

# Mobility in Motion

## CUPRA INTERVIEW SVEN SCHUWIRTH

"Be open and incorporate technology developed by others." This is the recommendation of Sven Schuwirth, COO of CUPRA, the challenger brand founded five years ago.

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## VALUE CHAINS

# A Team Performance

Transformation remains the constant theme for the automotive industry. On top of this are crises and supply crunches that are driving up costs – and new entrants who can plan their products and production with maximum efficiency because they're starting from the drawing board. To survive and thrive in this environment, incumbent OEMs and automotive suppliers must work together to bring costs down and improve performance throughout their supply chain. This calls for greater collaboration between the partners. Already desirable in the past, in the new world partnerships are nothing less than vital.

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OEMs and auto suppliers should use the transition to electric mobility as an opportunity to fundamentally rethink their product and production strategies. Vertical integration and product variance are key levers.

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# PARTNERSHIPS FOR PERFORMANCE

OEMs and automotive suppliers must work closer together to meet the challenges brought by electric mobility, digitalization and new competitors. Only in partnership can they improve performance within the value chain and permanently reduce costs.

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Cars are becoming more and more technologically complex. At the same time, the auto industry is moving toward electrification. These changes mean software is gaining an increasingly important role in the car. Dependence on critical raw materials and components like semiconductor chips and battery cells – and on their manufacturers – continues to rise. All this is driving up the cost of a vehicle – a shift with no end in sight.

It is unrealistic to expect consumers to pay the extra costs in full – and much-vaunted new business models have often proved all too fleeting in the past. To ensure that vehicles remain affordable and sell in the necessary numbers, it is vital to keep the increase in costs to a minimum by optimizing the entire value chain. All players in the industry will need to work together to bring their costs down. Other approaches that would allow the traditional automotive industry to operate with sufficient profitability, and thus continue to invest, should be considered systematically and in terms of how they complement each other – not as the main way forward. Cost control requires joint efforts and increased collaboration between OEMs and suppliers. This collaboration was desirable in the past – in the new world it is essential.

In recent years, OEMs have been able to push through higher prices and increase their profit levels due to the shortage of vehicles coming into the market. But the current trend shows that auto manufacturers in Western Europe and the United States are, or very soon will be, facing a squeeze on

earnings. Supply is coming back in line with demand. High-margin models with internal combustion engines are being replaced by electric vehicles, which are currently less profitable. Automotive suppliers have already been under severe pressure in recent years owing to declining volumes, supply bottlenecks and inflation – and the pressure is set to persist.

Only better collaboration between OEMs and suppliers can reduce costs along the entire value chain and provide healthy margins for all partners. So how can this be achieved? The first thing to do is to strengthen mutual trust. Lasting success for all parties is more important than short-term profit

**Partners must share  
the financial benefits  
of the win-win  
situation they  
created together**

gains at one partner's expense. Of course, every OEM and supplier will have to do their homework – review and, where possible, optimize their structures, processes, fixed costs, locations and business models. But this alone will not be enough.

The major potential lies in making improvements together. This could involve OEMs and suppliers collaborating more closely in the component development stage, for instance, with the aim of developing and manufacturing components at lower cost. The earlier the supplier's involvement in the development work, the more achievable this will be. In many cases it will be possible to streamline the OEM's specifications and bring them closer to reality, which will reduce internal costs.

Considerable savings can also be generated through economies of scale – by designing components that are not brand specific in such a way that suppliers can manufacture them for

several different customers with limited adaptation. In addition, the geographical distribution of value creation should be reassessed to determine where components can be produced most cost effectively – placing more emphasis on shorter supply routes, risks and sustainability requirements.

Greater efficiency can also be achieved through transparency. If OEMs present their technology roadmaps more clearly, suppliers won't need to invest time and money in solutions that have little chance of ever going into series production.

Only measures like these will ultimately create a win-win situation for both OEMs and suppliers, where each can invest in their business and safeguard their long-term viability.

## **RECOMMENDED ACTIONS:**

**Prioritize protecting profits** for the next 18 months to two years in order to maintain the investment scope required for transformation.

**Reduce product complexity** to lower the costs of development and production without significantly weakening the specifications that differentiate your product to the consumer.

**Develop long-term collaboration models** that enable OEMs and suppliers to jointly optimize the cost and performance side of the value chain.

**Plan more realistic transformation timeframes** without holding on to goals that cannot be achieved anyway.

**Establish long-term partnerships** for phasing out the business with combustion engine vehicles.

**AUTHORS: FELIX MOGGE, SEBASTIAN GUNDERMANN, FREDERIK EILERS**

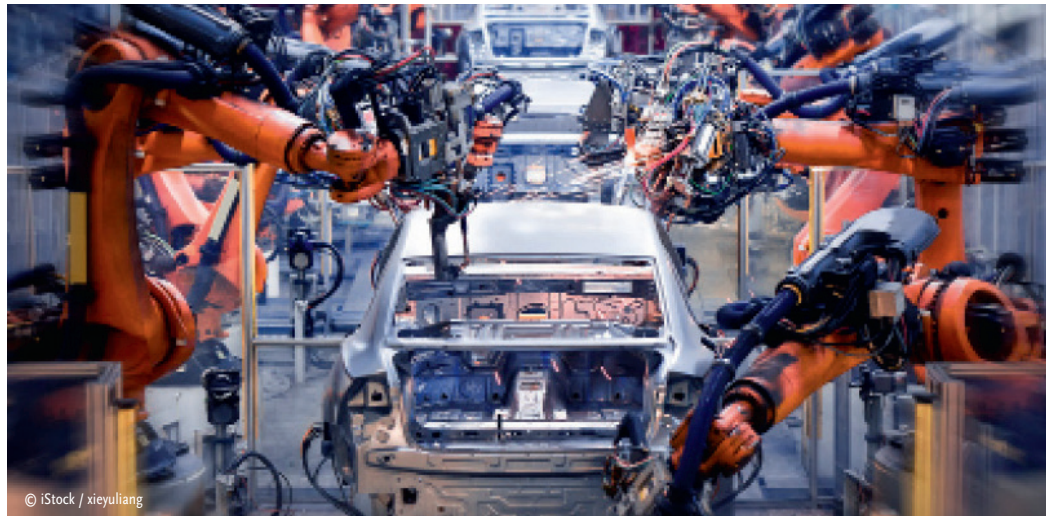
# STRUCTURES UNDER REVIEW

The automotive industry should use the transformation to electric mobility to totally rethink production and put it on a more competitive footing. Reducing complexity and product variance is a key lever.

