 2022, according to figures from automotive pressure group ACEA, while EVs were up 30%. The strong boost in pure-electric sales this year flipped their positions compared to the same period last year, with PHEVs now in second place with sales of 461,484, vs 629,747 for EVs.

Plug-in hybrids, led by the Ford Kuga, did manage to slightly boost their share to 9% of the total car sales across Europe, but only because their decline was fractionally slower than the rest of the market.

So is that it? Are plug-in hybrids doomed to follow diesel on a steep downward drop? There are competing forces at work here that complicate the answer.

The PHEV drivetrain has risen in popularity partly because it offers the flexibility of running on electric or petrol but mainly because it's heavily incentivised. The way tailpipe CO2 is calculated right now greatly favours plug-in hybrids against standard combustion-engined cars, or even hybrids, because it makes them appear incredibly climate-friendly in comparison. That unlocks incentives for the car maker, which lowers its average CO2 output across its annual sales, thereby helping it hit European Union and UK targets.

The buyer meanwhile also benefits from

Demand for PHEVs is sustained by hefty incentives

CO2-linked bonus-malus taxation such as company car tax. In the UK, 65% of all plug-in hybrids went to company car drivers in the first eight months of this year, according to SMMT figures.

What's becoming clear however is that PHEVs are nowhere near as fuel-efficient as the official WLTP tests claim. A study by the International Council on Clean Transportation (ICCT) in June found that the real-world fuel consumption of PHEVs in Europe is on average three to five times higher than WLTP test figures.

The ICCT found that while the test assumed a share of electric driving to be between 70-85%, in the real world that fell to 45-49% for private drivers and to just 11-15% for company car drivers.

The ICCT study isn't the first to conclude that 'fake electric cars' (as the green pressure group Transport & Environment dubs PHEVs) aren't the planet cleansers claimed in the tests, but increasingly these findings are reaching the ears of legislators.

The good news for plug-in hybrids in the short- and medium-term is that the EU can't react immediately, so the unrealistic CO2 test figures will remain probably until 2026/27 at the earliest, when legislators will be able to adjust the so-called "utility factor" in the WLTP emissions test by assuming less electric-only driving. So they will remain useful to car makers looking to reduce their official CO2 figure.

Most at risk are the local market incentives, which can be changed at much shorter notice. Examples of countries revoking support include Norway, which saw PHEV sales drop 78% in the first quarter this year after key incentives ended at the beginning

of the year. Company car drivers in the UK, meanwhile, will be anxiously awaiting the next announcement of changes to the company car tax bands, which currently only go up to April 2025.

Not everyone is pessimistic, however. BMW, the biggest-seller of PHEVs in the UK, reckons its global sales of such vehicles will continue at around 200,000 units a year for the next three to four years. Toyota is another cheerleader: "Toyota can produce eight 40-mile plug-in hybrids for every one 320-mile battery electric vehicle and save up to eight times the carbon emitted into the atmosphere", company head Akio Toyoda recently told US dealers. That's assuming buyers stick to the test cycle figures of course.

It's an expensive business to marry an EV drivetrain with a combustion engine, but it has been a lifeline to many premium makers as diesel falls out of favour with buyers. In the UK, four out of the top five plug-in hybrid brands were premiums in the first eight months of 2022, rising to five out of five for company car sales.

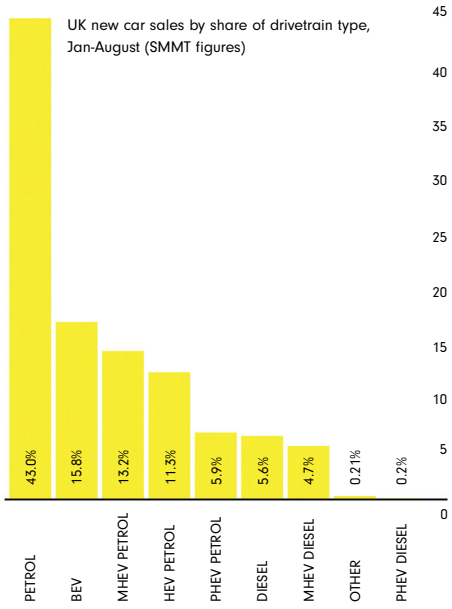
Lynk&Co registered 12,000 PHEVs from Jan-Aug

There's also the possibility that the dip in plug-in hybrid demand at the moment is temporary, as car makers redirect precious batteries and chips to electric cars or to PHEVs in higher-margin premium brands within a large group. Some of the biggest drop-offs in PHEV sales across Europe this year have occurred within mainstream brands. For example, sales of plug-in hybrid models at the VW Group's Seat brand have more than halved in the first eight months across Europe. Other PHEV models recording drops of 50% or more include the VW Golf, Skoda Octavia, Opel Grandland X and Mercedes A-Class.

