

2008

2009

2010

2011

2012

2013

2014

2015

2016

2017

2018

2019

2020



KPMG's 21st consecutive

Global Automotive Executive Survey 2020

Say goodbye to one global market – recognize increasing localization, accelerated by COVID-19.

Including
COVID-19
Insights

Please visit our interactive online platform at:
automotive-institute.kpmg.de

EXECUTIVE SUMMARY



Over 2,000,000 different views

automotive-institute.kpmg.de



There is not only one global answer:

Visit our online platform and use our dashboards to apply filters, try combinations, and find out more about differences between, e.g., regional perspectives or differing stakeholder views! Executives and consumers were asked many of the same questions. Compare the answers of both respondent groups!

This printed version is an extract of the millions of different possible views available on the online platform.

The best of ...

The early release of the online platform made it possible to analyze user behavior and to identify those topics that receive most clicks and catch people's greatest interest. With the hardcopy you are now provided with the survey's most important elements and this year's hottest topics around the future ecosystem of the automotive business.

WHAT'S NEW IN 2020

1. Demographics

- Over 1,100 executives and more than 2,000 consumers from 30 countries
- New stakeholder group truck manufacturers

2. New functionalities

- Improved search function
- Chapter highlights
- New share functionalities

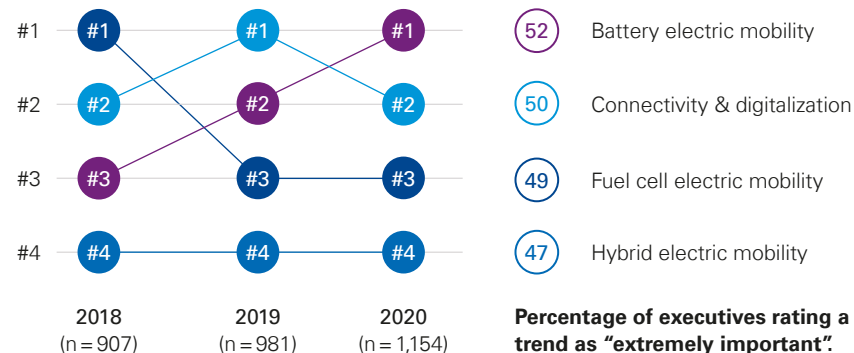
3. Mobile version

- Comprehensive mobile version
- 90% of the dashboards can be interactively viewed on your mobile/tablet

HOTTEST TOPICS OF THE GAES 2020

Global automotive executive key trends until 2030 [read more p.16](#)

"Battery electric mobility, connectivity & digitalization, fuel cell electric mobility, and hybrid electric mobility have established themselves as the key trends in the industry since 2017."



Industry politics [read more p.17](#)

"83% of executives surveyed believe that the future technology agenda of vehicle manufacturers will become much more driven by regulators than in the past."



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4. Interactive online survey

- Completely new look and easy to use
- Explore your own analyses based on your specific interests
- Customize your own dashboards
- See the difference in opinion: executives vs. consumers

Share between ICE, PHEV, BEV, and FCEV in 2030 [read more p.30](#)

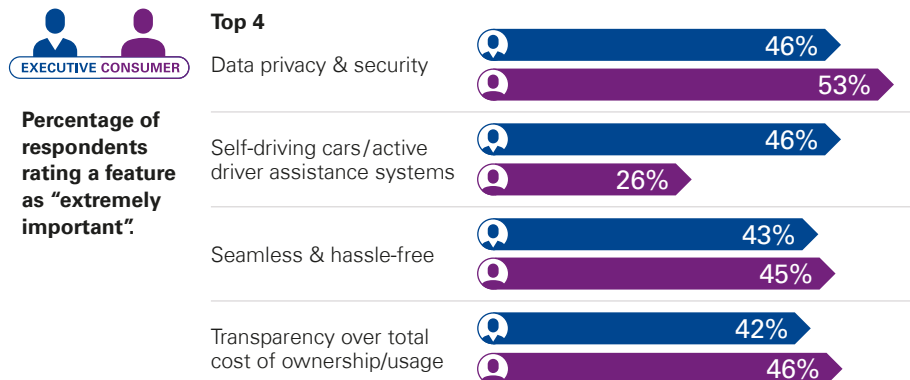
“For the first time in the history of our survey, executives think that by 2030 the largest share of vehicles will not be powered by an ICE powertrain: FCEVs, BEVs, PHEVs, and ICEs will co-exist.”

Percentages may not add up to 100% due to rounding.



Customer purchasing decisions [read more p.39](#)

“Transparency over TCO ranks second for consumers with 46% agreement. This is likely to further increase in the short to medium term due to restricted consumer budgets as a result of COVID-19.”



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ANGELIKA
HUBER-STRASSER

EMA & German
Head Automotive Practice

Dear readers,

The effects of the COVID-19 crisis on the automotive industry are far-reaching and complex: the fundamental change in demand goes hand in hand with a redefinition of the supply chain. In the course of the pandemic, a recession is developing that moves as a wave around the globe – the reaction to regionally time-shifted slumps in demand and production will be part of the “new normal” for automotive companies in the future.

This year, our 21st KPMG’s Global Automotive Executive Survey of 1,154 automotive executives and more than 2,000 consumers from 30 countries reveals one development in particular: the divergence of the global automotive market, accelerated by COVID-19. A recurring theme in our study is the division of the world into the three regions of China, USA, and Europe. The growing influence of industry politics and the availability of raw materials play a decisive role here: these will determine powertrain developments and technology agendas in the future.

This year we have again retained our general chapter structure. The study begins with an analysis of our so-called megatrends, including COVID-19. The following chapter “Product value” focuses on technical developments such as powertrains and autonomous driving. Customer behavior and how it dramatically changes the organizational structure and processes in retail and financial services is part of the chapter “Customer value”. The final chapter “Ecosystem value” focuses on the entire ecosystem – including the growing influence of ICT players – and how the roles of traditional automotive players are rapidly evolving.

It is my pleasure to invite you to join us in discovering insights, trends, and innovations along the entire automotive ecosystem and to identify the future “new normal” together. Let the results of the study inspire you, because one thing has and always will be certain in the automotive industry: change drives development.

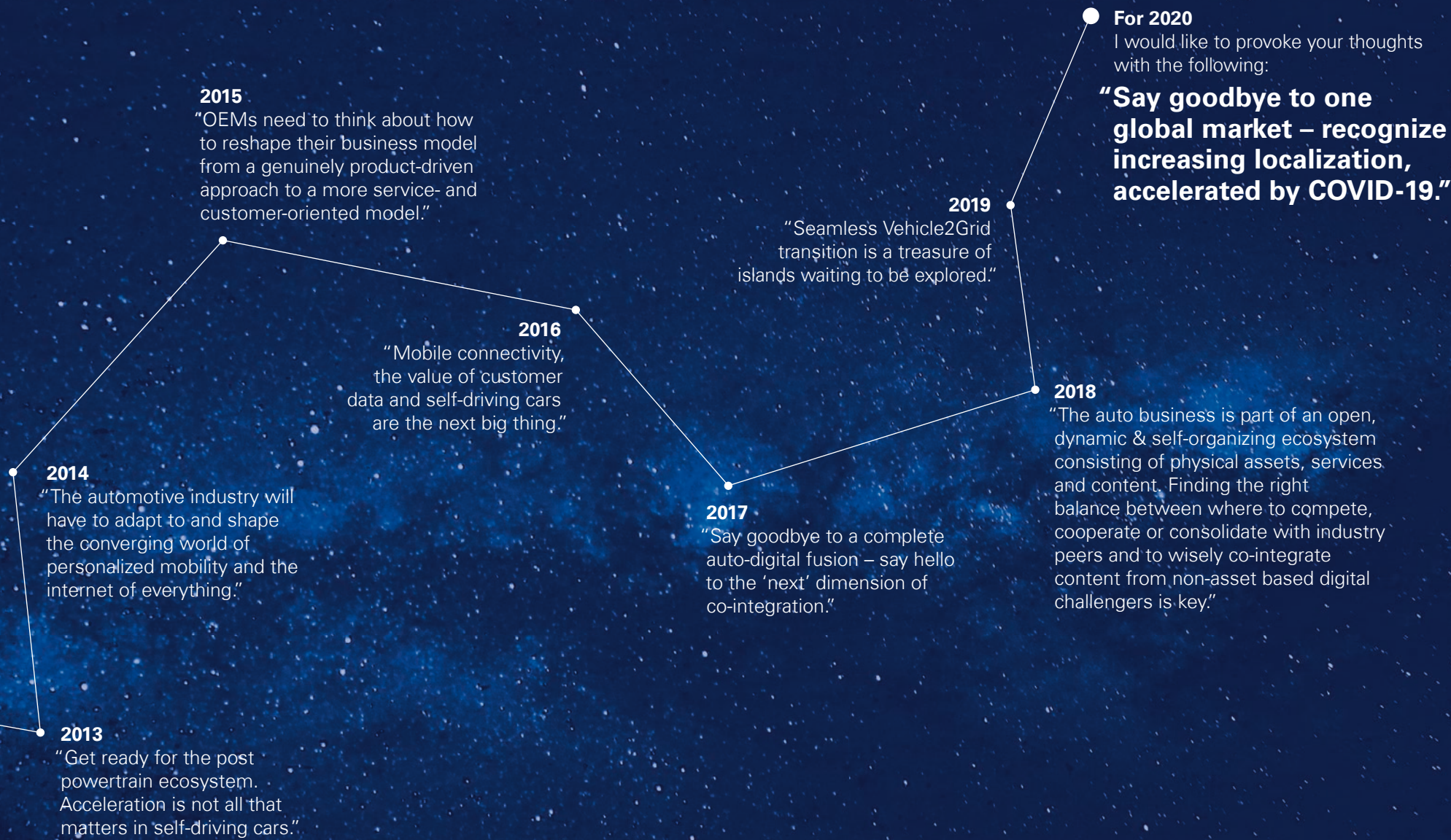
Enjoy the read!

2012

“New non-asset based players will increase in significance in the automotive value chain until 2025.”

2011

“Within the next decade the internet will revolutionize private transport. Web providers and car manufacturers will be vying for supremacy.”



How Automotive Institute analyses complement this year's survey like never before:

automotive-institute.kpmg.de

1.0 MEGATRENDS

Chinese subsidy strategy [read more p. 18](#)

Is there a pattern in Chinese subsidy strategies? What is the implication of phasing out subsidies for NEVs? Would it be beneficial for other regions to follow similar strategies?

Balances of trade [read more p. 22](#)

Is there a correlation between a country's electricity balance of trade and BEV market share? Which countries could benefit from electrification with respect to reducing dependencies on oil imports?

Global production & sales footprints [read more p. 26](#)

Which production and sales footprints position companies to emerge more strongly out of the COVID-19 crisis?

Raw materials*

In which countries are certain critical battery raw materials produced? How localized are deposits? What is the implication for supply chains?

Oil/lithium players*

Who are the biggest oil and lithium players by market capitalization? Will we see the emergence of an intergovernmental organization analogous to OPEC for battery raw materials?

2.0 PRODUCT VALUE

Cost of fuel vs. CO₂ footprint [read more p. 35](#)

What does BEV charging really cost? How are diesel and gasoline prices developing compared to electricity and hydrogen?

Battery prices*

What is the market opinion for the development of Li-ion battery prices? How does KPMG's Automotive Institute's opinion differ?

Hydrogen fueling stations*

How many hydrogen fueling stations are currently operational or being planned in Germany? Which areas have the highest densities of fueling stations?

* For these analyses please see the online platform.



3.0 CUSTOMER VALUE

Marketing expenses* [read more p. 18](#)

How have selling & marketing expenses developed in the last 10 years? How do OEMs compare to ICT companies?

KPMG's smart ecosystem radar for retail of the future*

What are the main areas of interest for start-ups focusing on retail in the automotive industry? Which ecosystem players are investing into which new retail models?



4.0 ECOSYSTEM VALUE

Market capitalization & cash positions [read more p. 46](#)

How have the cash positions and the market capitalization of OEMs & suppliers developed compared to mobile/tech & web/digital companies? How do capital markets assess value in different industries?

KPMG's smart ecosystem radar for OEM investment paths [read more p. 50](#)

Into which start-ups and areas are OEMs investing? How have interests shifted in the past? Which OEMs are cooperating or competing in which fields?

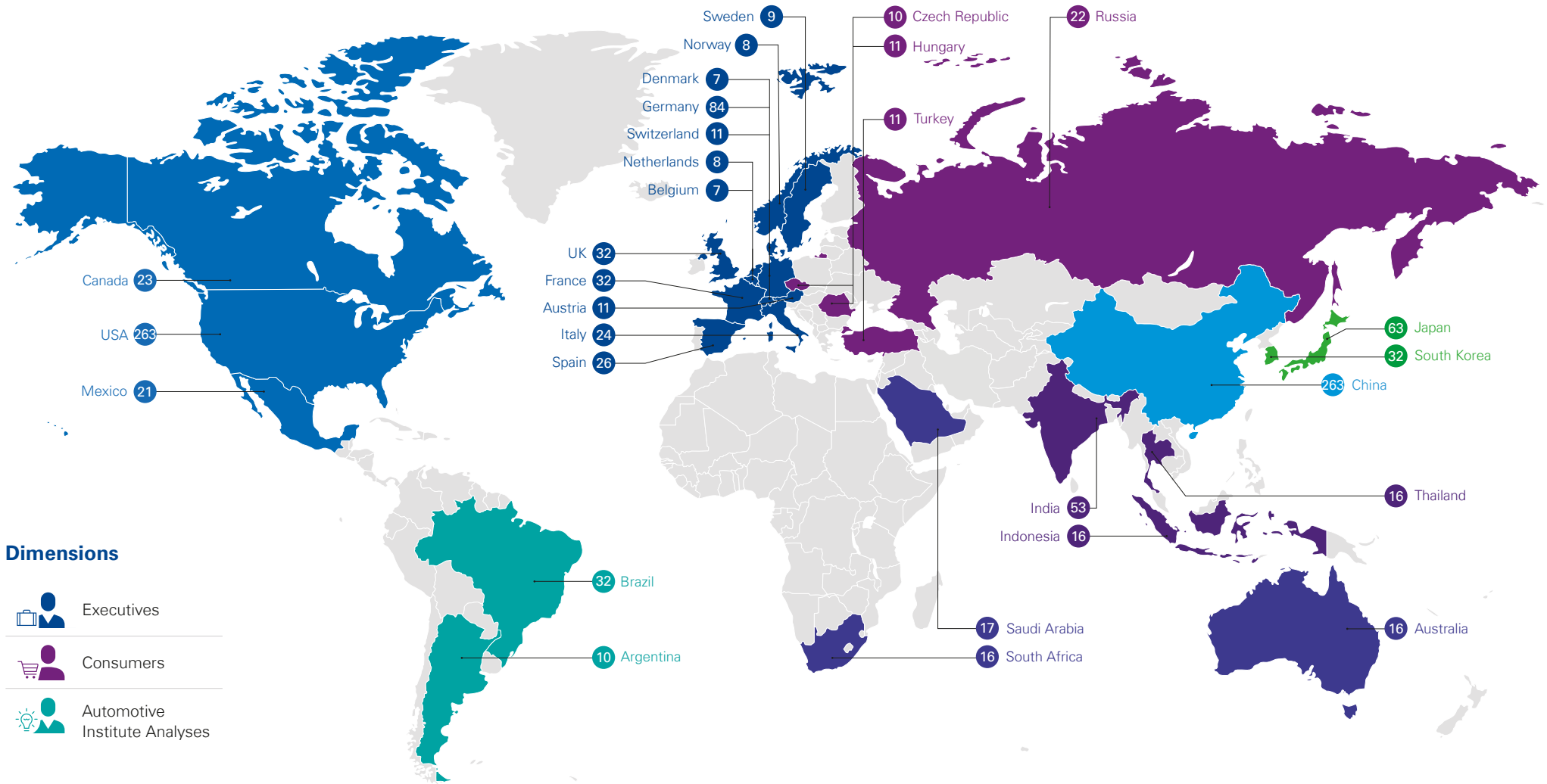
KPMG's smart ecosystem radar for data science [read more p. 57](#)

How are companies monetizing data in the automotive industry? What are the main investment areas? Which start-ups are receiving most attention?

R&D expenses – OEMs vs. ICTs*

How have R&D expenses developed in the last 15 years? How do OEMs compare to ICT companies?

About the executive survey



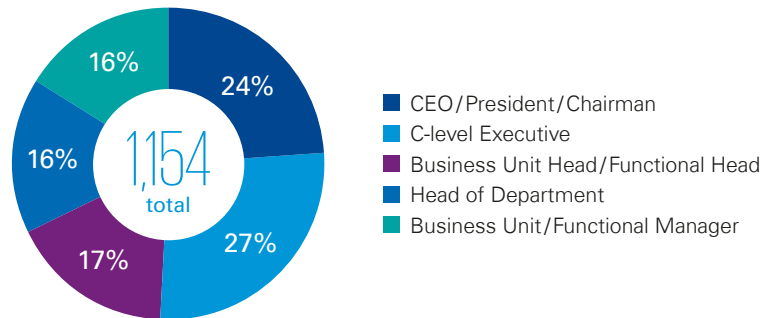
■ North America (n=307) ■ South America (n=42) ■ Western Europe (n=259) ■ Eastern Europe (n=54) ■ Mature Asia (n=95) ■ China (n=263) ■ India & ASEAN (n=85) ■ Rest of World (n=49)

Note: Executives (n = 1,154). Map shows number of respondents from each country. Percentages may not add up to 100% due to rounding.

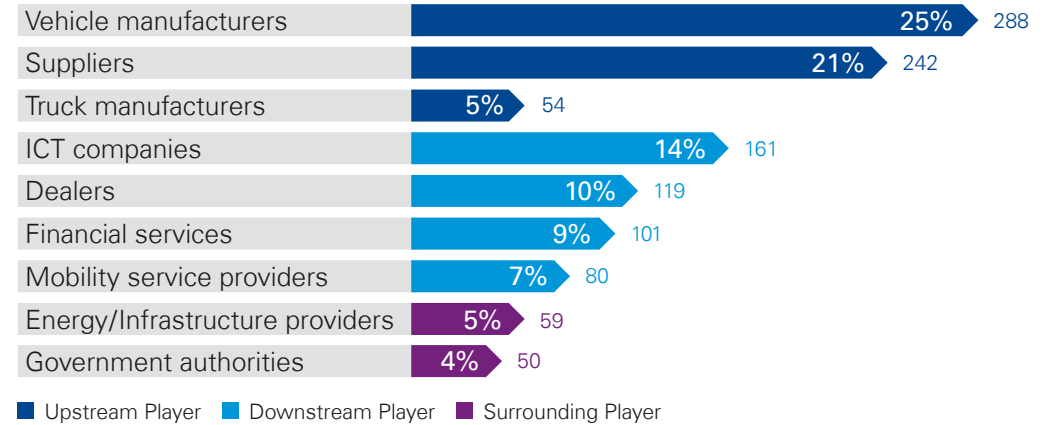
Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

For the 2020 survey we gathered the opinions of 1,154 executives from 30 countries.

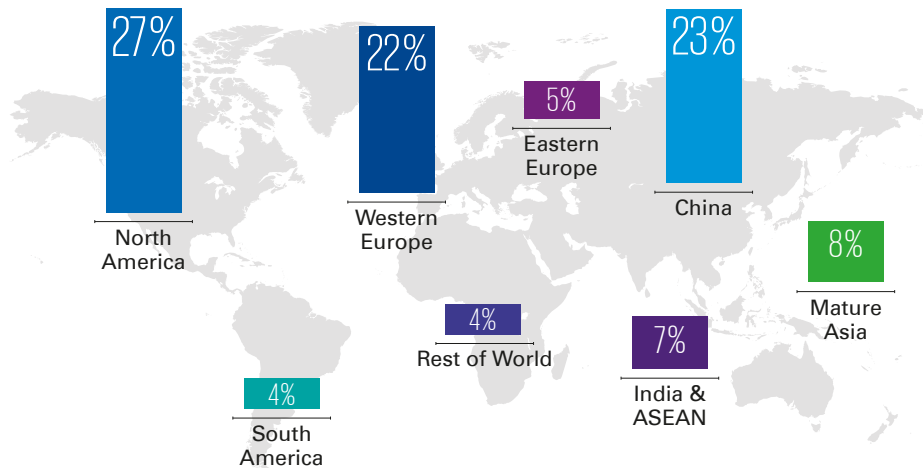
Respondents by job title



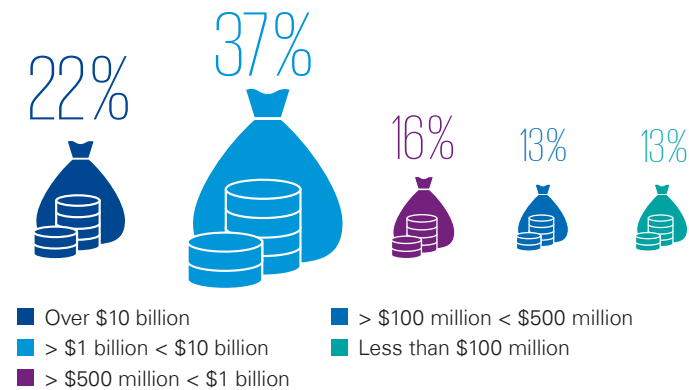
Respondents by company type



Respondents by regional cluster



Respondents by company revenue





Obvious automotive key trends [read more p. 16](#)

BEVs, connectivity & digitalization, FCEVs, and PHEVs have established themselves as the most important key trends in the industry since 2017.

One global answer to all strategic directions does not reflect reality – companies must develop independent regional strategies for customers and markets alike.

Industry politics [read more p. 17](#)

83% of execs agree that regulators and industry politics are driving technology agendas – subsidy strategies and tax breaks will become even more essential in a post COVID-19 world.

Regional shifts [read more p. 20](#)

76% of executives agree that by 2030 less than 5% of global car production will occur in Western Europe – a 9% increase in voter share since last year. This is likely to even further increase due to COVID-19's greater impact on the automotive industry in Western Europe.

Raw materials [read more p. 21](#)

73% of execs agree that a country's mineral resources dictate the country's preferred powertrain technology.

Sustainability [read more p. 24](#)

Almost all execs see sustainability as a key differentiator (98%), but 17% of consumers still do not recognize this at all – KPMG believes that the industry would benefit from a cradle to grave sustainability rating.

COVID-19 [read more p. 26](#)

We believe that it is essential to acknowledge COVID-19 as a global wave movement, which must be assessed simultaneously from a global production and sales footprint perspective. Wave management models capturing the time delay within supply and demand chains are now required (making use of the learnings from SARS).

People will move away from public transport and may be willing to spend more money to feel safe.

Combustion engine & vehicle architecture [read more p. 30](#)

There will be no clear single investment strategy, as long as raw materials and industry politics have a country-specific or regional root.

For the first time in the history of our survey, executives think that by 2030 the largest share of vehicles will not be powered by an ICE powertrain: FCEVs, BEVs, PHEVs, and ICEs will co-exist and complement each other.

KPMG's Automotive Institute believes that COVID-19 will lead to a delayed development of the future powertrain mix forecasted, especially if subsidy schemes are to fundamentally change.

Autonomy readiness [read more p. 33](#)

77% of execs agree that mixed traffic between autonomous and non-autonomous vehicles will lead to severe safety issues and liability claims.

KPMG's Automotive Institute believes that autonomous vehicles will only be truly successful in isolated regions – “islands of autonomy” – where each vehicle follows the same set of rules, grounded in bionic swarm intelligence.

Electric & fuel cell readiness [read more p. 34](#)

Providing a hassle-free and a seamless charging experience is essential for general BEV adoption – 84% of consumers see the responsibility for charging infrastructure with OEMs.

For consumers, price is the most important aspect when considering buying an EV.

84% of executives think that FCEVs will experience their breakthrough in industrial transportation – a 5% increase compared to 2019.

Efficiency savings through economies of scale will not outweigh increases in demand for batteries and battery raw materials – this will result in increased battery prices in the mid to long term.

Customer relationship

Individualized ID mgmt.

Co-competition

Investment paths

Seamless & hassle-free

Marketing expenses

Safe environment

Total cost of usership

Function on Demand

Market cap

Cooperations & start-ups

Growth strategy

Increase in software

Retail transformation

E-commerce

Profitability

Data ownership & trust



3.0 Customer value



4.0 Ecosystem value

Customer centricity [read more p. 38](#)

Understanding your customer at individual touchpoints is key. Customer mobility decisions will be driven by data privacy & security, TCO, and a seamless and hassle-free mobility experience – all enhanced by the fear regarding physical integrity.

It is crystal clear: OEMs can defend their lead in the battle for valuable customer relationships – nearly half of all execs and consumers agree that OEMs will also be closest to the customer in 5 years' time.

With increasing complexity in customer relationship management, one might expect marketing expenses to increase; this isn't the case for automotive players. Tech giants, meanwhile, are pursuing the opposite strategy.

We are further from online purchasing than expected: One in five global consumers say that they will not buy a car online.

Seamless multimodal mobility [read more p. 40](#)

COVID-19 will lead to much tighter budget management and TCO-orientation among consumers. Therefore, when considering mobility services, consumers will weigh up physical integrity risks against budgetary restrictions.

Long-term cumulative total cost of usership (TCU) for mobility services is being neglected. TCO seems to not be a main driver in customer decision-making when choosing between different services.

There is no "one and only" global mobility concept: Instead, we expect to see different mobility concepts for cities and rural areas. More than 80% of global executives agree that cities will have completely different mobility concepts than rural areas.

KPMG's Automotive Institute believes that post-COVID-19 uncertainty demands solutions for customers that allow for more flexibility in contractual commitments.

Retail of the future [read more p. 42](#)

One of the biggest challenges for retail organizations will be the software-driven development in vehicles, for which consumers are most likely to favor a central support organization.