The automotive industry is under intense pressure from the electric mobility transformation, new entrants and one crisis after another. Players in the industry should use the transition to electric vehicles as a chance to fundamentally rethink their product and production strategies and make them more competitive. Selective adjustments are no longer enough to streamline product and production strategies and respond competitively to the market's demands. Companies need to adopt a holistic approach – one that also considers distribution and procurement in addition to development and production in order to achieve a new optimum for the business. Competitiveness depends on six aspects in production, as shown in the graphic below.

The shift to electric vehicles is a good opportunity for companies throughout the industry to review their vertical integration. What are the elements of production that will differentiate you in the future? What do you absolutely need to keep? There is also the question of whether it's possible to make better use of industry standard components in the case of parts that consumers don't see as brand specific by outsourcing these to suppliers. Suppliers too should position themselves to benefit from the transformation.

A major driver of costs in the factory is product variance. It can account for one-fifth of total production costs. What new players are showing is that consumers will accept less choice. With fewer product and equipment variants at a given plant, OEMs can significantly reduce their production



control and process complexity and thus manufacture more cost effectively. To exploit this cost-cutting lever, development and distribution must work closely with production to find solutions.

The number of vehicle platforms has an enormous impact on plant efficiency. The more focused a plant is, the more it needs to be laid out for maximum volume efficiency. When there is a higher number of platforms, production line flexibility and synergies from cross-platform commonality need to be planned into the factory structure.

New vehicles are mostly integrated into existing production plants to reuse existing structures and ensure job stability. This comes with the risk of complex, unstable processes, high inventories and uncompetitive factory costs. Optimal production structures are therefore not a question of brownfield or greenfield investment but a question of to what extent you are able to consistently create the right conditions for optimal production. You need to think about production processes end to end and also integrate new and innovative production strategies in existing plants – just like you would on a greenfield site.

Traditional production structures must be challenged.

OEM and supplier newcomers benefit not only from the fact that they went right back to the drawing board for their model development: In many cases, what they also did was rethink production from the ground up.

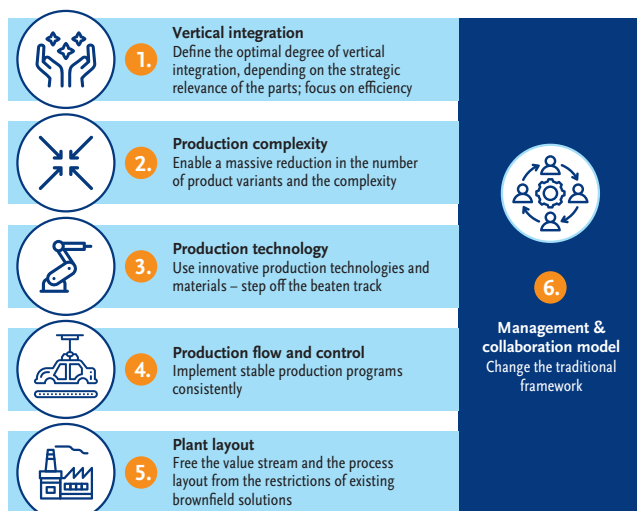
However, it is also evident that it pays to take time at the start to develop an ambitious target operating model. Not only does this ensure that everyone from the management to the planning team to the workers

has a clear line to follow, it also makes sure that the entire team is motivated to work in the new set-up.

Management should be visible at every stage of product and production development, helping to remove obstacles and thus reduce the cost of manufacturing the vehicles. The important thing is to design the products to be simpler, to limit the variance to what is really necessary and to create the scope for challenging existing processes. Top management need to set the example for others to follow – and carry it through to all areas of the company.

**Variants account for up to one-fifth of total production costs**

## Six success factors of optimized production



### RECOMMENDED ACTIONS:

- Use the transformation** as an opportunity to review all aspects of production.
- Rediscuss the depth of vertical integration** in order to exploit cost advantages more broadly.
- Reduce product complexity** to make production simpler and more transparent.
- Ensure strong leadership** to support the end-to-end optimization of production in close cooperation with other divisions of the company.

AUTHORS: MICHAEL W. RÜGER, ROLF JANSSEN



# NEW ROADS TO PROFITABILITY

For traditional auto suppliers, the changes in supplier networks bring both opportunities and risks. They continue to face margin pressure.

Automotive suppliers must continue to prepare themselves for challenging times ahead. The transformation pressure in the automotive industry continues, while car production figures are barely growing. Inflation is increasing costs and making financing more expensive. Since 2019, OEM and supplier margins have been heading in opposite directions: up for OEMs and down for traditional suppliers. Lately, most suppliers have been unable to pass on the full extent of rising costs for energy, materials and logistics. Their margins fell from 5.3% in 2021 to 4.6% in 2022 on average. In 2017, margins had been up at 7.5%.

The supplier component sector will grow strongly from around a trillion euros in 2020 to 1.3 trillion euros in 2030. However, this growth will center on new technologies, clients and suppliers. Much of it will be in the electrified powertrain segment, especially in batteries, as well as in digitalization. Consequently, only the suppliers

and infotainment suppliers were able to maintain their long-term margins of around 6%. Margins for interior suppliers were down by one quarter at 3.3%.

