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Automotive & Assembly Practice

Europe's economic potential in the shift to electric vehicles

The growth of electric vehicles presents both opportunities and challenges for Europe's economy. How can the automotive industry thrive in an increasingly electric world?

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October 2024

Executive summary

The automotive industry has been a stronghold of the European economy for decades but is now facing disruption from electric mobility. In 2023, the industry contributed $1.9 trillion in gross value added (GVA), with technology and car exports creating $620 billion in value. Electric mobility could add $240 billion to $300 billion in GVA in after-sales support and services by 2035. But based on current trends, European production value added could drop by $400 billion over the next decade. This assumes that European OEMs' global market share falls to 45 percent, from 60 percent, and that the value added from European OEMs' internal combustion engine (ICE) vehicle production is 85 to 90 percent, 50 to 60 percent for battery electric vehicles (BEVs) produced in Europe by non-European OEMs, and 15 to 20 percent for imported BEVs. Yet in turn, Europe and European OEMs could still reap the full benefits of the BEV disruption and even slightly increase current GVA from production, provided automotive companies pursue innovative strategies and participate in growing global markets, strengthen industry collaboration, and implement effective policies.

Europe has long been a pivotal force in the global automotive industry, renowned for being the birthplace of the automobile and subsequent innovations. European OEMs have consistently set the standard for designing and engineering safe and fuel-efficient vehicles; advanced vehicle safety features have helped to make European roads some of the safest in the world, while the region has historically also been a forerunner in fuel economy standards. In addition to positioning European auto brands as technology leaders, European OEMs' efforts have cultivated deep loyalty among global consumers.

Europe and the rest of the world are on a path to one of the greatest automotive transformations in history as vehicle electrification passes a tipping point. Our latest research and analysis finds that interest in electric vehicles (EVs) has surged among European consumers, with year-over-year sales increasing an average of more than 50 percent from 2020 to 2023. In recent months, however, EV sales in Europe have decelerated, at the same time as recent declines in battery-electric-vehicle (BEV) subsidies and burgeoning consumer interest in affordable EVs. Still, the region's long-term prospects for electrification remain strong. The global EV market is growing, primarily spurred by sales in China. (For a closer look at EV sales growth in China, Europe, and the United States, see sidebar "The McKinsey Electric-Vehicle Index.")

To understand how EV sales growth could affect Europe's automotive industry and economy, we quantified the GVA with the region's shift to EVs in 2035. We analyzed the current upstream value created by component and vehicle production and sales, as well as potential changes in downstream GVA from after-sales services, learning that the transition to EVs will have the greatest impact on upstream GVA. We then modeled three scenarios that show how the choices that European automotive leaders make today could affect value creation over the next decade. Building on our road map that defines seven pillars for the European auto industry to prosper, we identify strategies that could help the region thrive as electrification continues.

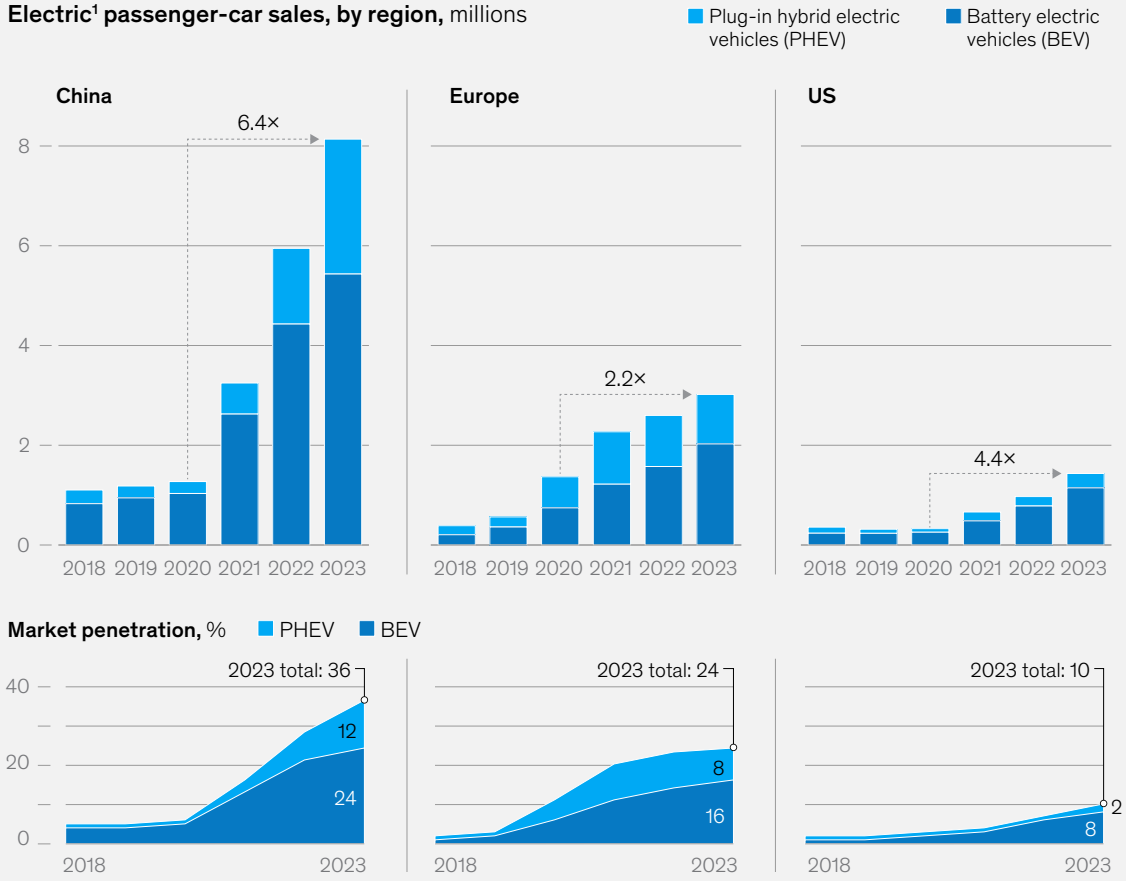
Our scenarios depict a range of outcomes for automotive stakeholders. If European auto leaders are not able to capture the benefits from electrification, more than $400 billion in upstream GVA—about 35 percent of the total—could be at risk in Europe. If they manage the transition well, however, e-mobility could generate about $300 billion in added value for Europe's economy, with multiplier effects on adjacent industries. (One caveat: this report assumes that all new cars sold in Europe in 2035 will be EVs, in line with the current regulation to phase-out sales of ICE vehicles. If policy makers decide to alter their sustainability commitments, the analyses presented in the report would still hold true at any new date.)