Co-competition [read more p. 46](#)

The market capitalization of the top 15 mobile/tech & web/digital companies is more than 5 times higher than the market capitalization of the top 50 traditional automotive OEMs & suppliers. In COVID-19 times this development has been reinforced, and tech & web/digital companies have emerged as the clear winners.

Competition is back: In contrast to last year and according to this year's executives, competition between automotive manufacturers and ICT companies has increased.

We see cultural similarities and geographical axes between USA/China and Germany/Japan – a finding also reflected in the responses of this year's survey.

Transformation readiness [read more p. 52](#)

Executives have shown a stable opinion in the last three years: New values, such as miles driven, measure market success – not units sold. With decreasing car ownership, one prerequisite – especially in COVID-19 times – will be making people feel safe in cars used by others, such as in mobility services.

Nearly three in four executives agree that the importance of financial service entities will increase, especially with rising debt levels of OEMs due to COVID-19.

Data supremacy [read more p. 53](#)

More than 40% of all executives agree that monetizing data is best done with safety-oriented applications such as car-2-x communication.

With new realities after COVID-19, we predict that this will be further reinforced, as physical integrity has become much more important.

Executives and consumers are not aligned regarding who consumers would trust most with their data.

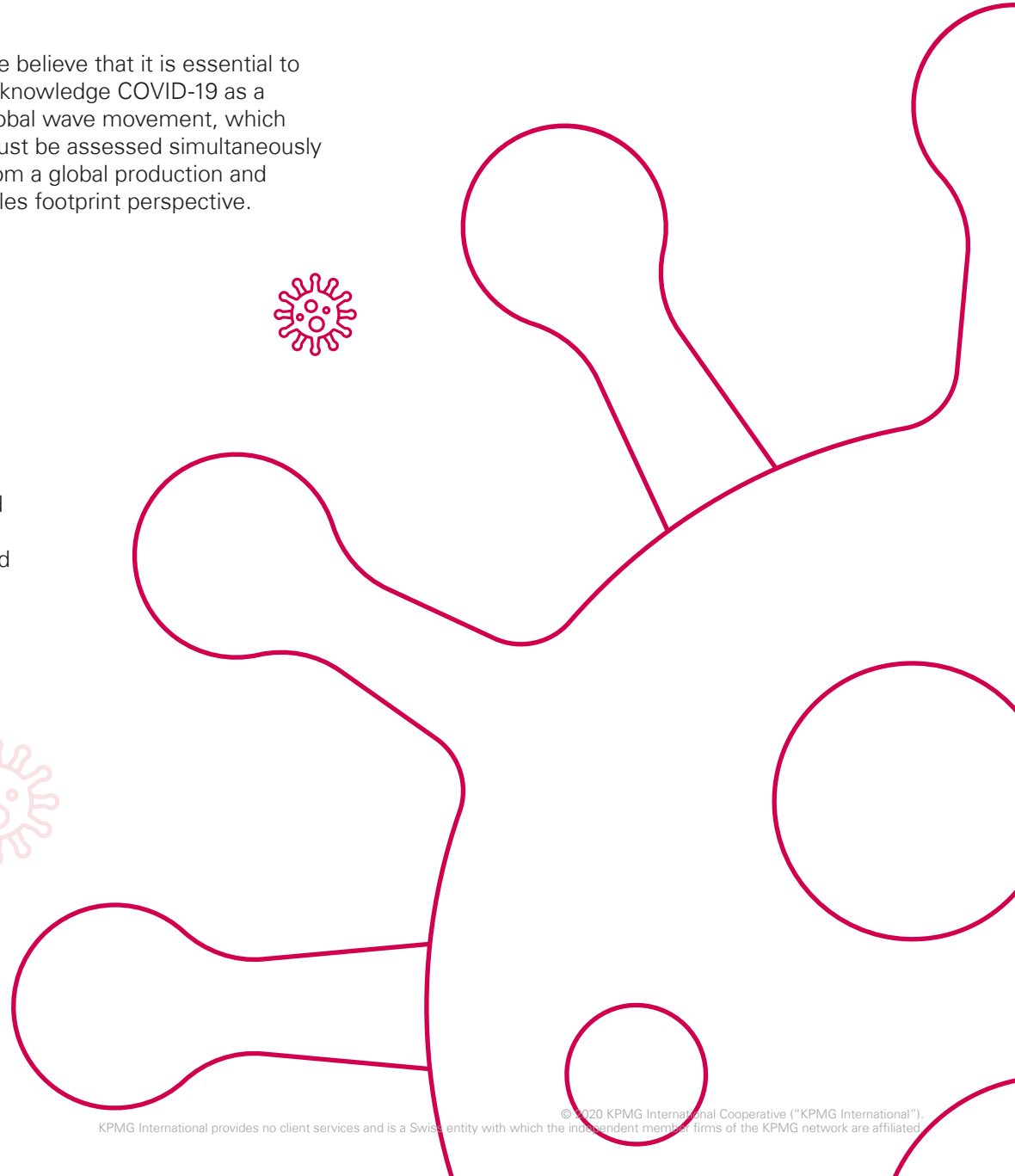
8 key takeaways on the impact of COVID-19

2. Wave management models capturing the time delay within supply and demand chains remain essential. This is a development that we have already seen with the SARS disease, but which began to decline after the initial wave.

1. We believe that it is essential to acknowledge COVID-19 as a global wave movement, which must be assessed simultaneously from a global production and sales footprint perspective.

3. The COVID-19 crisis has led to fundamental changes in demand, with the effect of a much deeper systematic recession. Sales teams should not be laid off. Instead, companies should focus intensely on managing customer relationships and digital demand and providing flexible, low up-front cost offerings to actively counter increasing consumer uncertainty and TCO-driven purchases.

4. KPMG's Automotive Institute believes that there will be long-term effects on public transport. People will move away from public transport and are willing to spend more money to feel safe – China's panic-like fear of disease and fever has led to an increasing demand in the high-end and low-end sectors.





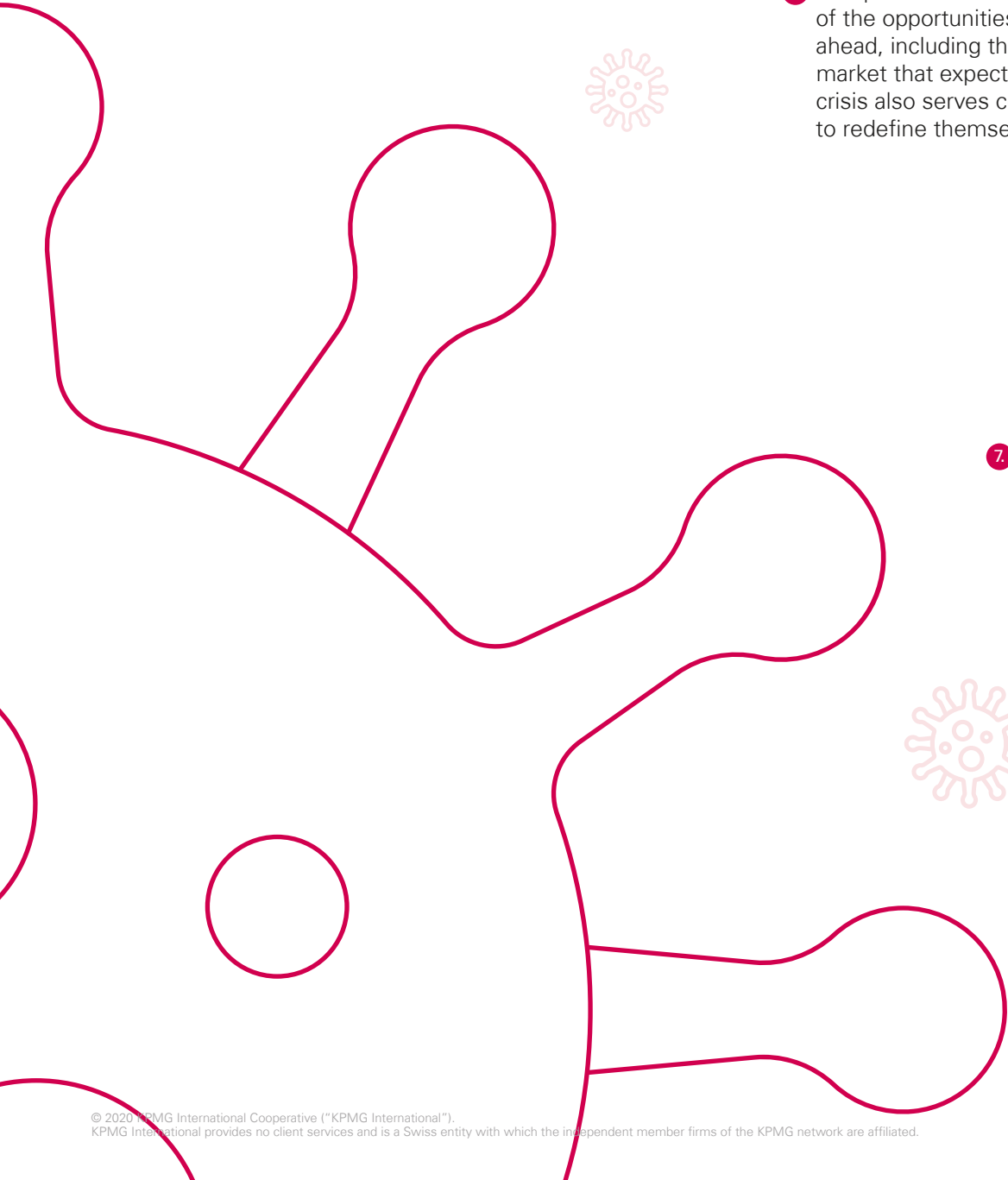
5. Companies with strong liquidity can take advantage of the opportunities in new partnerships that lie ahead, including the detection of M&A targets in a market that expects widespread consolidation. The crisis also serves certain companies with the ability to redefine themselves in the market.

6. Differentiating between cultures becomes essential: While China and the USA tend to have spending cultures, consumers in Japan and Germany are rather reluctant to spend. Increasing credit volumes could result in growth in demand.

7. CO₂ targets will be tested, and the widespread adoption of e-mobility will depend on high government subsidies. Without these, e-mobility will only be able to survive in certain application areas, such as in cities.



8. There is only one way forward and that is to redefine competition towards industry-wide "co-ompetition". This means to collectively ensure supply chain stability, alongside a global readjustment to a reduced demand structure, channeled through digital demand management and service factories.



Obvious automotive key trends [read more p.16](#)

BEVs, connectivity & digitalization, FCEVs, and PHEVs have established themselves as the most important key trends in the industry since 2017.

SO WHAT: COVID-19

In light of negative growth in both global production and sales in 2019, one can expect cost cutting and rationalization, combined with increased M&A activity.

Industry politics [read more p.17](#)

83% of execs agree that regulators and industry politics are driving technological agendas – subsidy strategies and tax breaks will be essential instruments.

SO WHAT: COVID-19

In response to a drastic change in external market conditions due to the COVID-19 crisis, the extension of subsidies for EVs in China this year demonstrates the remarkable flexibility of China's industry politics.

Regional shifts [read more p.20](#)

76% of executives agree that by 2030 less than 5% of global car production will occur in Western Europe – a 9% increase since last year.

SO WHAT: COVID-19

With the expectation that COVID-19 will have a greater impact on the automotive industry in Western Europe than in China, we will likely see a further reduction in the production share accounted for by Western Europe.

Raw materials [read more p.21](#)

73% of execs agree that a country's mineral resources dictate the country's preferred powertrain technology.

SO WHAT: COVID-19

If government EV incentives fall away in the wake of COVID-19, we believe that short-term purchase decisions will be dominated by TCO factors, significantly impacting the rate of transition to low carbon mobility.

Sustainability [read more p.24](#)

Almost all execs see sustainability as a key differentiator (98%), but 17% of consumers still do not recognize this at all – KPMG believes that the industry would benefit from a cradle to grave sustainability rating.

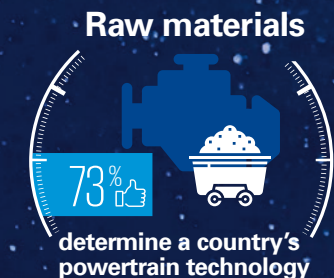
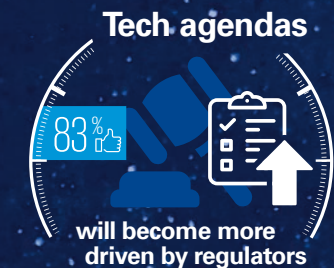
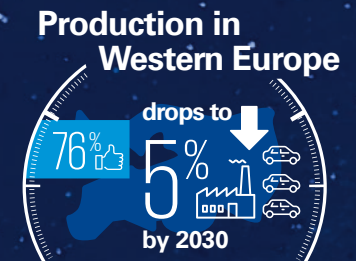
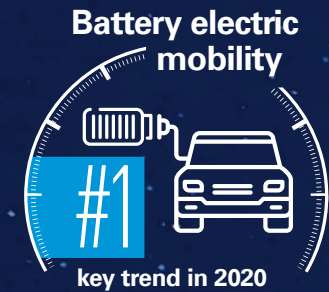
SO WHAT: COVID-19

COVID-19 shifts consumer priorities and strengthens TCO-driven thinking: widespread adoption of sustainability as a key differentiator may now become more difficult in the short term.

COVID-19 [read more p.26](#)

We believe that it is essential to acknowledge COVID-19 as a global wave movement, which must be assessed simultaneously from a global production and sales footprint perspective.

KEY TAKEAWAYS





1.0 Megatrends

Tap into the obvious and, even more importantly, the non-obvious megatrends that fundamentally shape the way we do business in the industry – today and even more so tomorrow.

We have identified the top four obvious automotive key trends, which have remained stable since 2017.

Battery electric mobility, connectivity & digitalization, fuel cell electric mobility, and hybrid electric mobility have established themselves as the key trends in the industry since 2017. However, COVID-19 could now shift the industry's focus from technological development to an agenda that focuses more on survival and operations. Autonomous & self-driving vehicles (ranked 8th this year) as well as (big) data monetization have once again not been able to break into these top spots, with the latter even moving from 7th to 9th place worldwide in the last year.

Globally competing industry politics will shape the future of the automotive industry. Subsidy and tax break strategies, which have now been given a more prominent platform as part of post-COVID-19 government stimulus packages, will be essential instruments in achieving technology agendas and defining market shares.

Last year, we saw that at 77%, there was already a very high level of agreement among executives that

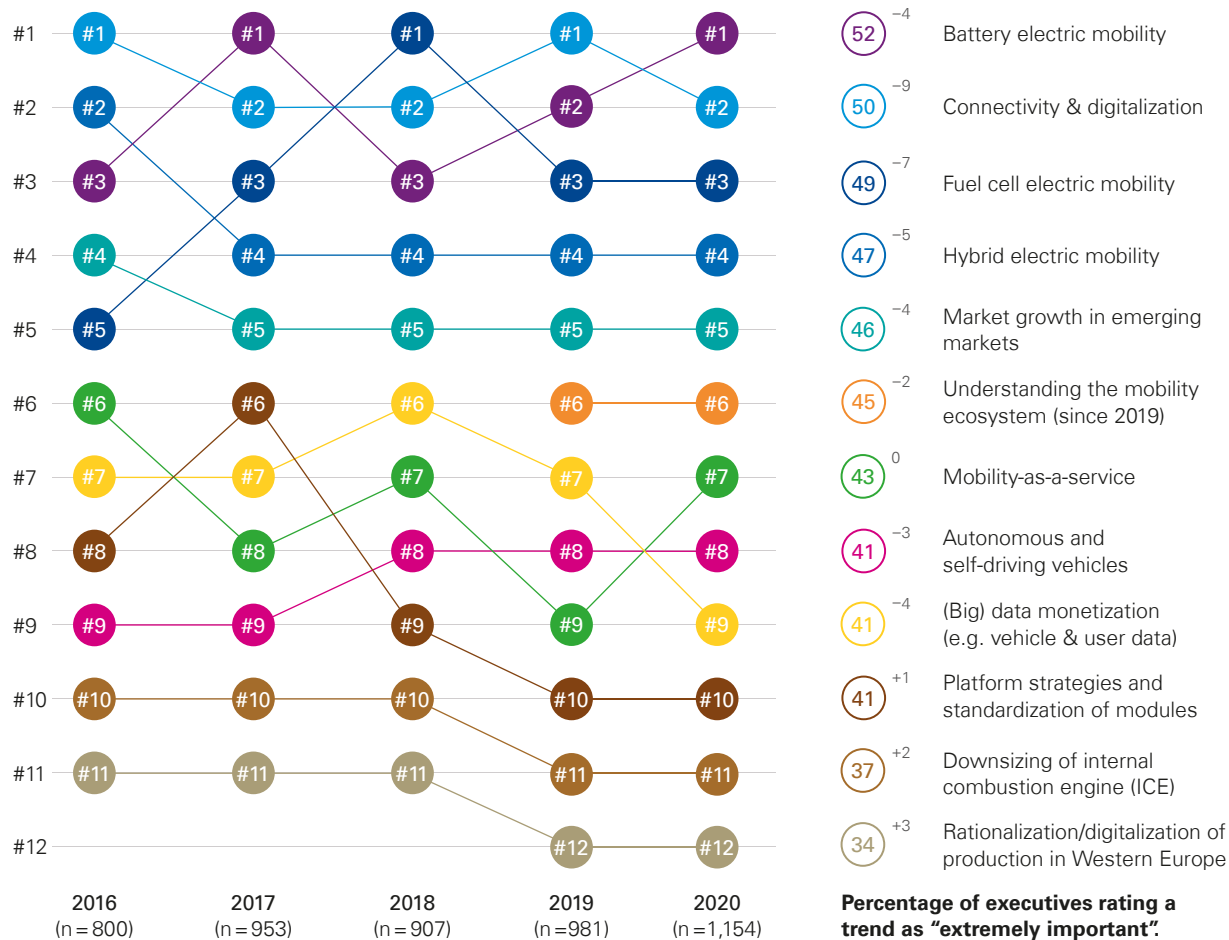
an agenda, driven by regulators and industry politics, exists behind technological developments in the automotive industry. Even before the rollout of COVID-19 stimulus packages, this consensus had further increased this year, with 83% of global executives surveyed believing that the future technological agenda of vehicle manufacturers will become much more driven by regulators than in the past.

We believe that it is essential to acknowledge COVID-19 as a global wave movement, which must be assessed simultaneously from a global production and sales footprint perspective.

The COVID-19 crisis has led to fundamental changes in demand, with the effect of a much deeper systematic recession. Sales teams should not be laid off. Instead, companies should focus intensely on managing customer relationships and digital demand, and providing flexible, low up-front cost offerings to actively counter increasing consumer uncertainty and TCO-driven purchases. Wave management models capturing the time delay within supply and demand chains remain essential.



Please rate the importance of the following key trends in the automotive industry until 2030.



Battery electric mobility, connectivity & digitalization, fuel cell electric mobility, and hybrid electric mobility have established themselves as the most important key trends in the industry since 2017.

Against the backdrop of a period of continuous global market growth from 2010 to 2017, followed by a stable 2018, we have experienced a period of sustained focus on the next generation of technologies and powertrains. This is reflected in our chart on the left, which shows the overall stability in the development of automotive key trends since 2016, as well as the establishment of battery electric mobility, connectivity & digitalization, fuel cell electric mobility, and hybrid electric mobility as the four most important key trends of the last four years. Autonomous & self-driving vehicles (ranked 8th) as well as (big) data monetization have once again not been able to break into these top spots, with the latter even moving from 7th to 9th place worldwide in the last year. This is an indicator that executive opinions continue to be more closely aligned with the slower rate of technological progress in these areas. Furthermore, this also supports KPMG's Automotive Institute's thesis that mixed traffic between autonomous and non-autonomous vehicles remains a major obstacle, hindering these trends from gaining real traction.



Moving forward, in light of negative growth in both global production and sales in 2019, combined with the unprecedented impact of the current COVID-19 pandemic, one can expect cost cutting and rationalization, combined with increased M&A activity, to transform the industry's previously technology-driven agenda to a much more survival and operationally focused agenda.

±1 Change from GAES 2019 (n=981)

Note: Executives (n = 1,154). Figures in percent. In 2019 the date in the question was changed from 2025 to 2030.

Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



In the past, OEMs could dominantly set the technological agenda for the market. Do you believe that in the future the technological agenda of OEMs will become much more driven by regulators than in the past?



Yes ■ ■ No ±1 Change from GAES 2019 (n=981)

Note: Executives (n = 1,154). Figures in percent. Percentages may not add up to 100% due to rounding.
Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

We believe that industry politics and regulations have replaced traditional market forces as the main drivers behind future technological developments.

Last year, we saw that at 77%, there was already a very high level of agreement among executives that an agenda, driven by regulators and industry politics, exists behind technological developments in the automotive industry. This consensus has further increased this year, with 83% of global executives surveyed – even before the COVID-19 crisis – believing that the future technological agenda of vehicle manufacturers will become much more driven by regulators than in the past. Agreement would likely be even higher if the survey was conducted again now, with many automotive players since even calling for government involvement in stimulating industry recovery and consumer demand. The COVID-19 pandemic has thus been seen by many as a perfect opportunity for governments to increase their influence in catalyzing an adoption of low emission products, in an effort to ensure the realization of climate change targets.

Agreement was highest among executives in India & ASEAN and China, with 92% and 90% respectively, and lowest in Western Europe and Mature Asia at 73%.

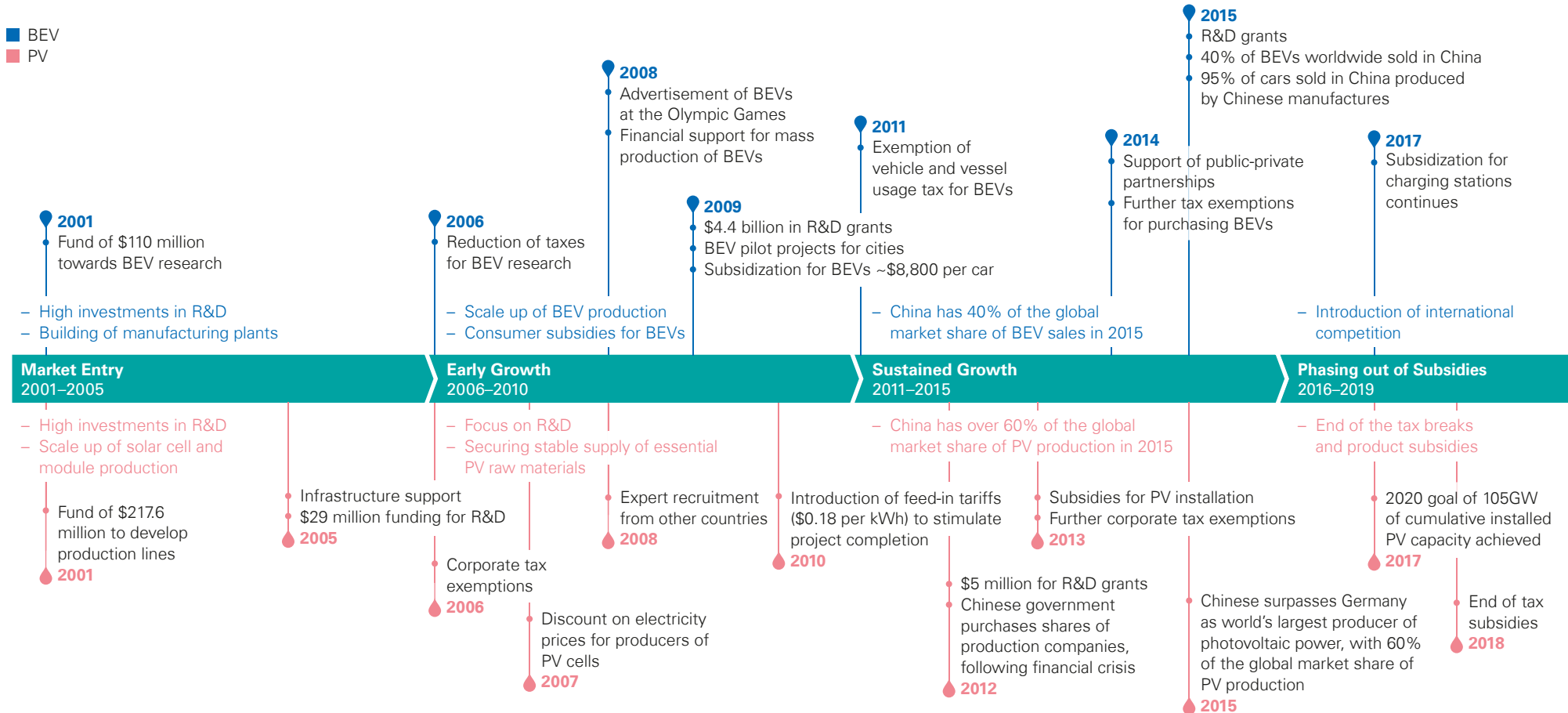
However, with stakeholders in Western Europe, we saw considerably higher agreement among OEMs and truck manufacturers with 83%, 77% agreement among executives from suppliers, lower agreement among downstream players ranging from 66% to 76%, and even lower agreement among surrounding players such as energy/infrastructure providers (57%) and government authorities (50%). We welcome you to visit our online platform for the full set of views.



