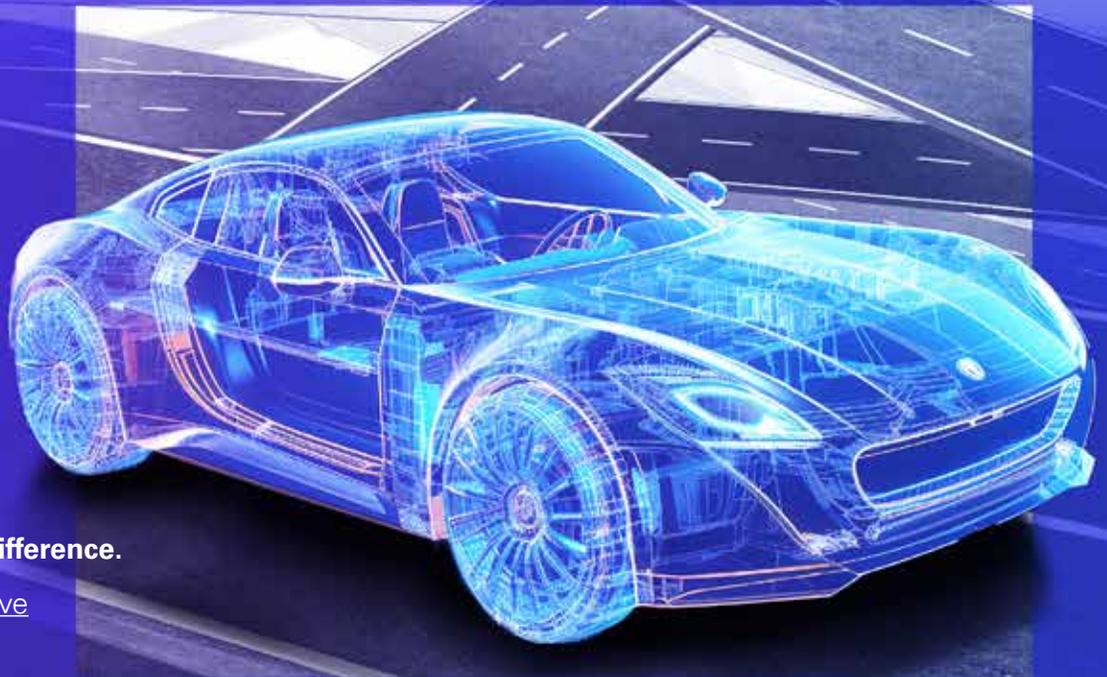




**24<sup>th</sup> Annual Global Automotive  
Executive Survey**

# Getting real about the EV transition

It's still an exciting—and rewarding—journey, but it may take longer and the ride won't be smooth.



**KPMG. Make the Difference.**

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# Foreword

Our 24<sup>th</sup> Annual KPMG Global Automotive Executive Survey comes at a pivotal moment for automakers. The business opportunities have never seemed greater, driven by advances in electric powertrains, self-driving technology, and the promise of a more magical customer experience in the vehicle. In the factory, the showroom, and on e-commerce sites, AI and other technologies are changing how cars are made, sold, and serviced.

Three years ago, when we published “[Place your billion-dollar bets wisely: Powertrain strategies for the post-ICE automotive industry](#),” we laid out the challenges and opportunities in the development of the market for electric vehicles. Then, even predictions of analysts diverged on how rapidly EVs would penetrate global markets.<sup>1</sup> Last year there was still wide variation in expectations about EV uptake among executives in our annual survey.<sup>2</sup>

But our latest survey of more than 1,000 executives in 30 countries and territories, shows that the industry is becoming more sober about market prospects. Having committed more than half a trillion dollars to the EV transition, the industry is asking when companies will see a return on the investment.

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## Interact with the data

Readers can go to our website to interact with the data and view graphical results by country, company type and job title. [Explore now](#)

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Our 24<sup>th</sup> annual survey examines in detail how executive sentiment is changing and the concerns and challenges that make global automotive leaders more cautious. The upshot: to help ensure companies end

up as winners, not losers, executives should rethink their strategies and ask themselves some important questions:

- Is the current slowdown in the growth rate of EV sales merely a pause or a sign of a more prolonged reassessment by consumers? Will their enthusiasm be rekindled by the new models about to hit the market?
- How long will it take to turn a profit on battery-electric vehicles (BEVs) and will manufacturers have enough cash to see them through?
- Will governments continue to be able to afford to subsidize the purchase of BEVs?
- What role will other powertrain choices such as hybrids and hydrogen fuel cells play in the market?
- What are the strategic choices for suppliers that are being squeezed by market changes, new competition, and rising demands of original equipment manufacturers (OEMs)? How can they thrive, not merely survive, in this new market?
- How much should automotive firms vertically integrate—in car operating systems, battery supply chains, and computer chips?

Finding the right answers to these and other strategic questions will help determine how companies succeed in the coming years. We believe that a dazzling future for the automotive business—with amazing products, more delighted consumers, and a positive impact on the planet—is still in view. But getting there will require overcoming near-term challenges.



**Gary Silberg**  
Global Head of Automotive  
KPMG International

<sup>1</sup> KPMG International, “[Place your billion-dollar bets wisely: Powertrain strategies for the post-ICE automotive industry](#)” (December 2022)

<sup>2</sup> KPMG International, “[23rd Annual Global Automotive Executive Survey](#)” (July 2021)

# Main findings



The global outlook

## Less confidence in profitable growth

**Slower growth, higher costs.** Around the world, auto executives are less confident that the industry will achieve more profitable growth over the next five years due largely to concerns over the global economy and rising costs. The share of Japanese executives surveyed who are extremely confident dropped from 32 percent to 10 percent. Extremely confident respondents dropped from 31 percent to 24 percent in Western Europe and fell from 48 percent to 43 percent in the US. Only in China did extreme confidence rise, moving from 28 percent

to 36 percent. Extreme confidence among suppliers fell from 56 percent to 23 percent.

**Automakers think they can raise prices in 2024. Can they?** More than two thirds of OEMs anticipate a 5 to 10 percent price increase in 2024. Independent dealers are even more likely to anticipate such price increases. However, given recent price declines and the high number of new models, we believe these price increases might be more difficult to achieve than anticipated.



Powertrains

## Executives have a more mature view of the EV transition

**Getting real about market development.** Three years ago, when we asked how much share of annual sales EVs might capture in 2030, the answers ranged from 20 percent to 80 percent. Even among analysts, there was a 1.6X difference between the lowest and highest estimates.<sup>3</sup> Now the range of estimates has narrowed, a sign of greater realism.

Even so, the mean estimates for penetration rose in the latest survey. In Western Europe, for example, respondents last year estimated that battery-electric vehicles would account for 24 percent of sales in 2030; this year the consensus estimate was 30 percent. In the US, the estimate went from 29 percent to 33 percent and in China the estimate jumped from 24 percent to 36 percent.

**Tesla on top.** Despite the flurry of new models by established brands, our survey respondents

still expect Tesla to remain on top. The opening of the Tesla Gigafactory near Berlin in March 2022 is helping Tesla gain share and heightening awareness about the global competition among European executives. In our survey, more European executives predicted that Tesla would stay on top through 2030 and fewer predicted that BMW and Audi would dominate.

**Parity still far off.** Executives are less optimistic this year than last about how soon EVs can reach cost parity with conventional cars (not counting subsidies). In the previous year's survey, 70 percent of executives said they expected parity by 2030; in the latest survey, 66 percent said that was likely. However, 87 percent of Chinese OEM executives expect parity by 2030. That compares with 71 percent last year.

<sup>3</sup> KPMG International, "[Place your billion-dollar bets wisely: Powertrain strategies for the post-ICE automotive industry](#)" (July 2021)



Digital consumers

## Customer experience is a key differentiator

**Seamless and hassle-free.** While performance remains the most important selling point, a seamless and hassle-free customer experience has moved up to second place. The emphasis on a smooth customer experience extends from buying the car to having seamless operating software in it, but the latter is a challenge for manufacturers. The car's hardware is usually reliable, the software less so.

**In-car experience: this stuff has to work.** The software-defined vehicle provides an opportunity to supply all sorts of driver applications. But consumers

are not likely to sign up for software subscriptions if the products aren't compelling. In this year's survey, OEM executives in particular are less confident than in previous years that they can generate subscription revenue.

**How good is cybersecurity?** Widely publicized breaches have raised concerns about automotive cybersecurity. In our survey, executives are still confident that automakers provide adequate cybersecurity and customer data protection, but they may be over-confident.



Supply chains

## Just in case is overtaking just in time

**Ongoing supply concerns.** After the disruptions of the past few years the new norm in supply chain management is becoming "just in case," rather than "just in time." Companies are pursuing a wide range of strategies to build resilience and things are far better than two years ago. Still, there is a high level of concern about the continuity of supply for many commodities and components over the next five years.

**But not in China.** As we saw across the survey, in many important areas, China is different. This was particularly true in supply chain. Chinese executives are considerably less worried about continuity of supply, likely because the country has been setting much of the supply of key commodities, particularly raw materials for EV batteries and EV components.



Technology

## The technology challenges grow more complex

**Less confidence in keeping up.** In the latest survey, automakers indicated that they feel less prepared than the previous year for advanced technologies, such as artificial intelligence, digital twins, and advanced robotics. Only 12 percent of auto executives said they felt extremely well prepared, down from 22 percent the year before.

The change is likely associated with the rapid advances in artificial intelligence, particularly generative AI, which is expected to bring automation to white-collar jobs. Automakers are going to have to train more workers to take advantage of AI in all its forms. Indeed, automakers will be competing with each other and with companies across industries for talent with AI skills. As noted in the recent KPMG report, "[Future of work](#)," companies that master

AI quickest will likely have a significant competitive advantage.<sup>4</sup>

**Hedging powertrain bets.** When it comes to powertrain technology, this year more companies seem to be hedging their bets. Hybrid technologies have jumped from fourth to second place overall in technology investments.

**Partners—and "frenemies"?** Choosing the right technology partners to accelerate development and share risks remains fundamental to automotive strategy. At the same time, automakers expect tech giants to jump into the auto market. Apple is the number one potential competitor, but the list is long, including Google, Samsung, Baidu, and others.

<sup>4</sup> KPMG International, "Future of work" (November 2023)



# The global outlook

Executives worldwide are less confident than before that the industry will achieve more profitable growth over the next five years. Overall, just 34 percent of executives said they are extremely confident that they can achieve profitable growth in the next five years versus 41 percent in the previous year. Among Japanese executives, the share who were “extremely confident” fell 22 points, from

32 percent to 10 percent. Confidence also fell (but less sharply) in the US and Western Europe.

Suppliers were the most downbeat group. The share of respondents from supplier firms who said they are extremely confident about achieving profitable growth tumbled from 55 percent to 23 percent.

## Expectations for profitable growth are weakening (except in China)

How confident or concerned are you that the industry will achieve more profitable growth over the next five years?

### Industry confidence in profitable growth: Breakdown for respondents rating extremely confident

#### Japan

Extremely confident



#### Western Europe

Extremely confident



#### US

Extremely confident



#### China

Extremely confident



■ 2022 ■ 2023

This change in sentiment is remarkable. Just a year ago, executives were excited about the prospects for transforming the industry with new kinds of cars. Now, they remain optimistic, but they are more sober about how difficult it will be to manage the transition and preserve or increase profits.

The reasons for concern are clear. Companies have made huge bets on electric propulsion and are increasingly concerned about near-term headwinds that could postpone the payoff. While a flood of new EV models is coming to

market, demand has weakened and some players may come under extreme pressure as competition intensifies.

This year, executives seem less concerned about the economy than last year. The share of US respondents who said that they are extremely concerned about the impact of high interest rates, energy prices, and inflation fell from 35 percent in 2022 to 27 percent in 2023. Among German executives the share of extremely concerned respondents fell from 30 percent to 16 percent.





Achieving profitability in a highly competitive and rapidly evolving market will require car makers to remain agile and innovative. Besides shaping brand recognition, manufacturers need to invest in cost optimization strategies, including supply chain efficiency, AI-infused manufacturing, and the reduction of battery production costs, to ensure healthy revenue streams. Ultimately, the companies that can deliver high-quality BEVs at an affordable price, while maintaining a healthy brand value, can emerge as the margin winners in the market.

**Dr. Andreas Ries**

*Global Lead Partner, Consulting  
KPMG in Germany*

The picture is different in China. The share of auto executives who are extremely concerned about the economy rose from 10 percent to 14 percent. Yet, while Chinese executives are more concerned

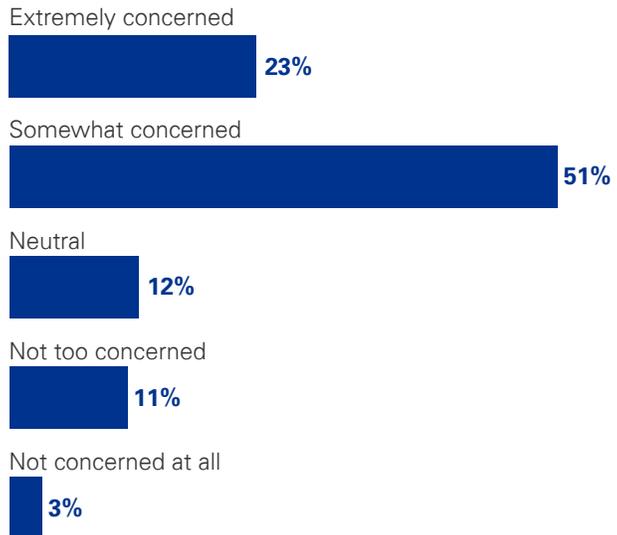
about the impact of high interest rates, energy costs, and inflation, the share of Chinese executives who are extremely confident that profits will grow over the next five years has risen.

**In most regions, economic concerns are moderating**

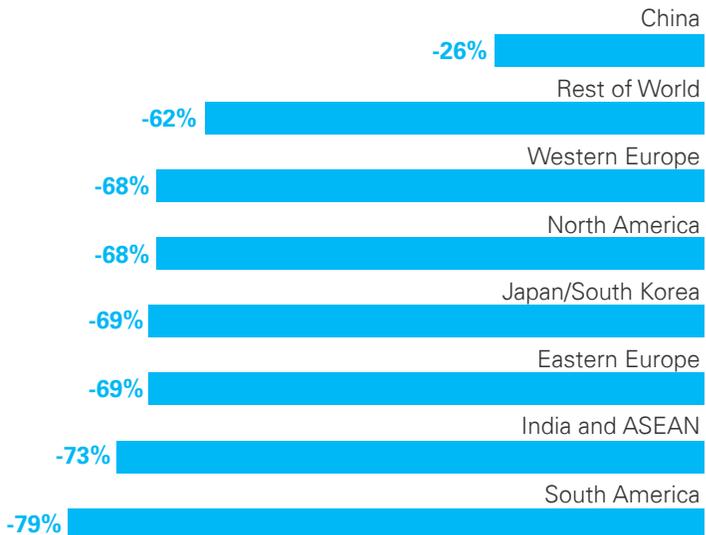
How concerned are you that higher energy prices, high interest rates, and inflation will adversely impact your business in 2024?