The McKinsey Electric-Vehicle Index

The global electric-vehicle (EV) market sustained its upward trajectory in 2023, with sales surpassing 13 million units—a 35 percent increase from the previous year (exhibit). China continued to propel growth in EV markets, with more than eight million units sold (a 37 percent year-over-year increase), which accounted for about 60 percent of new global EV sales. Meanwhile, Europe's sales growth rate decelerated to 16 percent, with over three million EVs sold, while the United States maintained a robust 48 percent growth rate, with EV sales reaching nearly 1.5 million units. (Globally, battery electric vehicles accounted for 13 percent of all new-vehicle sales, and plug-in hybrids represented an additional 6 percent.)

Exhibit

Global electric-car sales surpassed 13 million units in 2023, driven largely by sales in China.



[1]Battery electric and plug-in hybrid electric vehicles.
Source: EV Volumes; Light Vehicle Sales Forecast, S&P Global, Apr 2024; McKinsey Center for Future Mobility

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Significant value at stake amid a challenging shift to EVs

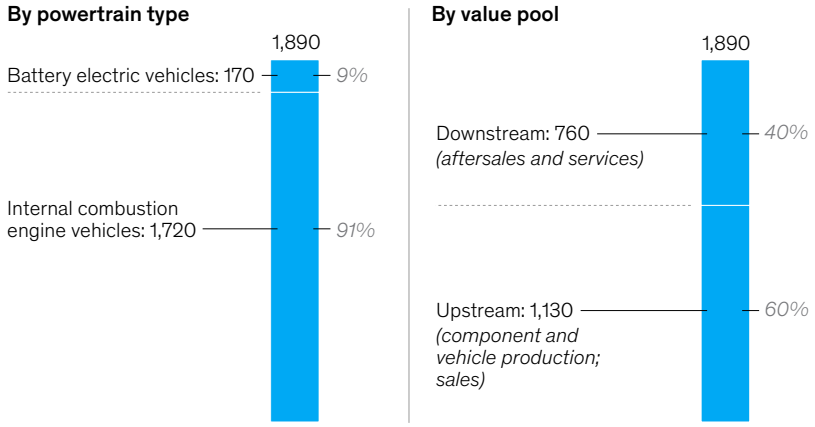
The European auto sector remains integral to the region's economy, with our analysis revealing that it generated about $1.9 trillion in GVA for the European economy in 2023, about 8 percent of the region's total GDP (Exhibit 1). Europe currently produces about 13 million passenger cars each year—more than one in six worldwide—and exports about four million.[1] Directly employing about 5.5 million people across the value chain, the auto sector accounts for nearly 12 percent of all EU manufacturing jobs. Beyond employment, the auto industry fuels innovation by investing $64 billion in R&D each year—more than 30 percent of total EU R&D spending.[2] In 2023, 12 million cars were sold in Europe, with BEVs representing a 16 percent share, and of the region's 294 million registered vehicles, BEVs made up roughly 2 percent.

The European automotive landscape is fundamentally changing in response to global energy transition commitments, with many countries agreeing to phase out new ICE vehicle sales, and Europe's target set for 2035. Automakers also face the emergence of new forms of mobility and shifting consumer preferences—in particular, the desire for increased vehicle connectivity. As a result, value chains are shifting to accommodate differences in EV design and manufacturing, as EVs incorporate a 40 to 50 percent share of nontraditional car components (such as batteries and semiconductors). At the same time, incumbent OEMs face intensifying competition from disruptive new OEMs that have already won a 55 percent share of the global EV market. Given the importance of the automotive sector to Europe as a whole, these changes could profoundly influence the region's future economy. (For more on how the shift to EVs could affect

Exhibit 1

Europe's automotive industry is an economic powerhouse, contributing about $1.9 trillion in value to the European economy in 2023.

European[1] automotive gross value added (GVA) composition, 2023, $ billion



[1]Europe = EU-27, Iceland, Liechtenstein, Norway, Switzerland, and UK.
Source: International Monetary Fund; McKinsey Global Institute analysis; McKinsey analysis

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[1] The McKinsey Center for Future Mobility estimates are based on passenger cars in the European Union, the United Kingdom, and the European Free Trade Association (EFTA). Annual production of 13 million passenger cars does not include the production volume of European OEMs in non-European plants.
[2] "R&D shares of industrial sectors in the European Union," ACEA, May 4, 2023.