ANALYSIS

Chinese subsidy strategy timeline – BEV vs. PV (Photovoltaic)

AUTOMOTIVE INSTITUTE ANALYSES



Source: Secondary research. KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

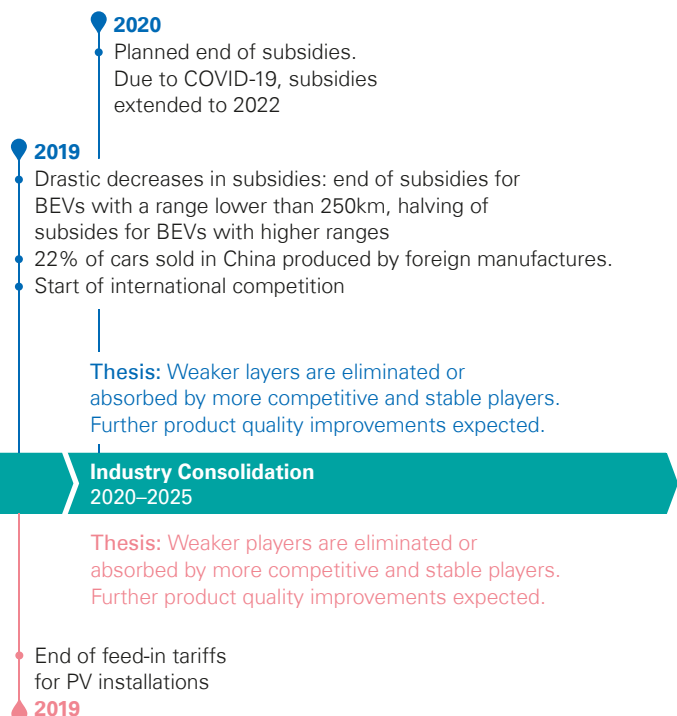
China's phasing out of new energy vehicle subsidies and tax breaks is not a precursor for a market exit; instead it marks the beginning of a new phase of increased market competition and industry consolidation.

In the diagram on the left, we have drawn a comparison between Chinese subsidy and tax break strategies for photovoltaics (PV) and battery electric vehicles (BEV), to highlight a clearly structured approach on how China has fulfilled government plans to attain rapid global market dominance in key future technologies through industry politics.

The timeline can be split into two main phases: a first phase, consisting of market entry, early growth, and sustained growth; and a second phase, consisting of phasing out subsidies and tax breaks, followed by market consolidation. The first phase entails the use of a variety of subsidies and tax breaks to encourage market entry and investment by a large number of local players. Further use of subsidies and tax breaks subsequently enables undercutting and elimination of international competition. Once a sufficiently large global market share is established among local players, a second phase commences, starting with the relatively abrupt phase-out of subsidies and tax breaks. This eventually leads to market consolidation, as weaker players are eliminated or absorbed by more competitive and stable players. In this way, the long-term aim of producing a national oligopoly of only the most competitive companies is achieved.

Understanding this government incentive strategy blueprint from China leads us to two important conclusions:

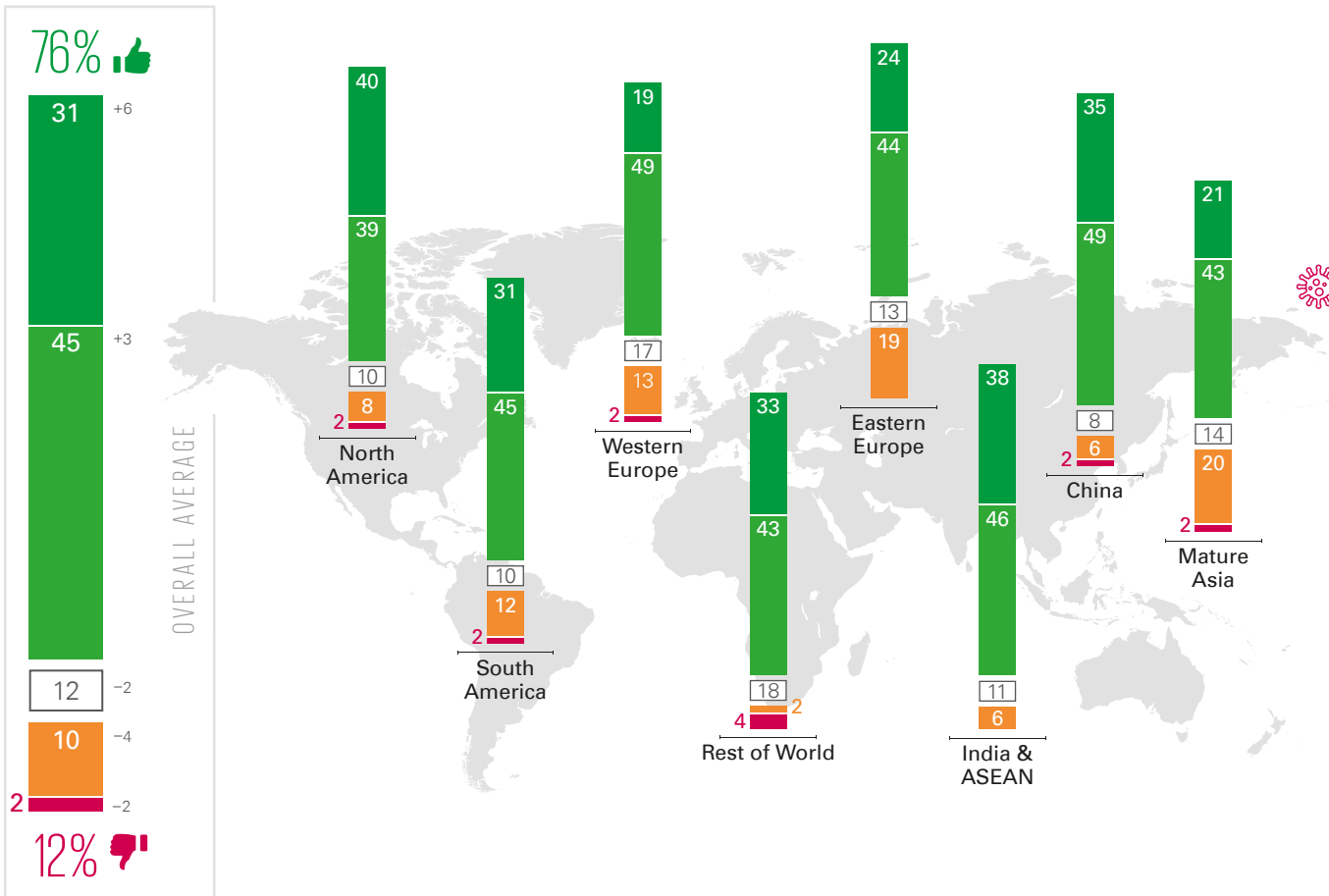
1. China's phase-out of subsidies and tax breaks for new energy vehicles is not an indicator of China exiting the market or shifting its focus to alternative powertrain technologies. Instead, this should be considered a new phase in China's long-term plan of forging competitive national players with an increasingly high quality of products.
2. In response to a drastic change in external market conditions due to the COVID-19 crisis, the extension of subsidies for EVs in China until 2022 demonstrates the remarkable flexibility of China's industry politics. The adoption of a similarly flexible, coordinated, multilateral incentive strategy for electrified products in Europe could be essential for the retention of global market shares of European players.





Please describe how much you agree/disagree with the following statement:

By 2030 less than 5% of the global car production will occur in Western Europe (2019: ~15%).



Global car production is expected to continue to decrease in Western Europe. However, government subsidy and tax break incentives for low-emission, electrified products could mitigate this continuing regional shift.

From 2010 to 2019, Western Europe’s share in global production of passenger cars and light commercial vehicles decreased from 18% to 15%. Meanwhile, China accounted for 27% in 2019. *With the expectation that COVID-19 will have a greater impact on the automotive industry in Western Europe than in China, we will likely see a further reduction in the production share accounted for by Western Europe this year.*

In this year’s results we see a 9% increase since last year among global executives who agree with the statement that “By 2030 less than 5% of global car production will occur in Western Europe”, with 76% of executives now either absolutely or partially agreeing. In Western Europe there is still lower overall agreement, with only 68% of executives agreeing with the statement. This is, nonetheless, a 10% increase on the 2019 result. In China, on the other hand, total agreement grew by 7% since last year and is now at 84%.

One potential lever to counter Western Europe’s struggle to hold its global market position lies in attracting vehicle manufacturers through government subsidy and tax break strategies for environmentally friendly technologies and products. However, any such incentives will still need to compete with the more traditional factors of labor costs, unit costs, market size, etc.

Absolutely agree ■ ■ ■ ■ Absolutely disagree ±1 Change from GAES 2019 (n = 981)

Note: Executives (n = 1,154). Figures in percent. Percentages may not add up to 100% due to rounding.

Source: KPMG’s Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



The richness of mineral resources of a country dictates which powertrain technology will dominate: Countries with large amounts of oil and gas will favor ICEs and FCEVs (e.g., USA), whereas countries with high electricity output will favor battery electric powertrains (e.g., China).



Agree ■ ■ Disagree ±1 Change from GAES 2019 (n=981)

Note: Executives (n = 1,154). Figures in percent. Percentages may not add up to 100% due to rounding.

Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

Raw materials are likely to play a crucial future role in driving regionally differentiated industry politics, technology agendas of OEMs, and EV battery prices. Through their impact on regionally differentiated industry politics, we furthermore expect raw materials to prevent the development of a single globally dominant powertrain in the long run.

Executives agree that a country's preferred powertrain technology will be determined by its mineral resources.

With results largely unchanged from last year, this year nearly three in four executives agree that a country's mineral resources dictate the country's preferred powertrain technology. This year's repeated strong agreement is perhaps somewhat surprising, considering the sharp decline of oil prices since the start of the year. It should, however, be noted that the drastic collapse of oil prices in April due to the COVID-19 crisis is not reflected in the results in the chart, which were collected in mid-February.

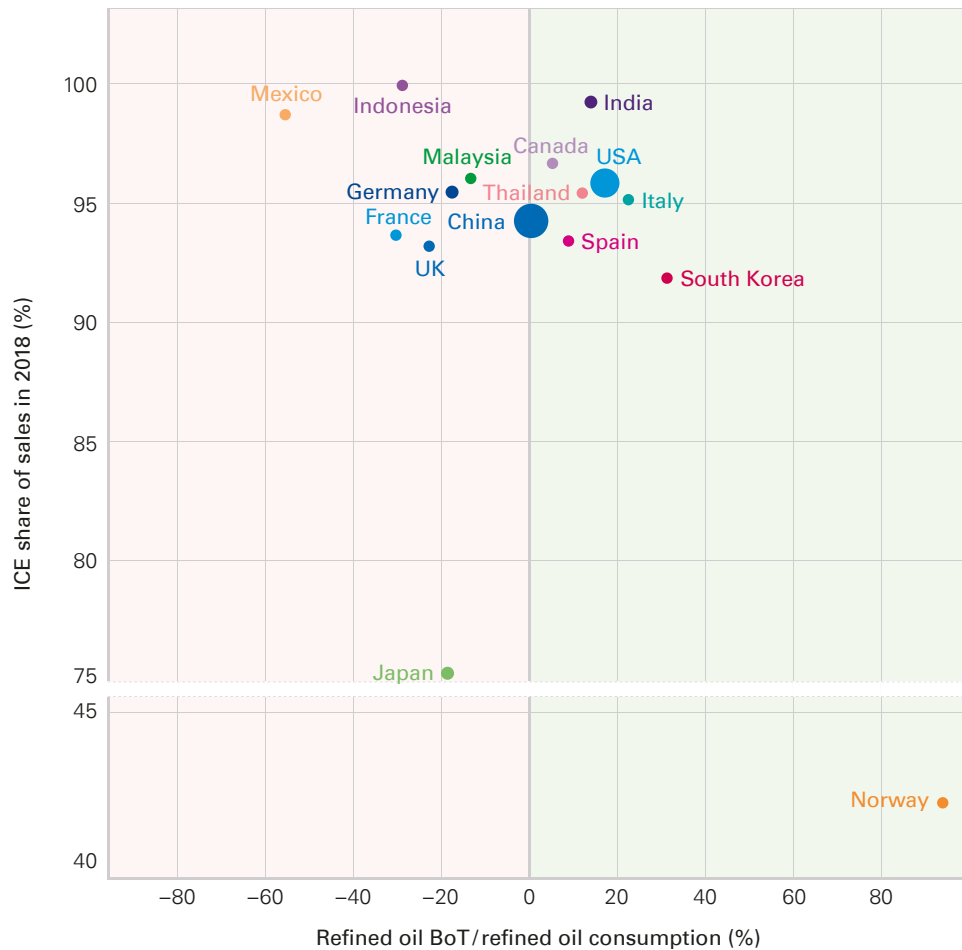
Regionally, there was greatest agreement at 88% among executives in China. This is not surprising, considering China's long-term strategy of acquiring and establishing stable access to large quantities of mineral resources beyond its own borders. The lowest agreement (59%) and largest disagreement (26%) was seen among executives in Western Europe. This reflects Western Europe's reliance on high margins – through its position in the premium segment – to be able to pursue the belief that the sector is still primarily driven by technological innovations. Moreover, an ununified Europe will always struggle to replicate a long-term raw material oriented foreign procurement strategy similar to China's.



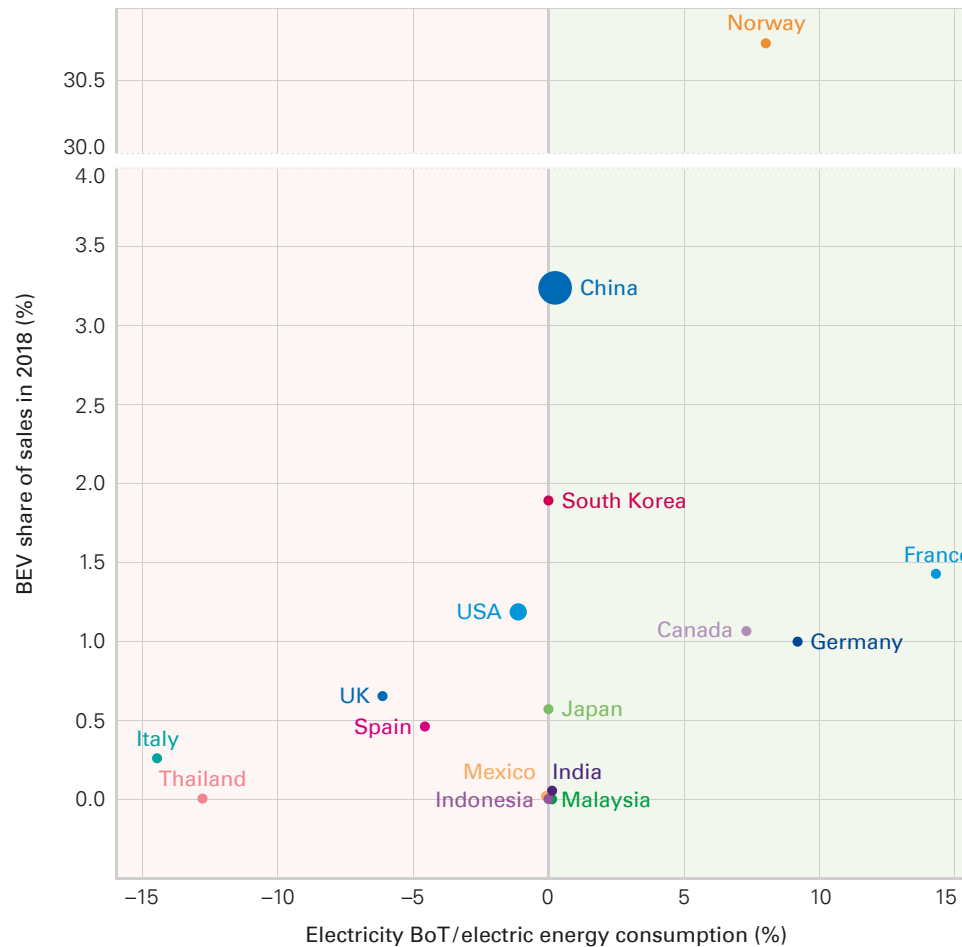
ANALYSIS

Balances of trade

Refined oil to ICE analysis (2018)



Electricity production to BEV analysis (2018)



Note: Data available every two years, with the latest release to date in 2018. Bubble size indicates ICE/BEV sales in 2018.

Source: Enerdata | LMC Automotive. KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

We already see a clear positive correlation between electricity balance of trade (BoT) and BEV sales. The electrification of powertrains could therefore be particularly appealing to countries with a currently high dependency on oil imports and a positive electricity BoT.

As in last years' survey, this year we again looked at the relationship between a country's oil and electricity BoT and its shares of ICE and BEV sales, with respect to the country's total passenger vehicle sales.

Our refined oil to ICE analysis shows that there is currently no clear correlation between refined oil BoT and the share of ICE sales per country. This is, of course, to a large extent due to many countries still being in the early stages of electrification. Our electrical energy to BEV analysis, on the other hand, shows a clear positive correlation between electricity BoT and share of BEV sales per country.

Looking ahead, in the interest of reducing dependency on energy imports, countries in the red half of the refined oil to ICE analysis and in the green half of the electrical energy to BEV analysis – such as Germany and France – have an incentive to focus their technological development on electrified powertrains.

On the other hand, countries in the green half of the refined oil to ICE analysis and in the red half of the electrical energy to BEV analysis - such as the US, Italy, Spain, and Thailand – have less of an incentive to electrify their powertrains from a balance of trade perspective. This suggests that these countries will continue to have high shares of ICEs in the future.

Through careful positioning, China has a slightly positive net balance of trade of both refined oil and electricity, opening itself up to pursuing a range of powertrain technologies. However, as can be seen from the energy production to BEV analysis, China has separated itself from the other countries in its more aggressive transition to electric powertrains, indicating that China's pursuit of BEVs is rooted in more than just balance of trade considerations. Importantly, China's slightly positive electricity BoT also positions the country more favorably for further electrification than the US.

In Norway, tax breaks and a host of other incentives, in combination with one of the highest median household incomes in the world, paved the way for the share of BEV sales to rise to almost one-third in 2018. This share continued to rise throughout 2019, as Norway strives to shift to a more green economy, using its healthy electricity BoT – sourced almost exclusively from

renewable hydropower – to support a rapidly expanding charging infrastructure. Japan's low ICE share, relative to other countries with a similar refined oil BoT, is also worth pointing out. This low ICE share is due to Japan's high share of hybrids. For Japan, given the country's negative refined oil BoT compared to a more balanced electricity BoT, this is a sensible development. This approach highlights a logical development direction for both Germany and France, as mentioned above.

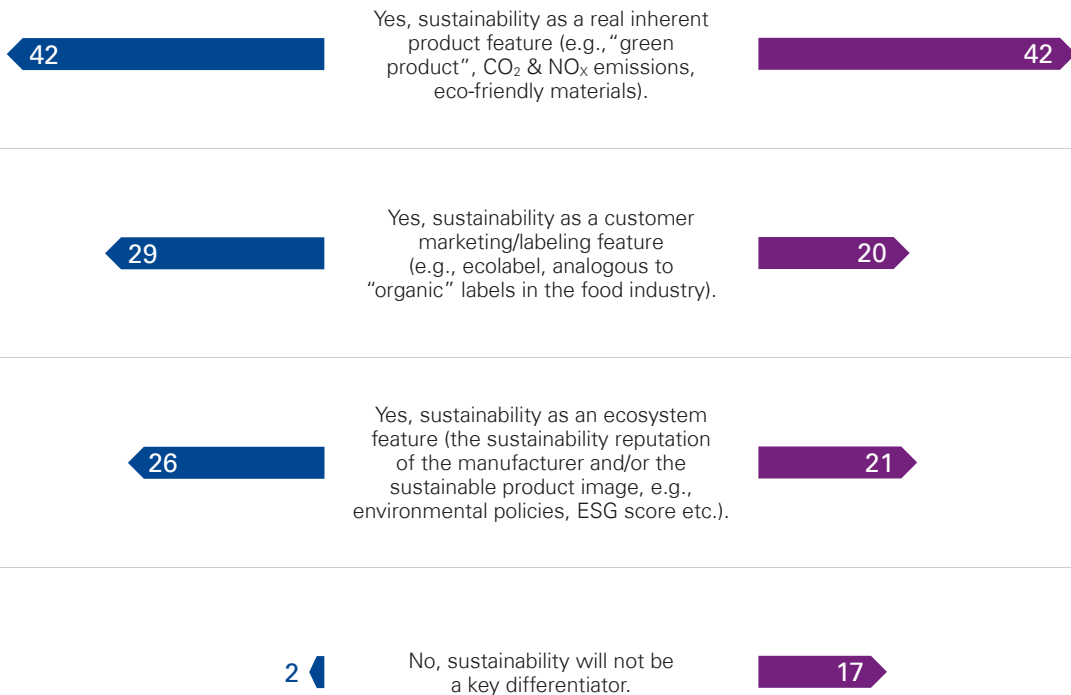
A further important dimension, which of course must be considered in all of the above analysis, is both the development and variation in the price of oil and electricity between different countries.

Generally speaking, the combination of lower total cost of ownership for ICEs following the fall in oil prices due to the COVID-19 demand crisis, along with steadily rising electricity prices and prevailing concerns regarding charging, range, and upfront costs of electric vehicles, is likely to suppress consumer demand for a transition to plug-in electric powertrains in the short to medium term. Furthermore, without the introduction of significant EV incentives in the wake of the COVID-19 recession, we believe that short-term purchase decisions will be dominated by TCO factors, significantly impacting the rate of transition to low carbon mobility.





Do you think sustainability will be a key differentiator in the automotive industry?



42% of executives and consumers believe that sustainability will be a key differentiator in the industry as a product, as opposed to a customer or ecosystem, feature. However, in a cost-conscious post-COVID-19 world, it will become even more difficult to fly the flag for sustainability in the short to medium term.

Environmental awareness, CO₂ emission standards, and newly emerging ESG regulations (environment, social, and governance) convinced us to dedicate one chapter to sustainability. We wanted to better understand whether sustainability already serves as a key differentiator for both executives and consumers, and whether they believe that sustainability is a feature related to the product, the customer, or even the ecosystem.

Although our survey was conducted before the COVID crisis, it would now be even more interesting to see if sustainability will remain important as everyone becomes more cost-conscious and TCO-driven than ever before. Consumers have only just begun to show interest in sustainable mobility and have just reached a turning point where they were about to change their behavior – at least in the emerging countries. But COVID-19 comes at an inopportune time, particularly from a sustainability perspective. Suddenly, governments are reconsidering the incentives to support sustainability and we are on the verge of breaking a change curve that has just overcome its greatest struggle.

Note: Executives (n = 1,154). Consumers (n = 2,028). Figures in percent. Percentages may not add up to 100% due to rounding.
Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

Almost all executives see sustainability as a key differentiator (98%), but 17% of the consumers still do not recognize this at all. 42% of both executives and consumers agree that sustainability will be a product rather than a customer or ecosystem feature. The chart on the left also shows that almost 30% of executives believe in sustainability as a customer feature and even fewer believe it will become a key differentiator as an ecosystem feature (26%).

Sustainability as a product feature:

If sustainability is truly seen as a product feature, it would mean taking responsibility for sustainability from cradle to grave. This includes ensuring a sustainable supply and value chain from the perspective of better resource use, in which the origin of raw materials and their extraction also play a crucial role.

Sustainability as a customer feature:

While mobility spending has remained the same in recent years, it is hard to imagine that consumers would now be willing to spend more just because it is sustainable – this is comparable to organic labeling in the food industry. Community and group thinking on sustainability does not exist yet in the automotive industry, mainly because the criteria for classifying a product as sustainable are still not precise and transparent enough for customers to make reliable decisions.

The criteria used in the food industry are very simple, clear, and widely adopted. If customers in the automotive industry want to base their decisions on how sustainable the mobility solution that they intend to buy, lease, or subscribe to is, shouldn't they also have transparency about what kind of materials were used, whether raw materials were mined without child labor, etc.? KPMG's Automotive Institute believes that it would be beneficial to have a cradle to grave sustainability rating to provide insightful information for customers and fleet managers alike.

Sustainability as an ecosystem feature:

From a global perspective, sustainability still seems a long way off from becoming an ecosystem feature linked to the manufacturer's sustainable reputation, sustainable product image, or ESG score – but regional views reveal interesting insights.

Regional differences:

(please see our online platform for the related data)
Looking at the regional differences, it appears that sustainability will be very country-specific – for both executives and consumers. Chinese executives are once again leading the way in seeing the big picture, with almost half of the Chinese executives (48%) classifying sustainability as an ecosystem feature. We also see very different views among consumers by region. Results show that consumers from India & ASEAN and China rank sustainability highest as a product feature at 57% and 49% respectively.

Moreover, only 4% of Chinese respondents voted for “No, sustainability will not be a key differentiator” – the lowest percentage from all regions. In Western Europe, by contrast, 21% of consumers don't believe in sustainability at all. Even more astonishing are the results from North America, where more than one in four consumers do not believe in sustainability.



Global production & sales outlooks by top 10 sales groups | 2015–2027

- Western Europe
- North America
- China
- Rest of World

Sales groups	Production share in % by regional cluster			Abs. growth	CAGR	
#1 Volkswagen Group	2015	37	6	35	9,900	
	2027	27	6	42	12,977	
#2 Toyota Group	2015		4	21	10	9,885
	2027		4	21	14	11,631
#3 Renault-Nissan Group	2015	18	19	12	9,376	
	2027	17	13	15	11,305	
#4 Hyundai Group	2015		9	21	8,039	
	2027		11	13	9,361	
#5 General Motors Group	2015		51	26	6,725	
	2027		45	32	6,595	
#6 Ford Group	2015	18	48	15	6,400	
	2027	14	50	9	5,902	
#7 Honda Group	2015	3	41	21	4,527	
	2027		34	34	5,228	
#8 Fiat Chrysler Automobiles	2015	17	58		4,739	
	2027	19	47	2	4,874	
#9 PSA Group	2015		56	17	4,265	
	2027		63	4	4,405	
#10 Daimler Group	2015		58	13	11	2,403
	2027		41	13	28	3,275
Total Volume	2015	16	20	27	88,617	
	2027	14	17	30	104,546	

Note: Figures in percent. Absolute values in thousands.

Source: LMC Automotive Q1 2020. KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

Companies with either a globally balanced footprint or a strong footprint in China will emerge more strongly from the COVID-19 crisis.