**Outlook on economic pressures impacting automotive businesses in 2024**

2023 Sentiment, all respondents



Net sentiment change by region from 2022 to 2023



Despite economic uncertainty, many executives still expect car prices to continue to rise. Two-thirds of automakers anticipate price increases of 5 to 10 percent in 2024. But automakers should consider carefully whether

these expectations are realistic. With rising competition and declining inflationary pressure, their ability to charge more for their cars in 2024 may be limited.

## Automakers are confident that they can raise prices in 2024

A year from now, where do you see prices going on average?

### Automotive sector price outlook 2024

Up more than 10%



Up 5%–10%



Similar to today



Down 5%–10%



Down more than 10%





# Powertrains

Two years ago, when we asked what percentage of new car sales would be EVs in 2030, we got a huge range of responses, from as low as 20 percent to as much as 80 percent. This year, the range of estimates has narrowed considerably, indicating that executives have developed a more mature—and realistic—view of how quickly EV penetration will occur. EV market share gains are also a function of slower growth in overall auto sales—EV sales are growing rapidly, but total sales are plateauing.<sup>5</sup>

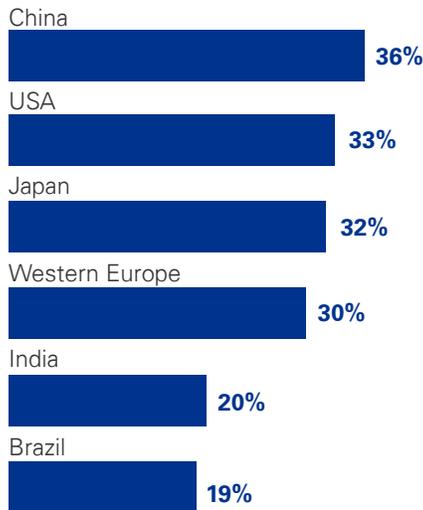
According to our survey, China is expected to have the highest penetration of EVs in 2030—36 percent of new car sales. Respondents expect penetration in the US, Japan, and Western Europe to reach 30 to 33 percent. Penetration is expected to be slower in India and Brazil, with sales limited by poor electricity infrastructure and lower incomes. The estimate of EV penetration by executives in our survey are far below those of clean energy advocates. The Rocky Mountain Institute in late 2023 predicted that EVs would account for more than two-thirds of global auto sales by 2030.<sup>6</sup>

## The EV penetration outlook is maturing—with less variation in estimates market share for 2030

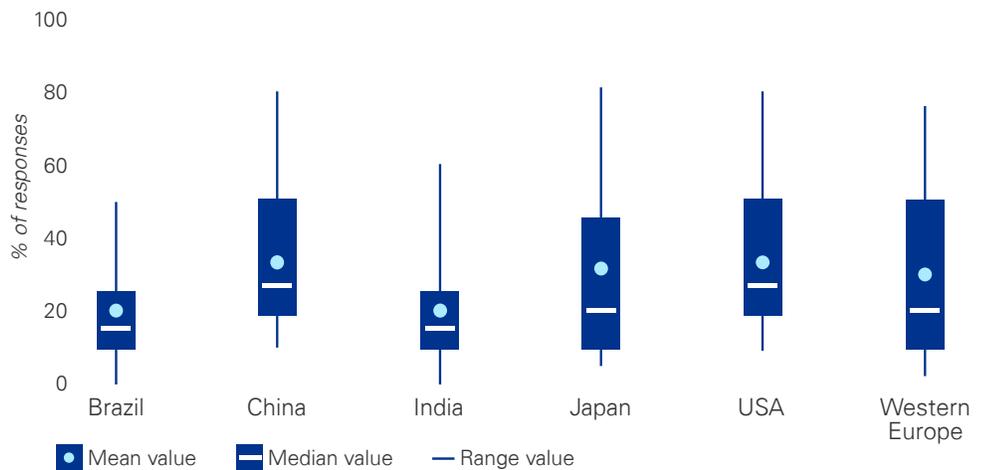
By 2030, what percentage of new vehicles sales do you believe will be battery-powered (excluding hybrids) within each market?

### Estimated EV market share in 2030

Mean estimate of EV penetration by market



Distribution by market: Mean, median, and range



When asked which companies they expect to dominate the market for battery-electric vehicles in 2030, Tesla came out on top, stretching its lead considerably as the perceived number one. BMW is a distant second, and Audi is third. Mercedes-Benz is fifth, followed by BYD. Toyota has moved up to seventh place.

The shift in perception is particularly marked in Western Europe, where 148 executives now expect Tesla to rank first or second in 2030, compared with only 66 and 57 respectively for BMW and Audi. European companies used to be skeptical of Tesla’s market power, but that changed after

the company’s assembly plant opened in Berlin in March 2022. In 2023, Tesla’s Model Y was set to be the biggest selling model in Europe—of all powertrain types. In Japan, Toyota is making rapid headway, while China’s BYD is now a force to be reckoned with outside its domestic market.

There still seems to be a good deal of fear and uncertainty about who can make it into the top ten—and who can secure a profitable share of market. Apple, which has not even confirmed that it will enter the market, is now expected to be in fourth place by 2030 (up from eighth in the previous year’s survey).

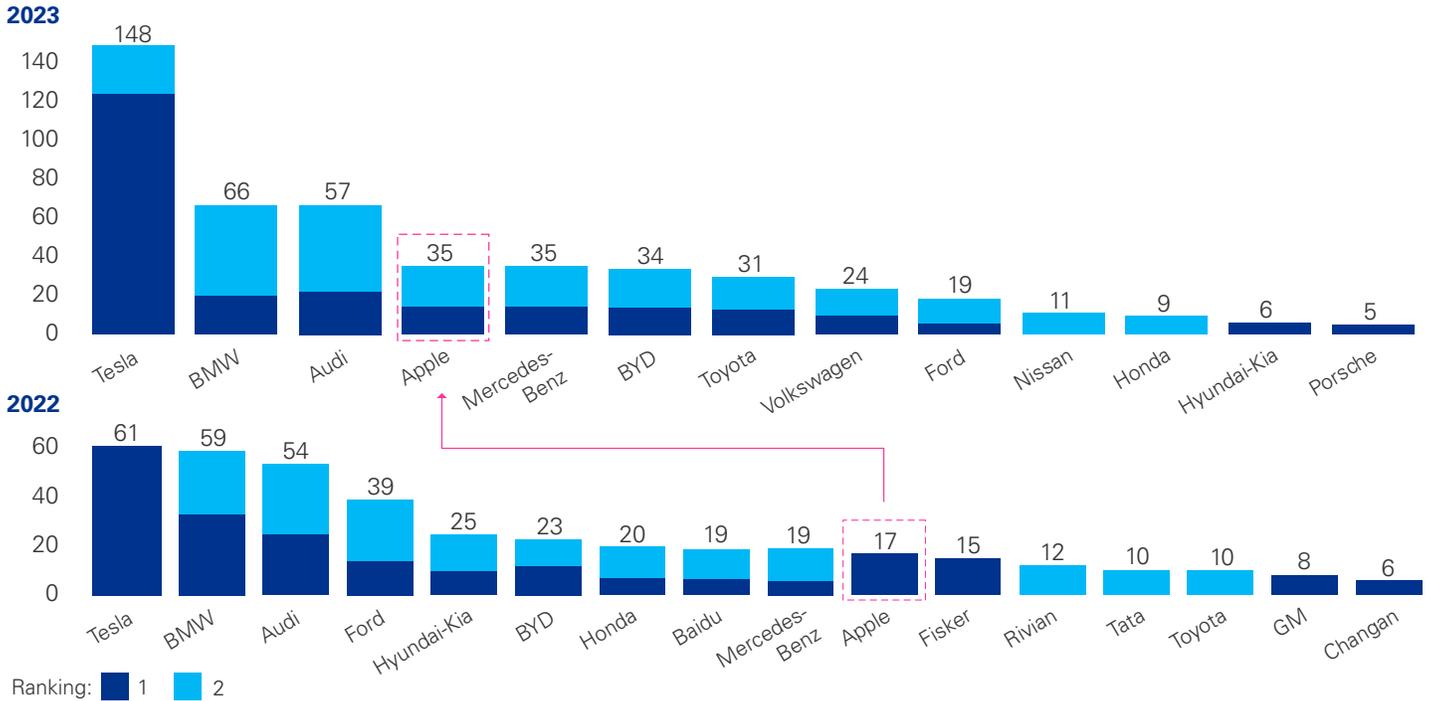
<sup>5</sup> KPMG International, “Automotive: In the midst of global transformation” ( August 2023)

<sup>6</sup> Green Car Reports, Stephen Edelstein (September 22, 2023)

## Tesla still reinforcing dominance in electric vehicles in Western Europe

Looking out to 2030, which of the following companies do you think will be the market leaders in battery electric vehicles?

### Respondent predictions: Future market leaders in battery electric vehicles by 2030



Globally, Tesla was by far number one with 464 executives responding in first or second place followed in next place by BMW with 236 executives.

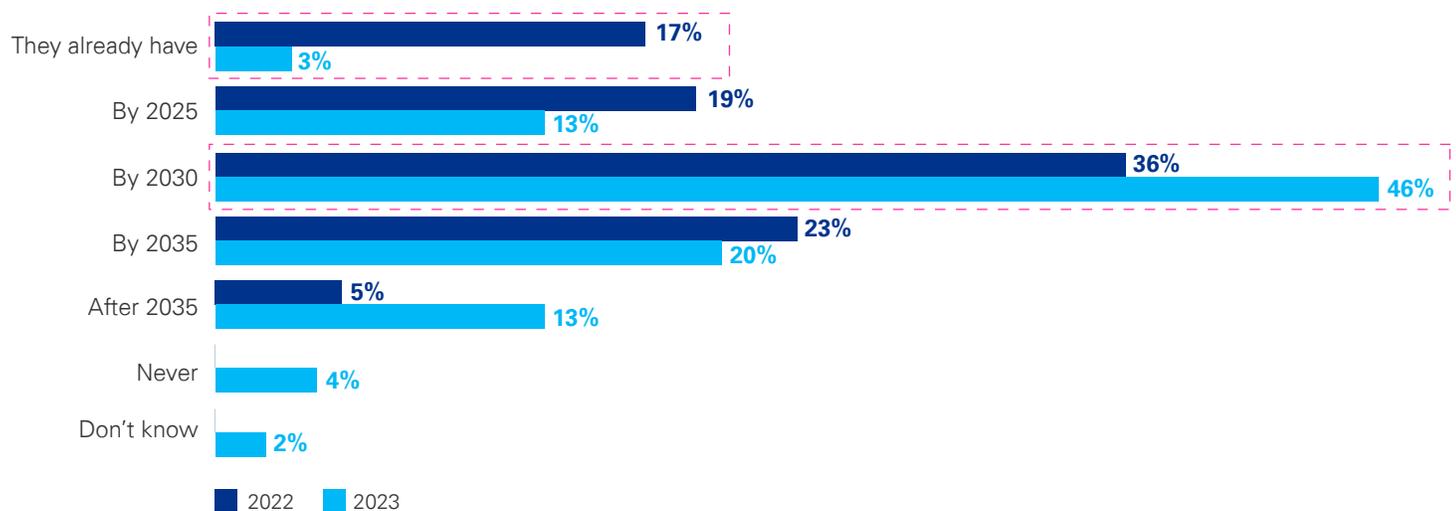
OEM executives and suppliers are generally much less optimistic this year than last about when BEVs, without subsidies, will reach cost parity with internal combustion engine (ICE) vehicles. The number of OEMs that say this point will be reached by 2030 has gained ten percentage points. Chinese companies are already the most efficient

EV manufacturers and 87 percent of Chinese executives in our survey expect cost parity at or before 2030. The Rocky Mountain Institute predicts that large EVs sold in the US will achieve price parity in 2026 and smaller vehicles in 2029; it predicts parity in China by 2025.<sup>7</sup>

## Estimated date of cost parity between EVs and ICE vehicles is moving further out

When do you believe battery electric vehicles will reach cost/affordability parity with ICE without any subsidies?

### Anticipated dates for EV and ICE cost parity



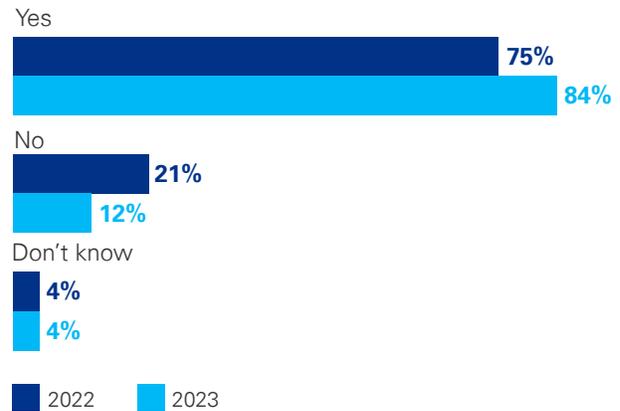
<sup>7</sup> Green Car Reports, Stephen Edelstein (September 22, 2023)

This year we saw stronger support for subsidies and incentives among executives. The share of respondents favoring direct subsidies grew from 75 percent in the previous year’s survey to 84 percent in the current edition. The increase is most marked in Western Europe, where automakers feel the heat of competition from China and industry leaders are calling for subsidies to match the ones in the US. The share of European executives favoring subsidies rose from 65 percent in the prior survey to 84 percent in the latest edition.

### Support for subsidies is stronger, especially in Europe

Some governments are providing direct consumer subsidies for electric vehicles. Do you agree with this policy?