Ten key insights about Europe's electric-vehicle transition

Exhibit

The economic impact of Europe's transition to electric vehicles reveals ten critical insights.

1. In 2023, the European automotive industry contributed ~$1.9 trillion in gross value added (GVA) to Europe's economy (~8% of GDP[1]), with upstream (component and vehicle production and sales) representing ~60% (~$1,130 billion) and downstream (after-sales services) representing ~40% (~$760 billion).
2. Europe's automakers contributed two-thirds of upstream GVA ($750 billion), followed by Japanese and Korean brands, at 20%, US brands at 10%, and Chinese brands at 3%.
3. Europe is an export powerhouse, with automotive technology and car exports representing ~55% (~$620 billion) of upstream GVA, compared with ~35% from European OEMs' local production and sales, and ~10% from foreign OEMs' sales in Europe.
4. Europe has built a strong value chain for internal combustion engine (ICE) vehicles, resulting in an 85–90% "European value add" for an ICE vehicle developed, produced, and sold in Europe, compared with 70–75% for an EU battery electric vehicle (BEV), due to Europe's strong dependency on the Asian battery value chain.
5. If a BEV is no longer developed in Europe but only produced and sold there (for example, foreign OEMs that maintain a local presence in Europe), the European value add drops to 50–60%, with further declines to 15–20% for an imported BEV that is developed and manufactured abroad.
6. Disruptors' global electric-vehicle (EV) market share has surged, reaching ~55% in 2023 and more than 90% in China, putting Europe's GVA at risk.
7. If this trend continues, $400 billion of upstream GVA, or ~35%, may be at risk in 2035, with European automakers' market share dropping to 45%, from 60%; the EU battery value chain remaining insufficient; and passenger-car exports falling to 2.3 million, from 3.7 million ("disruptive scenario").
8. However, if Europe could replicate its ICE expertise with BEVs, upstream GVA could be maintained. This would likely require a fully built-out EV ecosystem, continued technology leadership, and market shares at pre-2020 levels, or ~65% ("full-potential scenario").
9. With downstream GVA growing in all scenarios by $200 billion–$300 billion, mostly due to a larger fleet, higher financing penetration, and new services such as EV charging infrastructure (EVCI), digital services, and battery recycling, a gap of ~$500 billion remains between the disruptive and full-potential scenarios.
10. Through leveling the regulatory playing field,[2] collaborating on the industry's critical value chains,[3] and boosting local firms' productivity and performance,[4] Europe could close 70% of this gap by 2035, bringing total GVA above $2 trillion ("ambitious-plans scenario").

[1]GVA = GDP – (taxes + subsidies); direct and indirect effects included, eg, considering impact of EV transition on suppliers and suppliers of suppliers.
[2]Eg, reducing bureaucracy, stimulating cost competitiveness, and investing in critical infrastructure.
[3]Eg, battery, semiconductors, software, and critical materials.
[4]Eg, through agile processes, upskilling, and performance culture.
Source: McKinsey analysis

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Europe, see sidebar "Ten key insights about Europe's electric-vehicle transition.")

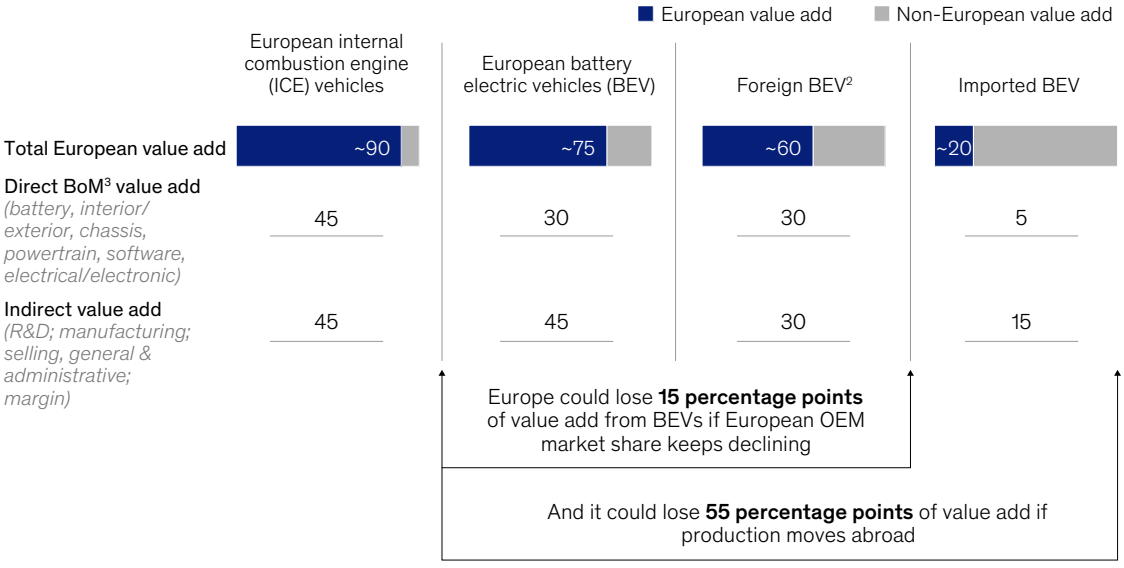
To fully understand the impact of the transition to EVs, we first analyzed the European auto industry's current GVA for both ICE vehicles and BEVs. For upstream GVA in 2023, about 55 percent of the $1.1 trillion in value came from export and overseas production of European cars, components, and technology. Another 35 percent came from European OEMs developing and selling cars in their home market, while 10 percent resulted from overseas OEMs selling vehicles in Europe.