KPMG’s Automotive Institute believes that the automotive sector will experience a global relaunch in Q3 2020. The ongoing adaption to COVID-19 will continue to delay the economic restart, despite the ongoing Chinese relaunch.

We believe that it is essential to acknowledge COVID-19 as a global wave movement, which must be simultaneously assessed from a global production and sales footprint. Companies with a heavy production and sales footprint in China have already seen a direct impact and have now begun a recovery phase, while companies with heavy production and sales footprints in Mature Asia, Western Europe, and North America are currently experiencing the full impact of the pandemic. *We predict that companies with either a globally balanced footprint or a strong footprint in China will be less affected by the COVID-19 crisis, as China has already started its cautious recovery phase.*



As can be seen from the chart on the left, showing the regional breakdown of the production and sales footprints of the top 10 sales groups, no two OEMs in the world have the same footprint. As the virus spreads in waves around the world, companies with a heavy footprint in China, who were hit strongly in February and March, will likely benefit from China’s current economic recovery, which began in April/May 2020. Such companies may even enjoy a small boom, as this market is supported by government incentives such as the extension of subsidies and tax exemptions for new energy vehicles into 2022.

Sales share in % by regional cluster		Abs. growth	CAGR
2015	35 9 37	9,798	2,965 2.2%
2027	29 8 43	12,763	
2015	6 29 12	9,766	1,901 1.5%
2027	6 23 17	11,667	
2015	24 23 13	9,270	2,159 1.8%
2027	21 17 16	11,430	
2015	10 21 22	7,635	1,183 1.2%
2027	11 21 14	8,818	
2015	53 26	6,763	-96 -0.1%
2027	49 31	6,667	
2015	20 47 16	6,202	-346 -0.5%
2027	22 47 10	5,856	
2015	3 40 22	4,646	664 1.1%
2027	3 34 33	5,310	
2015	21 56 3	4,627	216 0.4%
2027	24 49 3	4,843	
2015	62 17	4,384	-113 -0.2%
2027	66 2 5	4,271	
2015	42 19 18	2,294	990 3.0%
2027	35 14 30	3,284	
2015	17 23 28	89,056	16,780 1.4%
2027	16 20 30	105,836	

Combustion engine & vehicle architecture [read more p.30](#)

For the first time in the history of our survey, executives think that by 2030 the largest share of vehicles will not be powered by an ICE drivetrain: FCEVs, BEVs, PHEVs, and ICEs will co-exist and complement each other.

There will be no clear single investment strategy, as long as raw materials and industry politics have a countryspecific or regional root.

SO WHAT: COVID-19

KPMG's Automotive Institute believes that COVID-19 will lead to a delayed development of the future powertrain mix forecasted, especially if subsidy schemes are to fundamentally change.

Autonomy readiness [read more p.33](#)

77% of execs agree that mixed traffic between autonomous and non-autonomous vehicles will lead to severe safety issues and liability claims. KPMG believes that autonomous vehicles will only be truly successful in isolated regions – “islands of autonomy” – where each vehicle follows the same set of rules, grounded in bionic swarm intelligence.

Both executives and consumers believe that fully autonomous vehicles are further from being implemented than originally predicted. More than 1 in 5 execs don't believe in the adoption of autonomous vehicles before 2040.

SO WHAT: COVID-19

With the economic impact of COVID-19 reinforcing TCO-driven thinking, we believe the uncertainty surrounding the application of AVs is likely to only increase in the short to medium term, as the focus of consumers shifts to only necessary, as well as tried and tested, technologies.

Electric & fuel cell readiness [read more p.34](#)

Providing a hassle-free and a seamless charging experience is essential for general BEV adoption – 84% of consumers see the responsibility for charging infrastructure with OEMs.

For consumers, price is the most important aspect when considering buying an EV.

84% of executives think that FCEVs will experience their breakthrough in industrial transportation – a 5% increase compared to 2019.

Efficiency savings through economies of scale will not outweigh increases in demand for batteries and battery raw materials – this will result in increased battery prices in the mid to long term.

SO WHAT: COVID-19

The recent drop in crude oil prices due to COVID-19 lowers the cost of fuel for ICE vehicles powered by diesel and gasoline, resulting in lower costs in USD/km compared to BEV quick charging.

KEY TAKEAWAYS

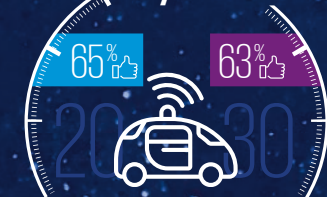
Powertrain technologies



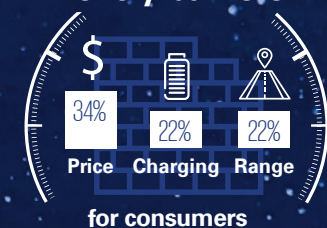
Hybrid powertrains are the first choice



Level 5 autonomy by 2030



Biggest EV entry barriers





2.0 Product value

In a post-COVID-19 world, the product may take on a protective role. Powertrains will co-exist, and investment strategies will be dependent on local industry politics and raw material access.

There will be no clear single investment strategy, as long as raw materials and industry politics have a country-specific or regional root.

For the first time in the history of our survey, executives think that by 2030 the largest share of vehicles will not be powered by an ICE powertrain: FCEVs, BEVs, PHEVs, and ICEs will co-exist. While in Western Europe OEM executives clearly focus their development on BEVs (83%) and PHEVs (80%), North American OEM executives tend to be willing to invest more in further developing ICEs (89%). Consumers, on the other hand, continue to favor hybrids, grounded in ICE technology.

Both executives and consumers believe that fully autonomous vehicles are further away than originally predicted.

KPMG's Automotive Institute does not believe in mixed traffic between autonomous and non-autonomous vehicles. Instead, we believe that autonomous vehicles will only be truly successful in isolated regions – "islands of autonomy" – where each vehicle follows the same set of rules, based on bionic swarm intelligence.

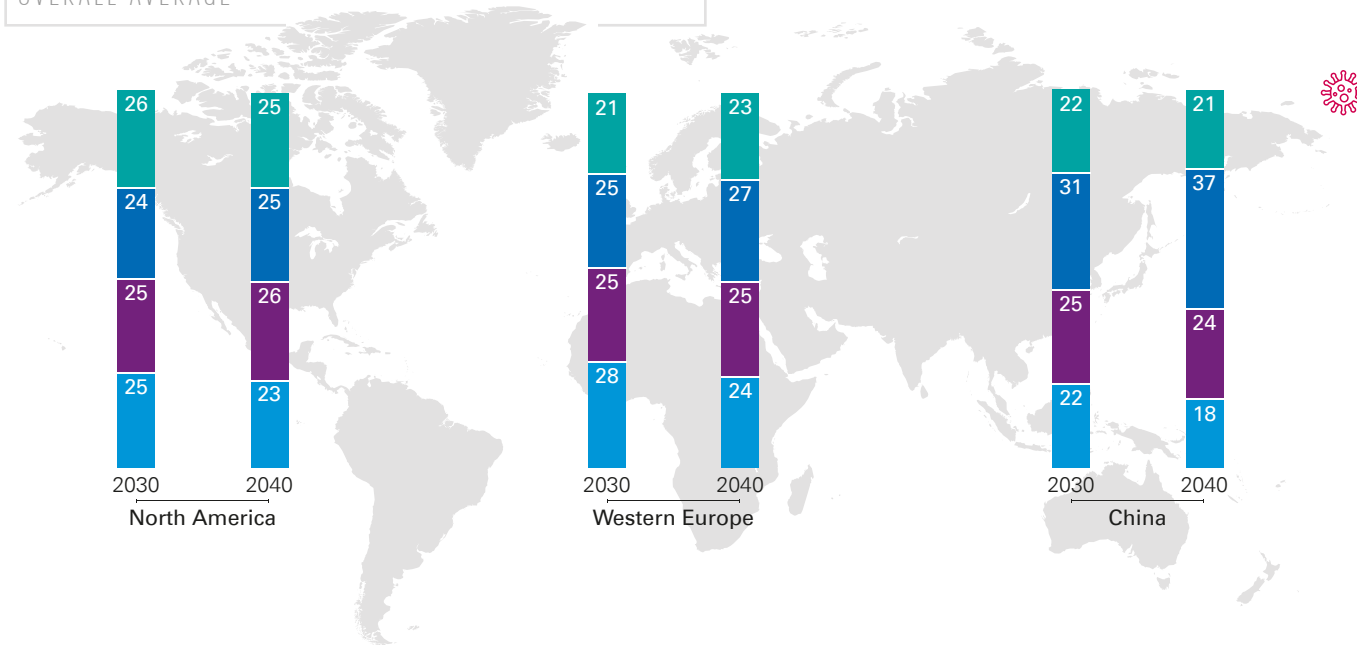
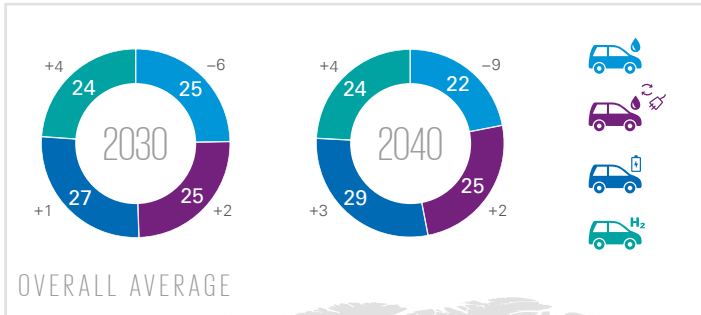
As in last year's survey, global results show that consumers expect to see fully self-driving cars on roads sooner than executives. However, 2030 is now clearly the most voted answer for both executives and consumers worldwide.

Purchase price remains the biggest entry barrier for consumers for BEVs.

Price remains the biggest entry barrier for consumers when considering buying an EV. Consumers still seem to focus primarily on the purchase price of a car (which will be further enforced due to COVID-19), but neglect TCO advantages offered by e-mobility (lower maintenance, lower fuel costs, etc.). Range is the joint second most important factor in this year's results. This may become the most important factor in the future, if prices for BEVs continue to fall due to higher production volumes.



What is your opinion on the share between ICE, PHEV, BEV, & FCEV in 2030–2040?



■ ICE (Internal combustion engine) ■ PHEV (Plug-in hybrid electric vehicle)
 ■ BEV (Battery electric vehicle) ■ FCEV (Fuel cell electric vehicle) ±1 Change from GAES 2019 (n=981)

Note: Executives (n = 1,154). Figures in percent. Percentages may not add up to 100% due to rounding.
Source: KPMG’s Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

The future will see a regionally differentiated mix of different powertrain technologies.

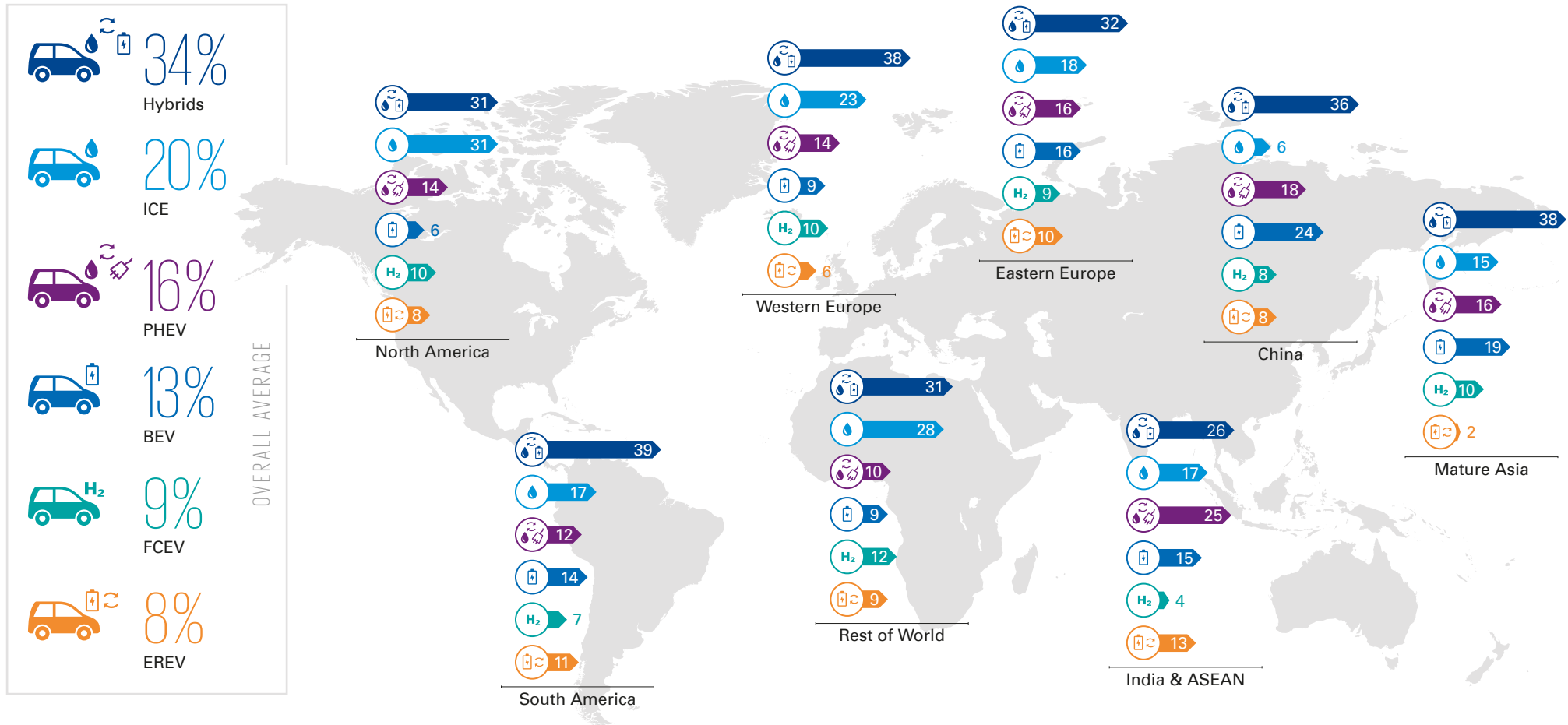
For the first time in the history of our survey, executives predict that by 2030 the majority of vehicles will not be powered solely by an ICE powertrain. FCEVs, BEVs, PHEVs and ICEs will coexist. While electric powertrains make great sense in urban areas, other applications like long-distance commuting and industrial fleet management demand seamless refueling and a higher range that is not yet available. KPMG’s Automotive Institute believes that COVID-19 will lead to a delayed development of the future mix described, which will be strongly regionally shaped by changes in governmental subsidy schemes. ICE sales may receive a boost due to the fall in oil prices and greater TCO-orientated purchase decisions, whereas governments may see an opportunity in pushing EVs through enhanced incentive schemes.

Hybrids, grounded in ICE technology, remain the most popular choice of powertrain for consumers.

Consumers have a clear favorite powertrain technology for their next car: these are hybrids, grounded in ICE technology, which have and continue to be subsidized in many countries. BEVs have slightly matured in the eyes of consumers, with 21% of consumers choosing BEVs or BEVs with range extenders. However, ICEs remain the clear second choice with 20% of consumer votes. A perhaps surprising trend can be observed in North America. Here, the percentage of consumers willing to buy an ICE vehicle declined from 35% to 31%, while acceptance of BEVs increased from 4% in 2019 to 6% in 2020, indicating that a certain level of environmental sensitivity is emerging.



Which powertrain technology would you choose if you were to buy a car in the next 5 years?



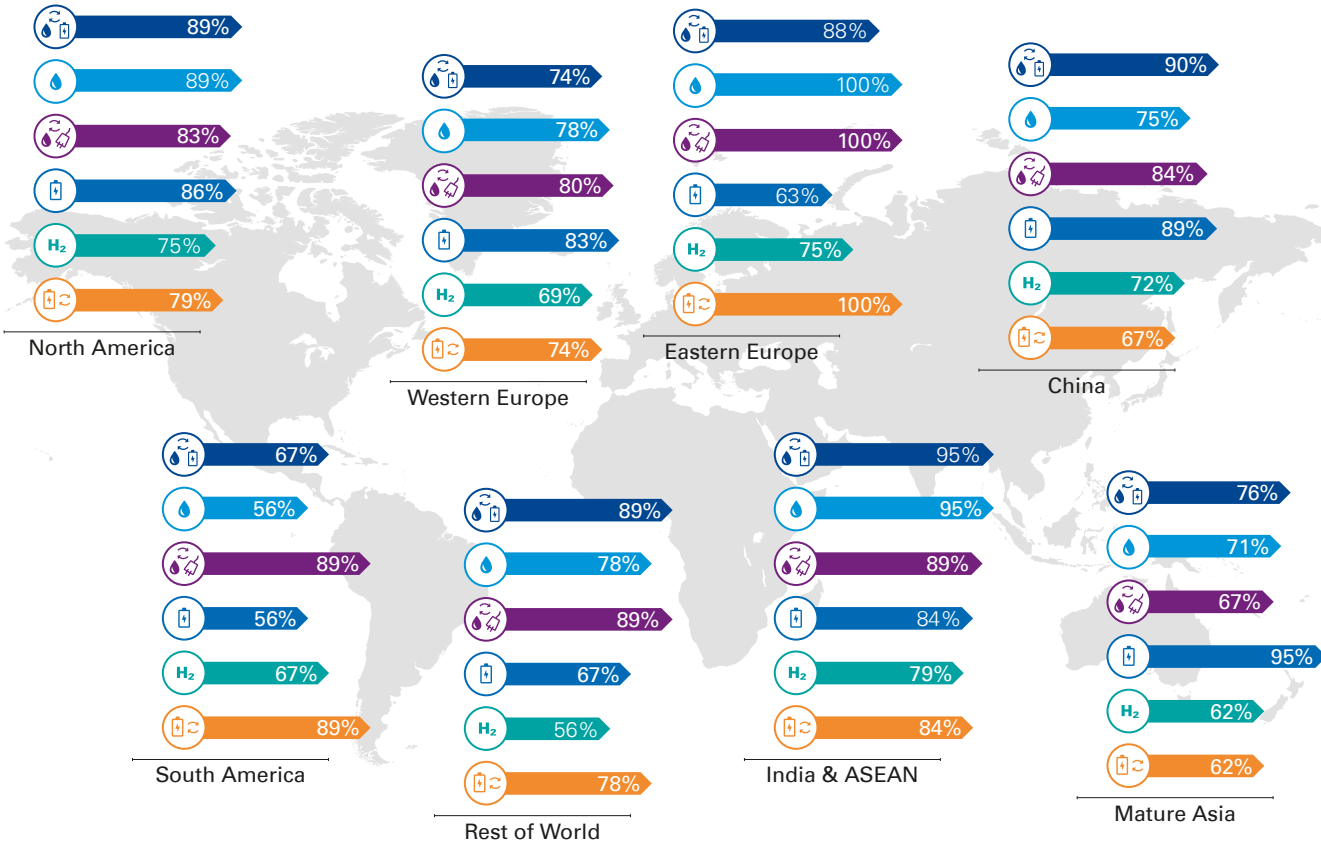
■ Hybrids ■ ICE (Internal combustion engine) ■ PHEV (Plug-in hybrid electric vehicle) ■ BEV (Battery electric vehicle) ■ FCEV (Fuel cell electric vehicle) ■ EREV (Extended range electric vehicle)

Note: Consumers (n=2,028). Figures in percent. Percentages may not add up to 100% due to rounding.

Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



Please indicate whether your company plans to invest in the following powertrain technologies over the next 5 years or which technologies you believe to be the ones receiving the highest investments?



There will be no clear single investment strategy, as long as raw materials and industry politics have a country-specific or regional root.

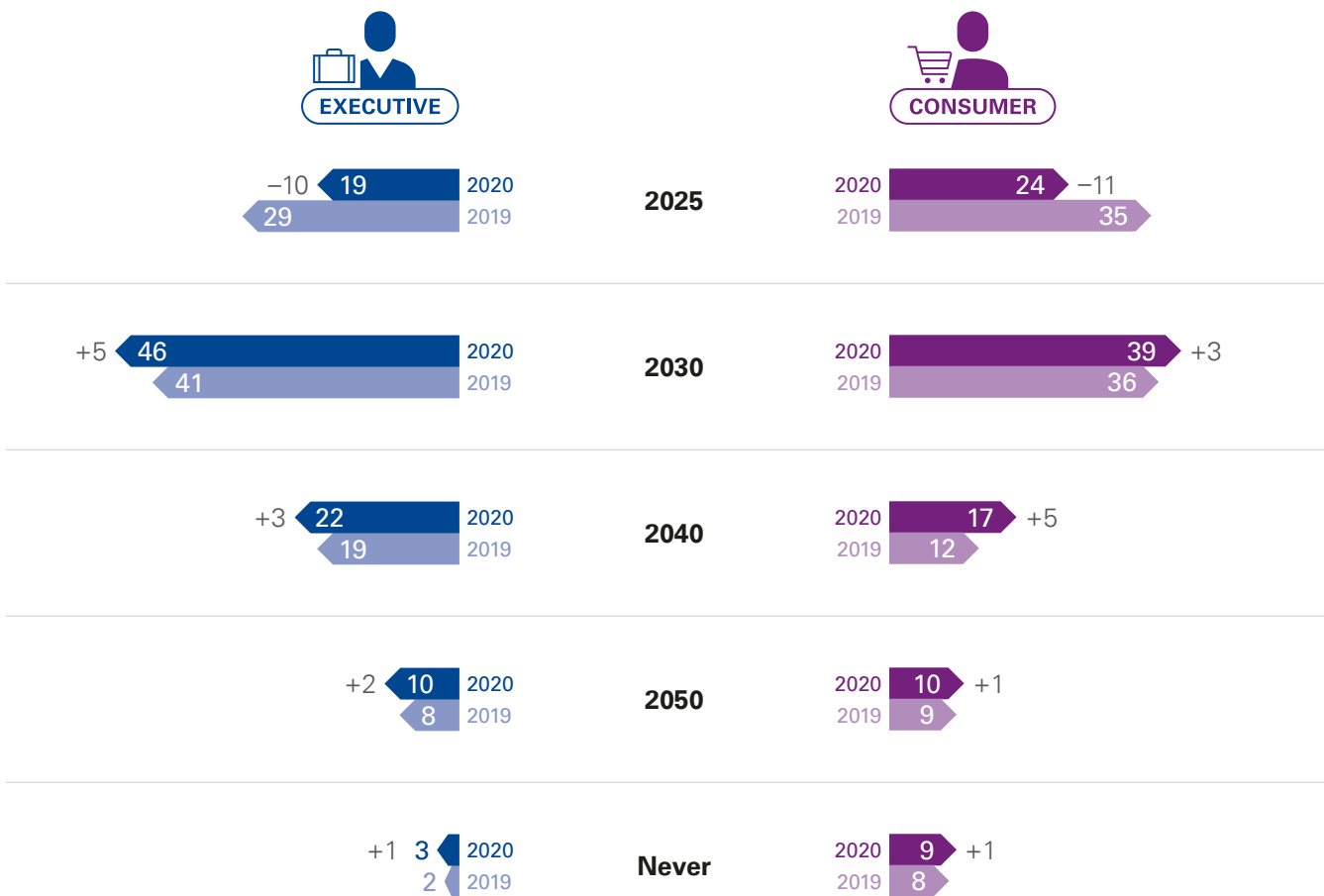
KPMG’s Automotive Institute believes that there will be no clear unidirectional investment strategy as long as raw materials and industry politics have country-specific or regional roots. BEVs & ICEs received the most votes across stakeholders from a global perspective. However, the chart on the left shows that the willingness of executives to invest in powertrain technologies varies greatly by region and industry. Having selected the smaller subset of stakeholders from vehicle manufacturers, we see that OEM executives in Western Europe are focusing more on developing BEVs (83%) and PHEVs (80%), whereas North American OEM executives tend to be willing to invest more in further developing ICEs (89%) and hybrid electric vehicles (89%). Chinese executives, on the other hand, continue to prioritize investments into BEVs (89%) and PHEVs (90%) in the next five years. These results once again suggest that industry politics, grounded in access to raw materials, is driving regional differences in the development of powertrain technologies.

■ Hybrids ■ ICE (Internal combustion engine) ■ PHEV (Plug-in hybrid electric vehicle) ■ BEV (Battery electric vehicle)
 ■ FCEV (Fuel cell electric vehicle) ■ EREV (Extended range electric vehicle)

Note: Executives from stakeholder group vehicle manufacturers (n=288). Multiple answers were allowed.
Source: KPMG’s Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



By when do you expect fully self-driving cars to be operational on the road in your market?



Both executives and consumers believe that fully autonomous vehicles are further away than originally predicted.

KPMG’s Automotive Institute does not believe in mixed traffic between autonomous and non-autonomous vehicles. Instead, we believe that autonomous vehicles will only be truly successful in isolated regions – “islands of autonomy” – where each vehicle follows the same set of rules, based on bionic swarm intelligence. The arrival of fully self-driving (Level 5) cars will mark the true breakthrough of autonomous technology. This will not only enable the realization of true swarm intelligence efficiency, but also allow for the implementation of new data monetization models, that depend on the full attention of passengers. Besides the development of the necessary vehicle software, the extensive rollout of 5G networks will be a further prerequisite for fully autonomous connected vehicles.

As can be seen from this year’s results, there has been a significant re-evaluation by both executives and consumers regarding their 2025 expectations on the emergence of fully autonomous vehicles, with executive and consumer votes falling by 10% and 11% respectively since last year. However, in general, as in last year’s survey, global results show that consumers expect to see fully self-driving cars on roads sooner than executives. 2030 is now clearly the most voted for answer for both executives and consumers worldwide, while 2040 has also gained considerable votes on both sides this year. Among consumers, 80% of Chinese respondents think that fully autonomous vehicles will be operational on roads by 2030. This is a strong contrast to Western Europe, where only 47% of consumers believe that fully autonomous vehicles will be operational on roads by 2030.