In terms of company size, suppliers with revenues over 10 billion euros were the most profitable, with EBIT margins of 5.9% in 2021. Smaller companies with revenues of less than 500 million euros managed just 2.8%. In future, size is also likely to be an advantage in the trend towards true local-for-local manufacturing. Geopolitical and economic risks mean that efforts towards regional decoupling are gaining momentum. Smaller suppliers in particular may hit a roadblock if their OEM customers expect manufacturing in other regions, which may require substantial investments.

Profitability also depends on a company's position in the supply chain. OEMs have been able to channel scarce parts into their products with the highest margins and also push through higher prices. Raw material producers, chip suppliers and transport companies have also achieved high margins due to the supply squeeze.

In between are two groups of suppliers. Customers of Tier-3 and Tier-4 suppliers often had to share the higher costs to prevent them

from disappearing from the supply chain completely. Tier-1 and Tier-2 suppliers, on the other hand, were only able to pass on part of their increased expenditure to OEMs, meaning their margins suffered more.

Traditional suppliers without the components for growth in their portfolio can only increase their

revenues by capturing more market share. Suppliers with the right expertise can pivot to components that offer growth, such as those in the electric powertrain. But with many companies trying to do just that, these markets are highly fragmented and fraught with competition. Those suppliers that do succeed in establishing themselves with leading technologies in electric powertrains or digitalization have the opportunity to make good margins. However, the number of such companies among traditional suppliers is limited.

For those that sell a broad range of products, including in the growth segments, it will be important to optimally manage the phasing out of the old products and the reallocation of investments and personnel to the new segments. When it comes to standard parts and commodities, manufacturers will have to concentrate on even more efficient production. They should also investigate whether their products and expertise can generate sales in other sectors.

Ultimately, the right strategy for turning challenges into opportunities depends on the supplier's individual situation – there is no one-size-fits-all solution.

## RECOMMENDED ACTIONS:

Improve **performance**.

Request **compensation from customers** for increased material and factor costs.

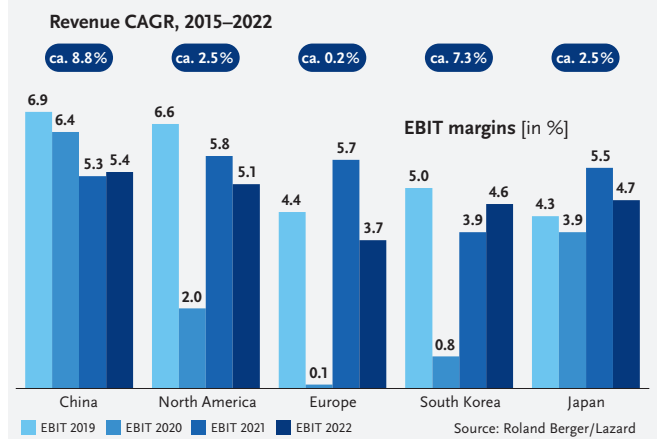
Renegotiate on **loss-makers**.

Seek **growth options** beyond the automotive sector (for traditional suppliers).

Focus on **growth markets outside Europe**.

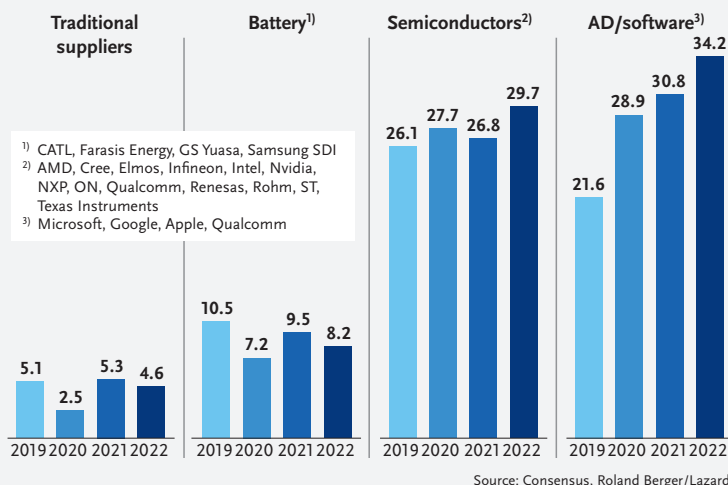
Consider **selling parts of the business** or entering partnerships with other companies.

## Development of revenues and EBIT margins of selected auto suppliers by region



## Digitalization offers the highest margins

[EBIT margins in %]



<sup>1)</sup> CATL, Farasis Energy, GS Yuasa, Samsung SDI

<sup>2)</sup> AMD, Cree, Elmos, Infineon, Intel, Nvidia, NXP, ON, Qualcomm, Renesas, Rohm, ST, Texas Instruments

<sup>3)</sup> Microsoft, Google, Apple, Qualcomm

operating in these areas will benefit. In addition, Chinese suppliers are expected to become increasingly active in Europe and raise the competitive pressure further.

Despite experiencing a decline in profitability, tire suppliers led the way in the traditional product categories with EBIT margins of 7.8%. Electronics

# SUCCESSFUL IN THE VUCA WORLD

Between de-risking, capsulation and decoupling: How OEMs can navigate the environment fraught with uncertainty.

The automotive industry has been in the midst of the transformation to electric mobility, digitalized vehicles and sustainability for many years. Other challenges are exacerbating the situation: Covid, chip shortages, the Ukraine war that has caused a shortage of wiring harnesses, inflation, and new geopolitical uncertainties. How are companies managing to balance the risks with the business opportunities?

VUCA is now an established acronym to describe this unique accumulation of challenges, never before seen in the history of the automotive industry. It stands for volatile, uncertain, complex and ambiguous. The word decoupling is often heard in related discussions. While it does play an important role, decoupling is not the starting point but the end point of a structured process through which OEMs and auto suppliers should make sure that their risk management sits on the right foundations to meet the new challenges.