While electrification is an important part of achieving global climate goals, if the transition is not properly managed it could significantly disrupt how much value the European auto industry can generate over the coming decades. BEVs that are developed, manufactured, and sold in Europe currently contribute 70 to 75 percent of their manufacturers' suggested retail price (MSRP) to the region's economy (Exhibit 2). That percentage is lower than the 85 to 90 percent typically seen with ICE vehicles, because Europe's battery value chain is not yet fully developed. The gap in GVA is even wider for non-European BEVs manufactured and

Exhibit 2

Europe could lose significant value added from battery electric vehicles if its OEMs' market share continues to decline and production moves abroad.

European value add, by type of car, 2023, % of MSRP[1]



[1]Manufacturer's suggested retail price.
[2]Foreign OEM, produced and sold in Europe.
[3]Bill of materials.
Source: Expert interviews; McKinsey Center for Future Mobility trade flows model; McKinsey Global Institute analysis; McKinsey analysis

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sold in Europe, which contribute only 55 to 60 percent of their MSRP to the region's economy, mostly because R&D and other overhead costs remain largely outside Europe. For an imported BEV that is developed and manufactured abroad, Europe captures only 20 percent of its value added.

Three potential high-stakes scenarios

The shift to EVs has already started to redefine the global market. Over the past 20 years, Europe, Japan and South Korea, and North America—historically, the three largest regions for car manufacturing—have considerably reduced shares of global passenger-vehicle production. Meanwhile, nearly one-third of the world's cars are now made in China, making it the most significant global auto market.

While multinational OEMs and their suppliers have greatly benefited from that trend, in recent years, Chinese OEMs have caught up in global market share, now accounting for 20 percent of global vehicle sales. In 2023, it is estimated that they have also become the world's leading region for vehicle exports for the first time. (This is even more pronounced in the BEV segment, where they capture over 45 percent.) This tendency also holds true for the sales mix in Europe, where Chinese OEMs are beginning to expand, having reached about 2 percent (and about 12 percent of BEVs in the entry/volume segment). Initially, OEMs sought growth through imports but have transitioned to localized production to avoid costly import tariffs.

Whether Europe can replicate its expertise with ICE vehicles in a fully BEV future is uncertain, but if it is unable to seize this opportunity, its auto industry could be headed for long-term disruption if current trends accelerate. To help industry leaders prepare for the future, McKinsey has modeled three potential scenarios for 2035 based on varying assumptions about the EV transition (Exhibit 3):

- a "disruptive scenario," in which emerging EV companies significantly reshape European markets, potentially leading to a $400 billion decline in European GVA
- an "ambitious-plans scenario," in which European industry leaders carry out their current plans to support the domestic automotive sector, enabling Europe to contain its GVA loss upstream to about $130 billion, while adding $280 billion in downstream GVA
- a "full-potential scenario," in which European OEMs fulfill their greatest potential for value creation: maintaining upstream GVA and capturing $300 billion in additional downstream value from new EV-related services and other activities

Disruptive scenario: New entrants shake up European automotive markets

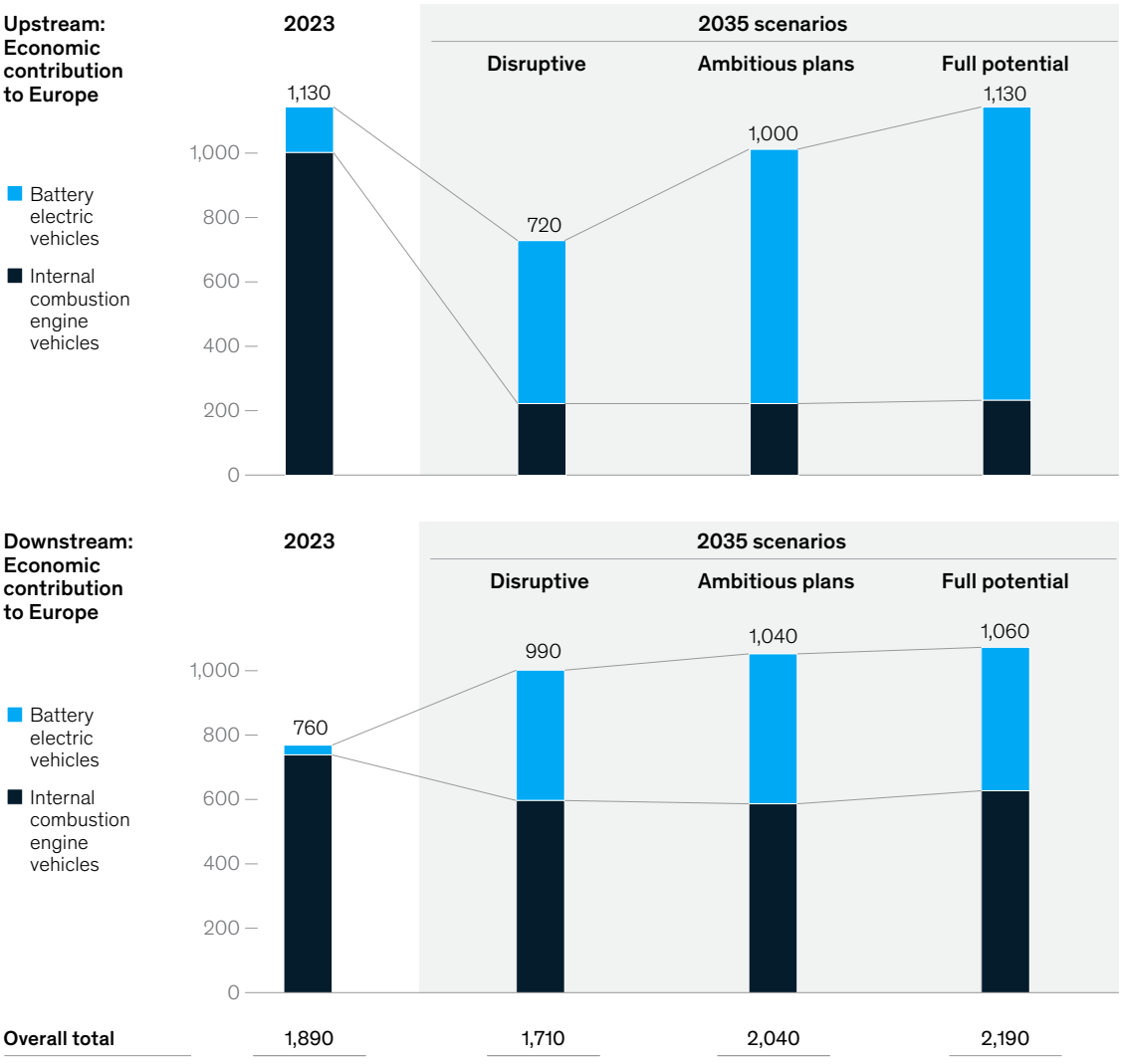
In the current transition to EVs, new entrants could continue to capitalize on their competitive advantages and challenge European OEMs on multiple fronts. Some Chinese EV manufacturers, for instance, can develop vehicles twice as fast as European OEMs, and at a 20 to 30 percent lower cost. In addition, China dominates key battery material supply chains in regions such as Africa and Indonesia and accounts for 90 percent of the world's capacity for lithium production, a critical metal for making EV batteries.