Much of that however will be down to tight supplies rather than a drop in demand, meaning the death of the PHEV could be exaggerated by the raw sales figures.

Other possible short-term boosts to PHEVs include the fact that electric cars themselves aren't easy to get hold of, forcing companies looking to green their fleet to turn to PHEVs instead, according to anecdotal evidence from auto analyst Matthias Schmidt. "The BEV inventory simply isn't there for now," he said.

Those car makers who do like plug-in hybrids continue to fill in gaps in their ranges. Stellantis, for example, has launched the new Peugeot 308 and Vauxhall Astra with PHEV options. Meanwhile China's Lynk&Co is busy growing market share with its subscription-only 01 PHEV, registering over 12,000 across Europe in the first eight months this year. Also from China is the MG HS SUV, following just behind the 01 with sales of over 11,000 in the region over the same time period.



Car companies are mindful of the precariousness of the position of PHEVs with legislators, and are anticipating test changes by increasing battery sizes to boost electric-only range. So for example the new plug-in hybrid Range Rover claims a 70-mile EV range.

The concept of the plug-in hybrid could morph as we get close to the 2035 target when the sale of CO2-emitting cars is banned in the UK and EU. Car makers could swap the combustion engine out for a fuel-cell stack, with early concepts already using a battery and electric motor to give the acceleration boost that fuel-cells can't deliver.

What happens in between is in the hands of the legislators, but there will be plenty of pressure from the industry to overlook the plug-in hybrid's less-than-perfect real-world environmental performance and instead focus on their ability to smooth out the path to electric so it doesn't come as too much of a shock when we are finally booted out of combustion-engined cars.

BMW is the biggest seller of PHEVs in the UK market

SPECIAL REPORT BY NICK GIBBS

Global volume brands need to address China slump

SHAPE UP OR SHIP OUT is the stark choice facing global car manufacturers as they try to adapt to a fast-changing Chinese car market that's rapidly turning to home-grown makers, particularly for electric cars.

The share of the world's largest car market for global, rather than Chinese, makers has dropped from 61% in 2020 to 49% so far in 2022, according to research from Bloomberg NEF.

All the signs are that the market will continue to favour the Chinese, who are both gobbling up the lower-priced market to the detriment of brands like Skoda, Peugeot and Chevrolet, while also attacking the premium end with smart new electrified brands like Nio, Xpeng and LI Auto.

It's hard to see how some brands will survive in the market. Skoda, for example, saw its sales drop to just 27,675 units in the first seven months of 2022, down 65% on the year before, according to figures from sales aggregator Bestsellingcarsblog.com.

Piggybacking long-standing joint ventures created by parent Volkswagen boosted the Czech brand's sales and for much of the past 10 years China was its largest market. It created China-specific cars like the sportier Kodiaq GT SUV and currently has nine models on sale built locally in four different factories. That's not sustainable, and the brand's new CEO, Klaus Zellmer, is currently weighing options. "China is a competitive battleground at the moment," he said at an August event. "We haven't made a decision but this is our homework."

Skoda isn't the only one to be hit. Hyundai has slid from eighth biggest brand in 2018 to 20th this year, with sales down 51% in 2022 alone. Kia, meanwhile, barely sold over 50,000 cars in the first seven months in a market that shifted over 10 million across the same timeframe.

VW remains the biggest global car brand in China

Xpeng is on track for rapid growth globally

Smaller Japanese brands like Mazda, Mitsubishi, Suzuki are recording sales so low they, too, have been considering whether it's worth building there any more. Import brand Subaru had to deny it was leaving altogether in August after recording just 9822 sales to the end of June.

Stellantis brands Citroen, Peugeot and Jeep have long struggled in China and in July the parent company pulled its Jeep brand out of a 12-year joint-venture with Guangzhou Automobile Group (GAC) and shut its factory in the central city of Changsha.

Stellantis's JV with Dongfeng continues but CEO Carlos Tavares has touted an "asset-light" strategy in China, focusing on imports from premium brands like Maserati and Alfa Romeo.

Volume brands that are fighting to stay put in China are realising they have to address customer needs for the freshest product, updated regularly and loaded with flashy tech such as the latest infotainment. The pace of development is key to success.

They also need electric cars. "Foreign car makers like VW and GM have not put together a BEV offer capable of competing with the Chinese offer or that of Tesla," French automotive analyst company Inovev wrote in a recent note. In the first six months of this year, EV sales in China stood

Stellantis is switching focus from mainstream to premium

at 19%, with plug-in hybrids taking a further 5%, Marklines data shows.

Heel-dragging in this area from established global players has allowed newcomers room to grow. Bloomberg NEF totted up the sales of new EV or electrified companies such as Xpeng, Hozon New Energy Automobile, Li Auto, Nio, Leap Motor and WM Motor, and found they are selling almost 150,000 EVs a quarter, 10 times what they were from the beginning of 2020.