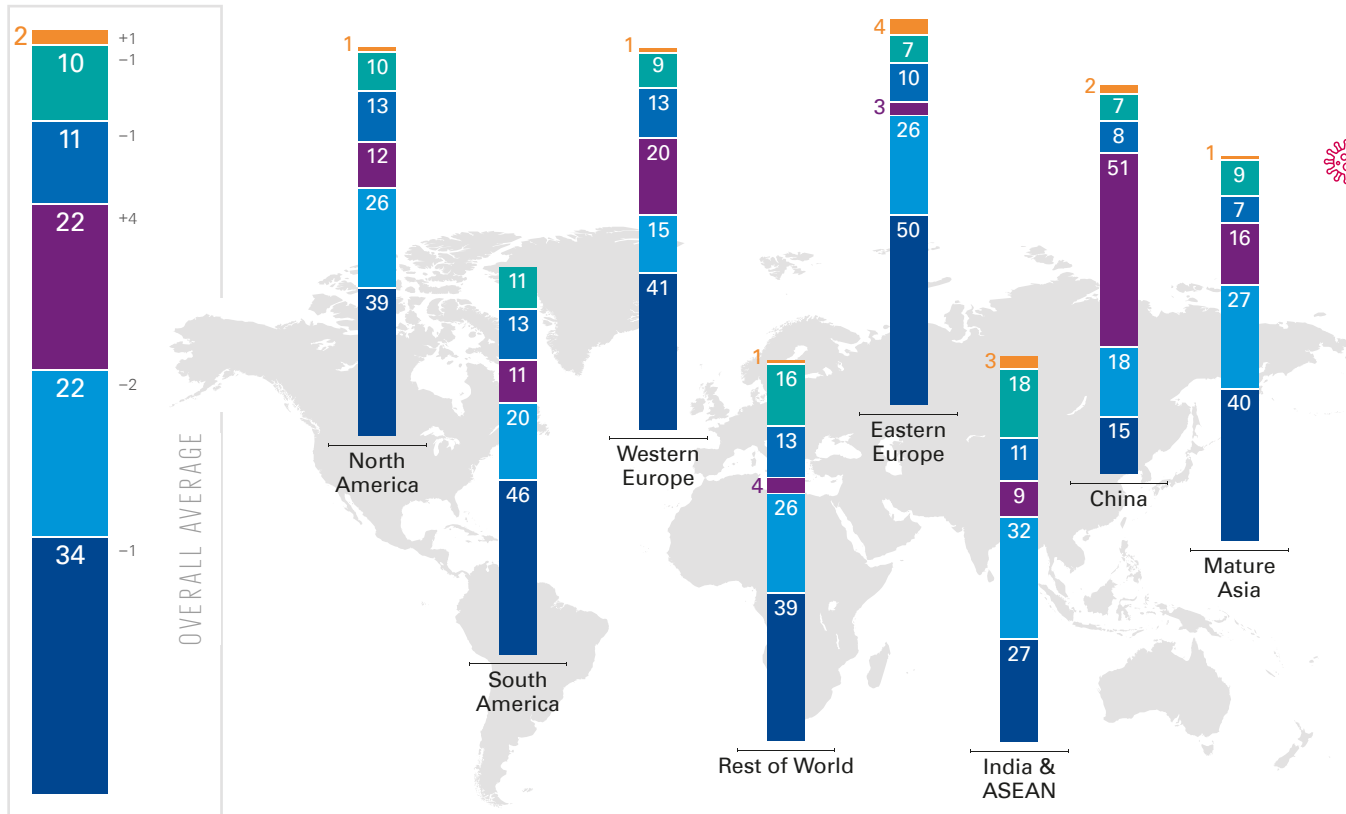
±1 Change from GAES 2019 (Executives n=981; Consumers n=2,028)

Note: Executives (n=1,154). Consumers (n=2,028). Figures in percent. Percentages may not add up to 100% due to rounding.

Source: KPMG’s Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



The one thing that really keeps me from considering a fully electric car is:



Purchase price remains the biggest entry barrier for consumers for BEVs. Providing a hassle-free and a seamless charging experience will also be essential.

Price remains the biggest entry barrier for consumers when considering buying an EV. Consumers still seem to focus primarily on the purchase price of a car (which will be further enforced due to COVID-19), but neglect TCO advantages offered by e-mobility (lower maintenance, lower fuel costs, etc.). Range is the joint second most important factor worldwide in this year's results. This may become the most important factor in the future, if prices for BEVs continue to fall due to higher production volumes. This can already be observed in China, where BEVs have developed very rapidly, resulting in falling prices. As a result, this year 51% of Chinese consumers rate range as the biggest entry barrier for BEVs, with price only in third place at 15%.

BEVs will fail due to the challenges related to setting up the required infrastructure.



±1 Change from GAES 2019 (Executives n = 981)



The unresolved infrastructure question continues to pose a major challenge for the breakthrough of BEVs. This year 69% of executives agreed that this challenge will lead to the failure of pure BEVs – this is a 14% increase since last year.

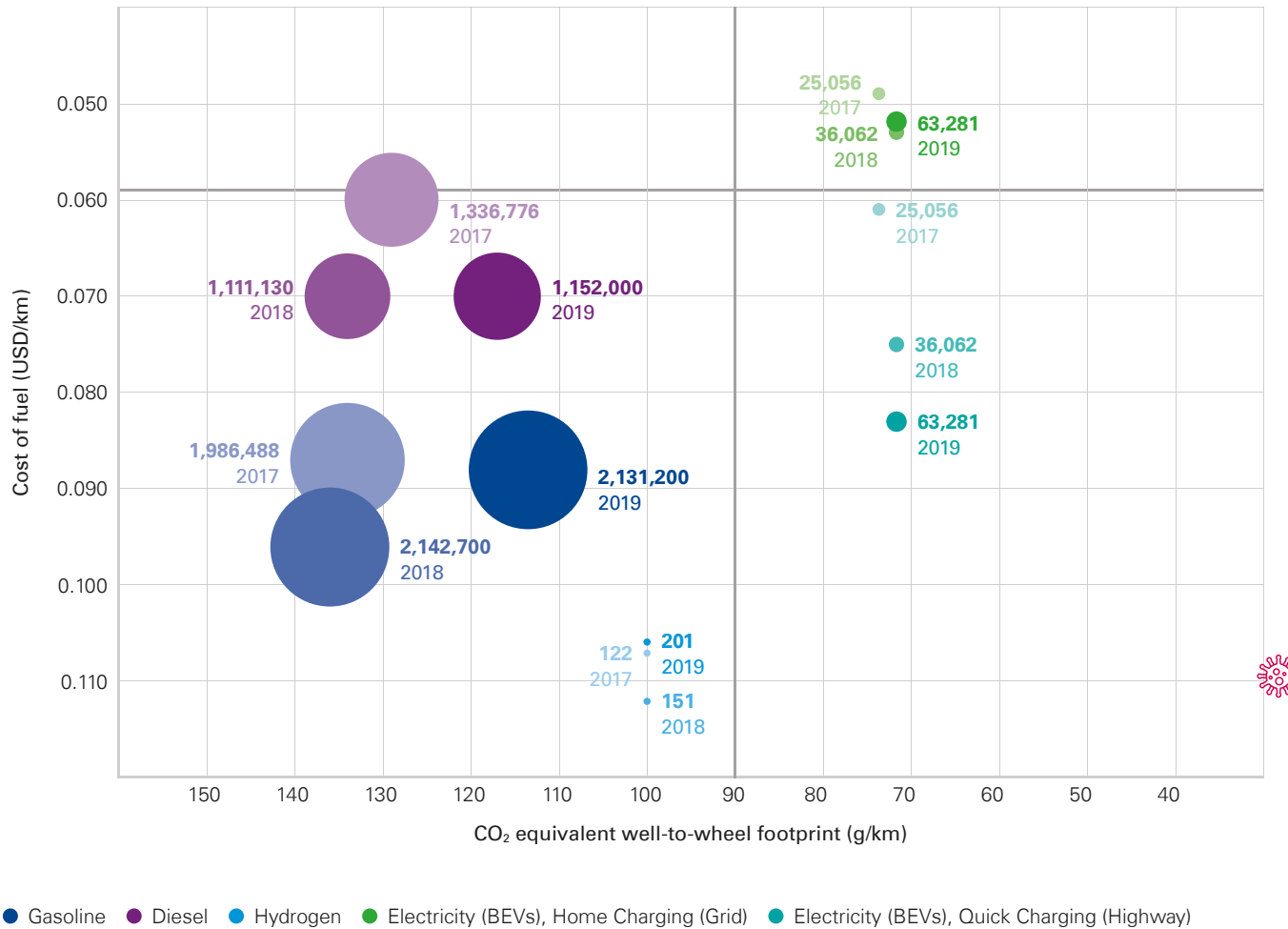
■ Price/cost ■ Charging ■ Range ■ Uncertainty about future tech developments
 ■ Suitability for daily use ■ Image ±1 Change from GAES 2019 (n = 2,028)

Note: Consumers (n = 2,028). Figures in percent. Percentages may not add up to 100% due to rounding.
Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



Fuel type comparison

Cost of fuel vs. CO₂ equivalent well-to-wheel footprint Germany 2017–2019



● Gasoline ● Diesel ● Hydrogen ● Electricity (BEVs), Home Charging (Grid) ● Electricity (BEVs), Quick Charging (Highway)

Note: Size of bubbles corresponds to the number of newly registered vehicles.

Source: Secondary research. KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

BEV charging: What does it really cost?

As TCO remains an important factor for choosing between ICEs and BEVs, the evolution of charging costs remains highly relevant for the future success of BEVs.

Our comparative analysis of fuel types between 2017 and 2019 in Germany shows that the CO₂ equivalent well-to-wheel footprint of ICE-powered vehicles has decreased significantly, approaching that of Hydrogen powered vehicles. This trend will become more pronounced in the future, as downsizing engines and improving efficiency remains a high priority in the automotive industry. On the BEV side, continuously increasing electricity prices have had an impact on the price of BEV charging. It can be clearly seen that infrastructure providers have significantly increased their prices for quick charging on German highways, which makes charging a BEV during long-distance travel as expensive as refueling an ICE-powered vehicle.

The recent drop in crude oil prices due to COVID-19 also lowers the cost of fuel for ICE vehicles powered by diesel and gasoline, resulting in lower costs in USD/km compared to BEV quick charging. This development, combined with increased TCO thinking, is likely to lead to suppressed consumer demand for a transition to plug-in electric powertrains in the short to medium term. As home charging remains low-cost, BEVs will be used in urban environments in the short term, offering customers a significant TCO benefit for short range vehicle usage. In general, gasoline, diesel, and hydrogen are expected to move to the lower right quadrant in the medium to long term, decreasing the gap to electric mobility.

Customer centricity [read more p.38](#)

It is crystal clear: OEMs can defend their lead in the battle for valuable customer relationships – nearly half of all execs and consumers agree that OEMs will also be closest to the customer in 5 years' time

Understanding your customer at individual touchpoints is key – customer mobility decisions will be driven by data privacy & security, TCO, and a seamless and hassle-free mobility experience.

With increasing complexity in customer relationship management, one might expect marketing expenses to increase; this isn't the case for automotive players. Tech giants, meanwhile, are pursuing the opposite strategy.

SO WHAT: COVID-19

53% of consumers make data and cyber security an absolute prerequisite for their purchase decision. This is followed by TCO, at 46% consumer agreement, which is likely to further increase due to restricted spending behaviour as a result of COVID-19.

Seamless multimodal mobility [read more p.40](#)

There is no "one and only" global mobility concept: Instead, we expect to see different mobility concepts for cities and rural areas. 85% of executives worldwide agree.

SO WHAT: COVID-19

A direct response to the more difficult post-COVID-19 economic environment: Help customers by offering contract flexibility with subscription models. COVID-19 will lead to a much tighter budget management and TCO orientation among consumers. Consumers will weigh up the risk of physical integrity against cost when considering mobility services.

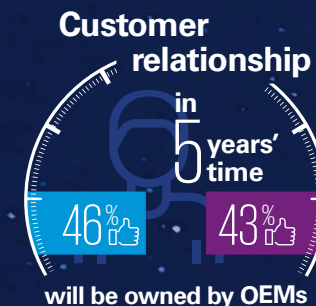
Retail of the future [read more p.42](#)

One of the biggest challenges for retail organizations will be the software-driven development in vehicles, for which consumers are most likely to favour a central support organization.

SO WHAT: COVID-19

There will be a dramatic reduction or reshaping of 20%–30% of physical retail outlets. The post-COVID-19 crisis will enforce this result.

KEY TAKEAWAYS





3.0 Customer value

Immerse yourself in a world in which the spotlight is on the customer - with constantly changing usage and behavior patterns, it will be a close race for which players will establish themselves as the daily companions of customers.

Understanding your customer at individual touchpoints is key – customer mobility decisions will be driven by data privacy & security, TCO, and a seamless and smooth mobility experience.

Customer value puts the spotlight on the customer, meaning that understanding the customer is a key priority. This includes their needs and preferences at individual touchpoints, which criteria define the offline or online purchasing decision, and which features are a must in a seamless mobility world. Our results reveal that OEMs can defend their lead in the battle for valuable customer relationships – nearly half of all execs and consumers agree that OEMs will also be closest to the customer in 5 years' time.

There is no “one and only” global mobility concept.

Mobility concepts must be designed on the basis of their application for cities and rural areas and must be closely geared to customer demand. As an immediate response to a more difficult economic environment in the post-COVID-19 period, making contracts more flexible through subscription models could help

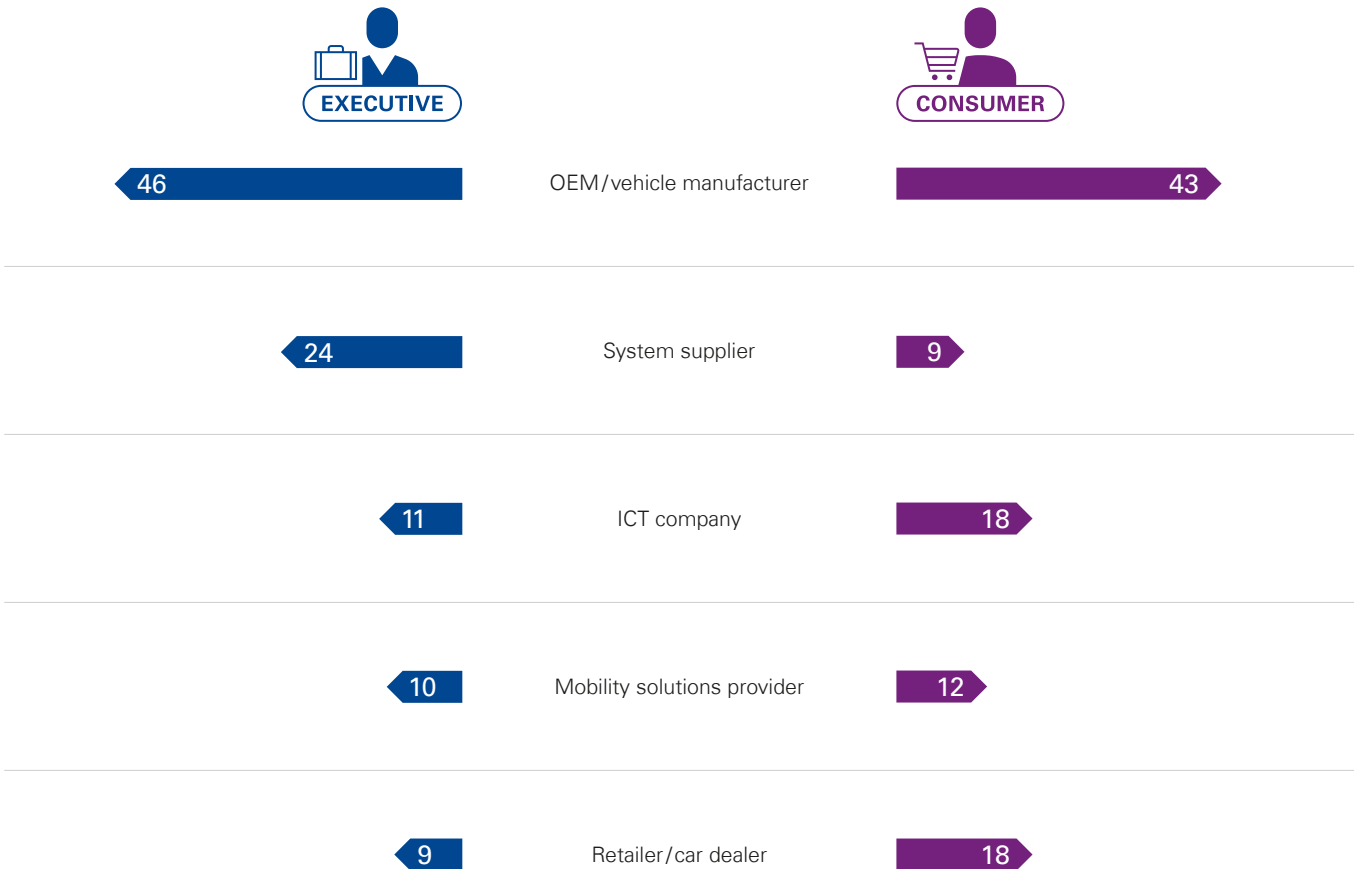
customers to overcome uncertainty. These models could be particularly helpful in times when TCO (total cost of ownership) or TCU (total cost of usership) models dominate a customer's mobility decision.

There will be a dramatic reduction or reshaping of 20%–30% of physical retail outlets. The post-COVID-19 crisis will compound this result.

Not only do executives expect the number of physical retail outlets to dramatically decrease, many executives also believe that there is no way around reshaping existing outlets. The increasing level of software in the vehicle is yet another challenge for OEM-independent retail organizations. Customers will expect to have one “go-to support organization”, fully dedicated to in-vehicle software – an area far removed from the comfort zone of the traditional retailer we know today.



Considering the business model and consumer behavior changes, who do you think will own/take over the customer relationship in 5 years?



It is crystal clear: OEMs can defend their leading position in the battle for valuable customer relationships.

Nearly half of all executives and consumers this year agree that OEMs will be closest to the customer in 5 years' time. Current opinions differ on the second position: While executives have placed substantial importance on suppliers (rising from 17% to 24% in just one year), retailers and ICT companies play a more crucial role for consumers. The guiding principle for a customer's mobility decision is marginal utility, and those players who rethink user-friendliness, offer individually customized services and business models (e.g., concierge service for premium customers, fleet vs. purchase models) will likely move into the fast lane. The tech world, with their in home voice assistants and on-demand IT service desks within stores, has already provided some customer-retention techniques, and it's up to OEMs to pick up speed by creating these proactive personal assistants in applications such as for new leasing contracts, finding cheaper insurance, predictive warning systems, or personalized route selection – obviously all tailored to individual user patterns. Whoever is best at putting themselves in the shoes of the customer will likely take over the future customer relationship.

Interestingly, according to Chinese consumers, OEMs are still winning the race with 30% but are very closely followed by ICT companies (26%). In countries where prominent ICT players have a more dominant role and shape daily life, ecosystem thinking is transferred to customers. By contrast, in Western Europe, where no dominant ICT players are triggering ecosystem thinking, retailers play a much more decisive role for the customer.

Note: Executives (n = 1,154). Consumers (n = 2,028). Figures in percent. Percentages may not add up to 100% due to rounding.
Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



How important do you think the following features will be to the customer when deciding to purchase a car / use a mobility service over the next 5 years?



Data privacy & security remains the most important purchasing criteria – for both executives and consumers.

Whether buying a vehicle or using a mobility service over the next 5 years, nearly half (46%) of all executives absolutely agree that companies that do not focus on data privacy and security are at an extremely high risk of sacrificing their brand reputation and failing to deliver real value from their data usage. This is supported by 53% of consumers, who make data privacy and security an absolute prerequisite for their purchase decision.



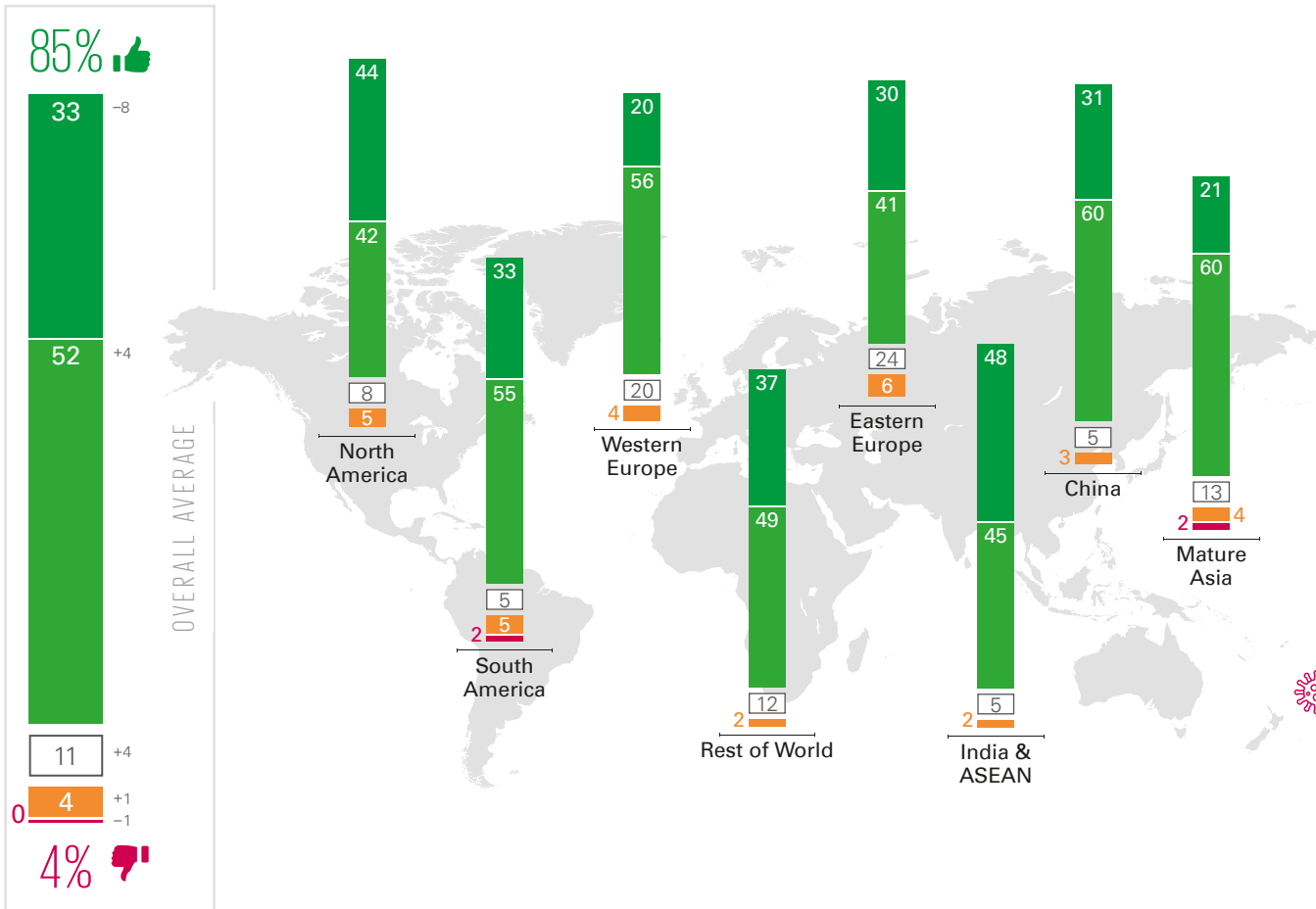
Transparency over TCO ranks second for consumers with 46% agreement. This is likely to further increase in the short to medium term due to restricted consumer budgets as a result of COVID-19. It will therefore become even more important to create a secure digital environment within a seamless connectivity framework that builds maximum customer trust.

Surprisingly, executives' highly ranked feature self-driving cars/active driver assistance systems does not strongly reflect consumer interest. More important to consumers is a seamless and hassle-free mobility experience, which ranks third (45%). These results strongly emphasize our opinion that if players do not provide a seamless and smooth experience for the customer, it will impact brand reputation and therefore ultimately also the purchasing decision. Especially when paying for mobility services, a smooth payment system, easy charging, and vehicle availability must be ensured. Consumers furthermore expect to be personally recognized at various touchpoints.

Note: Executives (n = 1,154). Consumers (n = 2,028). Figures in percent. Percentage of respondents rating a feature as “extremely important”.
Source: KPMG’s Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



Please describe how much you agree/disagree with the following statement:
 Mobility on Demand will not develop from a product orientation, but rather from a service-driven/customer-driven application perspective, meaning that urban and rural areas will have completely different mobility concepts.



There is no “one and only” global mobility concept: Instead, we expect to see different mobility concepts for urban and rural areas.

For companies investing in mobility concepts, it is very clear that there is no “one and only” global mobility concept for Mobility on Demand. The results of this year’s survey in particular repeatedly underline the fact that there is no global answer to most questions and that localization is increasing. This year more than 80% of global executives agree that cities will have completely different mobility concepts than rural areas.

Looking at regional differences, we see that in North America absolute agreement is about twice as high as in Western Europe, reflecting the much higher penetration of mobility concepts in North America than in Western Europe. In India & ASEAN we observe the highest agreement level among executives at 93%, followed by China at 91%. This is also a clear sign of the maturity of mobility solutions in these regions, which vary greatly between urban and rural areas.

A direct response to the more difficult post-COVID-19 economic environment: Help customers by offering contract flexibility with subscription models.

Whereas in the past customers leased a vehicle for a certain period of time, they now want to be offered a flexible full-service mobility package that allows them to choose a vehicle according to their individual needs in a specific situation (e.g., convertible for the weekend or station wagon for a family holiday).

Absolutely agree ■ ■ ■ ■ ■ Absolutely disagree ±1 Change from GAES 2019 (n = 981)

Note: Executives (n = 1,154). Figures in percent. Percentages may not add up to 100% due to rounding.
Source: KPMG’s Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



Do you think subscription models are the future of Mobility on Demand?