In a disruptive scenario, European OEMs' domestic market share could drop to 45 percent in 2035, from about 60 percent in 2023, with the region's market share abroad falling to 7 percent, from 12 percent, over the same period. Among other shifts, Europe could produce 20 to 25 percent fewer cars, with exports declining by 40 percent and imports increasing by an additional 1.2 million cars. Upstream value could decline by more than

Exhibit 3

Three scenarios show differences in automotive value added for Europe by 2035 in the coming shift to electric vehicles.

Europe's automotive value add, 2023–35, $ billion



Overall total	1,890	1,710	2,040	2,190
Key assumptions				
Vehicle production/ fleet, millions	11.8/294	9.3/310	11.5/310	11.7/310
European OEMs' market share in Europe, %	60%	45%	55%	65%
Europe battery value chain share, %	25%	35%	55%	75%

Note: Several growth drivers common across scenarios: growing car parc (~+10%); increased car complexity; increased financing penetration; new services (ie, electric-vehicle charging infrastructure [EVCI]; digital; recycling).
[1]Key assumptions include European value added on EVCI in Europe (86% in 2023, maintained at 87% in full-potential scenario, 82% in ambitious plans scenario, and 75% in disruptive scenario).
Source: Expert interviews; McKinsey Center for Future Mobility trade flows model; McKinsey Global Institute analysis; McKinsey analysis

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$400 billion, with OEMs and their tier-one suppliers absorbing most of the losses (Exhibit 4).

Ambitious-plans scenario: Europe delivers on its promises

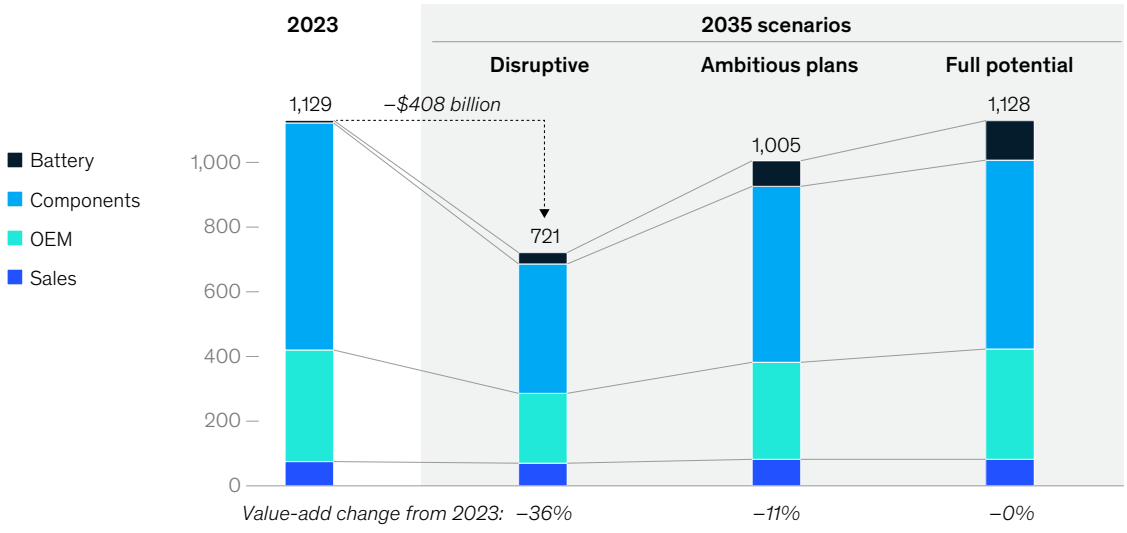
By pursuing strategies such as expanding the domestic battery industry, European leaders could rebalance potential future losses in GVA. This could help preserve European OEMs' presence in domestic and global markets. In an ambitious-plans scenario, Europe could maintain upstream GVA at about $1 trillion, containing its decline to about $130 billion below where it is today. This scenario could materialize as OEMs and other industry stakeholders keep acting to deliver the following:

— *Scaling battery industry in Europe.* Currently, Europe has 22 gigafactories. By 2035, battery makers and automotive companies are planning to break ground on an additional 35 facilities for an added capacity of 1,300 gigawatt-hours (GWh). However, expanding battery production in Europe is economically viable only with the appropriate private and public financing, including R&D for leapfrogging to new technologies and lowering energy costs. Furthermore, to capture additional upstream value before battery cell production, scaling efforts should also focus on increasing the region's share of sourcing and refining battery raw materials, including both primary materials and those from recycling, while accounting for the future battery chemistry mix (for instance, higher shares of lithium-iron phosphate/lithium manganese iron phosphate). This could help mitigate the risk of strong dependence on other regions within the upstream battery value chain.

Exhibit 4

More than $400 billion in upstream value could be at stake for the European automotive industry in 2035.

Europe's automotive upstream value added, 2023–35, $ billion



Source: Expert interviews; McKinsey Center for Future Mobility trade flows model; McKinsey Global Institute analysis; McKinsey analysis

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— *Ramping up European manufacturing.* Europe is attracting local production from new entrants. For example, Tesla opened its first European-based gigafactory in Berlin in 2022,[3] while EV Motors formed a joint venture with a Chinese OEM earlier this year and is investing about €400 million to establish a plant in Barcelona.[4] Such partnerships between European OEMs and new EV players can enable the mutual transfer of technology and widen access to markets. With more countries adopting economic policies that support local industry, Europe may need to find a response to remain attractive as an investment destination.

— *Streamlining the regulatory environment.* The European Green Deal, launched in December 2019, aims to make Europe the first climate-neutral continent by 2050. As part of its overarching strategy, the "Fit for 55" package, introduced in July 2021, includes several measures to reduce the administrative burden and accelerate the transition to EVs and other sustainable automotive technologies. Industry leaders demand to further reduce complexity to help accelerate infrastructure projects at speed and at scale and to regain a better position.

Full-potential scenario: Europe replicates its ICE expertise with BEVs

Our analysis suggests that it is possible for European business and government leaders to repeat their ICE expertise in a fully BEV world. To achieve its full potential for value creation, Europe would need to maintain upstream GVA at $1.1 trillion in 2035 and return European OEMs' market share to 65 percent—a level not seen since 2020. The region would also need to sustain its auto manufacturing capabilities, retain its position as an export powerhouse for cars and technology, and gain greater control of the EV ecosystem, including batteries, charging infrastructure, renewable-energy generation, and circularity (for instance, reusing battery components). The European auto industry's success in maintaining upstream GVA will largely depend on how much the region can localize each step of the value chain, the degree to which European incumbents pursue mutually beneficial partnerships with new entrants, and how quickly incumbents can make up lost ground on software and innovation along the battery value chain.

Additional opportunities for downstream value creation

Since two-thirds of Europe's registered vehicles are likely to be ICE vehicles in 2035 and consumers mostly use local businesses to service their cars, the transition to EVs may have a lesser effect on downstream value creation than upstream. Overall, the growth of EVs could contribute an additional $240 billion to $300 billion in downstream value by 2035, with total downstream GVA reaching $1 trillion (Exhibit 5). Among scenarios, differences in downstream GVA mostly result from how extensively the production of EV charging infrastructure is localized and whether or not European players begin offering digital services.

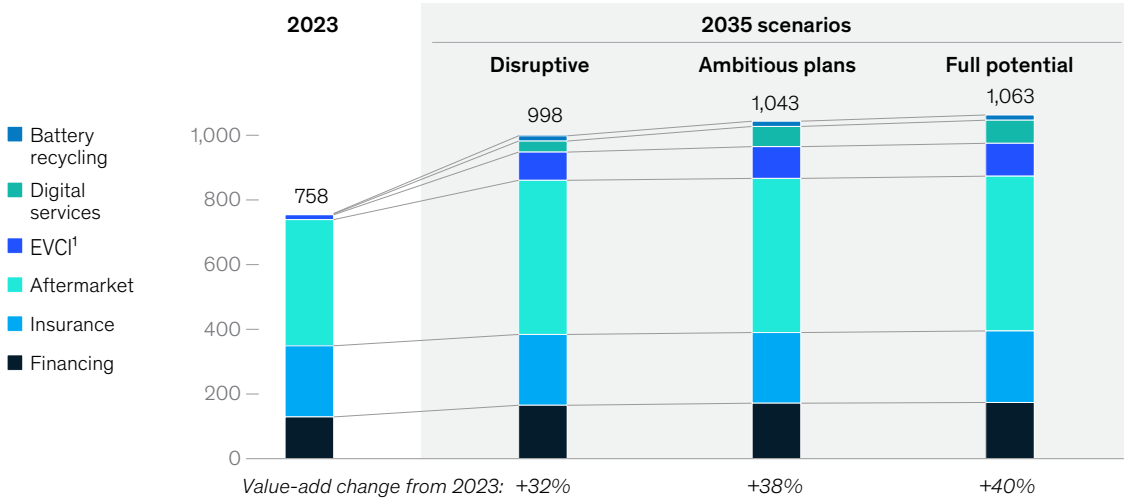
Several shifts are likely to propel growth in downstream GVA by 2035. Auto financing may increase organically, spurred by greater sales growth and penetration rates for EVs, which have a higher average MSRP than ICE vehicles. Consequently, auto-financing-related GVA could rise by $30 billion to $40 billion by 2035. The automotive aftermarket could also grow, since aging ICE vehicle fleets would require additional maintenance and the future fleet (composed of ICE vehicles and BEVs) could be more complex to maintain. These shifts could potentially generate an additional $80 billion in GVA. Although higher MSRPs for BEVs, aging ICE fleets, and greater repair costs could create financial burdens for insurers, those challenges may be offset by