One executive with experience running a western car maker in China we spoke to emphasised the difference in development speed of Chinese engineers compared to global players. Programmes dismissed as too expensive by western engineers because of the timescale were turned around by Chinese engineers in half or quarter of the time, with only small reductions in quality (Chinese customers tend to be more accepting of ride and handling weaknesses, in particular, that European buyers would flag up, mainly because of their more urban-oriented driving pattens).

The companies succeeding are doing so by studying the constantly changing market tastes carefully and reacting speedily. For example, Ford's best-selling car in the country is now the China-developed Mondeo, a five-metre-long saloon that took its learnings from the Evos, a striking combustion crossover designed to look like an electric car. Citroen, meanwhile, experienced a rare growth in sales this year with its now best-selling C5 X, another big car with a plug-in hybrid option and bold coupé-crossover styling.

"GIVEN A LEVEL PLAYING FIELD, GLOBAL COMPANIES WOULD HAVE LESS OF A PROBLEM"

Global companies, however, are at the risk of political backlash as trade with China becomes more vexatious globally, especially as the US and Europe move to establish home-grown supply chains for areas China has become strong in, for example automotive batteries.

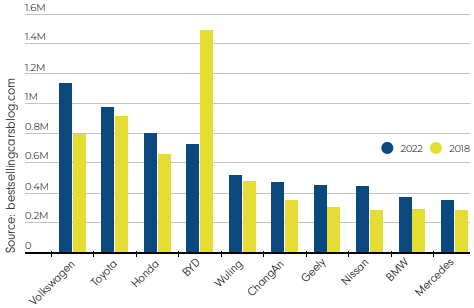
Stellantis's Tavares told investors in July that he was concerned about the "growing political influence on business in China" over the last five years. He drew comparisons with Iran and Russia, two countries where global companies have been forced to leave under pressure from sanctions. "I think that you will see that some of our competitors [in China] will be somewhat challenged in the near future because of these growing geopolitical tensions," he said.

The two biggest global players in China remain General Motors and Volkswagen, and the VW brand was still number one in the market for the first seven months of 2022. VW has in the past been forced to defend its factory in north-west China's Xinjiang region, where China has been accused of maltreatment of the local Uyghur minority, and already new CEO Oliver Blume has been asked by press if he would keep the plant (he said he would).

China remains a key market for global companies, particularly for premium makers, who so far have been more insulated from the pressure from domestic brands. But increasingly they will have to ask whether the cost of local production will pay off. Land Rover, for example, saw its imports overtake local production in the first seven months for the first time in many years. The premium paid for cars like the Defender, its best-selling import currently, more than offsets import duties.

Given a level playing field, global companies would have less of a problem. A study from the global financial rating company Fitch found that, with the exception of BYD, Chinese EV manufacturers remained unprofitable in the first half of 2022. Many of the proliferating EV brands won't make it, but there will be plenty who survive a cash crisis thanks to the wide variety of state or local government support available. Thanks in part to knowledge gleaned from the joint ventures, local companies are providing an increasingly formidable competition. Global car makers have to decide if they want to continue to accept that challenge, knowing they'll always be hobbled politically, or bow out gracefully.

China sales Jan-July 2022 (locally made cars) compared to 2018 positions



SPECIAL REPORT BY NICK GIBBS

Split or quit? Why firms are dividing EV and ICE arms

THE QUESTION for car companies is this: do you carry on with business as usual, making both electric cars and combustion engine cars, gradually replacing the latter with the former?

Or do you use the opportunity to overhaul your business by carving out the EV side and partitioning it away from the legacy business?

Car companies are increasingly looking at the split option, and that has huge implications for employees, suppliers and contractors, depending on how clean that split is.

The reasoning for dividing up a company to better face future upheaval is sound from a business point of view. Right now, as a car maker, your business making combustion-engined cars is likely the most profitable. But it also carries the burden of a network of legacy infrastructure and the inevitable dwindling of the market. UBS predicts the production of ICE vehicles will be broadly stable until 2024, before declining at a rate of around 15% a year.

On the other hand, right now, electric vehicles are expensive, mostly unprofitable, and somewhat dependent on state-controlled bonus-malus schemes with little forward visibility as to how long they might last. However, EVs also represent the future, with production expected to grow sixfold by 2030, according to UBS.

It makes sense, then, to protect your EV side and dole out production of electric cars and associated parts – such as batteries – to plants within your home country. Given the financial load on developing this side of the business, it also makes sense to reorganise how you build, sell, market and create revenue from those vehicles.

But how clean would the separation be?

Ford, for example, is splitting its company into three new business segments – Ford Model E (electric vehicles), Ford Blue (ICE passenger cars) and Ford Pro (commercial vehicles) – which it says is partly to bring more financial clarity to investors. Starting from the first quarter of 2023, the company will no longer report automotive as a single entity. "This change will not be a simple pro forma exercise," chief financial officer John Lawler said at the company's investor call in July. "These are true segments with both operating and financial accountability, giving you added transparency on our business."