Many companies find themselves putting in one task force after another out of sheer necessity these days. But if you're fighting one fire after the next, you no longer have the resources to successfully run your actual business strategically. In addition to that, the many task forces often operate bottom-up and completely separately, not following any common strategy. Such inconsistent approaches are inefficient at best. At worst they may even clash with one another.

To operate successfully in the VUCA world long term, OEMs and auto suppliers must create a decision-making framework that can help them work out a holistic, coherent and economically feasible plan.

The project must begin at board level, where the questions that need to be answered include: Where do we see the world going? How do we view the geopolitical, environmental, technological, societal developments or raw material sourcing in general and, in particular, the impact of these things on the automotive industry and, at an even more granular level, on our company? All the uncertainties make scenario thinking indispensable.

To be able to derive actions from these thoughts, top management must also determine what the company's appetite for risk is. One of the extreme



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positions you might adopt on the scale of risk appetite is "full steam ahead" because you see no way of mitigating the risks. At the other end of the scale is the exit strategy – completely withdrawing from certain markets, production locations or product segments.

With markets and supply chains in the automotive industry being extremely interdependent, companies are more likely to opt for strategies that lie between these two extremes and can be described as de-risking, capsulation and decoupling.

If you assume, for example, that there will be temporary problems in a country or region, you can choose the option of de-risking, whereby you might increase inventories or set up alternative warehouses to enable you to get through this phase.

The capsulation approach is suitable when you fear a longer-lasting period of crisis in a country or region, with problems not appearing ad hoc but escalating gradually. In this case, it makes sense to take all the preventive measures that you would not be able to implement quickly enough if the crisis escalated. This could mean already making production and sourcing not dependent on this region – and only switching to decoupling if and when the crisis actually occurs.

Decoupling is the last stage before an exit. It means making the business in a given market fully self-sufficient so that it can operate completely

independently of your company's home country in everything from production and sourcing to IT and administration.

It's clear that the measures taken at these different levels will result in various one-off costs and will lower profitability on an ongoing basis. The extent of these effects will become evident as soon as you run through the preferred risk strategy for all affected areas, such as production, procurement and development. Once you have a price tag for the approach you're thinking of taking, you will then normally go through an iteration phase that will readjust the measures and the costs.

Since the world is constantly changing, it is important to continuously compare the strategy you've defined against the latest developments in a dynamic process, making any adjustments as necessary.

## RECOMMENDED ACTIONS:

Put **risk management** on a new, much broader footing.

Build a **much bigger database** and a better flow of information on the issues where you could face risks. This is a prerequisite for being able to act fast in the worst-case scenario.

Engage in **scenario thinking**, dynamically updating and revising your situation assessments.

AUTHORS: NORBERT DRESSLER,  
OLIVER KNAPP, MARC WINTERHOFF

# "BE OPEN AND INCORPORATE TECHNOLOGY DEVELOPED BY OTHERS"

CUPRA COO Sven Schuwirth talks about the advantages of being a new brand and the challenges facing incumbent automakers in the new world of mobility.



combustion engine, and it too is going to have an electric motor as well. With this mix, we're trying to serve the conditions prevailing in the markets, which are all transforming at different rates. By 2030, CUPRA will be fully electrified.

## What is your strategy for digitalization?

We're taking a clear and simple approach: focusing on what is really necessary. Today's customers already have their ecosystem – it's called a smartphone. Wherever possible, we should not deny them the use of it, and we should offer only those functions that no one else can or that are necessary for the immediate task of driving. We need to be open and integrate tech from other providers. We've got to pick up speed here, given the

competition coming from the Far East.

CUPRA considers itself a "challenger brand". As a young brand, it has freedoms that traditional OEMs don't have. COO Sven Schuwirth on the mindset automakers need to succeed in the new automotive world.

**The new entrants from China represent a major challenge for incumbent players in the automotive industry. CUPRA itself is still a young brand. What advantages does that give you?**

CUPRA was founded 5 years ago as the first new brand within the VW Group. At a time when many brands were disappearing and new ones appearing, especially from Asia. For us, it was the perfect time to inspire the world from Barcelona. Challenge the conventional – that's one of our brand's central pillars. CUPRA has no history and no legacy and clearly that allows us greater freedoms. The freedom to do exactly the things that the customer expects from us and that are important in ultimately establishing a sharp profile in the market.

## How are you positioning CUPRA?

We are deliberately not aiming to be a volume brand, a brand for everyone. We want to be a brand that appeals to those who love the emotion of the product and the brand, who prefer an expressive design, who want to drive themselves and not be driven. And who want to be part of a community alongside the product: the CUPRA tribe.

**Electric mobility and digitalization are reshaping the automotive industry. How can European OEMs and suppliers position themselves to benefit from that instead of losing ground?**

We want to transform as fast as we can towards electric mobility – we want to prove that electric mobility can be sexy, not boring. And I think we've succeeded in doing that with the CUPRA Born and especially with the CUPRA Tavascan. But the internal combustion engine models, in the form of PHEVs, will continue to be with us for the time being, remaining in the range. The Terramar, next year, will be CUPRA's last model with a

**Chinese OEMs and suppliers are catching up rapidly and are now using cutting-edge technology themselves. How have they managed to do that?**

In electric vehicles in particular, they relied on strong software right from the start, and to do that they either partnered with other firms or they come from an IT company themselves. At the same time, they very intelligently – and over a long period – absorbed the knowledge and expertise of Western OEMs and incorporated it into their products. Respect for that. We can learn from this and enter into targeted partnerships with these OEMs, as the VW Group recently did.

**How can Europe's automotive incumbents compete?**

As I said, we need to learn from them and quickly adapt our own approach. And we need to shore up our strengths, particularly in design, branding and all-round experience, as well as in classic



parameters such as the chassis, or comfort. We'll be able to do that as long as we don't try to do everything ourselves but look instead to more collaboration and more alliances and focus on what we are really good at, which is a lot.