#### Support for EV subsidies in the automotive industry

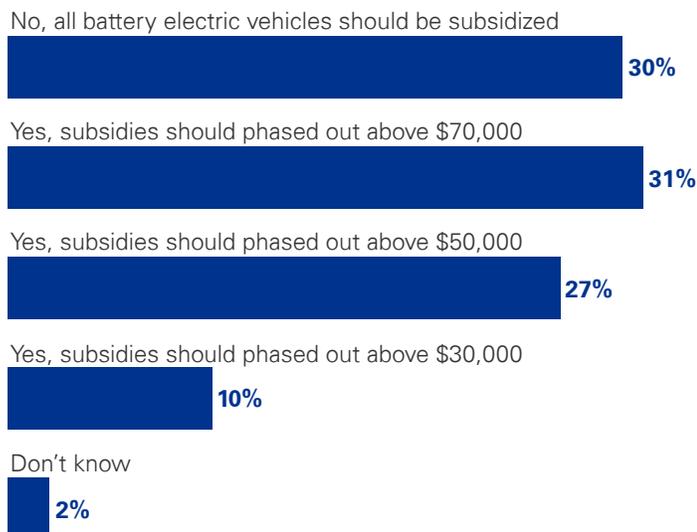


More respondents also said that incentives should be offered at all price points, including on luxury models. The share of respondents who said all battery-electric vehicles should be subsidized jumped from 21 percent to 30 percent. However, more generous and widespread subsidies might not be achievable at a time when governments are under pressure to reduce deficits.

### There is still support for subsidy phase-outs on luxury EVs

Should the subsidies be phased out for vehicles above a certain vehicle price?

#### Support for phasing out EV subsidies in the automotive industry





Another perennial concern about EV uptake is the state of the charging infrastructure. The who, how, and when of infrastructure buildout still seem to be unresolved questions. For example, when we asked who is best

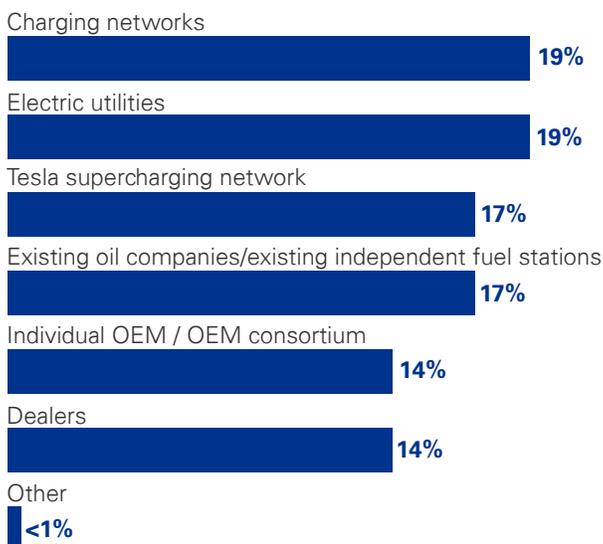
positioned to own and operate EV charging stations, the answers were nearly evenly split between dedicated charging-network players, electric utilities, followed by Tesla and oil companies.

## The charging market is up for grabs, but Tesla has a strong position

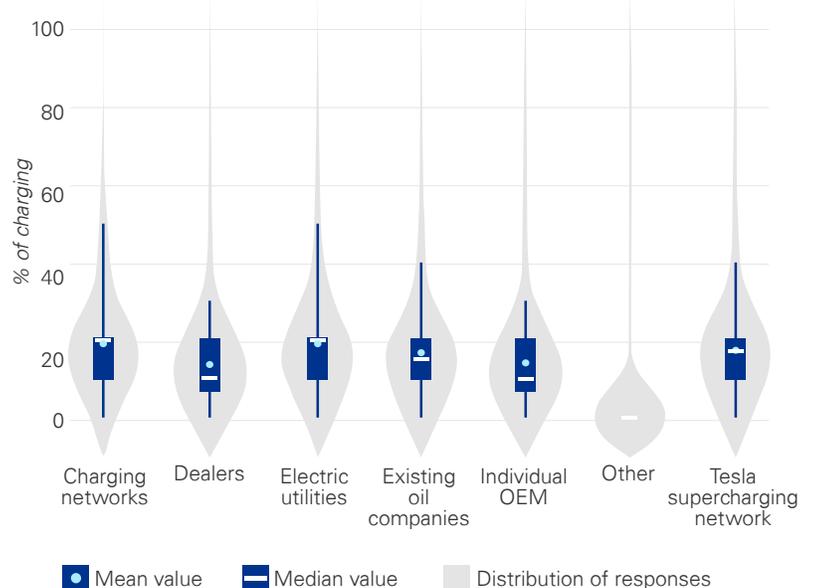
Who is best positioned to own and operate electric vehicle charging stations?

### Potential leaders in EV charging stations

Distribution of responses: Percentage mean



Distribution of responses: Mean, median, and range of responses



In today's market, Tesla is the charging leader, with its own network of superchargers in prime locations. The network is so effective that other EV makers have made deals to use Tesla's charging stations.

This is another example of the changes that automakers continue to wrestle with. It's not enough to build profitable cars—EV competitors must also make sure their customers have access to charging infrastructure. Tesla's

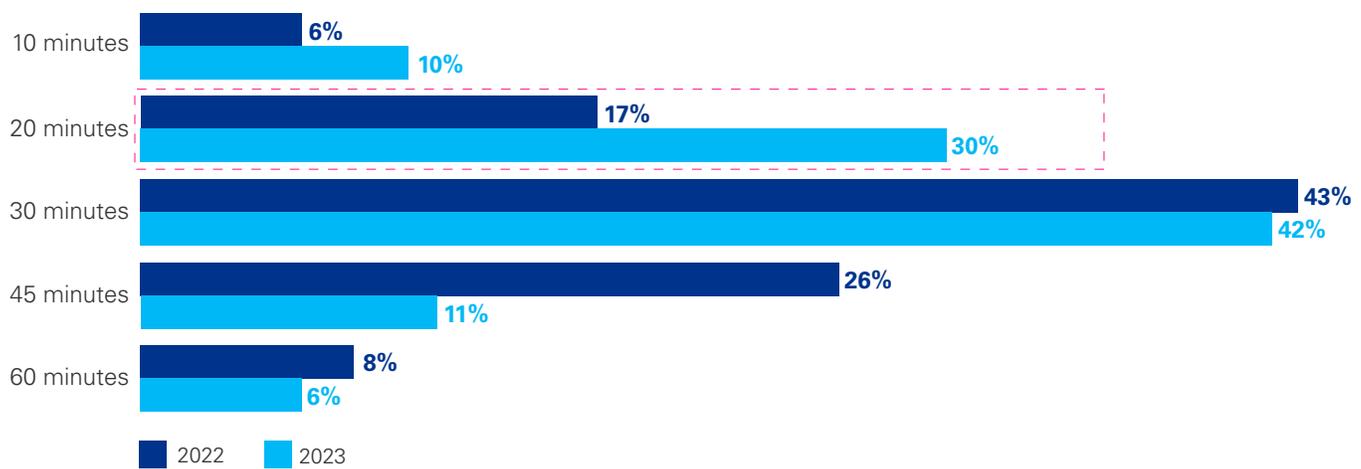
charging stations are fast, convenient and tend to be in safe areas.

Pressure to build an effective charging network will only grow, because car owners are becoming increasingly demanding about charge times in secure locations. For example, 83 percent of US survey respondents say that consumers want an 80 percent charge in no more than 30 minutes, up from 65 percent in the previous year.

### More consumers demand quick charge times, executives say

While traveling and running low on battery charge, how long will the typical consumer be willing to wait for an 80 percentage or greater recharge?

Automotive executive insights on consumer expectations: EV recharge wait times (≥80%)



Consumers are demanding faster recharging times and a more reliable electric infrastructure to support their needs. Through strategic partnerships and innovation, automakers can cultivate an ecosystem of charging options that serve the needs of consumers, drive customer loyalty, and position themselves for success in the years to come.

**Laurent Des Places**

Partner, Head of Automotive  
KPMG in France

As to where charging stations will be located, this will largely depend on where car owners live. If they have a house and a garage, they will charge their EVs at home.

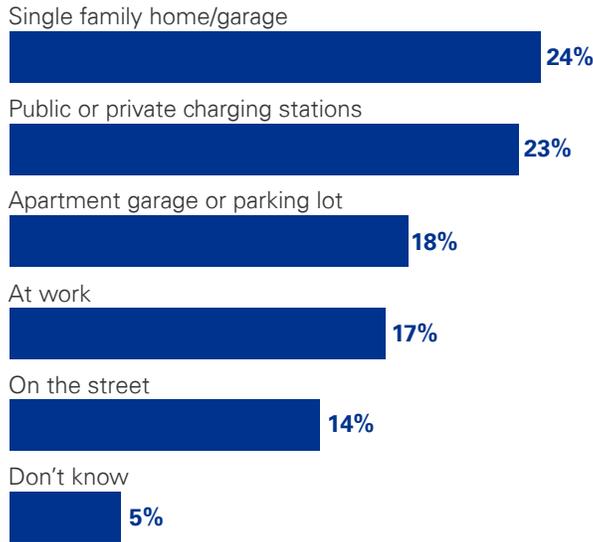
However, in densely populated areas—where car owners don't have access to personal chargers—home charging may not be an option.

### EV owners will charge in a variety of locations

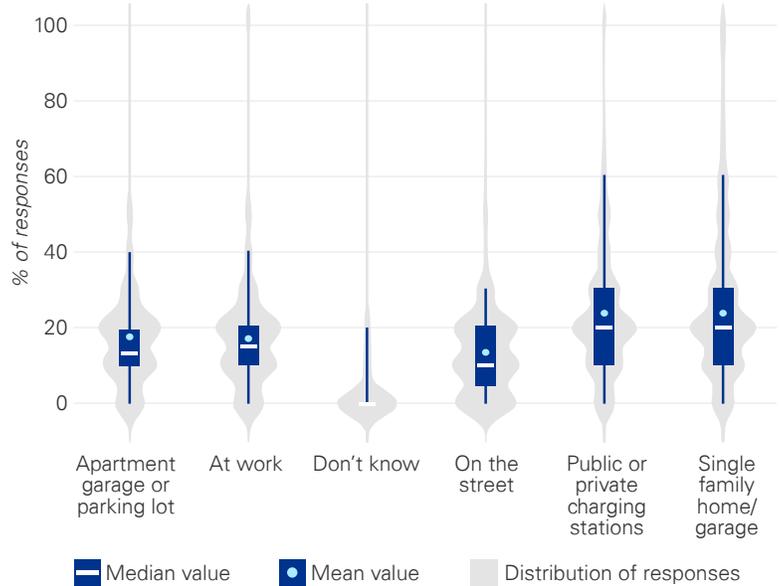
In your home market, where will owners charge their battery electric vehicles?

#### Anticipated charging location preferences for EV owners

Distribution by location preference: Percentage mean



Distribution of responses: Mean, median, and range



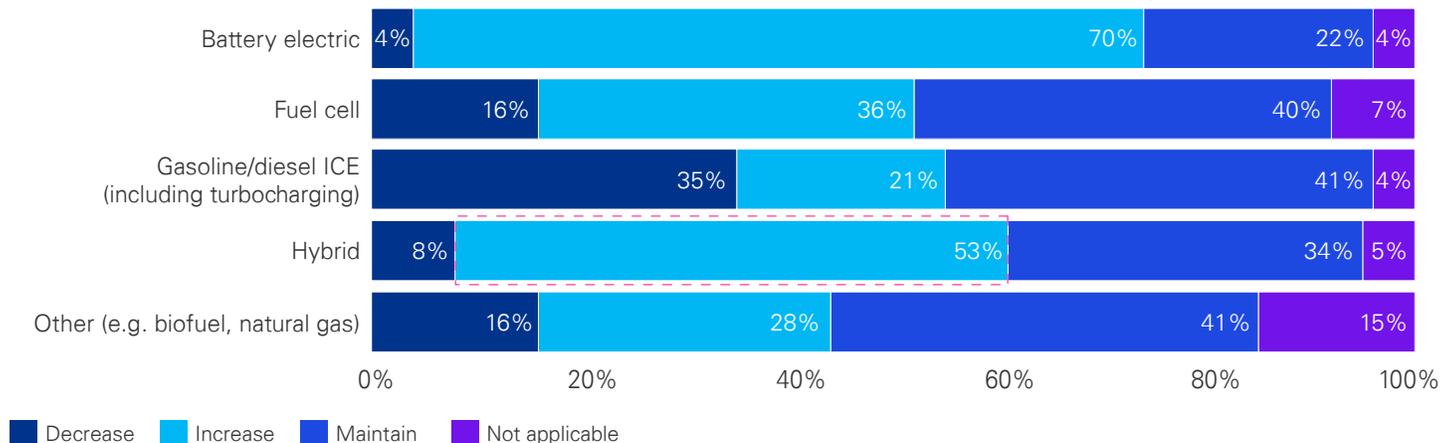
As noted, while companies focus on battery-powered EVs, they are also continuing to look at other powertrain options. When it comes to the expectations for future capital expenditure, the two most-favored areas for investment are BEVs and hybrids. But they are maintaining or increasing

investment in hydrogen fuel cells as well as advanced ICE technology and alternative fuels. However, more than a third of executives say they are going to invest less than before in gas- and diesel-powered engines.

### Companies are hedging their EV bets with investment in hybrid technology

What is your company's outlook for future capital expenditure and R&D investments in the following areas?

#### Anticipated capital expenditure and R&D investments by automotive companies





# Digital consumers

Consumers are perceived to be changing their priorities when it comes to buying a car. Driving performance remains the most important feature (cited as very or extremely important by 80 percent of global respondents). But a seamless and hassle-free customer experience has moved up to second place. The increase was particularly marked in the US, where the share of respondents saying a seamless experience is extremely important jumped from 24 percent to 39 percent.

Among dealers globally, the rise was even sharper. They can see that consumers are looking for a simple digital experience, starting with research and evaluation through purchase and ownership.



For consumers, best experiences become their expectations, so translating their mobile communications and entertainment choices into the car environment needs to feel intuitive and of high quality in order for car makers to capitalize on these new revenue streams.