> "WHO WOULD BE INTERESTED IN ICE DIVISIONS, KNOWING THEY'RE ESSENTIALLY DOOMED?"

Ford said this won't change the company ownership structure but the move does give it the opportunity to do so in the future.

But who would be interested in buying ICE divisions, knowing they're essentially doomed? The answer is: those companies who either don't think they are doomed, or those who believe they can create enough synergies in the time that's left to make a good business.

In the case of Renault's decision to split off its combustion engine business, companies on both side of that argument are interested in taking a stake, at least

Ford splitting ICE and EV is "not a pro forma exercise"

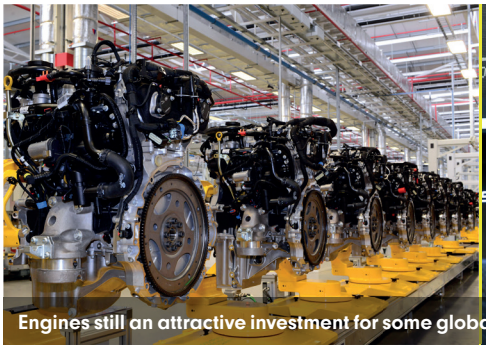
according to reports from France. One of those is Saudi oil giant Aramco, which is reportedly interested in developing synthetic fuels, and the other is Chinese car maker Geely.

Renault would keep a stake in its ICE business, codenamed 'horse', again according to reports, giving it a financial interest in the separated company while running the electric unit as before.

Geely, meanwhile, is clearly making a case for synergies, given it also has a stake in Aurobay, the company created out of Volvo's combustion engine business. As the combustion engine becomes increasingly electrified, the actual power unit itself becomes more and more commoditised, meaning few customers will care who makes it, or so the theory goes.

Suppliers are also preparing for the future by separating out businesses they feel won't chime well with the future needs of their customers. For example, Schaeffler last year sold off its timing chain business to a private equity fund, saying it "reduced risk".

Meanwhile, mega-supplier Continental spun off its ICE business in 2021 into a firm called Vitesco, which is now moving into EVs itself with electric motors and associated drivetrain technology. The new company reckoned that 80% of its order book in the second quarter of 2022 was "from the area of electrification". Vitesco also acts as a contract manufacturer for Continental, which is one way the original parent company can guarantee income for the new compnay and help it attract investment.



Engines still an attractive investment for some global players; Porsche IPO will fund VWG EVs

Other top-tier suppliers distancing themselves from ICE technology include Germany's BASF, which last year announced that it was spinning off its exhaust treatment division to focus on the more in-demand business of cathode battery materials, one of very few companies in Europe to offer that.

The other big reason for spinning off a company is to unlock value, mainly by floating part of it on the stock market. In the case of Porsche, it is handing its current owner Volkswagen a healthy chunk of money to invest in cash-consumptive technologies like electrification, software and autonomous driving. "VW is using the IPO to effectively raise capital," the bank Jeffries said in an investor note.

Geely, meanwhile, has floated part of Volvo-controlled EV brand Polestar and also wants to also list the electric 'lifestyle' SUV and saloon division of Lotus, dubbed Lotus Technology. The spider web of joint ventures, floated companies and technology tie-ups within Geely both reflect the more opaque ownership structures of Chinese companies and the more innovative ways it helps finance its business. Going forward, expect to see more complicated company make-ups as firms cushion legacy costs including pension liabilities.

"FEW CUSTOMERS WILL CARE WHO MAKES THE ENGINE, OR SO THE THEORY GOES"

Audi E-tron GT and R8 are built together in Germany

SPECIAL REPORT BY NICK GIBBS

Hydrogen can still help slash vehicle emissions

WILL HYDROGEN EVER BECOME an important part of the vehicle refuelling mix? Or is it, either used in a fuel cell or as a combustion fuel, doomed to remain on the sidelines?

Last year, fuel cell vehicle (FCEV) sales reached 15,538 globally according to data from IDTechX, compared to 6.6 million for plug-in vehicles, and the Toyota Mirai and Hyundai Nexo accounted for over 12,000 of those. And those sales were heavily subsidised, IDTechX pointed out.

Annual sales of fuel cell cars are expected to reach 126,000 annually by 2030, according to research from GlobalData Energy, but that would represent just 0.2% of predicted total car sales.

Guessing what will happen is hard. In 2013, the UK government figured that annual UK sales of FCEVs would be around 25,000 by 2022. From January to August, Toyota sold four Mirais and Hyundai two Nexos in the UK.

But there are some powerful forces working to make fuel cells a success, and the advantage of hydrogen for current manufacturers and suppliers is that its use in combustion engines or even fuel cells maintains a supply chain that doesn't need to change much.