**How can incumbent OEMs manage to remain masters of their automotive product instead of just being suppliers of hardware brought to life by other players' software?**

In entertainment, the customer is demanding that we open up – Apple Car Play integration is just one example. In vehicle controls, we have to act different and make a conscious decision about how far we go. But it won't work without being open towards partners like these. The customer demands it. The business demands it. And we shouldn't forget that what the customer buys is a car as a whole. The car is an extremely complex product. Orchestrating the overall experience, that's what it's all about – and we will never let that out of our hands.

**You spent many years working for established brands like AUDI, BMW and SEAT. What makes CUPRA different for you, and what can incumbent OEMs learn from that?**

It's the people. We all have a burning desire to achieve one goal, to create something new. To establish a new brand, a brand that's different from what's already on the market. That is incredibly motivating and it makes the team focus on what's really important. And of course our size also helps

### Sven Schuwirth ...

... has been managing the day-to-day operations of the CUPRA brand as COO since March 2023. Prior to taking on this role, he'd been Director of Digital Business and Product Strategy at SEAT S.A. since mid-2021, during which time he played a key role in developing CUPRA's product strategy and expanding the brand into new markets, such as Australia. With a degree in industrial engineering, Schuwirth has over 20 years of wide-ranging experience in the automotive industry within sales and marketing. He has spent most of his professional life at the VW Group, working for AUDI AG where he was primarily responsible for digitalization from 2019 onwards, delivering projects around digitalizing sales and offering customers a seamless, emotional and defining brand experience – both online and offline and across all touchpoints.



– we are a small team. Small, and that makes us fast, we have short communication channels. Everything that's called agile today, we are that already. And we need to stay that way. That is certainly the challenge for large companies with complex governance structures, which inevitably come with one thing: the risk of the talent, the human being, sometimes getting lost.

**CUPRA calls itself a challenger brand. Your second all-electric vehicle, the Tavascan, is going to be built in Anhui, China, from the end of the year. Does this mean the VW Group is getting a new workhorse in China?**

There are no plans to enter the Chinese market. The Tavascan was designed and developed in Barcelona and it's only the production that's happening in China. Why? China is a leader in electric mobility and we'll be taking advantage of economies of scope and partnerships within the Volkswagen Group. The plant in Anhui is a center of innovation and it has the right technology and the right platform to produce the CUPRA Tavascan on a large scale and bring it to market fast.

**What makes the Tavascan a promising challenger to BYD and the like?**

The design, the driving experience and much more. With the Tavascan, what we wanted to show in 2019 was that it's not just a model that reacts to change – it creates change. You'll see, when all is said and done, that it's a CUPRA. It's about more than "just" the product. The brand, its presence and our approach to customers are just as much a part of it. Those are some really good points. And we're looking forward to the competition and the challenge.

### The CUPRA brand ...

... was founded in 2018 and is headquartered in Martorell (Barcelona). CUPRA sees itself as an unconventional challenger brand that combines emotion, electrification and performance, inspiring the world from Barcelona. To date, CUPRA has delivered over 400,000 vehicles worldwide, more than 150,000 of them in 2022 alone. The best-selling model to date is the CUPRA Formentor, the first vehicle to be exclusively developed by the brand. The first all-electric vehicle is the CUPRA Born, to be followed by the second all-electric model, the Tavascan, scheduled to go to market in 2024. CUPRA aims to sell 70,000 Tavascans annually.

**What stage are your plans at for entering the North American market?**

We are taking it phase by phase. First of all, we are fully focusing on Europe. In addition to that, we are already successfully represented in other markets like Mexico, Israel and, most recently, Australia. North America is big and early analyses have shown that there is potential there for a brand like CUPRA. We will continue to monitor this, but it's too early to talk about data now. So let's wait and see.

You can access the full interview here



# A NEW LIFE FOR USED BATTERIES

To lower the costs of batteries, reduce their carbon footprint and limit your dependence on raw material supplies and prices, the circular economy is the gold standard.

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Vehicle batteries are what determine the range of electric vehicles. But producing them is expensive, requires scarce raw materials and comes with a large carbon footprint. The circular economy brings significant improvements in all three areas. There are three methods of recycling batteries that OEMs and battery manufacturers must gear their business towards.

Producing new electric vehicle batteries entirely from virgin raw materials is not going to be an option in the future. EU regulations will prevent it by setting recycling quotas and upper limits for carbon dioxide emissions from the end-to-end value chain. The automotive industry itself is also striving to reduce its carbon footprint as part of general sustainability efforts. Another argument in favor of battery recycling is that it can reduce your dependence on raw material suppliers and keep the rising raw material prices down.

This is why OEMs should view recycling as an important part of their overall battery lifecycle

management strategy. Basically, there are three options:

- Material recycling, in other words taking the battery apart and recovering the raw materials
- Second-life applications, which involve taking batteries that are still functional but no longer strong enough to power vehicles and using them for stationary energy storage
- Remanufacturing batteries so that they can be reinstalled in vehicles as spares

### The most cost-effective method of recycling depends on the battery cell chemistry

Economic efficiency will play a role in deciding which route to take. It makes a big difference whether the batteries are lithium-nickel-manganese-cobalt (NMC) or lithium-iron-phosphate (LFP). The recovery of the valuable nickel, cobalt and lithium from NMC batteries makes material recycling a very attractive option. Less so for LFP batteries because they contain lithium but no nickel or cobalt.

On the other hand, if you're looking at second-life applications, LFP batteries have an advantage over NMCs because they are more durable and their

thermal management is also easier. The fact that they have lower power density than NMC batteries is usually less of an issue for second-life applications. They could be used for emergency power supplies, as buffer storage for solar power, or when electricity is needed at a distance from power supply lines.