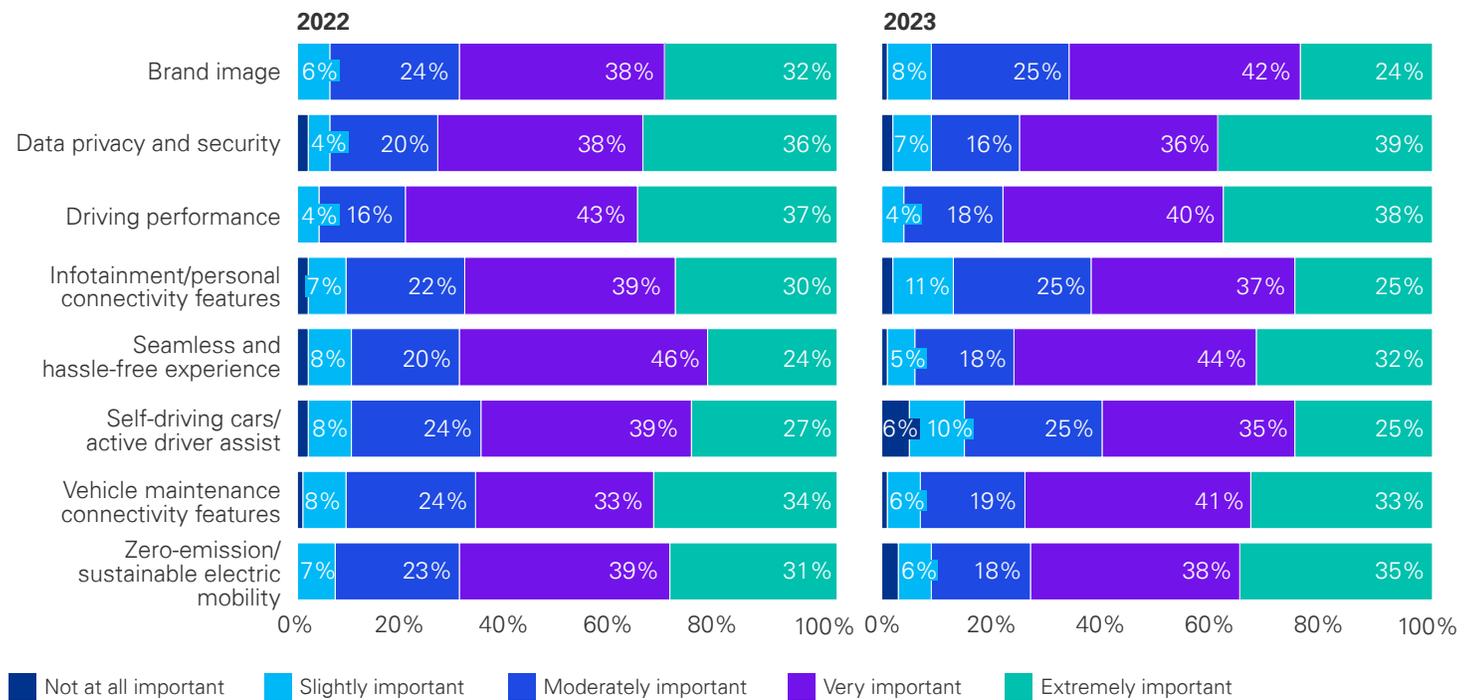
**Richard Peberdy**

*Partner, Head of Automotive, KPMG in the UK*

## Increasingly, customer experience is seen as a differentiator

How important do you think the following features will be for consumers when deciding to purchase a car in the next five years?

Automotive executive insights: The top consumer priorities in car purchasing over the next five years



While customer experience is recognized as increasingly important, the importance of brand image is falling. Brand image was seen as the sixth most important factor for consumers, down from third place in our previous year's survey. The decline is particularly marked among OEM executives, falling from 80 percent saying it is very or extremely important to 65 percent.

This is a sign that the market for BEVs is becoming less novel. An increasing number of manufacturers are producing electric vehicles, and Tesla, the leader, is now regarded as a mainstream car maker. As a result, consumers have more car makes to choose from and are becoming more discerning in their attitude to the new cars on offer.

Active driver assistance systems are a lesser feature for consumers when deciding to buy a car. This may be because customers increasingly expect these systems to be standard, built-in features rather than something extra they have to pay for.

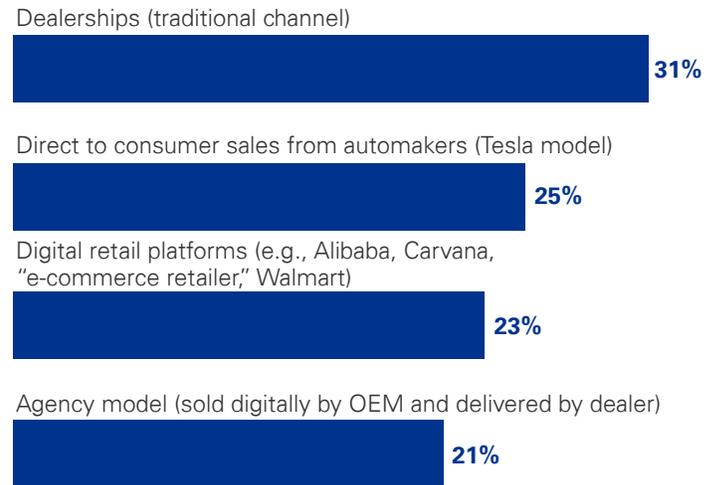
The industry also recognizes that consumers expect to be able to buy online. Executives estimate that by 2030,

69 percent of new cars will be sold directly to consumers through online retail platforms or by automakers. Even traditional dealers believe this to be the case.

### In 2030, the industry expects more than two-thirds of sales to be non-dealer

In 2030, what percent of new cars will be sold directly to consumers by automakers or nontraditional channels in your home market?

#### Projected distribution channels for new car sales in 2030



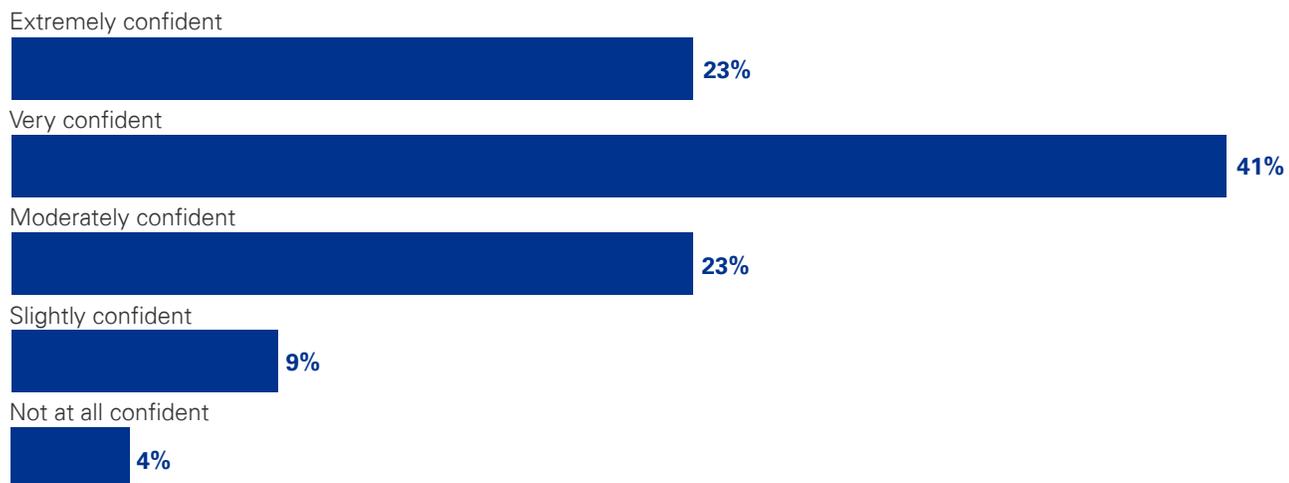
Many automakers are contemplating selling additional features and services on monthly subscription plans, but they are less confident than before that consumers will be willing to pay extra for this. OEM executives are especially

concerned about delivering subscription services. But captive finance companies are more confident they can bundle subscriptions into innovative finance plans that consumers will agree to.

### Expectations for software subscription revenues are declining

Many automakers are contemplating selling additional features and services as a monthly subscription (software services, maintenance, charging, Advanced Driver Assistance Systems, etc.). How confident are you that consumers would be willing to pay monthly subscription fees for this?

#### Automotive industry confidence in subscription fees for car features



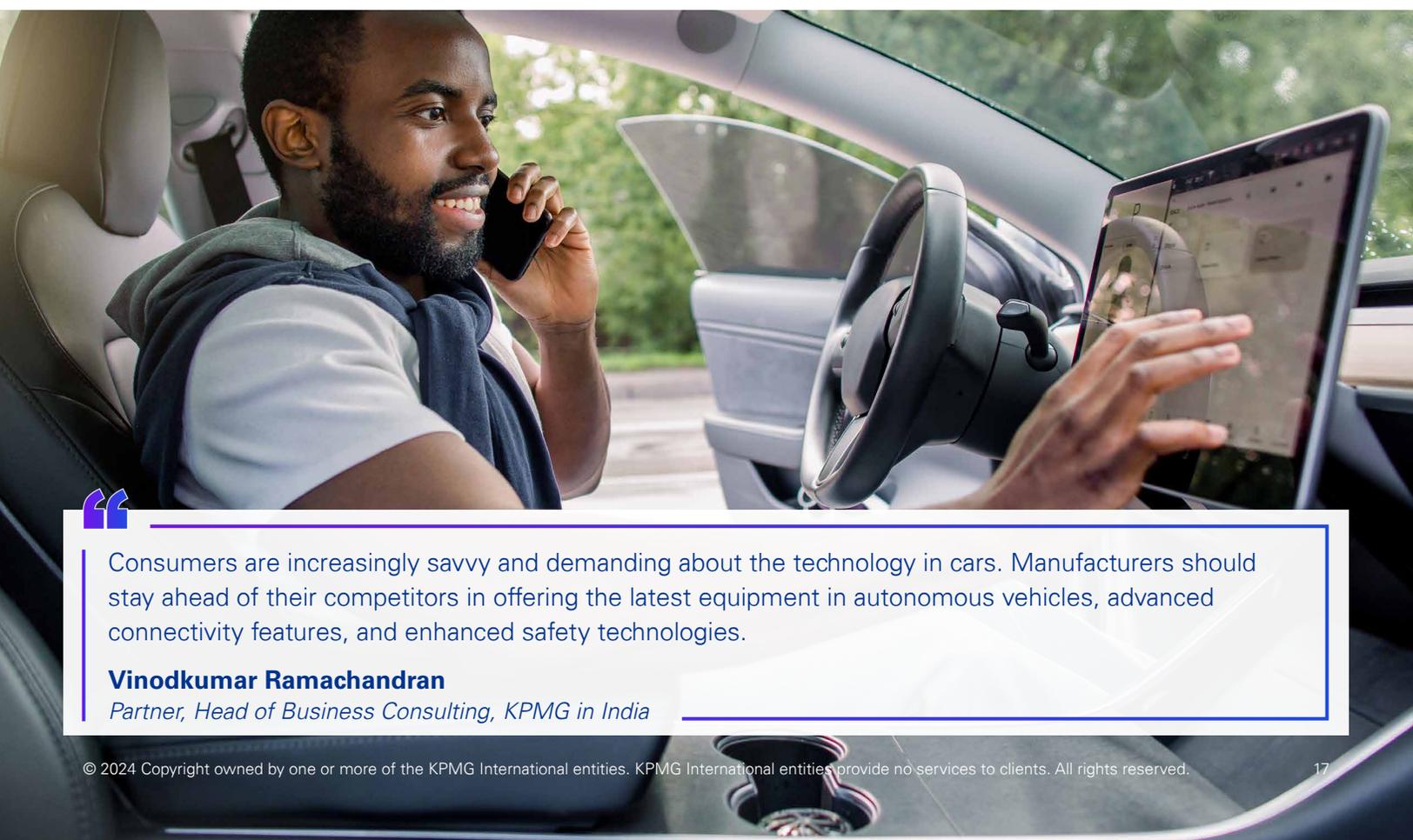
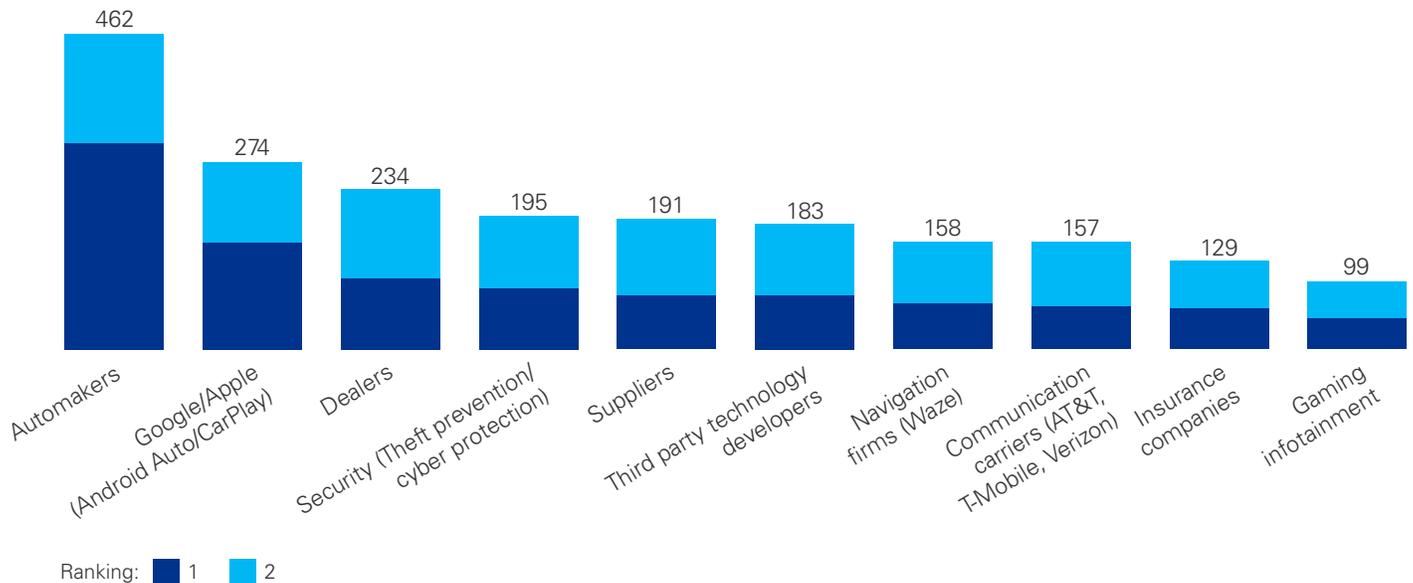
The industry—both incumbents and newcomers—is still counting on new revenue streams. Automakers are expected to be best positioned to capture new revenue streams from opportunities such as self-driving technology, infotainment, cybersecurity, and even gaming.

But large tech companies, especially Apple (CarPlay) and Google (Android) are already embedded in cars' software. The automakers and the tech firms will have to fight for their share of revenue, as other new companies enter the market to sell their in-car services.

### There is massive competition for new revenue streams

What players are best positioned to capture revenue streams from software-defined vehicles?