For example Bosch, the world's largest automotive supplier, is strongly pushing the use of hydrogen as it expands its fuel cell business, but also as an alternative fuel for combustion engines.

Britain's Johnson Matthey (JM), meanwhile, is turning to production of the fuel cell's polymer electrolyte membrane, or PEM, the thin layer through which positively charged ions pass, to replace its catalytic converter business.

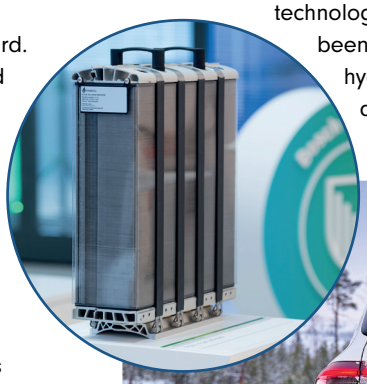
JM then sells it to fuel cell suppliers or direct to vehicle makers. The PEM, along with the two platinum-coated catalyst layers either side, forms the heart of the fuel cell and requires specialist metals chemistry knowledge. The rest isn't very tricky. "The natural habitat for our customers is, by and large, mechanical engineering and manufacturing. They make the other 997 pieces," said Eugene McKenna, commercial and strategy director for JM's Hydrogen Technologies business.

The best argument for the hydrogen fuel cells as an alternative to battery-electric technology has always been that filling up with hydrogen can be as quick as refuelling a petrol or diesel tank. For trucks, that means much less idle time.

Hydrogen also makes for a good alternative energy store, especially if it can be made using renewable electricity that might otherwise be wasted, for example at night.

These benefits have long been understood. But other arguments are coming to the fore as the shortage and subsequent price increases of battery materials become more acute with legislation pushing sales of electric vehicles.

If Russia's wider energy war shows us anything, it's that we should avoid relying on one energy source or technology, Markus Heyn, head of mobility services for Bosch, argued. "In the automotive industry, we should use this occasion to ask ourselves what we can do if there should ever be too few battery cells," he



BMW and Bosch are among most vocal FCEV proponents

told the Stuttgarter Zeitung newspaper in September.

Similar arguments were made by BMW CEO Oliver Zipse, who brought up both scarcity of raw materials for batteries and the lack of charging infrastructure as the reasons behind his company's push into hydrogen fuel cells. "If we run into an emission-free world, we have to have an offering of hydrogen, otherwise you will lose market share," he said on the company's second quarter earnings results call.

BMW has started making fuel cell versions of the X5 SUV using stacks from partner Toyota. The production run will be small initially, but Zipse said the company was planning a possible next-gen version and is also investigating making a fuel cell version of its Neue Klasse new generation of cars from 2025.

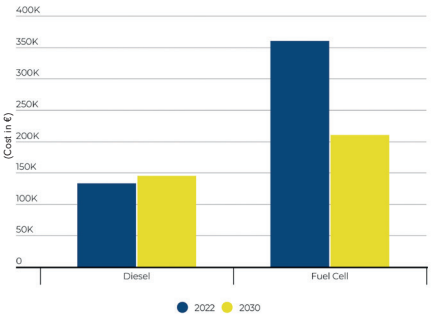
Premium brands such as BMW and Land Rover who make good money selling big SUVs are running over the numbers for fuel cells and weighing the advantages compared to a whopping great battery pack.

However, fuel cell SUVs will still need a battery. In BMW's iX5 the fuel cell imparts just 167bhp compared to almost 200bhp from an electric motor mated to a battery pack.

A similar set-up can be found in Land Rover's Zeus project that mates a fuel cell with a plug-in hybrid drivetrain in a heavily modified Defender. "In a premium SUV you don't want to put your foot down to find lag. That's what the battery's for," said Mo Mani, hydrogen fuel cell lead engineer at JLR.

The comparatively sluggish reaction time of a fuel cell is less of an issue in vans, another vehicle that's seeing some investment on the fuel cell side. Stellantis is already selling fuel cell versions of its mid-sized vans in limited numbers on mainland Europe, including the Citroën Jumpy and Opel Vivaro. A fleet could then invest in refuelling back at base.

Renault is also rolling out a hydrogen van, a version of the Master with a 40bhp fuel cell. But like the Stellantis vans it also has a battery, here 33kWh in size, to help with acceleration. This is great for parts makers, given it offers a range



Cost of fuel cell HGVs much higher than diesel now, but expected to fall quickly

of powertrain areas to supply into, but it also makes it much harder to achieve price parity even with battery-electric counterparts (pricing hasn't been revealed for the Renault or Stellantis vans).