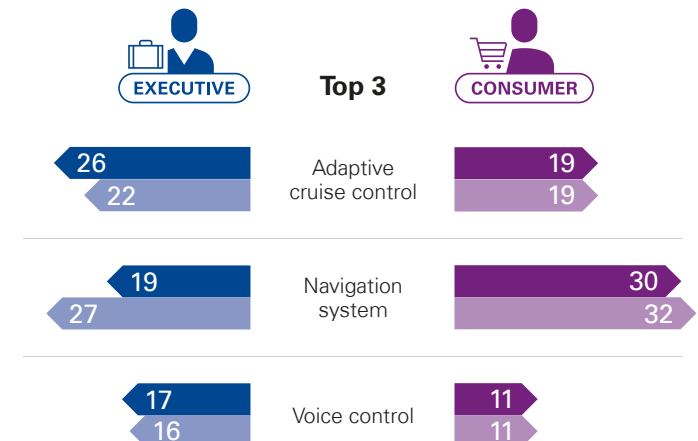
Yes No

Note: Executives (n = 1,154). Figures in percent. Percentages may not add up to 100% due to rounding.
Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

Even before the crisis, absolute agreement with our statement as to whether subscription models are the future of Mobility on Demand was high among executives (74%). In contrast to all other regions of the world, Western Europeans are once again among those who agree least, with only 61% agreement. This reflects fewer requests for contract flexibility in Europe in comparison to the other regions.

KPMG's Automotive Institute believes that post-COVID-19 uncertainty demands solutions for customers that allow more flexibility in contractual commitments.

Executives and consumers are not aligned regarding which Function on Demand features are most important to customers.

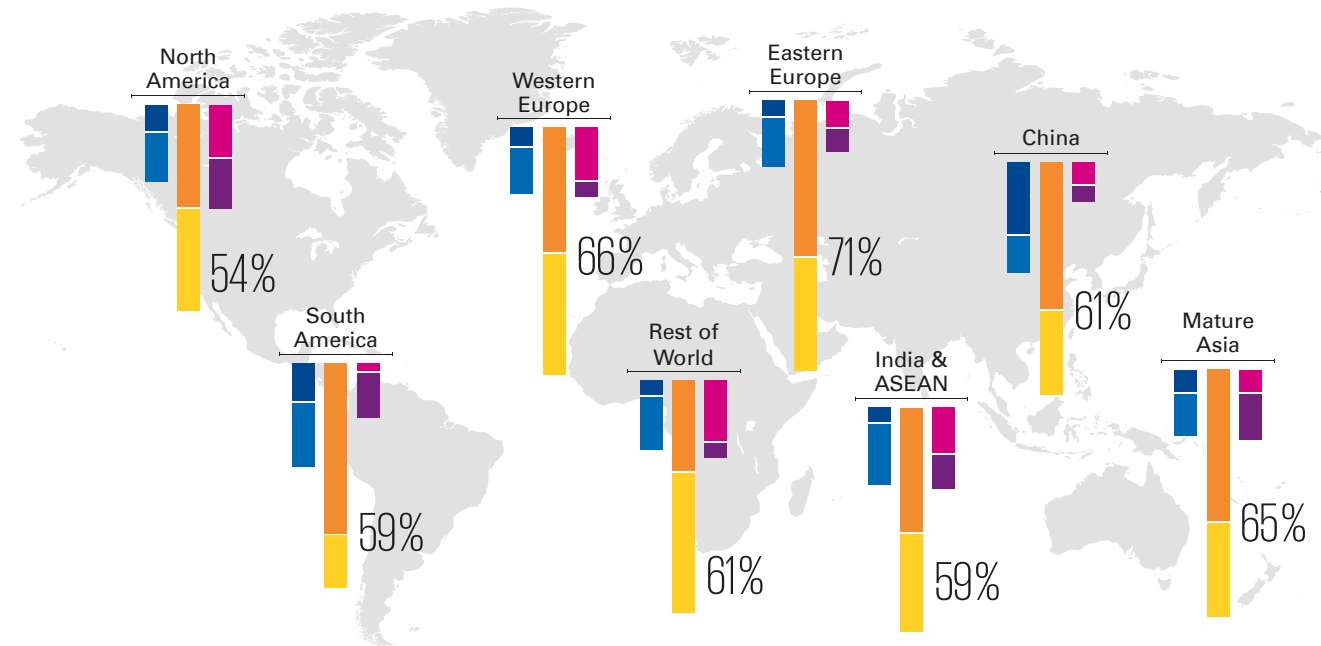
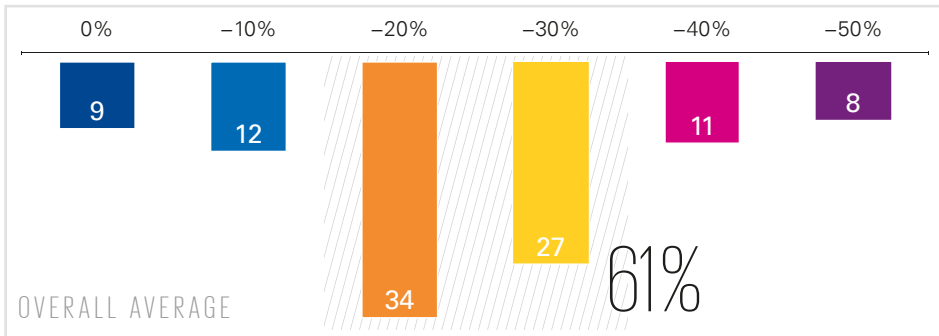


2020 2019

Note: Executives (n = 1,154). Consumer (n = 2,028). Figures in percent.
Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



The number of physical retail outlets as we know them today will be dramatically reduced in 5 years' time by ...



There will be a dramatic reduction or reshaping of 20%–30% of physical retail outlets in the next 5 years. The post-COVID-19 crisis will likely compound this result.

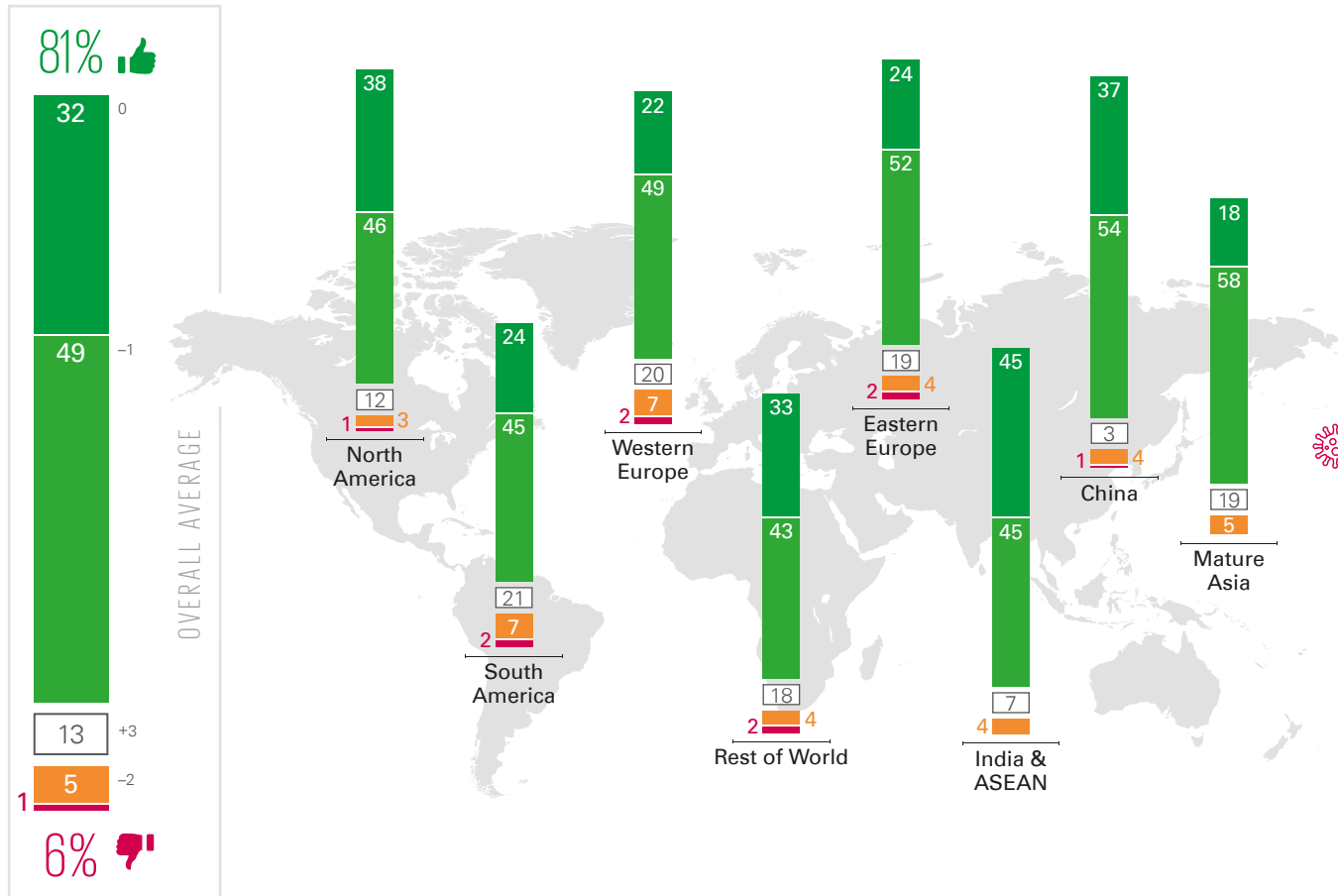
When we asked executives how they expect the number of physical retail outlets to develop over the next 5 years, more than 60% voted that they believe the number will decrease between 20%–30% worldwide. In China, the highest percentage of executives, 19%, believe in stability. This also tells us that 81% of the remaining Chinese executives believe that the world's largest single vehicle market will decline. We can also conclude from the results that executives from North America predict a comparably low overall degree in change. Here, retail concepts are still very much independent of the OEM business as a separate sector, but even in this region most executives predict a 20%–30% decline. *In reality, we now expect a much higher decline as a consequence of the COVID-19 crisis.*

Note: Executives (n = 1,154). Figures in percent. Percentages may not add up to 100% due to rounding.
Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



Please describe how much you agree/disagree with the following statement:

The only viable option for physical retail outlets will be the transformation into becoming service factories or used car hubs. New car sales will be processed via other more digital channels.



More than 80% of executives are confident that the role of retail outlets must be reshaped and transformed.

With results largely unchanged from last year, still more than 80% of executives are confident about the necessity for the transformation of physical retail outlets. It is interesting to note that the highest absolute agreement in favor of retail transformation and sales processing via more digital channels is found in India & ASEAN (45%), followed by North America (38%) and China (37%). There are not many questions in this year's survey where the results around the world are so similar. For us, this is a clear indicator that the operating model for retail outlets in all countries needs to change dramatically. *KPMG's Automotive Institute believes that the transformation of retail outlets is not yet complete and will now be catalyzed by COVID-19.*

The combination of digital channel support, more flexible subscription models and contracts, as well as expanded vehicle lifecycle management is increasing the need for an overhaul in the retail sector. This goes hand in hand with the expected reduction of physical retail outlets over the next five years.

The increasing level of software in the vehicle is yet another challenge for OEM-independent retail organizations. Customers will expect to have one "go-to support organization", fully dedicated to in-vehicle software – an area far removed from the comfort zone of the traditional retailer we know today. OEM-independent retail organizations are therefore likely to have even more trouble positioning themselves as go-to organizations or trusted players in the remanufacturing business in the future.

Absolutely agree ■ □ ■ ■ Absolutely disagree ±1 Change from GAES 2019 (n=981)

Note: Executives (n = 1,154). Figures in percent. Percentages may not add up to 100% due to rounding.

Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

Co-competition [read more p.46](#)

The market capitalization of the top 15 mobile/tech & web/digital companies is more than 5 times higher than the market capitalization of the top 50 traditional automotive OEMs & suppliers.

Competition is back: In contrast to last year and according to this year's executives, competition between automotive manufacturers and ICT companies has increased.

We see cultural similarities and geographical axes between USA/China and Germany/Japan – a finding also reflected in the responses of this year's survey.

SO WHAT: COVID-19

With the currently expected post COVID-19 economic recession, we believe that more OEMs and Tier One suppliers will be forced to start cooperating and consolidating within the industry than ever before.

Transformation readiness [read more p.52](#)

Nearly three in four executives agree that the importance of financial service entities will increase, with debt levels expected to rise.

SO WHAT: COVID-19

In the future, profits will be determined by access to data and miles travelled, not by units sold, especially if car ownership in certain applications, such as cities, is fundamentally decreasing. One prerequisite, especially in COVID-19 times, will be making people feel safe in cars used by others, such as in mobility solutions.

Data supremacy [read more p.53](#)

More than 40% of all executives agree that monetizing data is best done with safety-oriented applications such as car-2-x communication.

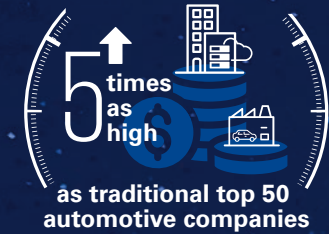
Executives and consumers are not aligned regarding who consumers would trust most with their data.

SO WHAT: COVID-19

Safety-oriented applications like car-2-x communication or even physical safety dominate executive opinions of how best to monetize data. With new realities after COVID-19, we assume that this opinion will grow, as now physical integrity has become much more important.

KEY TAKEAWAYS

Market cap of top 15 tech/digital companies



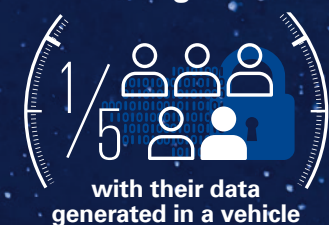
Future market shares will be based on



Monetizing data is best done



Consumers trusting OEMs





4.0 Ecosystem value

Explore the secrets behind the ecosystem value, and realize that an investment into the “living matrix” may carry you to the next level.

Post COVID-19 consolidation: The market capitalization of the top 15 mobile/tech & web/digital companies is more than 5 times higher than the market capitalization of the top 50 traditional automotive OEMs & suppliers.

Due to tough post-COVID-19 market conditions and even greater complexity in the automotive industry, with huge investments into new technologies and especially customer-oriented services evolving at record-breaking speed, this new survey continues to report what it has for years: It is a misconception that traditional mobility players can act alone and still cover the entire value chain single-handedly. Automotive players currently exist in ecosystems that act as a living matrix – so don't risk not investing to find yourself stranded on a desert island. On the contrary, although it may not seem profitable at first glance, invest in an ecosystem which supports you and will help you survive at a later point in time.

The transformation from ownership to shared-use turns the way we do business upside down.

Market success is being redefined from measuring units sold to miles driven. Products must be adapted to application needs, usage patterns, and expected service life, while overengineering must be actively avoided. With the growth of mobility services, debt levels are expected to increase and with them the importance of financial services will rise.

Data is the raw material for data-driven business models – more than 40% of all executives agree that monetizing data is best done with safety-oriented applications such as car-2-x communication.

Executives and consumers are not aligned with respect to whom consumers would trust most with their data. While customers clearly say that they want to have control over their data, OEMs still believe that they would be trusted to own the valuable data. Regional results furthermore reveal that China remains the frontrunner in thinking in ecosystems. In comparison to traditional auto manufacturers, ICT companies are the clear winners of the data race.

The market capitalization of the top 15 mobile/tech & web/digital companies is more than 5 times higher than the market capitalization of the top 50 traditional automotive OEMs & suppliers.

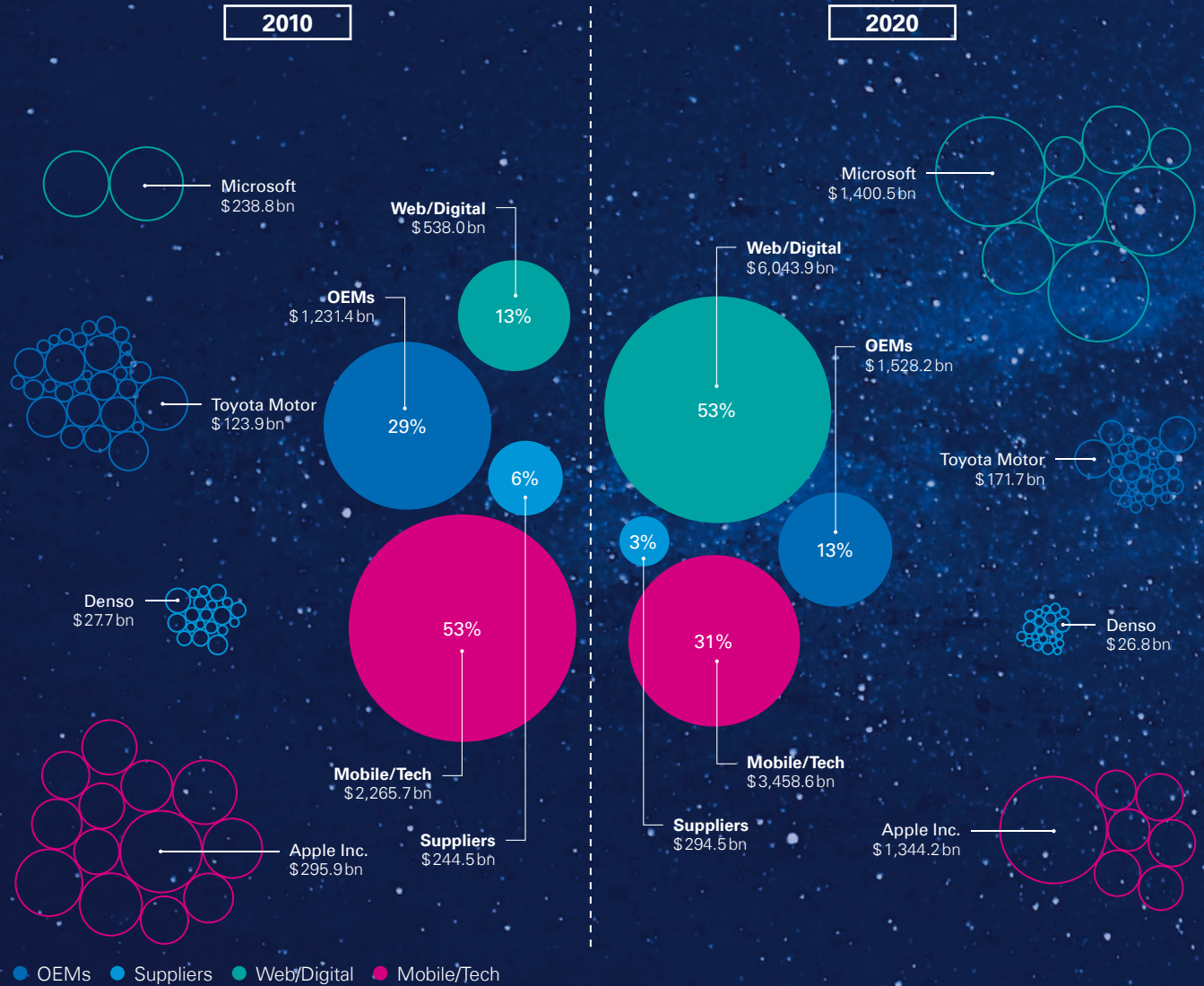
In recent years, most of the automotive industry has gotten used to good levels of profitability. This is going to change now, and we will most likely see profitability levels decreasing. As in recent years, we compare market capitalization and cash levels of traditional automotive players to tech companies. If we compare developments over the last 10 years, mobile/tech companies and web/digital companies are clearly outgrowing the automotive industry with ease. Market capitalization of the top 15 mobile/tech & web/digital companies is more than 5 times higher than the market capitalization of the top 50 traditional automotive OEMs & suppliers.

This scenario is not as devastating for cash positions, but due to the COVID-19 crisis we expect it to become even more difficult for traditional OEMs to defend their position against cash-heavy ICT players.



ANALYSIS

OEM vs. ICT – Market capitalization



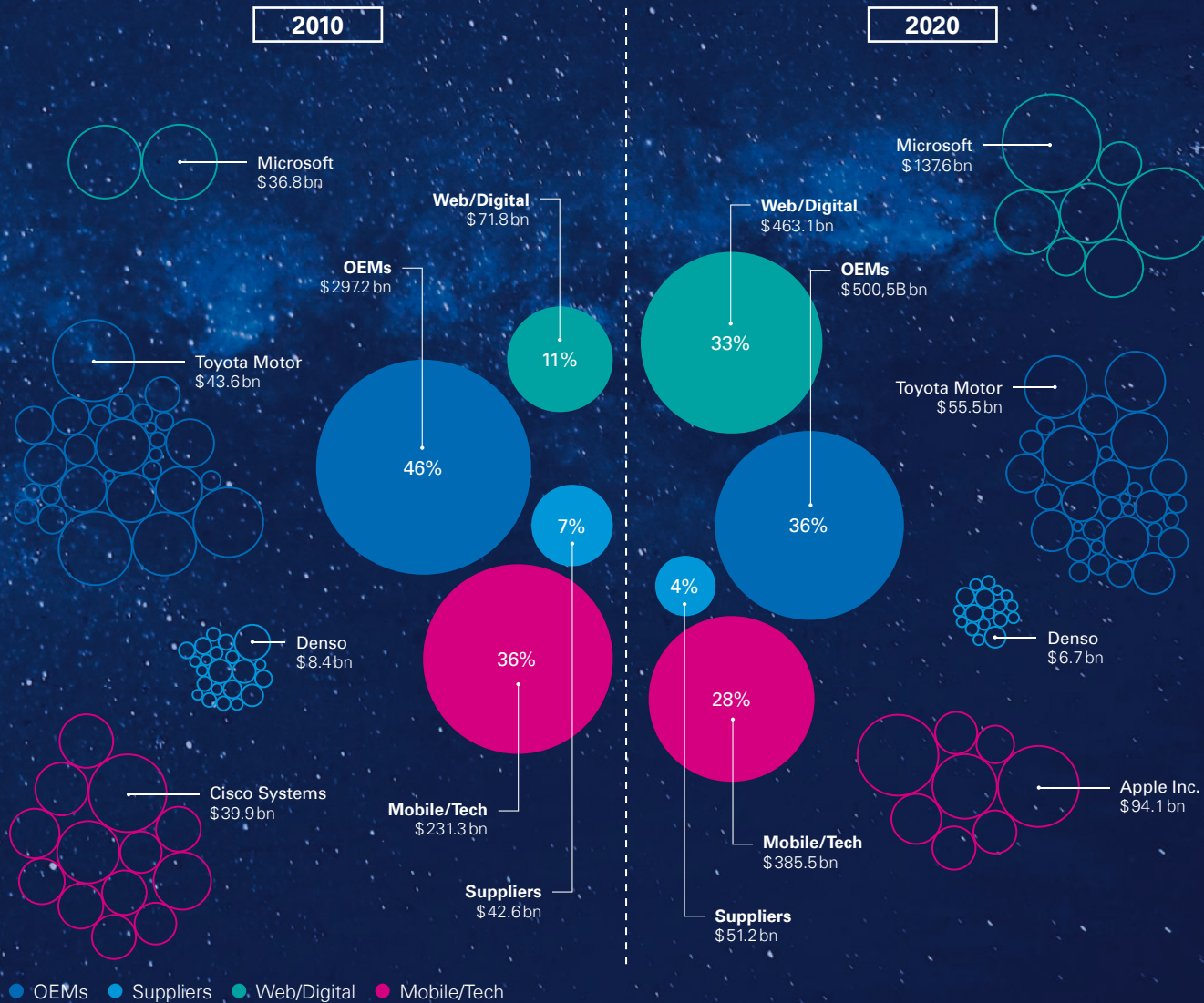
Note: Percentages are share of total market capitalization and may not add up to 100% due to rounding. The proportions of the companies are only comparable within the sectors and years.

Source: Pitchbook as of 11.05.2020. KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



ANALYSIS

OEMs vs. ICTs – Total cash, cash equivalents & short term investments



Note: Percentages are share of total cash and short-term investments and may not add up to 100% due to rounding. The proportions of the companies are only comparable within the sectors and years.