#### Automotive executive insights: Potential leaders in software defined vehicle revenue streams



Consumers are increasingly savvy and demanding about the technology in cars. Manufacturers should stay ahead of their competitors in offering the latest equipment in autonomous vehicles, advanced connectivity features, and enhanced safety technologies.

**Vinodkumar Ramachandran**

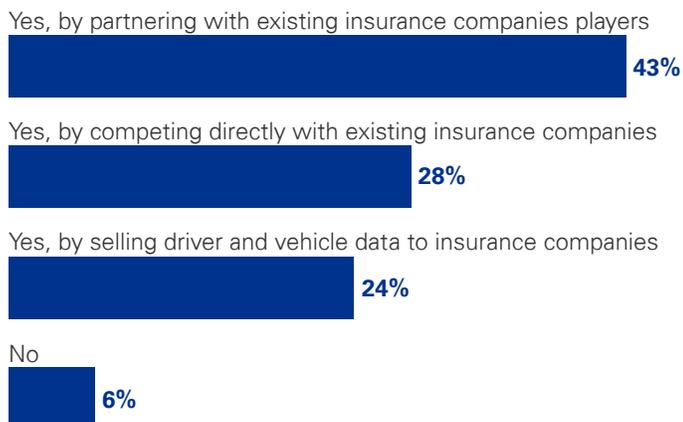
Partner, Head of Business Consulting, KPMG in India

One potentially lucrative area may be insurance. Based on the massive amounts of data collected from connected autos, auto executives are becoming more confident that they can compete directly with insurance companies. The share of executives who expect automakers to succeed in insurance has gone up from 7 percent to 28 percent. The success of Tesla encourages them to believe that they can make more on selling insurance than just selling data to insurers.

### Insurance is seen as another likely source of revenue

Do you think automakers will successfully participate in the insurance market? If so, how?

#### Predictions on automaker participation in insurance market

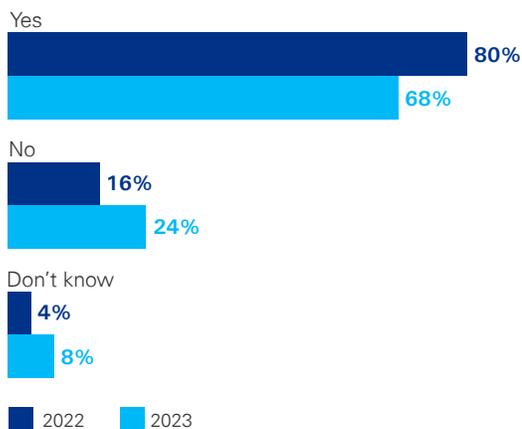


Despite the well-publicized data breach, 68 percent of respondents say automakers have adequate cybersecurity and customer data protection. But this is a decline from 80

### Automakers seem perhaps overconfident about cybersecurity and privacy protections

Do you believe automakers have adequate cybersecurity and customer data privacy protections in place?

#### Automotive industry confidence in their cyber security and data privacy

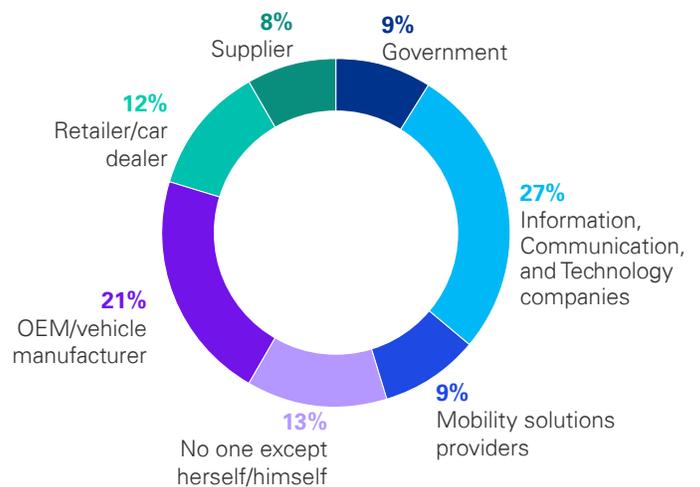


These data-driven revenue streams will not materialize if consumers are not confident that automakers will protect their privacy and data. Following one massive data breach in 2023, the share of survey respondents who believe consumers will trust automakers with their data has plunged from 80 percent to 40 percent. The proportion who thought consumers would trust tech companies most more than doubled to 27 percent.

### Automakers are not as trusted as tech companies for guarding data

Whom do you think a consumer would trust most to safeguard the data generated by the vehicle?

#### Who consumers trust in safeguarding vehicle data



percent the year before. Automakers are realizing it is their brand image that is at stake. Data security must therefore be a critical risk to focus on.



As connected cars become more prevalent, it is essential that car manufacturers prioritize cybersecurity, not only to protect their customers' personal data but also to safeguard their brand and reputation. Executives should take a future-oriented approach to cybersecurity to proactively address potential vulnerabilities and mitigate the risk of data breaches.

**Per Edin**  
Partner, Advisory, KPMG in the US



# Supply chains

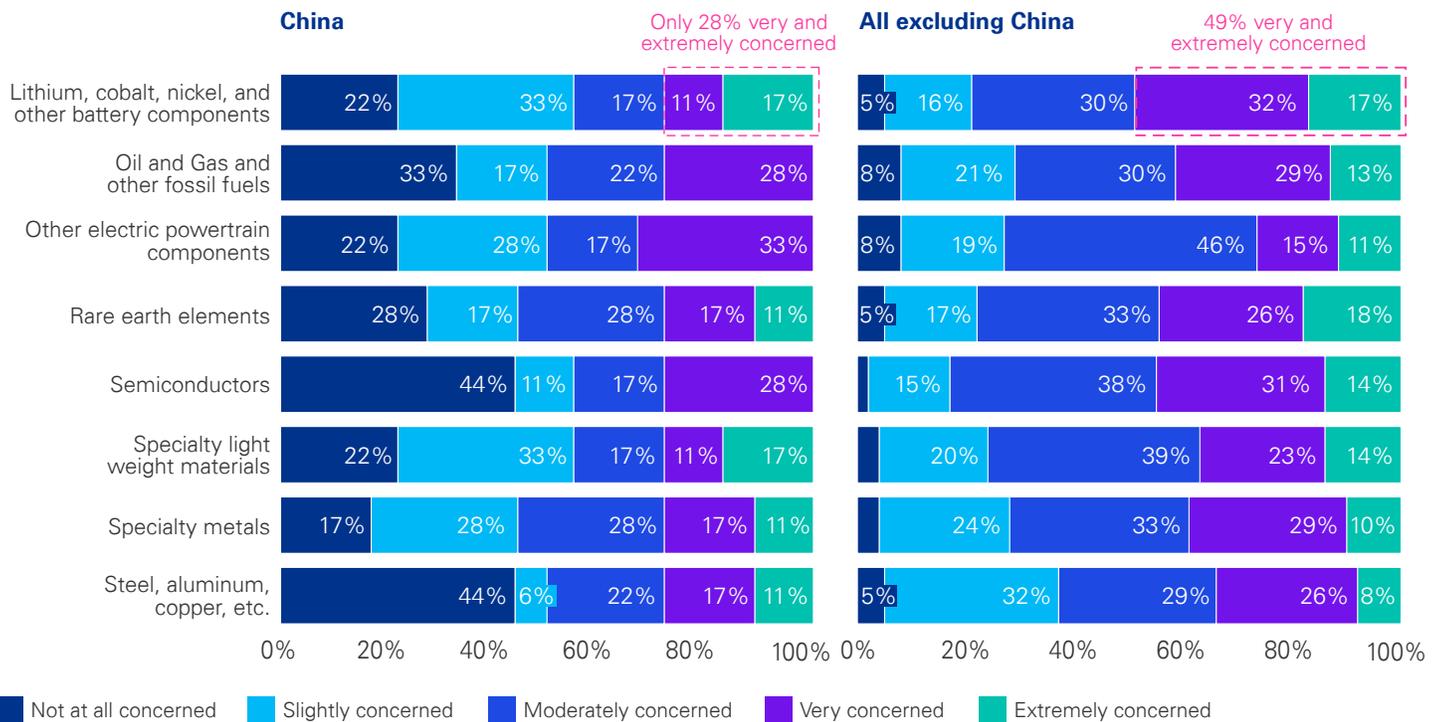
In our survey, 45 percent of respondents (outside China) were very or extremely concerned about access to lithium, cobalt and other battery components. In last year's survey 78 percent of OEM executives were very or extremely concerned about lithium supplies (and 63 percent in 2023).

The view is strikingly different from inside China, where only 28 percent of Chinese OEMs and suppliers are very or extremely concerned about supplies of lithium and other critical battery components. This is likely because China has been setting the supply of these commodities, giving Chinese executives greater confidence in the resilience of their supply chains.

## Industry automakers and suppliers remain concerned

How concerned are you about continuity of supply in the next five years for the following commodities/components?

### Continuity of supply concerns for key commodities/components over the next five years



Note: Percentages do not total to 100 due to rounding





Since the disruptions of the pandemic and ongoing geopolitical tensions, companies have spent heavily on locking up raw material supplies, with direct investments, joint ventures with component manufacturers, and stakes in mining. Slower growth in BEV sales may give car makers breathing space to strengthen their supply chains further.

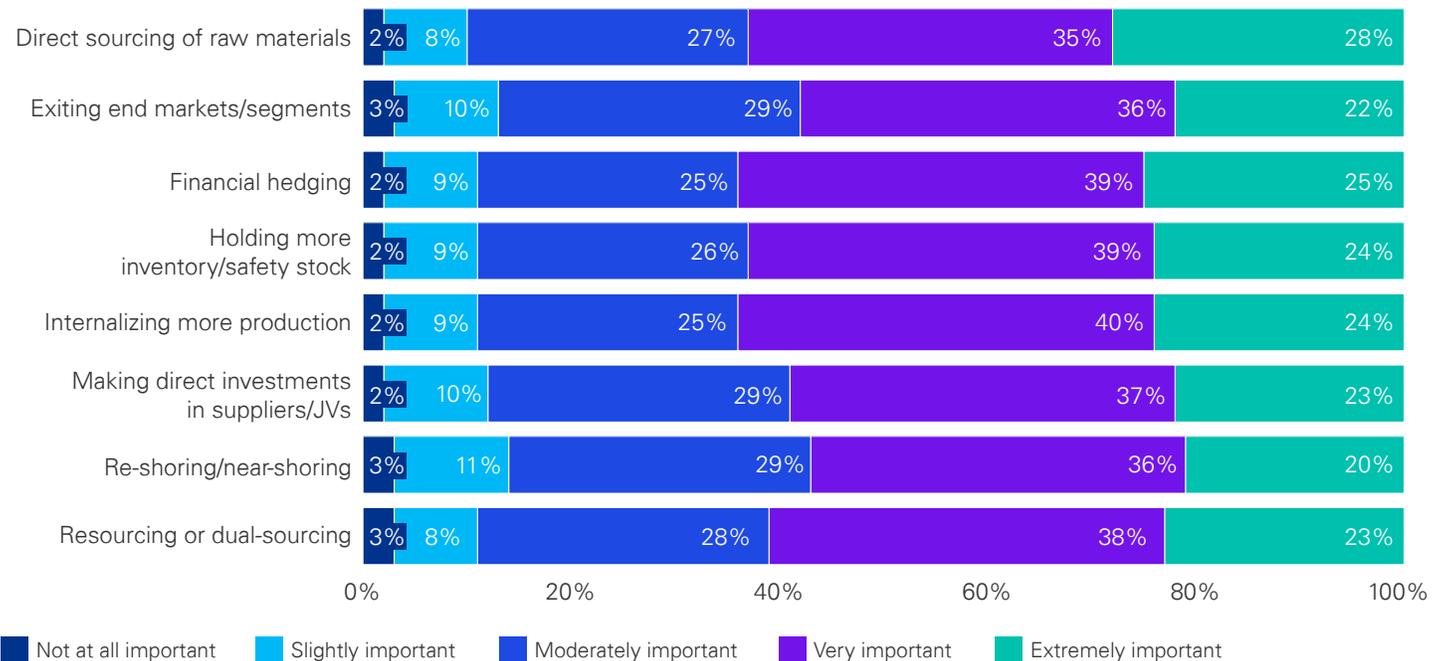
Around the world, companies are employing a range of methods to strengthen and diversify their supply chains.

As was reflected in the previous year’s survey results, companies are trying to move to a “just in case” approach to supply chains to become more resilient to disruptions. Executives are talking about using more hedging to manage commodity prices and bringing more production in-house. Overall, however, executives are becoming less worried about their supply chains, as the shock of the supply interruptions that occurred in 2020 and 2021 wears off.

## Companies are using a variety of strategies to mitigate supply chain risks

How important are each of the following to your future supply chain strategy?

### Strategies to manage supply chain risks



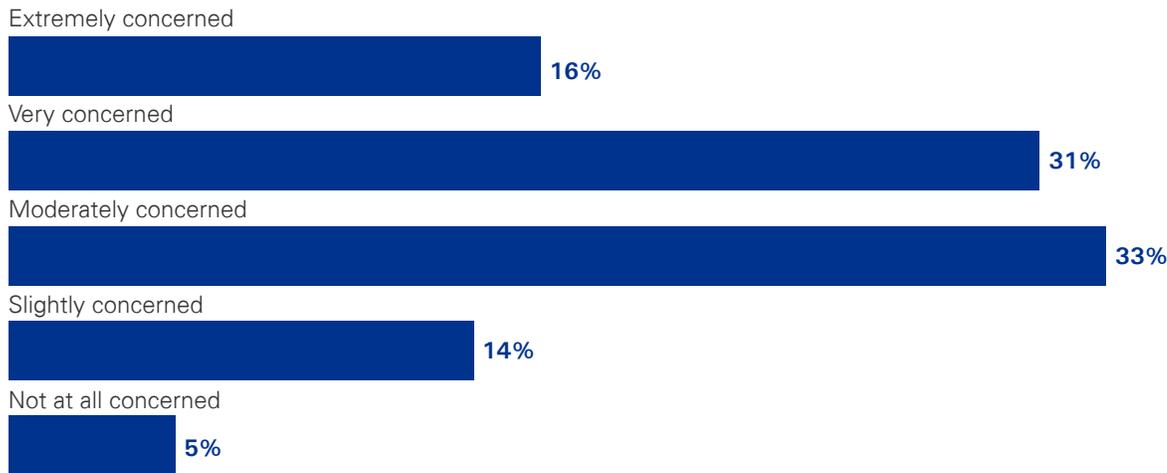
For similar reasons, executives are somewhat less worried about the volatility of commodity prices than they were in the year prior, although the anxiety level is still high.