The cost of the stack, together with the cost of hydrogen, means FCEVs won't see price parity with electric cars until "later this decade or in the 2030s" according to even the Hydrogen Council, a global organisation of hydrogen-interested

COSTS NEED TO DROP

HGVs stand to gain from fuel cell tech

Fuel cell tractor-trailers consume around 9kg of hydrogen per 100km today, potentially decreasing to 6.6kg/100km by 2030.
Pump hydrogen costs will fall to an expected €5-8/kg in 2035. However a break-even hydrogen price of around €3-5/kg is needed for fuel cell trucks to reach cost of ownership parity with diesels by 2030.
Fuel cell HGVs are 10-12% more energy-efficient than diesels, but battery-electric trucks remain the most efficient powertrain.

Source: ICCT

companies that tends to err on the side of optimism.

That optimism is growing however. The push from established suppliers, as well as longtime hydrogen flag-waver Toyota (representing the goals of the Japanese government) are keeping the conversation alive. As is the accelerated need to find not just zero emission solutions but also energy independence.

The European Union's Fit for 55 goal within its European Green Deal, calling for cuts in emissions by at least 55% by 2030, included the Hydrogen Accelerator. This has the target of using 20 million tonnes of renewable hydrogen in the EU by 2030, of which 10m would be produced in Europe. This would replace a quarter of Russian natural gas imports, the EU believes, and also help drive down costs of the greenest (and therefore most expensive to produce) hydrogen.

It will still need significant incentives applied before it reaches current diesel levels, a recent study by the International Council on Clean Transportation found. "The price of hydrogen fuel is the primary driver of the economic viability of fuel cell electric trucks," it concluded.

The other big accelerator is China's first long-term plan for hydrogen vehicles, unveiled in May, that calls for 50,000 FCEVs on the road by 2025, up from 8000 in 2020. When the Chinese state starts throwing its weight behind a technology, growth seems inevitable.

But then China is also leading the charge on swappable batteries and that right now is looking like the closest rival to hydrogen fuel cells, particularly in the taxi market, local buses, and municipal vehicles. It could even become a niche alternative for larger SUVs, following the lead of Chinese Tesla rival Nio. Then there's the pace of development of batteries themselves. More energy-dense batteries supporting more rapid charging could render fuel cells obsolete as the pace of electric vehicle and battery cell investment continues to far outpace that of fuel cells.

In the vehicle industry right now, where the rapid pace of development is being measured in dog years rather than human, it's difficult to call. But hydrogen is definitely going to be in the mix.

SPECIAL REPORT BY NICK GIBBS

Agency model brings brands and customers closer

NEXT YEAR will mark an important shift in the relationship between car makers and their dealers as the switch to the 'agency' model shifts up a gear.

Brands such as Polestar, Tesla and Genesis have already embraced direct sales, but then these relatively new brands haven't known anything else and didn't have to convince an established dealer network to move to a radical new way of doing business.

However, on 1 January Mercedes-Benz will transfer entirely to selling its cars directly to customers, meaning dealers are relegated to 'agents' who take a fee for the sale.

Mercedes has already switched to this model in some countries, including Sweden and Austria, but neither are anywhere near the size of the UK.

Also moving to the agency model next year are Stellantis premium brands Alfa Romeo and DS, as well as its vans division. This is the first wave for Stellantis, and the model will ultimately be followed by all its brands. Joining in 2024 will be Jaguar Land Rover and Mini, while BMW is slated to make the change in 2026.

Brands like Mercedes are moving to the agency model to get away from being car manufacturers who wholesale to dealers, and instead establish that same direct relationship with the customers that dealers currently have.

"We want to have more proximity [to the customer] and therefore have better control of pricing," Harold Wilhelm, Mercedes chief financial officer, told attendees of the Economics of Desire investor day in May. "That's why we need to move the current set-up from dealer to agency role, so the final contract can be made with the customer."

Polestar is an early adopter of agency sales

Being the one to set the pricing, rather than letting the dealer do it, brings important benefits.

For one thing, the price customers will pay is clear throughout the process. That can't be said for the wholesale model, in which car companies sell cars to the dealers below list price and, except in a few cases, let them set the margin. That means the dealers can discount when they've got cars to shift – to the point their margin might be zero – instead of relying on selling extras (like finance and insurance) or volume bonuses.

Consequently the customer doesn't really know what the price should be, which is a real negative when you're trying to expand online sales. "Let's be honest, customers don't really enjoy going into a dealership and haggling. You can't buy a new car entirely online under the franchise model, because there's a negotiation point in it. But the agency model is completely transparent," Tony Whitehorn, ex CEO Hyundai UK told Autocar earlier this year.

Mercedes wants to own the customer relationship

The second benefit is that more of the sales price goes back to the manufacturer, or so they hope. This year, dealers have done very well off the back of the constricted supply of new cars to increase the profits they make. For example, dealer group Vertu made £2124 gross profit per car in the six months to the end of September, a rise of 26%, while Pendragon's rose £2576 in the six months to the end of June.

Dealers traditionally discount to offload stock

The sticking point, of course, will be the fee paid by the manufacturer to the dealer for each sale, which sometimes might not happen at the dealer at all but online (the customer will nominate their nearest dealer for servicing purposes, dictating where the fee goes).