Source: Pitchbook as of 11.05.2020. KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

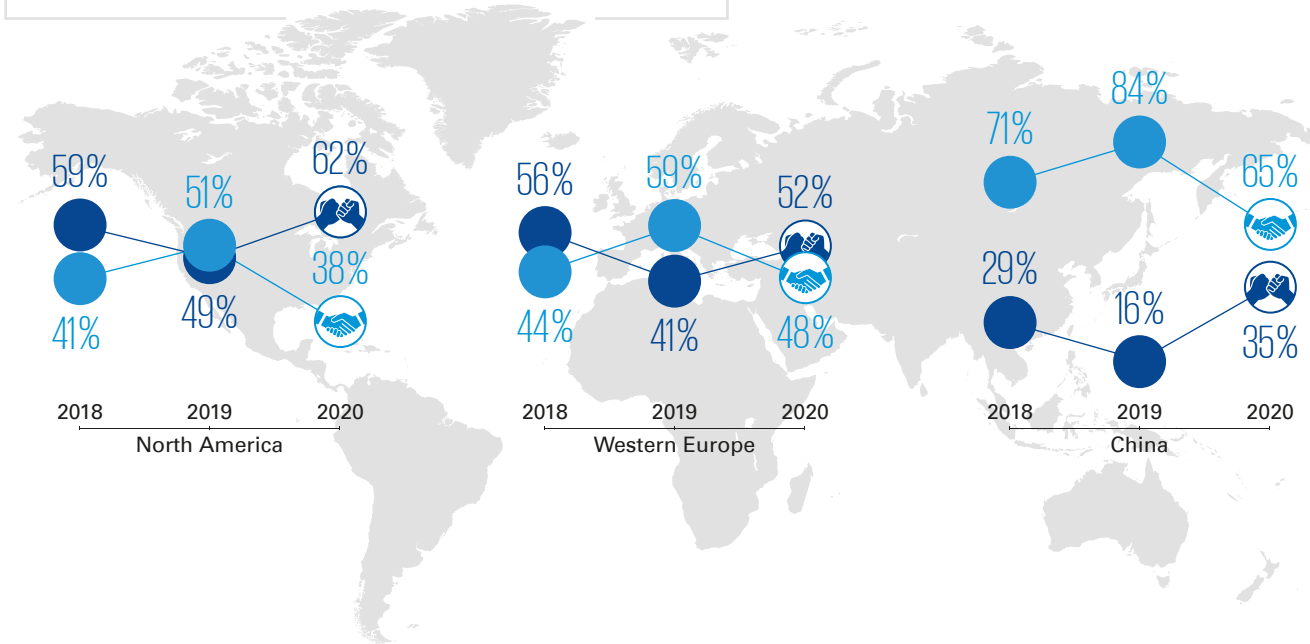
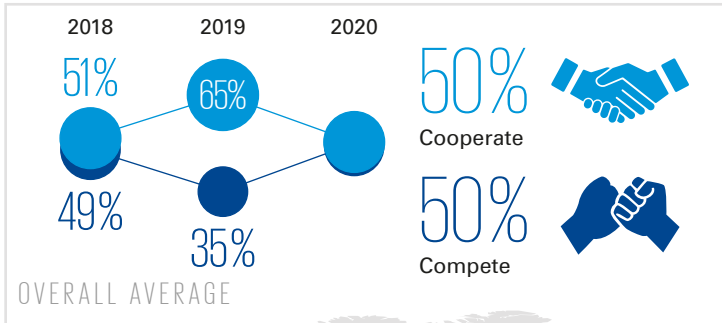
We have asked ourselves two central questions in the last two years:

1. On which level do capital markets reflect real market opportunities of global mobility solutions?
2. On a traditional automotive player level or platform provider level, which capital markets are dominated by tech players so far? The focus on online and mobile business models has been strong, especially in times when physical mobility has been limited to a minimum.

Not all executives may be aware of the capital market paradigms that allow for later profits. A paradigm enabling later profits must also guarantee that a company's share price is kept high. In reality, traditional automotive companies have never been judged like their digital counterparts. Traditional automotive companies are typically assessed using traditional financial indicators, while digital players that aim to attract as many people as possible to their platform are measured by traffic and not RoI. Even so, one North American player in the electromobility sector defines itself as an "ecosystem digital player", who is in doing so being measured completely differently by capital markets. For us, this is just another indication that software will make the difference in the future and will redefine the aging process of automotive products. If software elements are kept updated, aging of automotive products could be slowed down and could generate new life cycles at the product level, with major consequences for financing and leasing.



Do you expect ICT companies and automotive manufacturers to compete or cooperate in the future?



● Compete ● Cooperate

Note: Executives (n = 1,154). Percentages may not add up to 100% due to rounding.
Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

Competition is back: Compared to last year, competition between automotive manufacturers and ICT companies has increased.

In 2020, 50% of automotive executives believe that ICT companies and auto manufacturers will cooperate, while 65% of them believed so in 2019. While North American executives are least convinced of ICT and automotive cooperation (38%), Chinese (65%) and Western European (48%) executives believe strongly in this concept. **North American executives have always taken a more competitive approach, which may also be due to their mentality and protectionist attitude. The post-COVID-19 period will show us whether they will be forced to change their minds due to lack of profitability.**

The chart on the right shows a clear trend that cooperation in the automotive industry has been growing steadily since 2014. We have identified three main phases: In the first phase, automotive companies started showing their interest in start-ups and ICT players, showing awareness that disruptive ideas usually come from a greenfield approach. In the second phase, the automotive industry saw itself as the biggest competitor in its sector and therefore saw ICT companies as ideal partners for further development. Finally, in phase three, automotive companies recognized that real competition is coming from outside the industry, which led to much more intensive cooperation with peers, in order to be stronger in the overall ecosystem. **In light of the current COVID-19 crisis, we believe that even more OEM and Tier One suppliers will be forced to start cooperating and consolidating.**

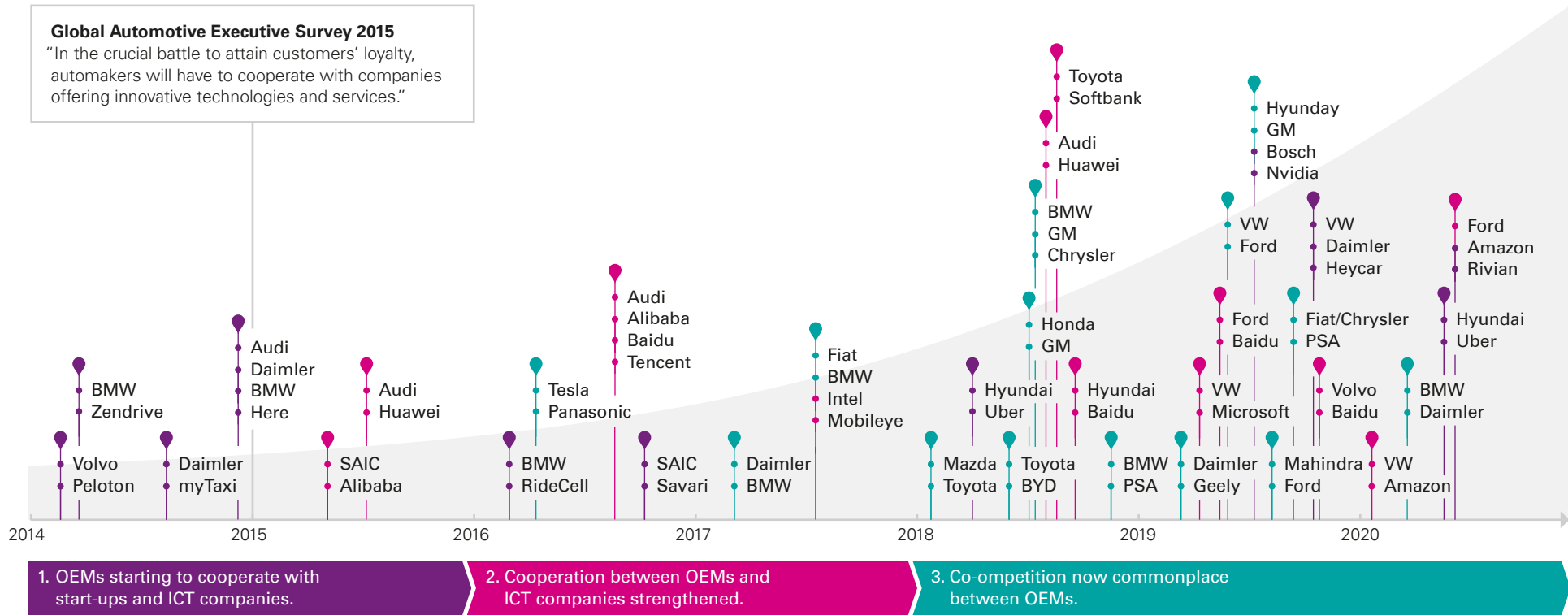


ANALYSIS

Co-competition Timeline

Global Automotive Executive Survey 2015

“In the crucial battle to attain customers’ loyalty, automakers will have to cooperate with companies offering innovative technologies and services.”



AUTOMOTIVE INSTITUTE ANALYSES

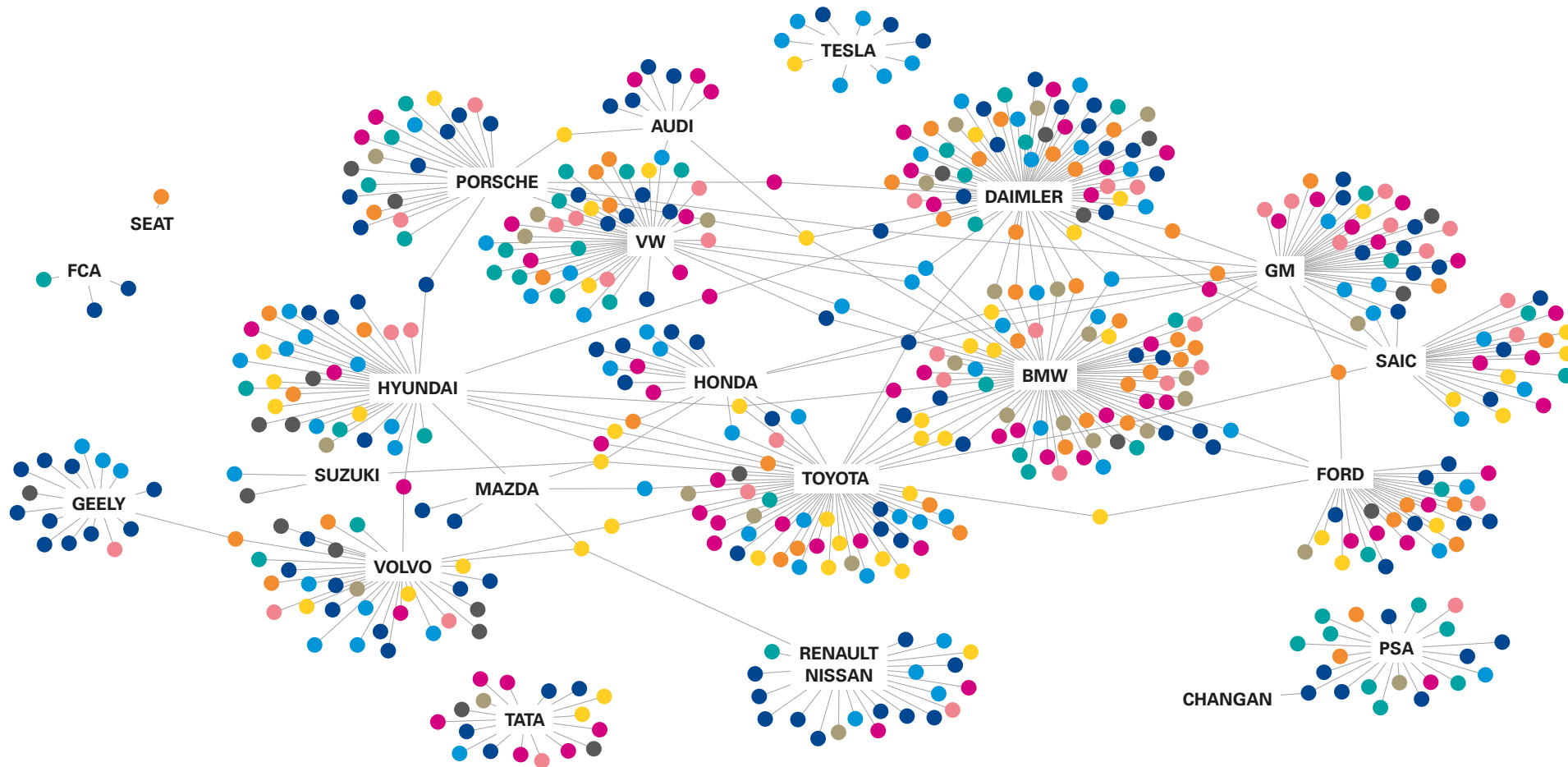
Source: Secondary research. KPMG’s Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



ANALYSIS

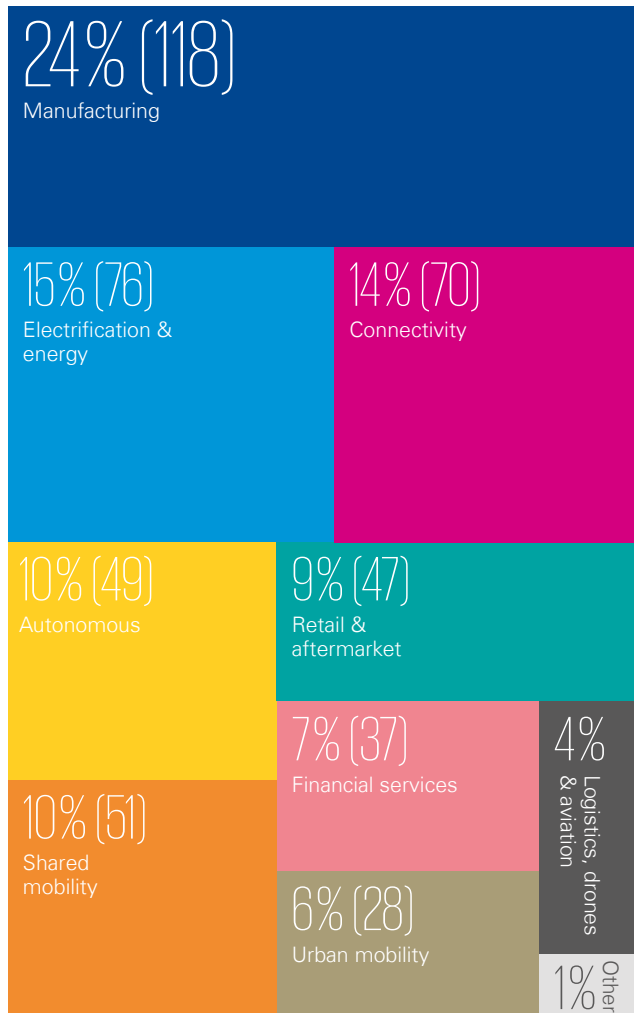
KPMG's smart ecosystem radar for OEM investment paths

AUTOMOTIVE INSTITUTE ANALYSES



- Manufacturing
- Connectivity
- Shared mobility
- Urban mobility
- Logistics, drones & aviation
- Electrification & energy
- Retail & aftermarket
- Autonomous
- Financial services

Source: Pitchbook 2020. KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



Investment paths provide a good indication of potential future co-competition scenarios as well as the existing presence players already have in the ecosystem.

When discussing these key investment areas for different types of players, it is interesting to analyze investment paths into start-ups worldwide. In doing so, it is possible to identify key investment interests and patterns over the years. It quickly becomes clear that tech, mobile, and social media companies have not invested heavily in asset-based businesses in recent years, since in the long term they believe only in non-asset-based business cases. For example, both Alibaba's as well as Amazon's key investment areas focus on software, retail, entertainment, and connectivity. In comparison, the investment paths of traditional automotive companies reveal a focus on older and more traditional topics, such as manufacturing or electrification & energy, stemming from their heritage. Investments in connectivity, shared mobility, or urban mobility have only recently emerged and are now being pursued by at least some of the premium OEMs.

In addition, analysis of investment paths provides an opportunity to better understand the dynamics and interdependencies of entire networks, as displayed in the network analysis chart on the left. This picture clearly shows which companies are already interconnected with each other, whether industry

players are collaborating to invest in the same areas, and whether individual players prefer investing within the industry or see more opportunities in the wider ecosystem.

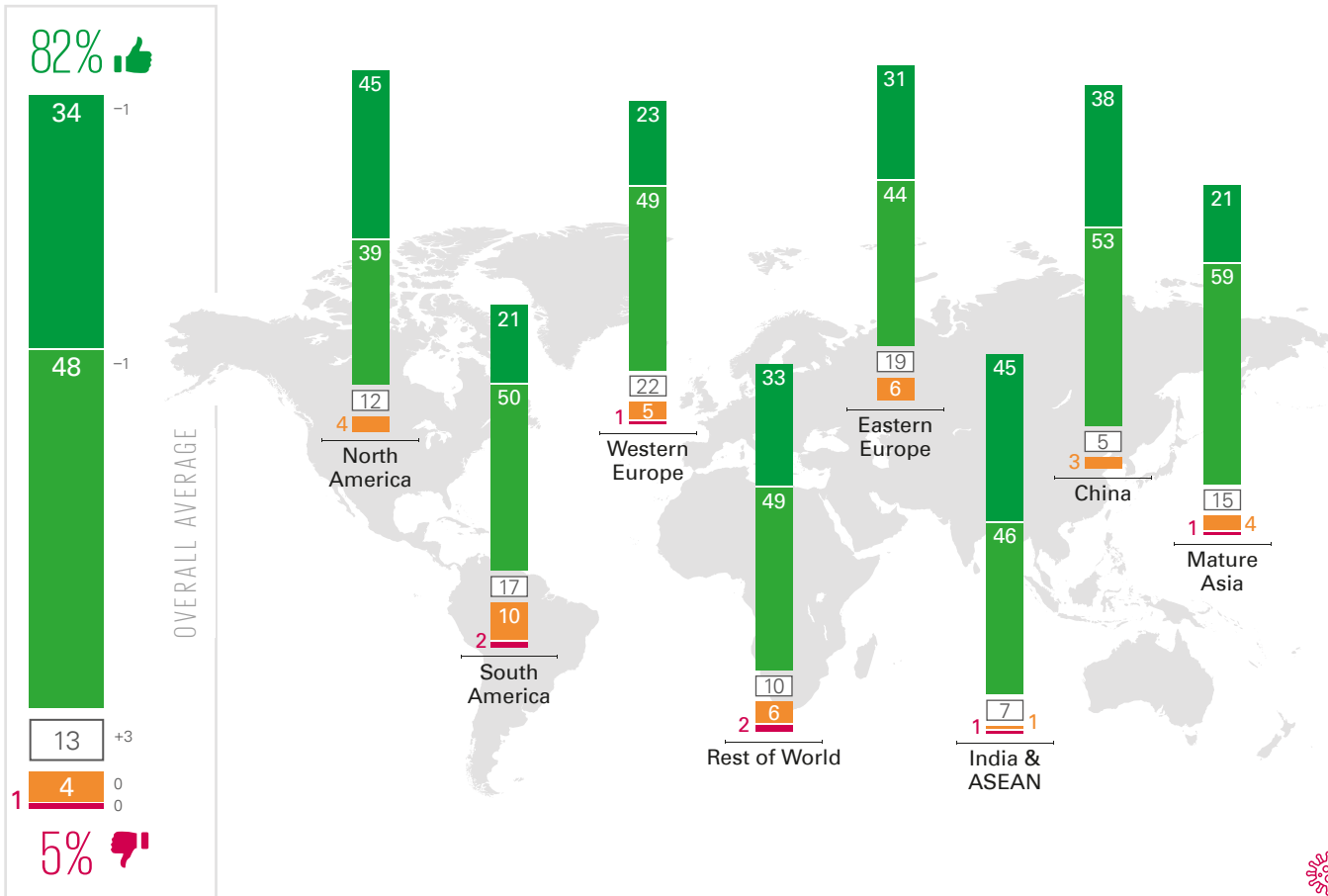
Having looked at the development of investments over the years (please see our online platform), although 24% of the investments made by traditional automotive players still focus on manufacturing, interest has been slowly declining in this area in recent years as we see a shift towards new topics such as electrification, autonomous driving, connectivity, or shared mobility solutions. One thing is certain, whichever investment path we look at, the share of information technology is growing in importance from year to year.

There will be many co-competition scenarios within these groups that the industry is not yet prepared for, **especially in light of an expected consolidation wave as a result of the current COVID-19 economic recession.** One of the biggest challenges will be to develop concrete co-competition models, including how to organize different cultures across different regions, in order to bring together the best skills and know-how despite existing organizational structures. These so-called agile work structures, where organizational power is not tied to a certain number of people in charge, but to the joint results of a team, are expected to become more important than ever.



Please describe how much you agree/disagree with the following statement:

From an ecosystem perspective, measuring market shares solely based on unit sales is outdated, as the future focus will be on miles driven or an alternative measure of usage.



Do units sold determine market success? Executives continue to stand by their opinion of the last three years: New values, such as miles driven, will measure market success in the future.

This year's results once again show that the majority of executives believe that measuring market shares based solely on units sold is outdated. 82% of executives believe that measuring vehicle usage or miles driven will become the focus of attention, but we regret that most companies still do not implement such ecosystem-oriented measures.

From a regional perspective, we see the highest combined absolute and partial agreement in China, Mature Asia, and India & ASEAN, and the lowest agreement in South America and Western Europe, where ecosystem thinking is less developed and still far behind.

When comparing hierarchy levels (please see our online platform), strategically oriented CEOs are more aware of new market share measures. This suggests that they are aware of the imminent shift in revenue streams from vehicle sales to car usage. Profits will be determined by access to data and miles traveled, not by units sold, especially if car ownership in certain applications, such as in cities, is fundamentally decreasing. *One prerequisite for the further rollout of alternative mobility solutions, especially in COVID-19 times, will be making people feel safe in cars shared by others.*

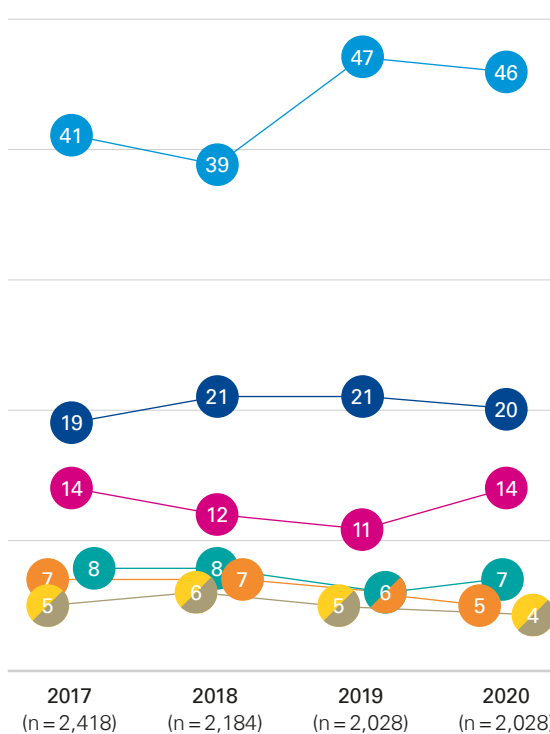
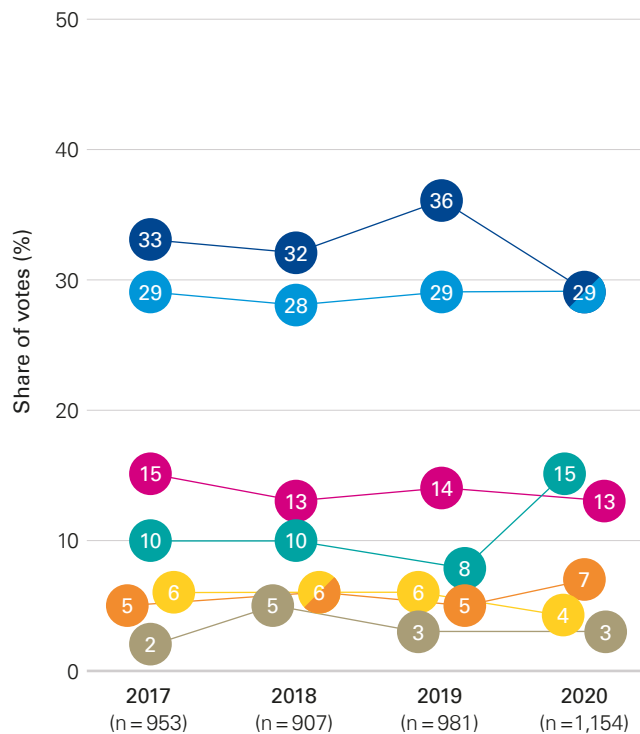
Absolutely agree ■ ■ ■ ■ ■ Absolutely disagree ±1 Change from GAES 2019 (n=981)

Note: Executives (n = 1,154). Figures in percent. Percentages may not add up to 100% due to rounding.

Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



Connected cars generate an enormous amount of consumer & vehicle data. Who do you think should be the “owner/guardian” of the vehicle data in 5 years’ time?



This year is the first time in five years that OEMs and the customer have received an equal share of votes by executives regarding who should be the owner of product-centric vehicle data.

In our understanding, vehicle data focuses on the connection between the customer and the use of the car by considering technological information about the car and its systems.

This year is the first time in five years that OEMs and the customer have received an equal share (29%) of votes by executives regarding who should be the owner of product-centric vehicle data, due to a 7% decrease in votes for OEMs from 2019 to 2020. On the consumer side, it is interesting to note that ICT companies are rated closer to OEMs than in the previous years. In China (please see our interactive online platform), customers received only 10% of executive votes to own the vehicle data, while ICT companies and suppliers received 26% and 22% respectively.