Forty-seven percent of executives are very or extremely concerned, compared with 58 percent in the year before.

### Concerns over commodity prices are also easing

How concerned are you that the volatility in commodity prices will adversely impact your business in the next 12 months?

#### Business sentiment on the impact of commodity price volatility in 2024



Sourcing new channels for materials is only one of the tools for introducing redundancy into the supply chain. Offsetting volatile prices with financial hedging instruments such as futures, options, and swaps, organizations can offset price risk and help create a more predictable supply chain.

**Seung-Hoon Wi** *Partner, Industrial Manufacturing, KPMG in South Korea*

There are wide geographical differences, however. In the US, 57 percent of vehicle manufacturers and suppliers are very or extremely concerned about volatile prices, compared with 75 percent the year before. By contrast, the number in China who are very concerned jumped from 4 percent to 26 percent, due to trade worries, geopolitics, and the decline of China’s Renminbi against the dollar.

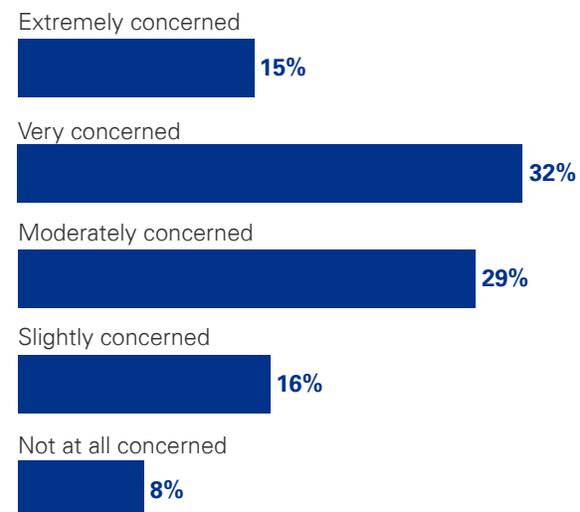
When asked how concerned they are about labor shortages and wage increases in the next 12 months, the overall level of anxiety has remained around 50 percent. Among CEOs, though, the number that are very or extremely concerned has dropped to 41 percent from 60 percent. Among vehicle manufacturers and suppliers in the US, the decline is even more accentuated.

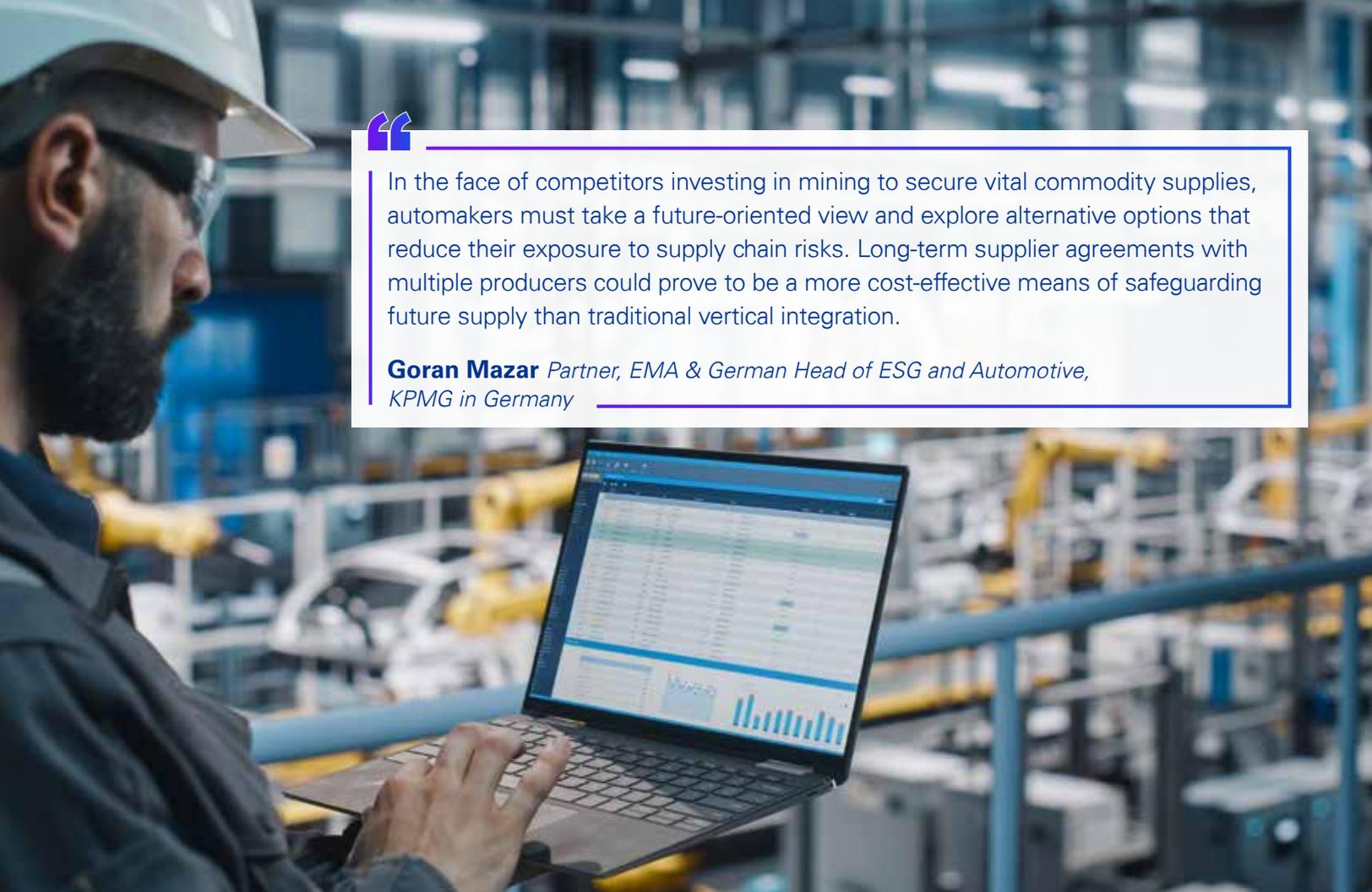
In contrast, the level of concern is higher among tech companies in the auto industry than in other categories, as demand for specialized skills remains very strong.

### Labor shortages remain a concern

How concerned are you that labor shortages or wage increases will adversely impact your business in the next 12 months?

#### Outlook on labor shortages and wage increases in 2024





In the face of competitors investing in mining to secure vital commodity supplies, automakers must take a future-oriented view and explore alternative options that reduce their exposure to supply chain risks. Long-term supplier agreements with multiple producers could prove to be a more cost-effective means of safeguarding future supply than traditional vertical integration.

**Goran Mazar** *Partner, EMA & German Head of ESG and Automotive, KPMG in Germany*

Only 16 percent think the cost and complexity of tariffs, trade rules, and regulations will increase significantly in the next five years, slightly below the level of concern cited in the previous survey. The decline is likely to be due to a perception that growth of regulation may have peaked—after the introduction of new measures that affect the automotive sector such as the US Inflation Reduction Act (IRA) and the EU Carbon Border Adjustment Mechanism (CBAM), a carbon tax on imported goods.<sup>8</sup>

Only 9 percent of US OEMs believe there will be a significant increase in regulations, against 44 percent the year before.



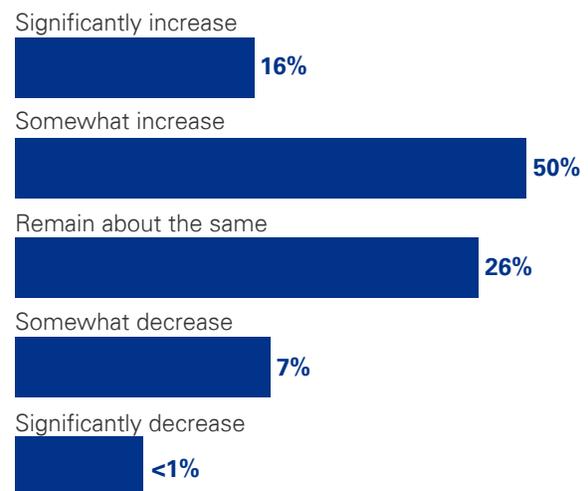
The IRA provides massive incentives for EVs sold and produced in the US, but the rules are complex and there is still confusion about how they apply. Getting this right is critical. There are billions at stake.

**George Zaharatos**  
*Principal, Tax, KPMG in the US*

### Has the trend to more regulation peaked?

Do you believe the cost and complexity of tariffs, trade rules, and regulations will increase or decrease in the next five years?

#### Expectations for changes in trade rules and regulations



<sup>8</sup> KPMG International, "[Impact of the EU's Carbon Border Adjustment Mechanism](#)" (July 2022)

# Technology

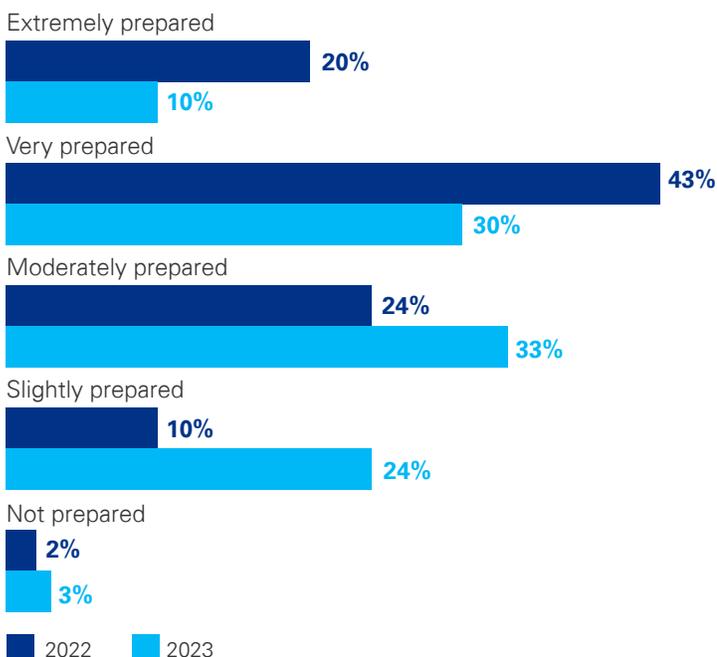
There is a growing sentiment that automakers are less prepared for advanced technologies, such as artificial intelligence, digital twins, and advanced robotics, than in previous years. Those saying they are very or extremely well prepared dropped by 23 percentage points. Companies are realizing that it is extremely difficult to excel in many fields and to take advantage of a range of technological breakthroughs requires immense capabilities.

Companies may feel less prepared to implement new technology this year because of the proliferation of new AI systems. Across industries, companies are rushing to adopt generative AI, which potentially puts AI tools in the hands of workers across many functions. But that will also require job redesign, training, and hiring. The automotive sector increasingly competes with companies in other industries for talent with advanced skills in areas such as AI.

## Confidence in the ability to implement new technology has declined

How prepared is your company for advanced manufacturing technologies? (e.g. artificial intelligence, machine learning, digital twins, advanced robotics)

### Industry preparedness for advanced manufacturing technologies



GenAI is now embedded in the way vehicles are designed, engineered, manufactured and sold. It will also supercharge competition based on how effective genAI is used for new products, new features, and optimization.

**Fabrizio Ricci**

Partner, Advisory, KPMG in Italy

When asked which skills will be the most important in the next several years, AI jumps to first place from third. In Germany, AI climbed by 16 percentage points and by nine in the US, whereas Japan remains focused on advanced manufacturing skills. Clearly, auto companies need a wide range of skills as they transform their operations.



As the race to develop cutting-edge artificial intelligence technology heats up, the auto industry finds itself in competition not just with tech companies but with every sector vying for top tier AI talent. Automakers should proactively evaluate their strategies for recruiting and training the existing workforce for these new technologies.

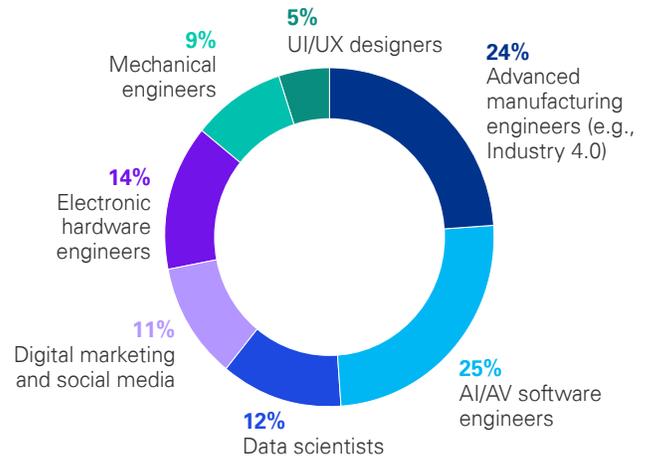
**James Walker**

Partner, Advisory, KPMG in the US

## AI has become the most important skill

Which of the following jobs/skills do you believe is the most important to your business in the next several years?

### Anticipated automotive roles and skills for the near future



R&D across a range of technologies is regarded as critically important, a finding little different from the year prior. But marked differences occur when considering individual countries. In the US, advanced computing

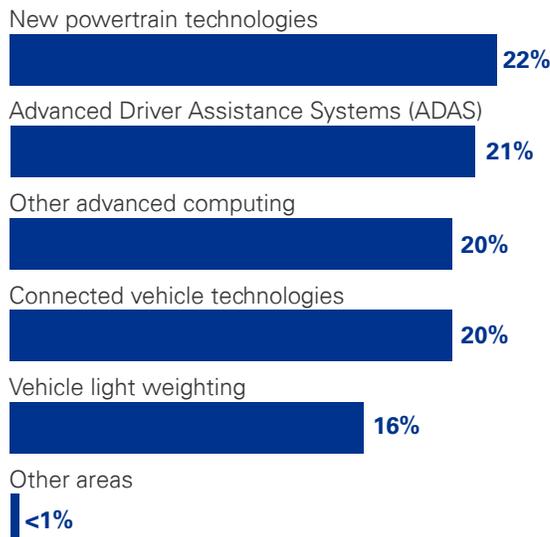
jumps from fifth to first place year on year, as cars evolve into “supercomputers on wheels.” China and Germany, by contrast, place more emphasis on new powertrain technologies.