The dealer groups are, outwardly at least, happy about the arrangement. The capital cost of holding cars until they are sold transfers from dealer to manufacturer, while the dealer still makes a sum from each car without the pressure of actually having to sell it in the traditional way. "Agency is a very simple model that's very transparent. Customers like that ease and, importantly, this is very, very profitable," Duncan McPhee, COO of dealer group Lookers, told Autocar earlier this year.

The secondary cost benefit to the car maker is that it can control residuals better, rather than watching semi-helplessly as dealers destroy the used value by giving away their margins on discounts. Lotus, for example, will continue to own cars after they are traded in. "It's a clever mechanism to control the brand for a good five or six years," Nima Khandian-Nia, owner of Lotus Silverstone, told Autocar.

Dealers seem happy on the surface, but internally it's not such a popular move. The National Franchised Dealers Association has warned about possible secondary consequences, quoting one unnamed former car executive as saying: "In a one-price environment for direct-to-consumer,

> "CUSTOMERS LIKE THE EASE, AND THIS IS VERY, VERY PROFITABLE..."

the manufacturer sets the RRP and there's no room for negotiation, so it will result in higher transaction prices." However, the NFDA has been unable to find any specific contravention in UK selling regulations, in direct contrast to the US where selling directly is banned in many states.

Not all car makers are embracing it. Toyota, Hyundai, Kia, Suzuki, Renault and Nissan have all said either explicitly or implicitly that they will not make the transition. Renault points out that the agency model is not necessary to put a stop to discounting, as it has proven with its increasingly popular Dacia brand. This, of course, may change if they perceive the benefits to outweigh the opposition from their dealers.

Car makers across the board are looking for savings, and distribution costs are right in the line of fire. Ford CEO Jim Farley highlighted earlier this year that distribution costs total around $2000 (£1800) per car, "more expensive than Tesla".

"Our competitors are pure-play EVs and the Chinese that are absolutely coming. And that means we have to get this $2000 out of our distribution cost to be competitive with them," he said at an investor conference in June.

But it might be that the newly established relationship with the customer, rather than the dealer, could be the real gold mine for the car companies. When the customer buys their car through a centrally-run digital portal, whether while sat at a dealership desk or at home, they enter what will be a whole new ecosystem designed to both make their life easier but also sell them features and services long after the car has been delivered.

Much of this has still yet to manifest itself as car makers begin the laborious task of developing software enabled cars with cloud connection and downloadable options.

Depending on what's negotiated, the dealer may yet take a cut of those, but clearly the centre of gravity is moving to the car brand in terms of that relationship. A simpler world of handovers, servicing and stress-free human interaction awaits the dealer. It could be just as revolutionary as the shift to electric.

WHO'S GOING DOWN THE AGENCY ROUTE?


Lotus Emira launched with agency model

ALREADY AGENCY: Polestar, Lotus, Cupra, VW EVs, Genesis
2023: Mercedes, Alfa Romeo, DS, Stellantis LCVs
2024: Jaguar Land Rover, Mini
2026: BMW
MOVING BUT DATE TBA: Volvo, Citroen, Jeep, Fiat, Peugeot, Vauxhall, Ford, Seat, Skoda
NO PLANS AS YET: Toyota, Suzuki, Renault, Hyundai, Kia, Mazda, Nissan

Source: ICDP/AUTOCAR

SPECIAL REPORT BY NICK GIBBS

2023 holds promise but uncertainty clouds outlook

PREDICTIONS ARE A MUG'S GAME at the moment, particularly for the car industry, but predict the industry must as it prepares itself for the potential rollercoaster that will be 2023.

Also looking into the crystal ball are financial analysts, hoping to steer their clients to make better investments in the sector. So, what does the future hold?

First let's recap where we are, entering the fourth quarter of 2022. Shortages of parts such as semiconductors have forced car makers to cut back on production, which has led to the "unusual" situation, in the words of Stellantis CEO Carlos Tavares, where they have been able to harness the laws of supply and demand to jack up prices and more than cover price inflation for parts, raw materials, energy and the rest.

Thanks to this, the majority of car makers are sitting on a large cash pile that's further cushioned by a healthy order bank.

UBS bank's chief autos analyst Patrick Hummel recommends any OEMs celebrating strong Q3 results "take a picture and frame it" because it's about to get much tougher, ironically as parts supplies start returning to normal.

A boost in supply could reduce profit margins

Value brands like Dacia have posted upticks as the market declines

"We think it will only take three to six months for the auto industry to end up in over-supply, which will put an abrupt end to unprecedented OEM pricing power and margins," Hummel wrote in a recent report.