Remanufacturing degraded batteries for use as spares makes sense for both battery types – depending on your precise needs. Thus, used or damaged batteries can become an important part of your supply of spare parts. Producing spares on demand through battery remanufacturing is much more economical than storing spare batteries for 15 years after the end of production and keeping them ready for use in a given vehicle model.

That said, battery recycling will be slow to get going because the batteries being installed in cars today are not expected to reach the end of their service life until ten to twelve years into the future. Up until around the end of the decade, therefore, it will mainly be production waste from the battery manufacturers' plants that is being recycled.

The EU is taking a two-pronged approach to recycling requirements. It applies both to old batteries and to new battery production. In 2028, at least 90% of the cobalt and nickel and 50% of the lithium will have to be recovered from old batteries. In 2032, these values will rise to 95% and 80%, respectively. The proportion of recycled material used in new batteries must be 16% for cobalt, 6% for nickel and 6% for lithium by 2028, rising to 26%, 15% and 12%, respectively, by 2031.

Particularly in the initial phase, when the number of end-of-life batteries is still low, it would make sense for several OEMs to work together in order to keep costs reasonable. The EU regulations expressly provide for OEMs, for example, to set up consortia to organize recycling on a joint basis.

### RECOMMENDED ACTIONS:

**In battery pack design** and battery lifecycle management, consider from the outset the issues of second life, remanufacturing and recycling.

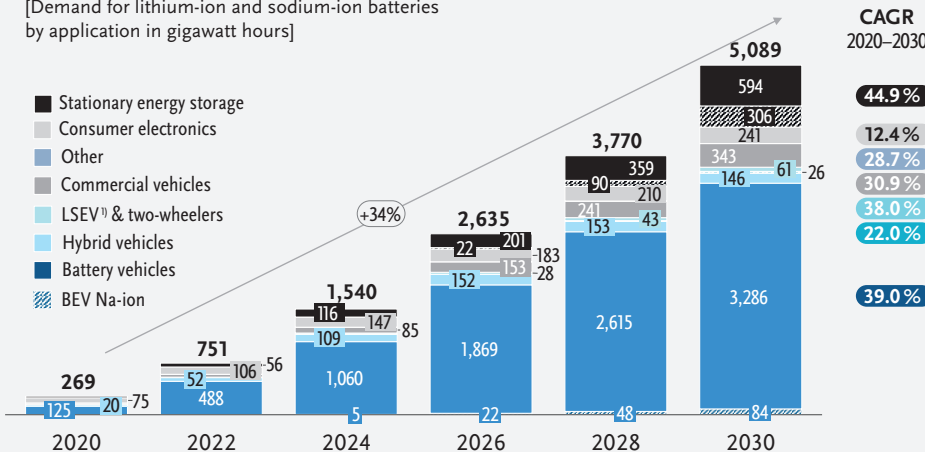
**Develop a long-term strategy** early on for all the individual steps involved in recycling used or defective batteries.

**Establish partnerships** to achieve economies of scale for the collection and recycling of batteries as early as possible. For example, with other OEMs, with battery manufacturers and with operators of suitable recycling facilities.

**Secure access** to the batteries at the end of their service life. At that point they belong to the vehicle owners.

## Electric vehicles drive the demand for lithium-ion batteries

[Demand for lithium-ion and sodium-ion batteries by application in gigawatt hours]



<sup>1)</sup> Low-speed electric vehicles

Source: IHS, Wood MacKenzie, Avicenne, Roland Berger

AUTHORS: WOLFGANG BERNHART, TIM HOTZ



# PURPOSE-BUILT FOR EVERY APPLICATION

Purpose-built vehicles are much easier to realize on electrified platforms than they were in the age of the internal combustion engine. They bring new sales potential for both auto OEMs and suppliers.

Electrification creates new opportunities for purpose-built vehicles (PBVs): Vehicle platforms are being partly redefined, allowing for the added flexibility needed for variable bodies. The flexible skateboard platforms offered by various OEMs are one example. Platforms in the light commercial vehicle (LCV) segment are particularly suitable as a basis for PBVs. According to ACEA, the number of fully electric vehicles registered in the LCV segment in Europe in 2022 was 43% higher than the previous year – an attractive growth market.

Decoupling platform from body also enables economies of scale. It means different body variants and use concepts can be realized on a single platform that is produced in large quantities.

Lower total cost of ownership makes PBVs attractive for users. Platforms can be designed to be recycled after a few years and fitted with a new body, potentially for different use cases. This means platforms can be used more intensively and potentially even alternate between B2B and B2C applications.

There is a variety of possible use cases. As people-movers for passenger transportation, PBVs can function in both the B2C and B2B segments, for instance as camping vans or for

ride-hailing and taxi use. In Asia, demand is slowly growing for mobile workplaces for private individuals. Fitted with appropriate bodies, PBVs can also be used as delivery vehicles, moving refrigerated goods, for example.

However, PBV production has its challenges. Introducing new vehicle concepts, modular construction and new technologies initially