[3] "Elon Musk breaks out the dance moves as he opens new Tesla factory in Germany," CNBC, March 22, 2022.
[4] Joan Faus, "Chinese carmaker Chery says Spain to be among its main exporting plants," Reuters, April 19, 2024.

Exhibit 5

Growth in financing, the automotive aftermarket, and new electric-vehicle-related services could create additional value in 2035.

Europe's downstream automotive value added, 2023-35, $ billion



[1]Electric-vehicle charging infrastructure.
Source: Expert interviews; McKinsey Center for Future Mobility trade flows model; McKinsey Global Institute analysis; McKinsey analysis

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the growing use of advanced driver-assistance systems (ADAS), which has already reduced accidents. Thus, the insurance sector's contribution to GVA could remain stable.

In another boost to downstream revenue, automotive players may have major opportunities to generate value by offering new, EV-related services. Digital and connected services, such as advanced infotainment, autonomous driving, in-car entertainment, and predictive maintenance, could generate an additional $30 billion to $70 billion in value. Moreover, to meet its sustainability goals, Europe may need to install, operate, and maintain an additional 410,000 charging stations each year to 2030, which could increase the value added to the European economy by $70 billion to $100 billion.[5] Lastly, battery recycling services could increase value added by $15 billion while allowing battery makers to source over half of certain metals from recycled material in the next 20 years. That could make battery recycling a fundamental driver of long-term value and a source of significant potential for GVA beyond 2035, which could help safeguard Europe's industrial backbone in future electric-mobility markets.

A way forward to a thriving European EV industry

Addressing critical challenges in three areas could help to ensure that Europe's EV industry thrives in 2035:

— *Productivity and talent.* While Europe's productivity growth in manufacturing reached 11.9 percent in the decade between 1997 and 2007, it decelerated to just 3.7 percent from

[5] "Electric cars: EU needs 8 times more charging points per year by 2030 to meet CO2 targets," ACEA press release, April 29, 2024.

2012 to 2019. Hourly productivity in the auto industry has plateaued in Europe over the past decade, while increasing an average of 7 percent per year in China.[6] The region also faces an intensifying talent gap in critical areas for the growing EV industry. In 2021, for instance, the Organisation for Economic Co-operation and Development reported that the European Union had 20 percent fewer STEM graduates per thousand inhabitants than the United States, and 45 percent fewer than South Korea. The transformational power of generative AI could help leaders address long-standing productivity challenges and should be leveraged across the automotive value chain.

— *Energy.* High costs can pose financial burdens to European businesses. For example, in December 2023, electricity prices for businesses were, on average, twice as high in Germany than in the United States and three times higher than in China.[7]

— *Regulatory complexity.* In a 2023 report by the European Investment Bank, regulatory complexity was cited as a main barrier to investing in Europe by a quarter of business leaders across Europe and the United States.[8]

About the McKinsey Center for Future Mobility

These insights were developed by the McKinsey Center for Future Mobility (MCFM). Since 2011, MCFM has worked with stakeholders across the mobility ecosystem by providing independent and integrated evidence about possible future-mobility scenarios. With our unique, bottom-up modeling approach, our insights enable an end-to-end analytics journey through the future of mobility—from consumer needs to a modal mix across urban and rural areas, sales, value pools, and life cycle sustainability. Contact us if you are interested in getting full access to our market insights via the McKinsey Mobility Insights Portal.

Toward a thriving European EV industry

By proactively addressing the region's challenges, European OEMs and other stakeholders could potentially strengthen Europe's future BEV market and generate considerable value for its economy. The following efforts might help.

Company-wide initiatives to address perennial problems

To navigate disruption and uncertainty, European automotive companies could pursue innovative strategies in several critical areas. Given the region's challenges, all European players would benefit from minimizing supply chain vulnerabilities. For instance, they might consider investing in advanced technologies such as blockchain, developing a robust and diversified supplier base, and embracing AI-enabled predictive analytics to anticipate potential issues and respond proactively.

Upskilling existing employees in areas such as artificial intelligence (AI), machine learning, and cybersecurity is crucial to closing the talent gap in software development. Collaborating with European educational institutions and developing targeted, in-house training programs could help employees gain needed skills.

Within R&D, OEMs could benefit from adopting agile processes to compete more effectively in the fast-moving automotive landscape. Cross-functional teams and iterative methods could allow companies to shorten product development cycles significantly. Agile practices might also foster continuous innovation, which may help companies respond more efficiently to evolving consumer expectations and environmental standards.