## Companies have many priorities for R&D investment

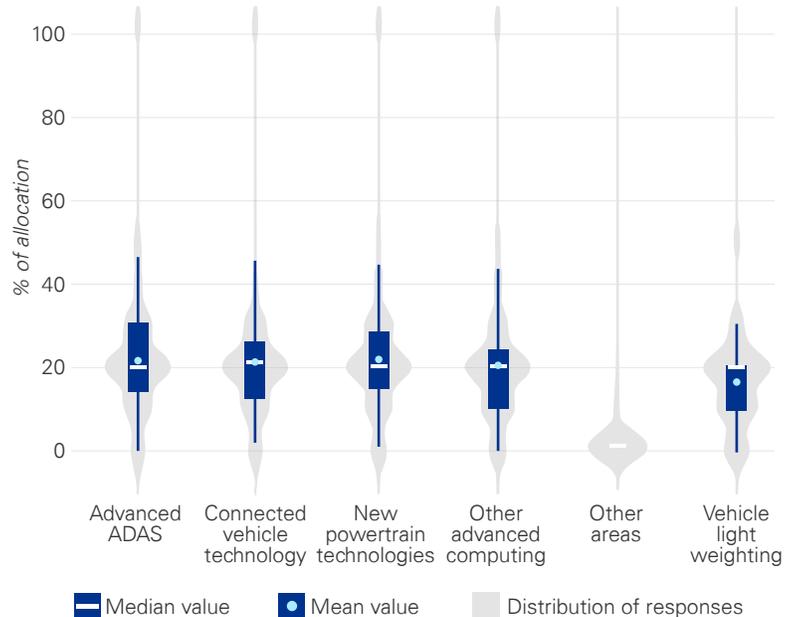
If you were given approval to double your existing R&D investment, how would you allocate the additional funding among the following technologies?

### R&D investment allocation: Executive technology priorities

Distribution of responses: Percentage mean



Distribution of responses: Mean, median, and overall distribution



Regarding investment in powertrain R&D, there is, again, a narrow dispersion among the seven categories, and for the same reason. Car makers are hedging their big EV bets among a plethora of options and hybrid technologies have jumped from fourth to second place overall and, in the US, are tied for first place with advanced batteries. In addition

to hedging EV bets in wealthy economies, executives know they cannot afford to miss out on opportunities in huge markets such as India, Indonesia, and Africa, where BEVs are going to take a long time to arrive in large numbers. In China and Europe, though, consumers are demanding more and more electric vehicles.

### Just in powertrain technology there are many R&D priorities

If you were given approval to double your powertrain R&D investment, how would you allocate the additional funding among the following technologies?

#### Powertrain R&D investment allocation: Executive technology priorities



Car executives continue to view large tech companies as potential disruptors in the OEM market. However, it is equally important for executives to plan for the potential disruption of smaller-scale suppliers. Proactively identifying and cultivating partnerships with up-and-coming suppliers can help address critical strategic areas, from safety and security to advanced sensor technology and autonomous capabilities.

**Norbert Meyring** *Partner, Head of Industrial Manufacturing, KPMG China*

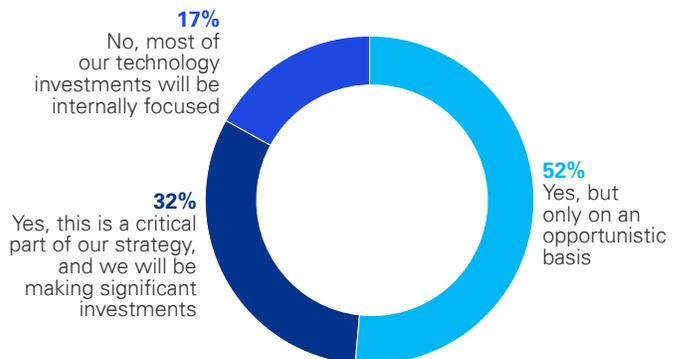
Investing in, or partnering with, new technology companies should be part of every player’s toolkit. Changes in car technology are occurring too fast to ignore, and pursuing these opportunities frequently requires established companies to partner with emerging entrepreneurs. Eighty-four percent of executives recognize this, little changed from the previous year.

There are geographical differences, though. Germany is emphasizing more in-house development than external acquisition, similar to Japan. US executives see external investments as more important and in China, the appetite for external acquisitions and partnerships is even stronger.

### Tech partnerships are critical

Are you considering making investments/acquisitions/partnerships in new technology companies in the next several years?

#### Automotive executives’ plans for tech partnerships and acquisitions



The survey shows that investment in auto startups remains strong. This is particularly true in China, where the proportion who thinks that startups will have a major market impact has risen 15 points. In Japan, the number soared by 22 points.



Startups are the global engines for innovation acceleration and the EV ecosystem has some tremendous potential to catalyze significant disruption. EV technologies continue to attract strong interest from investors and are a key area to watch within the broader cleantech and energy markets.

**Conor Moore**

*Global Head of KPMG Private Enterprise, KPMG International*

**Startups continue to play a key role**

In the next 10 years, what do you think the impact of startup companies will be?

**Auto executive outlook on the impact of startups**

**Major impact** one or more will take significant market share causing a reordering of the industry



**Moderate impact** A few will find some success, but will be eventually bought out by established automakers or will remain niche players



**No impact** most, if not all, will fail



More than half of executives are very or extremely likely to divest non-strategic parts of their businesses in the next several years, little changed from the year before. As noted in our recent papers “[Finding value as ICE melts: Difficult choices for auto parts suppliers](#)” and “[Automotive in the midst of global transformation](#),” the EV transition and the beginning of a decline in sales of ICE vehicles will involve corporate restructuring.<sup>9, 10</sup> We expect companies to divest assets that are overly dependent on ICE markets and continue to invest in electrification. Some players may try to consolidate ICE businesses as the market declines.

**Auto execs say will likely divest non-strategic assets**

How likely are you to divest non-strategic parts of your businesses in the next several years?

**Likelihood of divesting non-strategic assets in the near future**

Extremely likely



Very likely



Moderately likely



Slightly likely



Not likely at all



Smart divesting of non-core assets allow companies to free up cash to invest in new technology but also to streamline their operations, paving the way for more profitable growth in the years ahead.

**Lenny LaRocca**

*Partner, Advisory, KPMG in the US*



<sup>9</sup> KPMG in the US, “Finding value as ICE melts: Difficult choices for auto parts suppliers” (2023)

<sup>10</sup> KPMG International, “Automotive: In the midst of a global transformation” (August 2023)

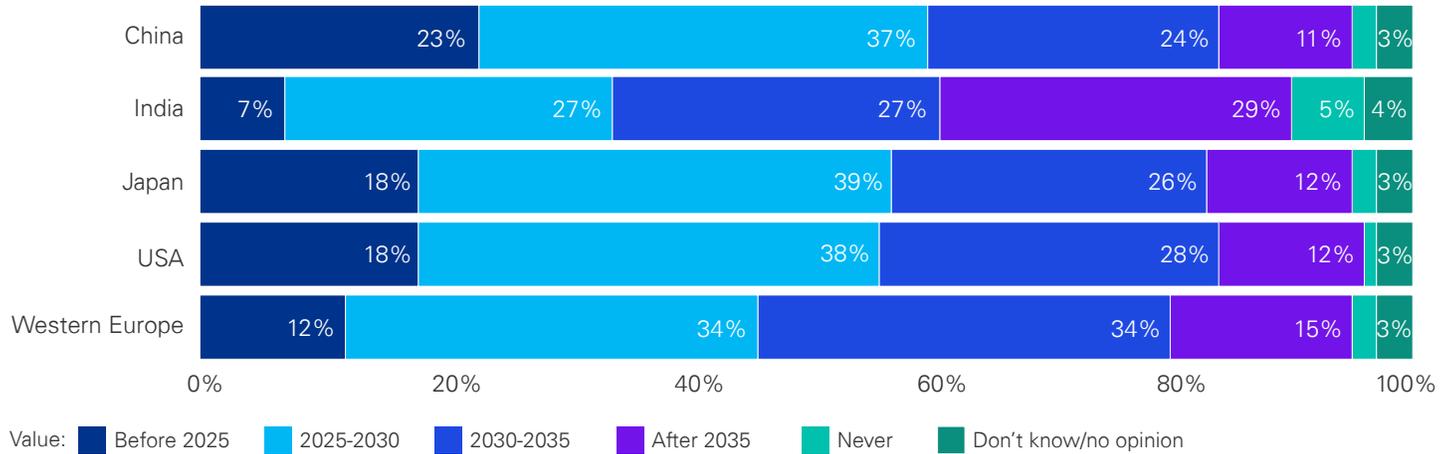
One manifestation of new technology is autonomous ride hailing and delivery, and, in this respect, there is a growing expectation of a faster introduction in major cities than in previous surveys. Seeing is believing: more and more cities are allowing autonomous taxis to operate.

The proportion of executives who expect this to occur in the US, Japan, China, and Germany by 2030 rose by 4 to 9 percentage points. The expectation of this happening in India by then is considerably lower.

### The timeline for the arrival of autonomous vehicles is getting shorter

When do you believe autonomous ride hailing and/or delivery will be commercially available within major cities in the following markets?

Automotive executive timeline predictions got autonomous ride hailing/delivery in major cities



When it comes to autonomous vehicles, there is no doubt which car company is seen as the leader. Fifty-five percent say Tesla, virtually unchanged from the previous year, likely reflecting the company’s success in winning approval for its autonomous driving technology in many countries. The jostling among the runners-up occurs in individual countries, with Huawei (China), Cruise (US), and Woven by Toyota (Japan) in second place in their homelands.



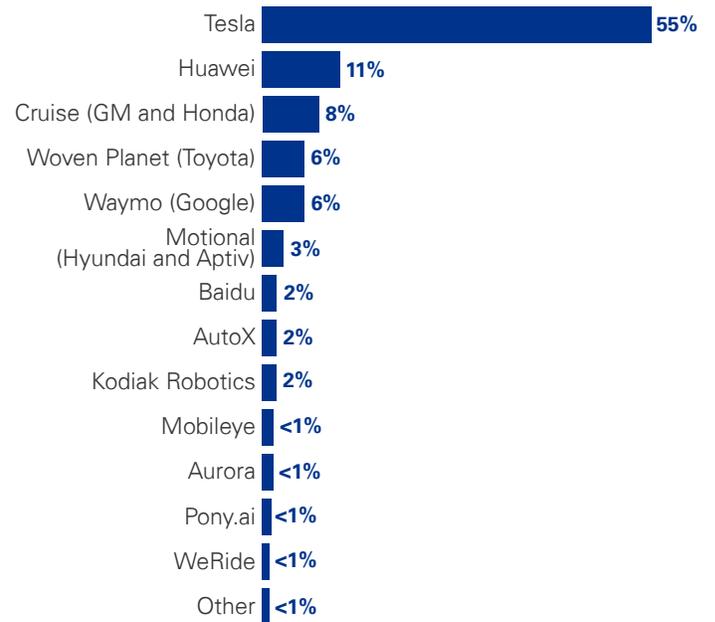
Autonomous taxis are becoming a tangible reality in many major cities around the world with its potential to revolutionize urban transport and fundamentally alter the competitive landscape. Through strategic partnerships, innovative business models, and a forward-looking approach, companies can prepare for a future in which autonomous taxis play a central role in the urban transportation mosaic.

**Megumu Komikado**  
*Partner, Automotive, KPMG in Japan*

### Tesla is the clear leader in autonomy, followed by local players across geographies

Who do you think will be the leader in your country in autonomous vehicles?

Anticipated leaders in autonomous vehicle technology



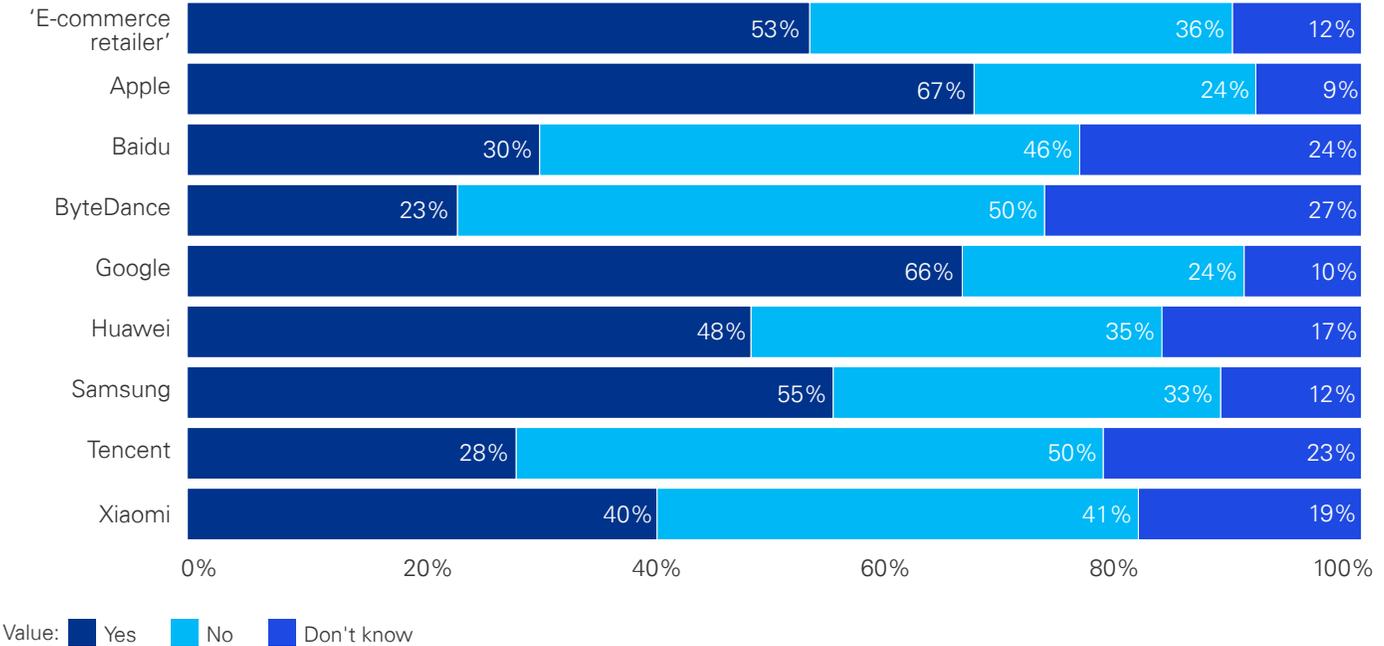
Most executives believe more tech companies will enter the industry with their own branded vehicles. Apple remains the number one choice, with 67 percent, but

it is now followed very closely by Google. Major global tech brands such as Samsung are also seen as likely competitors in automotive markets.

### Apple is expected to enter the auto market – and other tech giants, too

Do you think the following major technology companies will enter the auto market with their own branded vehicles?