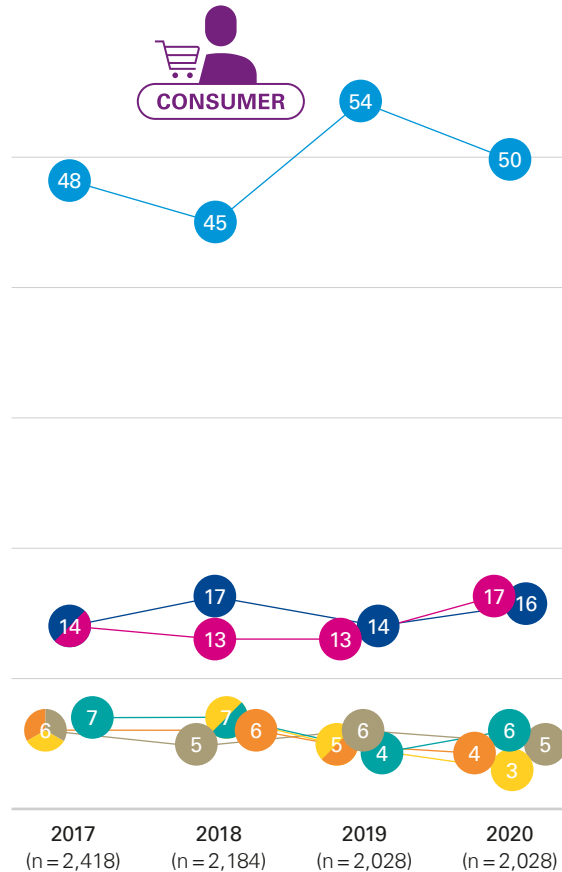
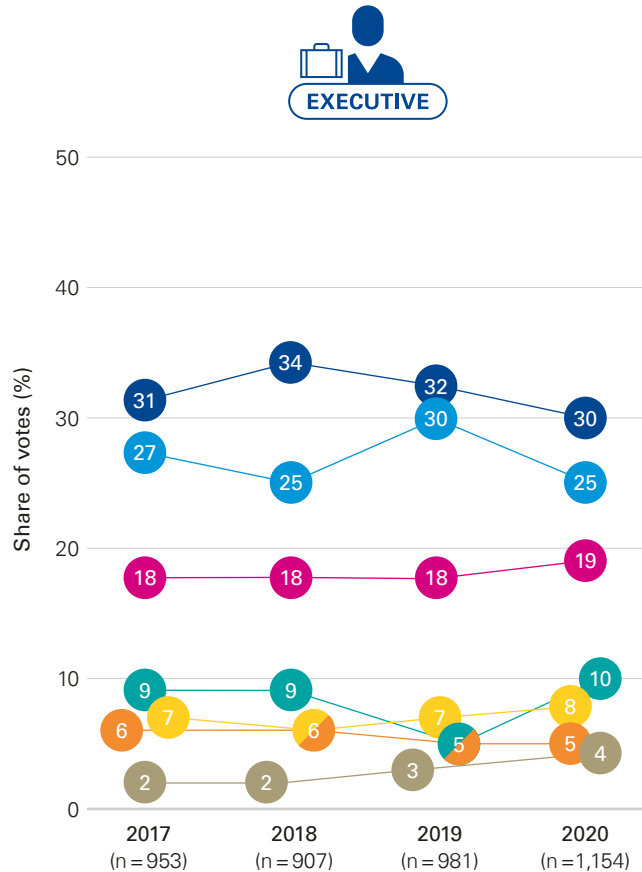
- OEMs/vehicle manufacturers
- Owner/driver of the car
- ICT companies
- Suppliers
- Mobility solutions providers
- Retailers/car dealers
- Government

Note: Executives (n = 1,154). Consumers (n = 2,028). Figures in percent. Percentages may not add up to 100% due to rounding.

Source: KPMG’s Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



Connected cars generate an enormous amount of consumer & vehicle data. Who do you think should be the “owner/guardian” of the consumer data in 5 years time?



Customer data is non-negotiable as property of the owner.

In our understanding, customer data focuses on customer behavior in the car, such as usage time, personal driving style, consumption behavior, health status, etc.

Executives have now shared a clear opinion for three consecutive years on the ownership of the valuable consumer data generated in a vehicle. In the past three years, fewer and fewer executives believe that customer data should be owned by OEMs (34% in 2018 to 30% in 2020). This is a trend we have been postulating for years, as we believe that cars are just an additional application in the life of consumers, and ICT companies already have a much more complete picture of consumer data and individual consumer profiles than OEMs.

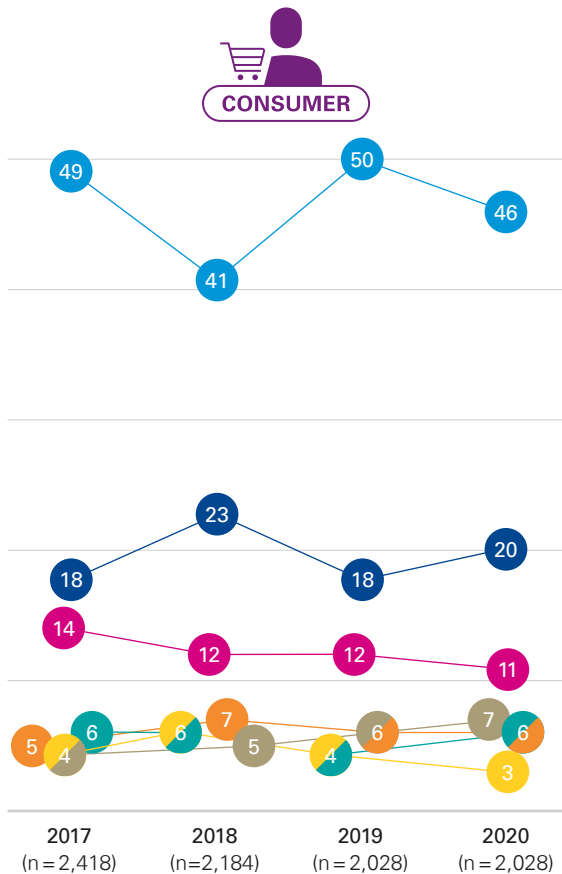
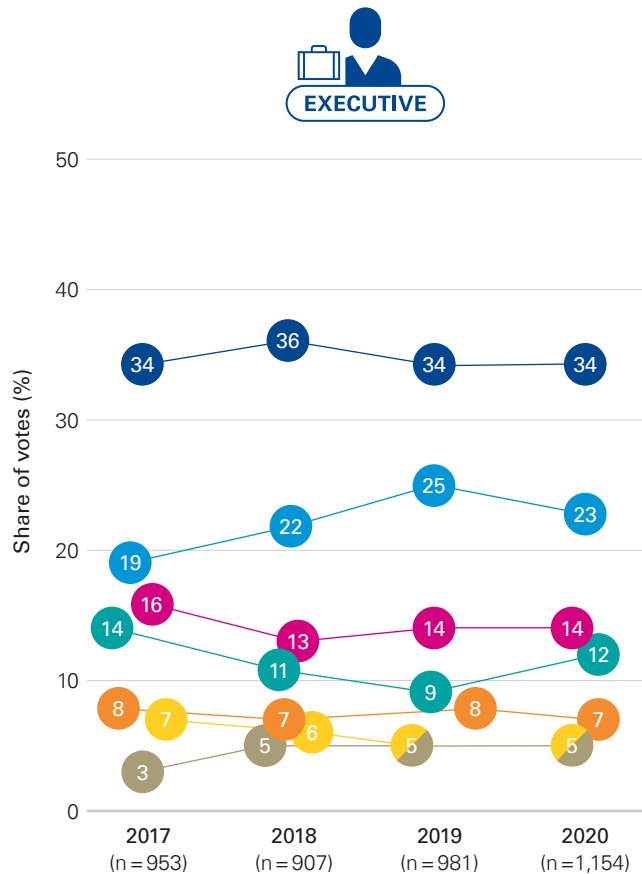
Using our interactive online platform, we see that while executives in most regions of the world share the global opinion, only 6% of executives in China agree that the owner of the consumer data should be the driver of the car. Instead, Chinese executives believe that consumer data should be owned by ICT companies and OEMs. Furthermore, one can observe that executives from regions with higher consumer data protection laws believe in consumer data ownership by the driver of the vehicle, whereas those from countries with lower standards of consumer data protection agree less to ownership of consumer data by the driver of the vehicle.

- OEMs/vehicle manufacturers
- Owner/driver of the car
- ICT companies
- Suppliers
- Mobility solutions providers
- Retailers/car dealers
- Government

Note: Executives (n = 1,154). Consumers (n = 2,028). Figures in percent. Percentages may not add up to 100% due to rounding.
Source: KPMG’s Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



Who do you think a consumer would trust most as the "owner/guardian" of the data generated in a vehicle?



- OEMs/vehicle manufacturers
- Owner/driver of the car
- ICT companies
- Suppliers
- Mobility solutions providers
- Retailers/car dealers
- Government

Note: Executives (n = 1,154). Consumers (n = 2,028). Figures in percent. Percentages may not add up to 100% due to rounding.
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Executives and consumers are not aligned with respect to whom consumers would trust most with their data.

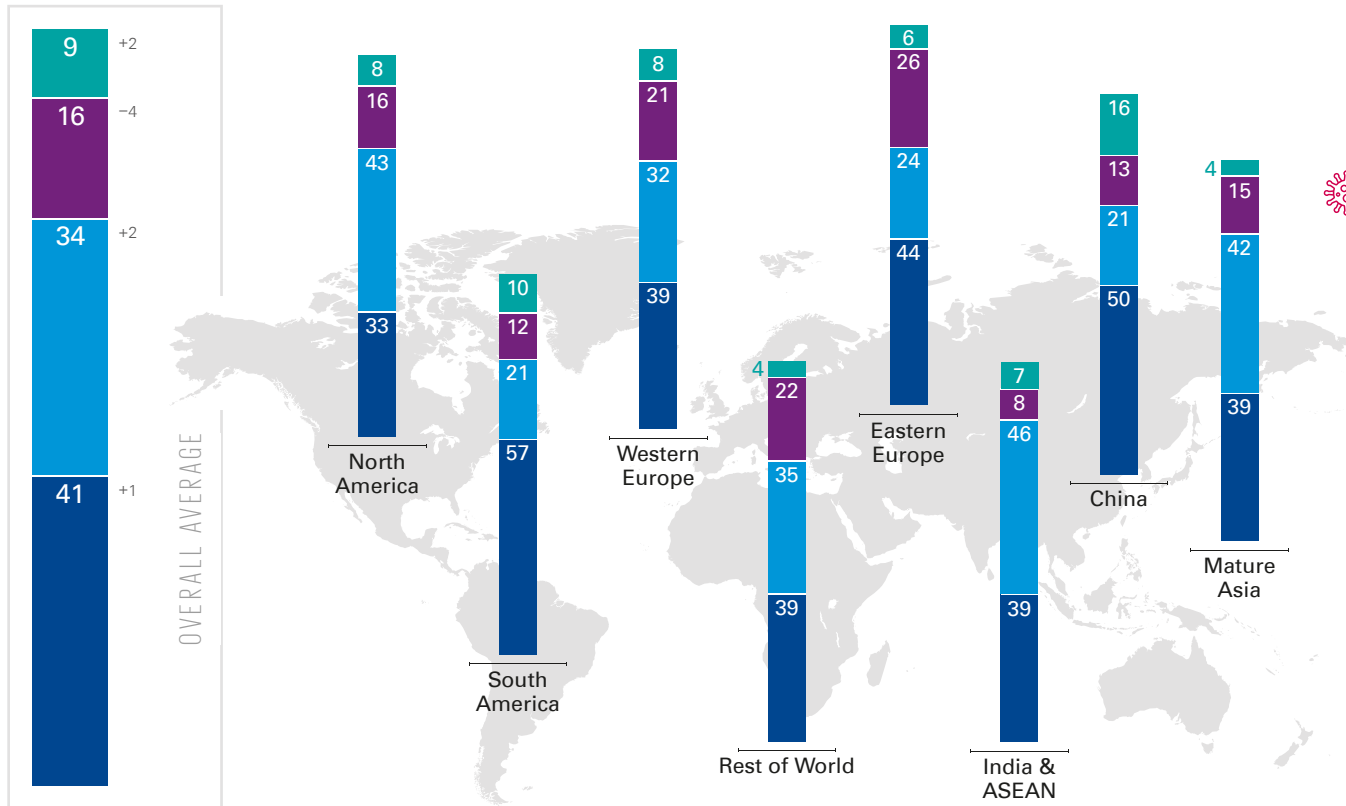
What stands out again in this year's results is the vast difference in opinions between executives and consumers with regards to whom consumers would trust most with their data. While consumers clearly say that they want to have control over their data (46%), executives still believe that OEMs would be trusted most to own the consumer data (34%). In our opinion, one approach to close this gap in opinions is to provide more transparency on how data is used. This includes showing a positive impact to customers, which means either taking a TCO-oriented approach or creating added value. We believe that the low level of trust in ICT companies especially (14%) can be explained precisely by this lack of transparency.

Consumer trust, on the other hand, is distributed at 20% for OEMs, 11% for ICTs, 7% for governments, and less than that for other ecosystem players. Comparing results over the last five years, the gap between trust in themselves and trust in OEMs has changed only slightly – a little in favor of OEMs.

Comparing regions using our interactive dashboard on our online platform, one can see that OEMs are trusted most by consumers in India and ASEAN (32%), Mature Asia (29%) and South America (28%). Compared with other countries, Chinese consumers have more confidence in ICT companies as owners of their data (23%). This once more clearly demonstrates that ICT companies in China are much more integrated in the ecosystem than in other regions of the world.



What do you judge to be the most likely area in which car companies can monetize data?



More than 40% of executive respondents agree that monetizing data is best done with safety-oriented applications, such as car-2-x communication.

This year's results once again show that safety-oriented applications such as car-2-x communication dominate the opinion of executives surveyed worldwide (41%).

With new realities after COVID-19, we can assume that support for this opinion will grow, as physical integrity becomes much more important.

If we link our thoughts to the "Customer value" chapter, in which we elaborated on the transition from ownership to use, we expect to no longer see the asset car in the future. Urban applications, where owning a car is becoming a burden for customers, are therefore seen as particularly lucrative. We also believe in differentiating between applications and vehicle segments, as a model for monetizing premium data could look different to a "mass" data model.

Comparing results regionally, support for safety-oriented applications is highest among executives in China (50%) and South America (57%). As in last year's survey, executives worldwide continue to agree that the second greatest potential for data monetization lies in performance-based models, which provide information about performance and emissions and which can also be used for maintenance purposes. The lowest level of agreement for this type of application is seen in China, where on the other hand ecosystem-orientated applications rank highest (16%). Regional differences in opinions once again indicate that there cannot be a single global approach for all data-driven business models. The market demands a completely locally tailored approach, in order to comply with local regulatory standards and customer preferences.

- Safety-oriented:** guarantee better anti-theft capabilities, car-2-x communication
- Performance-oriented:** guarantee better performance of the car (e.g., emissions, maintenance)
- Customer-oriented:** community profiling & better touchpoint management
- Ecosystem-oriented:** resale of generated data to third parties (e.g., insurance, weather, groceries)

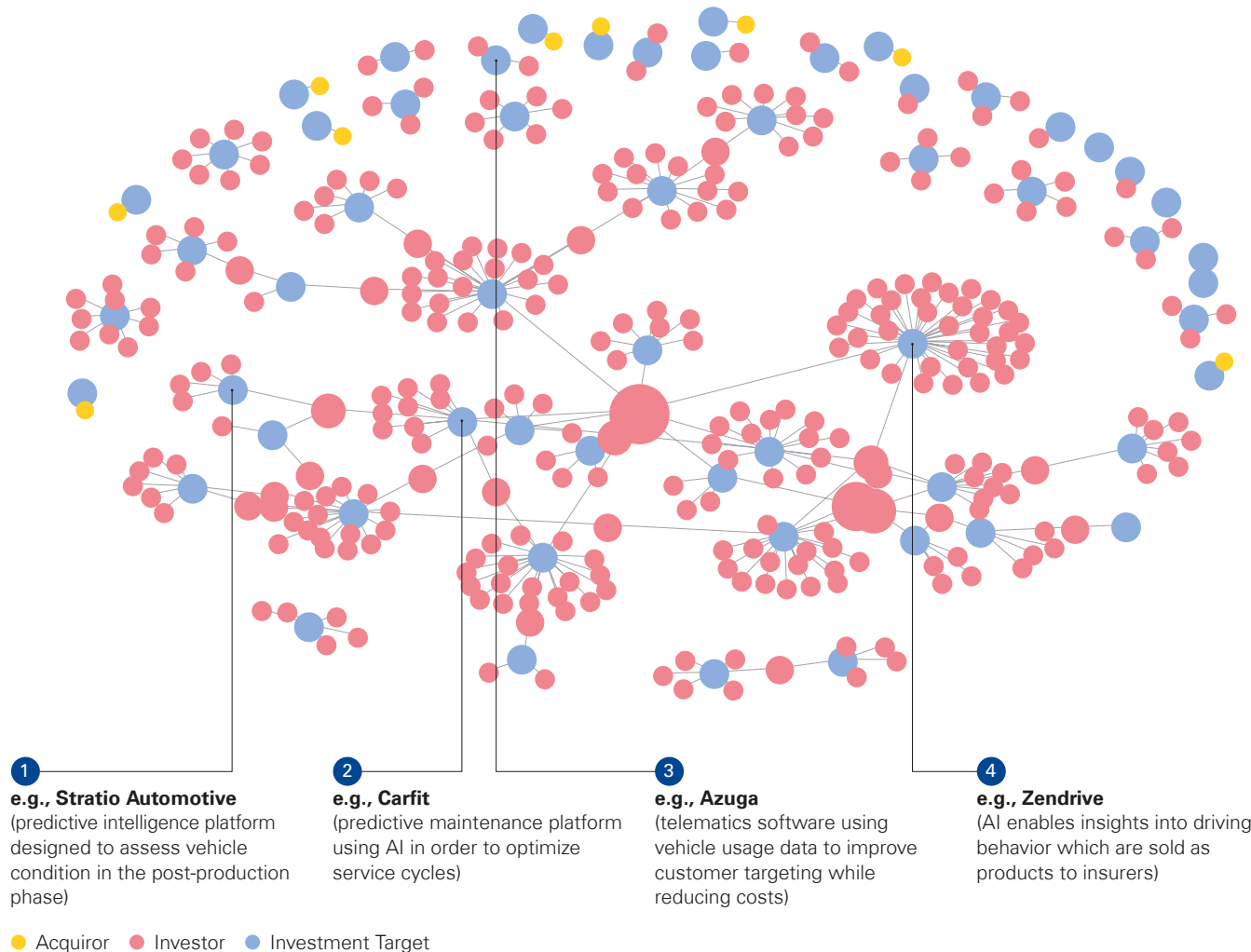
±1 Change from GAES 2019 (n=981)

Note: Executives (n = 1,154). Figures in percent. Percentages may not add up to 100% due to rounding.
Source: KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute



KPMG's smart ecosystem radar for data science | Start-up monitoring

Data science | automotive industry



Data is the raw material for ICT company business models – start-up monitoring helps reveal the secret of data-driven business models.

For years, automotive companies have been trying to find out in which areas data-driven business models have the highest probability of success. The more customers switch from buying to usage models, the more pure asset models will lose their appeal. With KPMG's Smart Ecosystem Radar (SERa) we have developed a start-up monitoring tool that provides ideas for such data-driven business models.

Will data one day become so valuable that mobility becomes free of charge? There are many ways of monetizing customer usage data. We have identified four main areas in which companies are investing to make use of data and ranked them based on customer responses about their willingness to provide their personal usage data for certain applications:

- 1 Optimization of internal processes**
(e.g., adaptive engineering)
- 2 Predictive maintenance**
- 3 Customer journey mapping**
- 4 Revenue streams from parallel industries**
(e.g., insurance, infrastructure, healthcare)

The chart on the left highlights examples of start-ups – which are being invested into by players in the automotive industry – active in these four core areas.

Source: Pitchbook 2020. KPMG's Global Automotive Executive Survey 2020 | © KPMG Automotive Institute

KPMG's latest automotive thought leadership



2020

Anticipating the green flag: Accelerating a COVID-19 exit for auto retailers

When the COVID-19 lockdown ends, U.S. auto shoppers will start buying again – but many say they won't set foot in a showroom. KPMG surveyed 2,500 consumers in April to find out what auto demand will look like after the lockdown and how auto retailers can capture that demand.



2020

EV Plan B?

Most American drivers are not willing to pay more for EVs and are not comfortable driving on battery power. Yet, automakers are preparing to introduce hundreds of models into the U.S. market in the next five to ten years, risking a potential glut. KPMG shows automakers how they can recalibrate their EV plans in this new report.



2019

Automotive semiconductors: The new ICE age

In advanced automobiles the Internal Computing Engine replaces the Internal Combustion Engine. We are entering a new automotive age, when cars will be differentiated by the functionality enabled by semiconductors and electronics. This shift places semiconductors at the heart of automotive innovation.



2019

The future of automotive retailing

The impact of e-commerce on auto retailing is hard to miss. The challenge to remake automotive retailing to deliver a better customer experience – while enabling dealers to make money, too – is massively complex. It will take innovation, new dealer strategies and collaboration with automakers.



2019

Digital Gravity

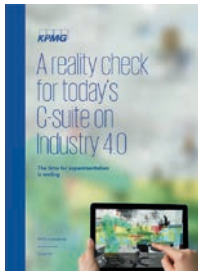
Compared to other industries, the automotive industry has the greatest advantage in terms of experience as it has been the “fastest” to adopt digital transformation. We have therefore asked executives in the automotive sector about the topics of leadership, culture, organization, processes and technology as part of this global study.



2019

Global Automotive Executive Survey 2019

Seamless Vehicle2Grid transition is a treasure of islands. See them sooner with KPMG.



2018

A reality check for today's C-suite on Industry 4.0

Industry 4.0 (i4.0) is a historic paradigm shift that has the potential to catapult manufacturing into the next generation. But true progress is being thwarted by familiar roadblocks – including a lack of leadership and strategic direction, confusion, fear of disruption, ROI uncertainties and more.



2018

Autonomy delivers: An oncoming revolution in the movement of goods

Consumers using autonomous delivery to move goods: This change in consumer behavior will lead to an explosive new demand for autonomous delivery vehicles, specialized for different kinds of delivery, as well as new service businesses and new infrastructure.



2018

Global Automotive Executive Survey 2018

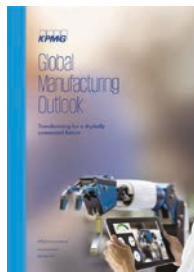
It's time to join forces, refocus on a strong asset-based heritage, wisely conquer new white spots and find out how and where asset-based companies can really compete with non-asset based digital giants who claim the same roles, touchpoints and profit streams.



2018

Me, my life, my wallet

A comprehensive survey focused on identifying what consumers value in an experience, understanding which moments matter to them, getting smarter about the connections that contextualize their lives, and learning about the trade-offs they make regarding time and money.



2018

Global Manufacturing Outlook

In this 8th edition of the Global Manufacturing Outlook report, our findings from a survey of 300 CEOs and interviews with manufacturing industry executives and KPMG partners show there is no time to waste in building a comprehensive digital transformation strategy.



2017

Global Captive Finance Survey 2017

Automotive captive finance companies have grown considerably in recent years, benefiting from high margins and somewhat manageable risk exposures. However, they face changes in the market environment, technology and regulation.

Acknowledgements



ANGELIKA
HUBER-STRASSER

**EMA & German
Head Automotive Practice**

I wish to personally thank our respondents and contributors for their involvement in this year's survey.

In the 2020 survey, its 21st consecutive year, more than 1,100 senior executives from the world's leading automotive companies were interviewed. As in previous years, participants included automakers, suppliers, dealers, financial services providers, mobility services providers, and companies from the information and communication technology sector. We also interviewed energy and infrastructure providers as well as government authorities – allowing for a comprehensive and yet differentiated view across the entire ecosystem.

Additionally, more than 2,000 consumers from around the world gave us their valuable perspectives and expectations, so that we could compare these with the opinions of the leading global auto executives.

The responses were very insightful, and I would like to personally thank all those who participated for giving us their valuable time.

Our very special thank you goes to Dieter Becker for his tremendous enthusiasm and commitment in leading this study. In addition we would like to thank the entire KPMG global automotive sector steering group and the whole Automotive Institute team in Germany, under the lead of Aline Dodd, Global & EMA Executive for Automotive, for their creativity, inspiration, and dedication throughout the realization of this thought leadership project.

How to use the online platform: Interactive n-dimensional dashboards for individualized analyses

automotive-institute.kpmg.de

Navigate through different pre-built analyses to find the answers you are looking for.

Customize each dashboard

Apply several filters, try combinations, and find out more about differences between, e.g., regional perspectives **1** or differing stakeholder views! All results displayed on a dashboard are adjusted according to the selection of applied filters **2**. The deep dive view, found on many dashboards in the lower half, gives you a more detailed view of the core results in the upper half. Choose an analytical dimension **3** that best meets your interests and deepens your insight!

Maybe you'll find answers to questions we haven't even thought of ...

Directly interact with the dashboard & dig deeper into the results

Apart from the filter function, you can also directly interact with the dashboard by hovering over results **4** for detailed information or by picking specific areas of interest **5**. Just click on the respective part of an analysis and you will find all displayed results filtered accordingly.

Executive vs. consumer view

Executives and consumers were asked many of the same questions **6**. Compare the answers of both respondent groups!

Customize the results of an executive dashboard by region, stakeholder type, job title, and company revenue **7**. All data displaying consumer views can be filtered by region, age, educational background, and living circumstances.

"n" represents the number of respondents **8** that are contained in your current filter selection.

There is not only one global answer:

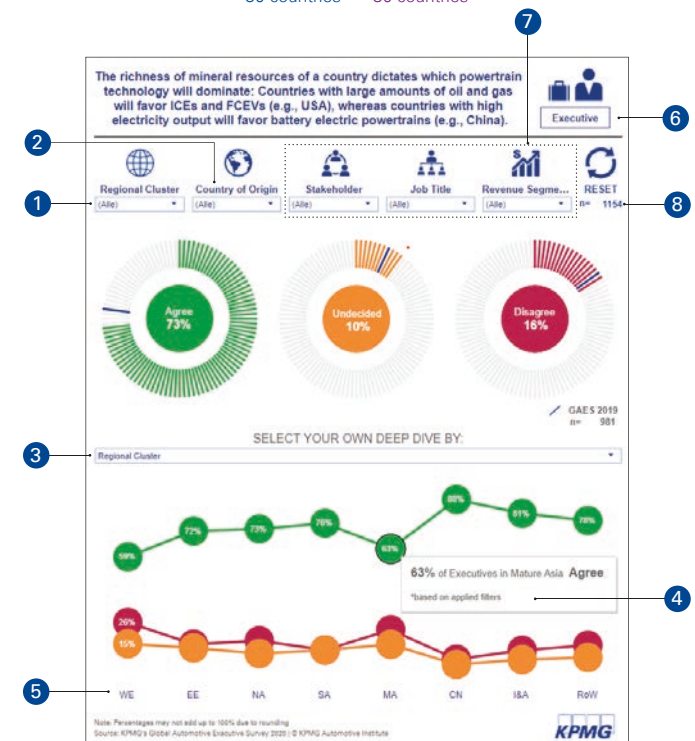
OVER 2 MILLION
DIFFERENT VIEWS



EXECUTIVE CONSUMER

Contains 1,154 interviewed executives from 30 countries

Contains 2,028 interviewed consumers from 30 countries



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