The long-tail effect of the endless wait for new cars means that orders from customers still flush from Covid lockdown savings are still flowing through. However, once that ends, new orders are likely to be lower and for cars more at the budget end, as customers look to make savings as bills for energy, food and mortgages rise. Witness Dacia's 18% growth rate in Europe this year in a market down 12%.

UBS points to growing inventories (mainly in the US for now), weaker used car prices, cancelled orders and higher credit risks among customers as evidence.

The biggest reason for car makers moving from their traditional margin-destructive over-supply to profit-ballooning under-supply has been the lack of semiconductors, but that's about to change. Some, for example Stellantis's Tavares, say the shortage will finally be over by the end of 2023 but others think it's going to be much quicker than that.

"Our view is that there has been an increasing number of cancellations from white goods/smartphones, increasing allocation to automotive companies," said Philippe Houchois, who leads automotive analysis for the bank Jefferies. "We think the shortage will finish earlier than the predictions of mid next year, more like mid Q1/early Q2".

We put this bearish view of the market to Carlos Tavares as he spoke to journalists at the Paris motor show. Won't the return of supply kill your record margins? "That's

possible, if you don't master inflation," he said.

Right now, inflation plus the imbalance between cars built and cars needed is pushing prices up, which could lead to orders being retracted in a tough economic climate. But if orders start to fall so will the inflationary pressure. "If the demand is not very high and if the economy is gloomy, inflation will also vanish," Tavares said. "We already see the price of steel going south, anticipating a gloomy industry."

How it all plays out is tricky to predict, especially given energy prices are linked to the ongoing Russian invasion of Ukraine. "The problem is that it's difficult to estimate which opposing events will combine," Tavares said.

The energy cog in the economic mystery machine could yet prolong the car

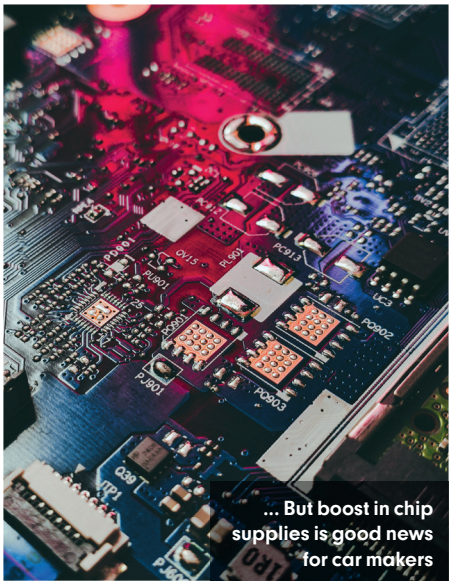
"THE PROBLEM IS IT'S DIFFICULT TO ESTIMATE WHICH OPPOSING EVENTS WILL COMBINE"

shortage, warned analyst company S&P Global Mobility, formerly IHS Markit. Any restrictions on energy use in the cold, wet winter predicted for Europe could seriously impact production in the region, to the tune of almost one million vehicles per quarter "starting in the fourth quarter of 2022 through the entirety of 2023" S&P predicted dramatically in a recent report.

"If you look through the supply chain - particularly where there's any metallic structure forming through pressing, welding or extrusion - there's a tremendous amount of energy involved," said Edwin Pope, lead analyst for materials and lightweighting at the company.

The report highlighted energy costs increases from €50 euros per built vehicle to between €687-773. Already some manufacturers are altering their production patterns to save energy, for example running night and day then pausing to avoid daily high-energy restarts. This

Soaring energy costs could heavily impact production...



... But boost in chip supplies is good news for car makers

and the raw material price increases "undermine margins in a market where cost increases will be difficult to pass on to customers already facing food and energy inflation," S&P wrote.

The car industry might be flush right now, but the fact remains the European volumes are 26% down on 2019 figures and is left wondering when those lost sales are going to return, if ever. European lobby group ACEA is calling on the European Union to craft a policy framework that "enables the market to both recover and make the shift to zero-emissions", ACEA said in a statement in October.

Perhaps mindful that it would be wrong to push for financial help amid a period of record profits, it instead asked for help boosting resilience in supply chains, a "Critical Raw Materials Act" to help it secure battery materials and more EV chargers.

Helping the car makers is the fact that they cut costs dramatically both before and during the pandemic, cushioning them against any dramatic tail-off in demand. For example, Tavares boasted that Stellantis has a break-even point of 40% of current revenues. UBS also points to the switch to direct sales, giving the car makers a better handle on pricing, as well as continuing strength of used car pricing, even if they're down on recent highs. "We have some confidence that we're not going to test historical lows next year," UBS's Hummel wrote.

So, it's a tough time for forecasters, but here's the positive view: returning chip supplies will increase production and sales, in turn reducing pricing power and cutting car maker profits. That's good news for consumers as new cars get cheaper and easier to get hold of, but companies need not suffer too much thanks to a tighter cost structure, continuing recent residuals and new retail models that include selling features directly to consumers.

Or it could go in a different direction entirely.