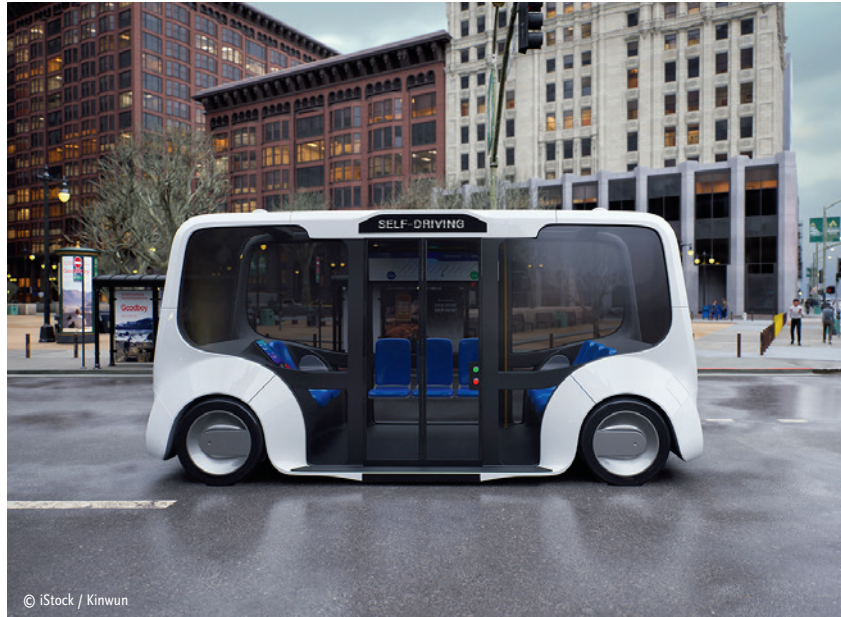
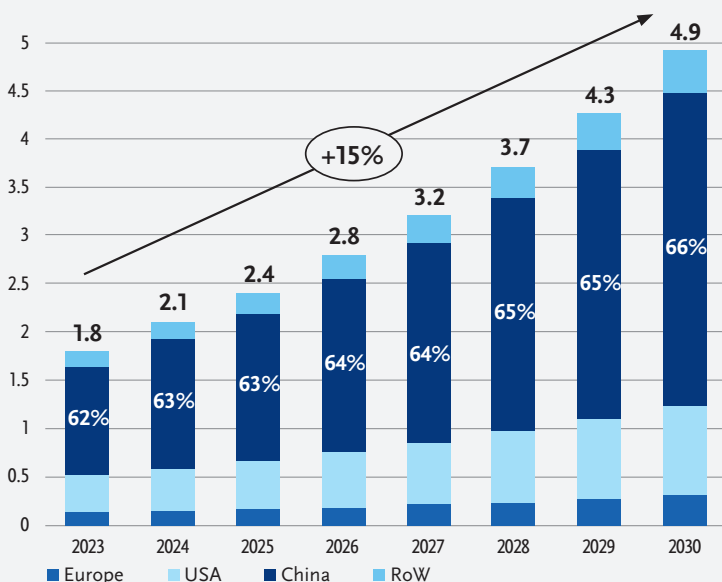
comes with high investment. This is challenging as B2B customers are highly price sensitive. OEMs will therefore need to find a balanced mix of models to ensure profitable production on a large scale.

Both B2B and B2C people-movers are enjoying high sales volumes and have lower price sensitivity. Especially early on, OEMs could leverage these

## The right mix of customer groups is the key to success

## Sales of ride-hailing and ride-pooling vehicles

[in million units]



© iStock / Kinwun

That said, further regulations in urban private transportation mean a higher share can be expected in the medium term.

## RECOMMENDED ACTIONS:

**Plan a mix of B2B and B2C solutions** to achieve critical mass: Spacious platforms from the B2C segment can be used as volume drivers. These will ensure capacity utilization and enable (B2B) PBV use cases to be implemented on the same platform.

**Investigate the potential customer segments** and their needs on a regional basis, as they may differ significantly. Analyze local maturity levels.

**Define anchor customers** for regionally promising use cases and develop solutions in close collaboration with them.

**Form partnerships** to generate economies of scale: In the PBV segment, brand differentiation comes much more from the body itself and the customer use case it enables than from the drivetrain. Platform sharing across OEMs can thus reduce costs, for example, without jeopardizing your customer position.

Although electric vans are currently booming, this segment will likely account for no more than 10% of the ride-hailing market in 2025.

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# SAVING CO<sub>2</sub> IN A CLOSED LOOP

With the advent of electric mobility, greenhouse gas emissions in the supply chain are taking on a much greater relevance. Operating within a closed loop, or circular economy, is an important decarbonization lever that supports other approaches. It aids environmental and resource conservation and helps secure material supplies.

Decarbonization and the circular economy are very much intertwined when it comes to achieving sustainability goals. OEMs and automotive suppliers must lose no time in taking immediate action to determine their strategies for reducing carbon emissions and to establish closed-loop material cycles along with the necessary supply chains.

Electric mobility is turning the previous situation on its head. Internal combustion vehicles cause the majority of their lifecycle carbon emissions when they are being driven. With battery vehicles, on the other hand, most of their greenhouse gas emissions come from the materials and components that go into making them. It is thus these emissions that are becoming the focus of companies' sustainability efforts.

By far the bulk of this carbon footprint arises not during vehicle production but in the upstream supply chain, all the way up to the extraction of the raw materials themselves. There is enormous potential for savings in these Scope 3 upstream emissions. Significant emission reductions are possible along the length of the traditional supply chain. A further massive reduction can be achieved

by operating within a circular economy. However, circular economy efforts will only pay off in the relatively long term. That is why it is so important to quickly drive forward all other decarbonization efforts along the established supply chains as well.

To this end, the first step must be to record your carbon footprint, and then to define short-term and long-term targets in accordance with the SBTi rules. Any company can use the standards of the Science-Based Targets initiative (SBTi) to operationalize the Paris climate targets in their business. This approach

## The circular economy requires new supply and value chains to be built

has become the gold standard for decarbonization. To reduce Scope 3 upstream emissions, measurable actions must be defined and prioritized. Product design, supply chain, raw materials and country of origin are the primary areas to influence. Product development itself has a major impact on production costs and sustainability. According to the EU's Circular Economy Action Plan, 80% of environmental impacts are already determined during the product development stage.

Some parts, for example, can be designed with more or less material input or can be made from different materials. One approach could be to require suppliers to use renewable energies and to

enforce the same with their upstream suppliers as well. When it comes to raw materials, the amount of greenhouse gases emitted during extraction can vary depending on the country or the company involved. Transportation routes are another point.



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The country where automotive components are manufactured also plays a role because the electricity used in production will have a very different carbon footprint depending on how it was generated. In India, for example, an average of 632 grams of carbon dioxide is emitted per kilowatt hour of electricity, compared to 531 grams in China and 385 grams in Germany.