Additionally, European OEMs should consider adopting a more radical approach to streamlining their product portfolios, reducing hardware complexity to a minimum and focusing on

[6] Total Economy Database.
[7] 2023 electricity prices were $0.27 per kilowatt-hour (kWh) in Germany; $0.137 per kWh in the United States; and $0.087 per kWh in China, based on GlobalPetrolPrices.com data.
[8] *Investment barriers in the European Union 2023, European Investment Bank Group*, February 13, 2024.

differentiation through software—all supported by a well-structured electrical/electronic (E/E) architecture.

Finally, a performance-driven culture can be advantageous in times of change. Setting clear metrics, fostering an environment of continuous improvement, and prioritizing employee engagement and well-being can improve labor productivity and keep workforces motivated.

Enhancing industry collaboration

Worldwide, automotive OEMs and other companies are competing to develop the best technologies, particularly for EVs and software-defined vehicles. In addition, scale has become a critical success factor, making it challenging for smaller automotive companies to compete against tech giants and new disruptors, including those from China. As emphasized in our 2019 report, *RACE 2050—a vision for the European automotive industry*, attempting to tackle these challenges independently is ineffective.

To shoulder the financial burden of multibillion-dollar investments in future technologies, particularly when capital costs are high, automotive leaders could consider building coalitions across the industry. Examples might include relocating essential segments of the value chain to Europe—such as batteries, semiconductors, and ICE sunset technologies—and forging an industry alliance for ADAS. (While the Airbus concept[9] does not directly apply to automotive carmakers, European OEMs can review it to see an example of successful intra-industry collaboration—within the boundaries set by competition law.) Vertical collaboration along the value chain can also increase resilience in a volatile market environment.

Finally, European business leaders can explore strategic partnerships with global counterparts. They might, for instance, pursue opportunities for M&A with new entrants to accelerate the transfer of technology.

Developing effective policies

Three actions may help European automotive leaders create a flourishing ecosystem for the future auto industry. First, they could consider enhancing cost competitiveness by rapidly expanding renewable energy sources and the European grid, implementing a practical energy transition plan, boosting labor productivity, and addressing shortages of skilled labor. Powering transport with locally produced renewable electricity, instead of imported gasoline, would represent another value chain shift, potentially unlocking additional GVA for Europe.

Second, harmonizing regulations could reduce complexity, making a positive contribution to reducing delays in some areas. (According to the ACEA's European EV Charging Infrastructure Masterplan, for which McKinsey provided analytic support, while the average end-to-end installation time for a direct-current fast charger in Stockholm is around seven months, it can take up to 20 months in other European locations, such as Lisbon.)

Streamlining labor-permitting processes for charging infrastructure and other critical projects can ease administrative burdens, improve efficiency, and speed up permit processing timelines. The European Union has already introduced some policies in this area. For instance, the Critical Raw Materials Act limits permitting times to a maximum of 24 months for strategic projects involving extracting raw materials and to a maximum of 12 months for processing and recycling projects.[10]

Finally, to remain competitive with other regions, the European automotive sector's transition to EVs requires targeted and continuous investments in infrastructure such as charging stations and in innovative technologies including semiconductors, batteries, and AI applications. If such investments are in place, they could attract players to establish vehicle assembly and component plants within Europe, significantly strengthening Europe's automotive industry.

[9] The multinational aerospace company, Airbus, was established as a joint venture of Europe-based aerospace businesses.
[10] "Briefing on EU legislation in progress: Critical Raw Materials Act," European Parliamentary Research Service, June 2024.

While our analysis primarily focuses on the all-electric target state, it is important to note that achieving full electrification by 2035 is only feasible if the proper boundary conditions are established in time—such as EV affordability, charging infrastructure, renewable-energy availability, and a robust battery supply chain. According to McKinsey analysis, the ecosystem must be developed in sync, meaning that every gram of CO_2 fleet emissions reduction will require around 40,000 charging stations as well as a battery gigafactory with an annual capacity of at least 10 GWh.

The recent slowdown in the EV market highlights that the shift cannot happen overnight and will take time, during which transition technologies, such as full hybrids, PHEVs, and range extenders, will play an important role. These technologies, deeply rooted in the EU auto industry's DNA, not only allow OEMs to transition smoothly into the EV space but also boost European GVA, given the higher value per vehicle from hybrid powertrains developed and produced in Europe. Even in China, the leading EV market, hybrids are critical to this shift, with one in three electric cars sold in 2023 being a PHEV. Europe must find the right pace for electrification; moving too fast could dilute GVA, as cars may need to be sold at large discounts, or consumers might hold back because of insufficient charging infrastructure. On the other hand, moving too slowly risks losing market share to disruptors. To make scenarios comparable, our analysis does not consider timing but compares different potential economic outcomes in an all-electric world.

The transition to EVs will happen. While EV adoption is currently sluggish, European leaders can invest in critical EV and software-defined vehicle capabilities. By committing to bold transformation over incremental changes, European OEMs can prepare for the age of e-mobility, ensuring their leadership in key areas of the electrified future. The economic potential of EVs is immense. If European OEMs collaborate across the industry, they can strengthen their position as global leaders while supporting economic growth. With the right investments and partnerships, Europe can reap the benefits of EVs for years to come.

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The authors wish to thank AVERE (the European Association for Electromobility) for its contributions to the report.

This article was edited by Belinda Yu, an editor in the Atlanta office.

Designed by McKinsey Global Publishing