#### Tech companies anticipated to enter auto market with branded vehicles



A large majority believe new automakers can succeed with an “asset light” strategy, even though OEMs are finding that working with contract manufacturers is extremely challenging. Nevertheless, new entrants have opted for contract manufacturing with companies such as Foxconn of Taiwan, which also makes iPhones for Apple.



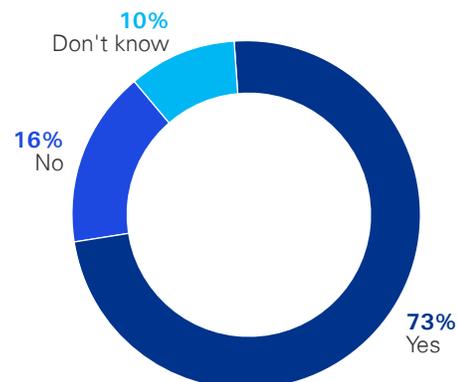
European car manufacturers are increasingly concerned about Chinese competitors dominating the lower-priced segments. To stay competitive, they should take a forward-looking approach in streamlining their manufacturing processes and reimagining their supply chains.

**Angelika Huber-Straßer**  
*Managing Partner, KPMG in Germany*

### Interest in asset-light manufacturing remains strong

Many new automakers are pursuing “asset-light” strategies using third parties to manufacture their vehicles. Do you believe automakers can succeed using contract manufacturing?

#### Perspectives on the success of asset-light strategies





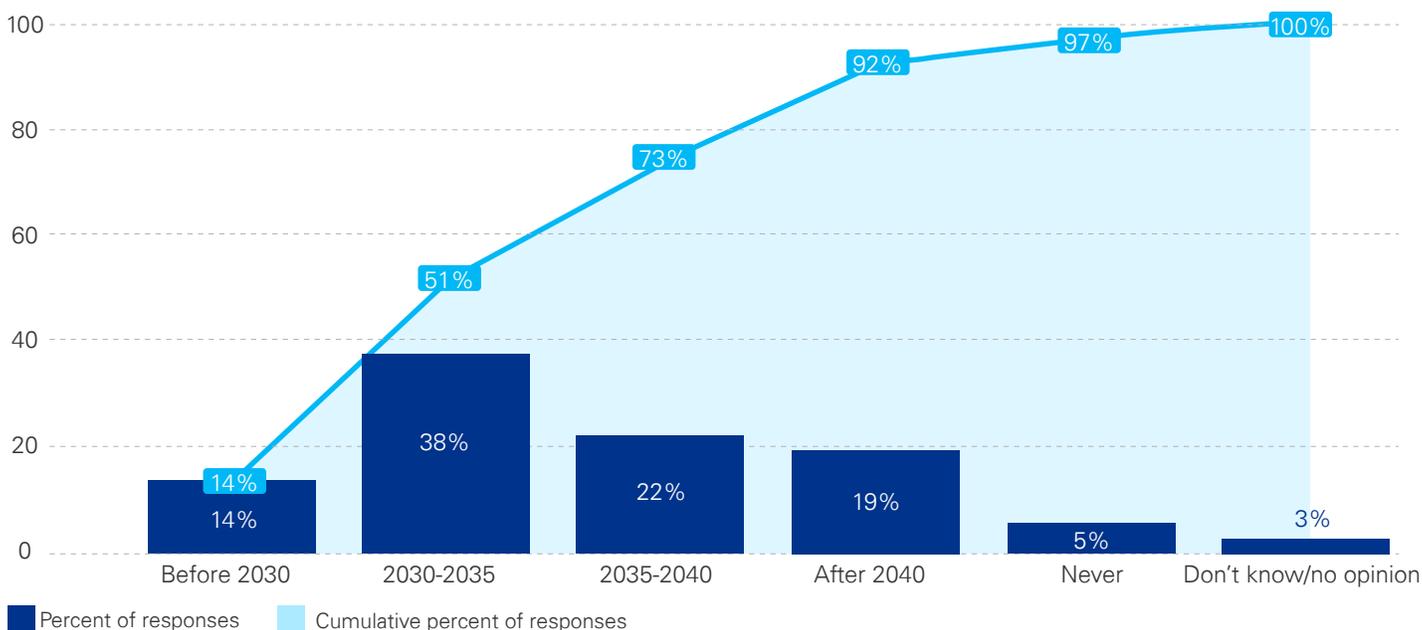
Regarding flying cars, known as electric vertical takeoff and landing aircraft (eVTOLs), executives are tending to push the prospect of eVTOLs further into the future, compared

with their responses last year. But in China, there is a higher proportion than elsewhere who believe eVTOLs will operate in their cities before 2030.

### Yes, flying cars are coming – but when?

Flying cars, known as electric vertical takeoff and landing aircraft (eVTOLs), have received significant investments by many automakers. When, if ever, do you believe eVTOLs will be available in most major cities?

**Timeline expectations: Predicting the arrival of eVTOLs in major cities**



# What to do now

There is more excitement in the automotive industry today than at any time since the early years of the industry. New powertrains, new ways of building cars, and new customer expectations are driving a far-reaching transformation. Consumers have a growing array of buying options, while manufacturers press ahead with diverse R&D efforts, not just in EVs, but also in hybrid technologies, hydrogen fuel cells, and alternative fuels. At the same time, convergence with the technology industry will only accelerate. It is a time of rapid innovation, big bets, and big risks. There will be winners and there will be losers as the automotive business transforms.

Faced with so many challenges and opportunities, executives should recalibrate strategies—and act. These are four priorities for top leaders to better position them in the altered automotive business.

## Hedge your bets—and commit to a future vision

There are so many variables in the car market right now that CEOs could be forgiven for throwing up their hands in exasperation. But they have to act. Manufacturers should hedge their bets about the trajectory of both the internal combustion engine and all the alternatives. However, if they spread themselves too thin they risk losing to competitors that more successfully predict the future and focus more narrowly. The answer, then, is to entertain heretical theories, employ a diverse array of talent with different perspectives, and make your best bets.

*Do CEOs have teams that are up to the task?*

## Get ready to embed AI everywhere

The power and range of artificial intelligence is exploding. Generative AI has captured the imagination of business leaders across industries and is vastly expanding access to AI. We believe AI technology will likely touch virtually every aspect of the automotive business, from the way autos are designed and manufactured to how they are sold and driven.

*The critical question for auto executives, then: Is your AI strategy sufficiently comprehensive and forward-looking?*

## Find the collaborators you need

Car manufacturers have tended to go it alone when it comes to developing automotive technologies, often with unspectacular results. Given the array of business opportunities and the limited pool of skills, auto companies have little choice but to look outside for the ideas and know-how they need to supercharge their R&D operation. Nobody can do it all on their own.

*How effective is your ability to work the ecosystem and find alliances and business partnerships?*

## Face up to global challenges

The EV transition highlights important differences in national auto markets. Demand for electric vehicles is soaring in parts of Europe, the US, and China. In other big markets, such as India, Latin America, and Africa, the growth of electric cars will be slower, hampered by low incomes and poor infrastructure. Global automakers cannot afford to ignore these regions because of their growing populations and diverse needs. At the same time, automotive companies must continue to build resilience to ongoing geopolitical turmoil and changes in the global economy that affect supply chains and markets.

*Does your company have a global strategy that can help you profit from the differences among markets, not just their similarities? Are you resilient to global disruptions?*

**All these trends make life exceedingly complicated for auto executives. They must navigate a maze of choices to come out on the winning side.**



# How KPMG can help

KPMG firms provide audit, tax, and advisory services to automotive companies around the world. KPMG firms are leaders in delineating critical trends in the automotive sector—mobility, autonomy, electrification, and turning them into actionable strategies. Our global automotive practice helps top companies in the industry plan and execute strategies to make the most of these trends.

Our data-driven approach allows us to quantify the impact of trends such as mobility for automakers, dealers and other players so they can identify and prioritize emerging opportunities. KPMG professionals then assist clients in defining technology investment and development roadmaps to pursue these opportunities.

In addition, KPMG firms support clients with operating-model and business transformations to prepare their organizations for building new types of products and doing business in new ways. For example, KPMG is a recognized leader in supply chain strategy.



## Automotive/mobility clients

*Our audit, tax, and advisory teams serve:*

- Major OEMs
- Tier 1 suppliers
- Aftermarket players
- Mobility providers
- EV/AV start-ups
- Institutional investors

## Examples of recent projects

- Market sizing and entry options development for EV and mobility as a service (MaaS)
- Tax strategies re-imagined for the new mobility market
- Scenario development for regulatory changes based on AV/EV adoption
- Analysis of industry supply chain shifts and future options
- Development of vehicle subscription operating models based on ROI simulation
- Retail innovation and customer experience transformation

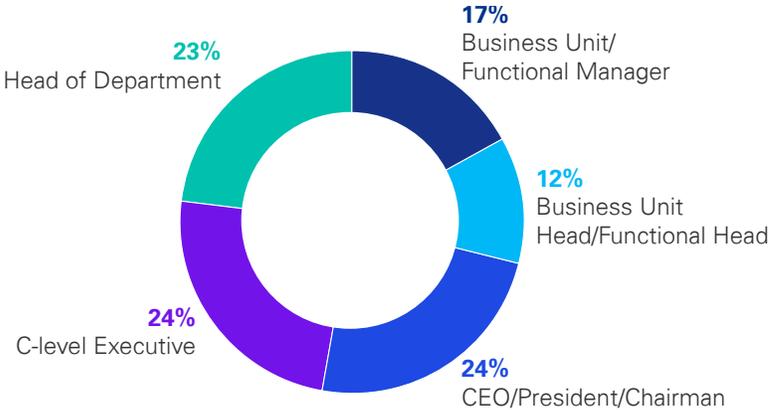
Source: KPMG International, KPMG recognized as a Supply Chain Pacesetter” (March 2023)

# Respondent profile

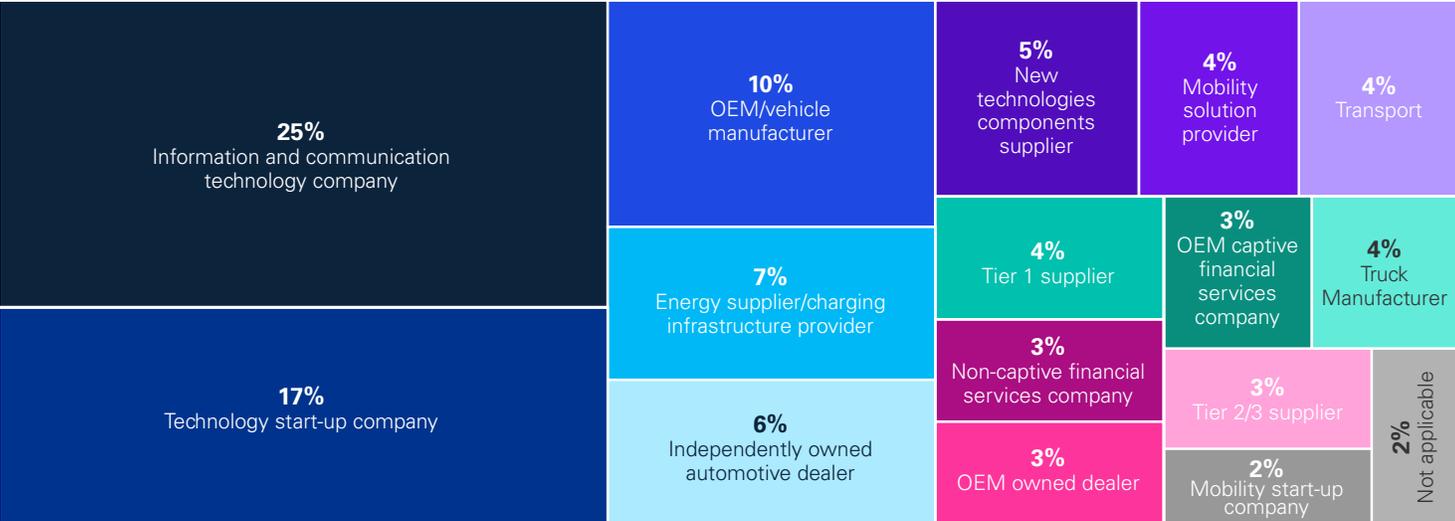
KPMG conducted a survey of 1,041 executives across the automotive and adjacent industries in October 2023. Almost a quarter were CEOs and another quarter were C-level executives. The remainder were heads of department and business units or functional managers. Ten percent worked in OEMs, 7 percent in suppliers and 9 percent in dealerships. The rest worked in car-related financial services, in automotive technologies, and in the provision of charging infrastructure.

In terms of corporate size, 323 worked at companies with at least US\$1 billion in annual sales, 238 were in companies with US\$500 million to US\$1 billion in revenue, and 459 were at firms with under US\$500 million. A total of 30 countries and territories were represented from Africa, Asia, Europe, Latin America, Middle East, and North America. The two largest pools of respondents were in the US (277) and in China (154).

### Which of the following best describes your job title?



### Which of the following best describes your company?



Note: Percentages do not total to 100 due to rounding

## Which of the following best describes your company's annual global revenue in 2022?

Number of responses

Over US\$10 billion



US\$1 billion to US\$10 billion



US\$500 million to US\$1 billion



US\$100 million to US\$500 million



Less than US\$100 million



Not Applicable

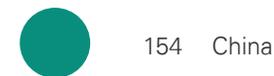


## In what country, territory, or jurisdiction do you live?

### North America



### China



### Rest of the World



### Western Europe



### Eastern Europe



### South America



### India and ASEAN



### Japan / South Korea



● Number of respondents

# About the author



## **Gary Silberg**

Global Head of Automotive  
KPMG International

Gary is the global head of automotive for the KPMG automotive practice. He has advised numerous domestic and multinational companies in strategy, mergers, acquisitions, divestitures, and joint ventures. For the past nine years, he has focused on the intersection of technology and the automotive industry, developing groundbreaking research on the developments in electric powertrains, autonomous vehicles, mobility services, connected cars, and automotive retailing.

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## **Acknowledgments**

This survey would not be possible without the collaboration from colleagues around the world who generously contributed their support, knowledge and insights into the planning, analysis, writing and production of this report.

Thank you to: Adam Ashenfelter, Alex Clayborn, Ashley Peck, Bala Lakshman, Brian O'Neill, Dave Royce, Gary Chung, Geoff Lewis, Gia Gustovich, Lara Volpe, Lily Ainapure, Michael Miller, Pranya Yamin, Tara Nelson, Tony Magrogan, and Yoshi Suganuma



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Designed by DAS Design Center. DASD-2023-14137

Publication name: 24th Annual Global Automotive Executive Survey: Getting real about the EV transition

Publication date: January 2024