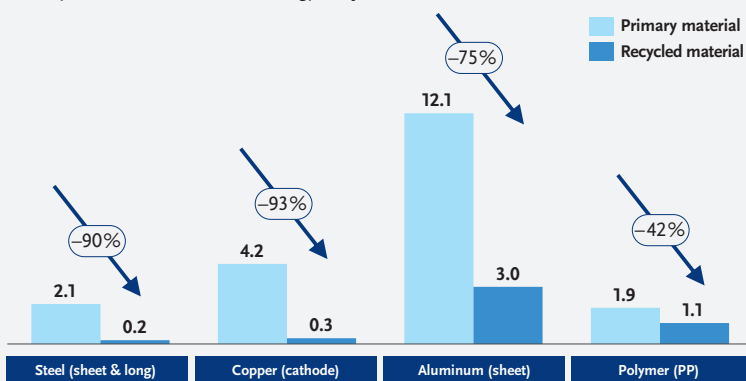
The circular economy is a sustainability strategy that defines new paradigms for material flows and requires new supply chains to be built. What it offers in return is not only a lesser impact on the environment but another advantage too: Recycling gives you greater independence from rising raw material prices and raw material shortages. This is an even more significant consideration with electric mobility, as many of the materials that go into batteries are expensive and scarce, and their extraction is sometimes associated with significant environmental impacts.

The rules of the circular economy can be characterized by four words: repair, reuse, remanufacture, recycle. This means reducing the use of materials, especially virgin materials, using products for as long as possible and repairing instead of discarding them, remanufacturing products where possible to extend their use, and finally recovering the materials used and recycling them in the manufacture of new products.

Because establishing supply chains is a costly business, it makes sense to focus first on materials that are present in large quantities in vehicles and that have a large carbon footprint. These are primarily metals (steel, aluminum, copper), plastics and battery materials. Using recycled materials can enable a reduction of Scope 3 upstream emis-

## Enormous decarbonization potential lies in the use of recycled materials

[Tons of CO<sub>2</sub>e emissions per ton of material produced; values dependent on production method and energy mix]



Source: Roland Berger

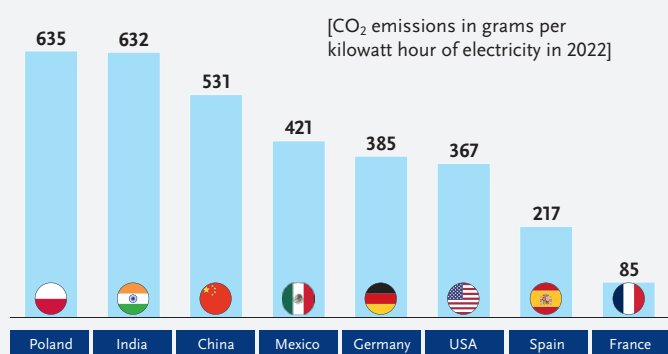




sions by 40% to 90%. Using completely new steel in a vehicle, emissions of 2.1 metric tons of CO<sub>2</sub> per metric ton of steel are produced. Using melted scrap, the figure can be as low as 0.2 metric tons – 90% less. For copper, the savings can be as high as 93%, and for aluminum sheet 75%.

A mind shift will be required in many areas and players will need to collaborate closely. Both of these things take time, and they will only pay off after some delay, which is why it is important to act quickly.

### Offshoring can drive the decarbonization of production



Source: Ember, Energy Institute Statistical Review of World Energy

The necessary new approaches in development cannot be implemented overnight either. Products need to be designed to be repairable, and then easily recyclable at the end of their life. Both of these factors place added demands on the joining technology, for example. When it comes to recycling, it is important to be able to separate the materials from the product easily and cleanly,

which is why you should use as few mixed materials as possible. And it will be many years before vehicles designed according to these rules get into the recycling loop and the materials can be recovered.

But there are other constraints that already need to be considered and planned for in order to make the circular economy as effective as it can be. To achieve a true closed-loop system, it is important

that recycling an end-of-life product does not turn into downcycling. This means using high-value materials in lower-value products, for example when special steel or aluminum alloys from automobiles later become beverage cans.

This happens when different alloys are not recovered separately. And it is why some companies have already started to collect their metal production scrap separately

by alloy so it can be melted and reused without any loss of quality.

Achieving such clean separation becomes much more difficult when a vehicle is scrapped. Processes for this still need to be established involving many partners throughout the value chain so that, for example, the history and composition of the individual parts can be easily traced when the car

is scrapped. This requires common standards. One approach to creating such transparency can be found in systems like Catena-X, where the intention is for many different companies to feed in data on the parts they supply. It takes time to intro-

duce circular economy initiatives because many players along the value chain have to align and agree on a common approach and exchange data. This makes it all the more important to tackle this

issue at speed.

How soon the circular economy will become established depends in part on how efficient and cost effective the necessary processes are. Unless regulations, companies' own CO<sub>2</sub> targets or a shortage of raw materials force the pace of the circular economy, price will remain the deciding factor. If it is cheaper to dismantle the products and recover the materials than to use virgin raw materials, then that is the route that will be taken.

It's time to go all in: for vertical integration, the creation of an ecosystem committed to common standards and maximum collaboration.

#### RECOMMENDED ACTIONS:

**OEMs and automotive suppliers** should develop and implement strategies for decarbonization and the circular economy.

**Protect your competitive position** with immediate action. Because implementing these strategies along the entire supply chain is complex and will take considerable time and effort.

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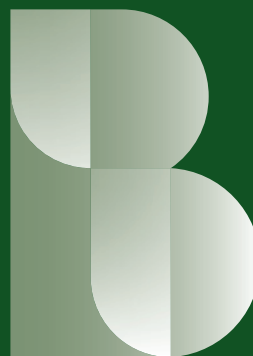
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