VDA | Verband der Automobilindustrie

Automotive Insight 2023



Looking back

On the automotive industry in 2023

Foreword



Dear readers,

There are few constants one can rely on in a dynamic, ever-changing world, but one of them is the innovation of the German automotive industry. Our member companies continue to illustrate this: manufacturers and suppliers of trucks and commercial vehicles, trailers, and buses. Major crises certainly leave their mark on our industry as well. Yet the German automotive industry has proven uniquely innovative in the face of such challenges.

In spite of the hurdles, this industry is shaping automotive transformation with high investments and immense dedication. The companies are pushing the shift to electrical mobility, developing fascinating solutions for autonomous driving and software-defined vehicles, and making their production processes climate-neutral. Our industry is also performing extremely well when it comes to recycling. There are many other topics and trends that are driving our industry forward. The range of innovation exhibited by our member companies is enormous, as is made impressively clear by this annual report.

We are also aware that our industry is being challenged by new competitors. The German automotive industry is making considerable investments in order to weather such a dynamic environment, with around 280 billion euros to be invested in research and development worldwide by the year 2028. These investments are chiefly focused on transformation, in particular electrical mobility, which includes battery technology, autonomous driving, and digitalization. Manufacturers and suppliers are investing 56 billion euros in research and development across the globe every year, increasing their expenditures in this area as they do so. In addition, they are spending around 130 billion on the repurposing of existing factories and the construction of new ones in this same time frame.

Over one in every three euros that companies in Germany invest in research and development comes from the automotive industry. This industry employs nearly one third of all employees in the German research sector. It generates over 500 billion euros in revenue per year and makes up nearly one fifth of the gross value added in the manufacturing industry. It is tackling the challenges of this transformation with significant investments and conviction.

At the same time, international competitors within the automotive industry itself are not the only obstacle. The world in which we live has become more volatile. Starting with the coronavirus pandemic, to Russia‘s inhumane war against Ukraine in breach of international law that remains ongoing, to Hamas‘ dreadful attack against Israel on October 7, 2023 and the consequences thereof for the Middle East: Recent years have shown us time and again that international cooperation has become ever more precarious. Unfortunately, crises have become virtually routine and they impact all sectors. This is cause for great concern for us.

Against this backdrop, it is all the more important for policymakers to not simply react to the major challenges we face. This means that Germany and Europe must become more internationally competitive and expand its network of partners around the world. Action must be taken urgently, as the world will not wait up for us. While other regions have already opened up and are taking a proactive step toward the future, Germany and Europe remain reticent and are losing their competitive edge. The German automotive industry—from mid-sized family companies to major DAX corporations—is also struggling with these circumstances.

It is high time for Europe to act. The EU Commission must make it a top priority that Europe recognize the necessity of a decisive, strategic economic and industry policy and connect this with its climate policy. Effective climate protection to which the German automotive industry has committed itself and that we push forward with investments, innovation, and dedication, can only succeed through close cooperation between policymakers, industry, and society. As we work toward this, it becomes increasingly clear that while the goals have been defined, the parameters for achieving them are sorely lacking. We thus demand ambitious planning that will be implemented quickly and easily. This applies to the urgently needed reduction of energy prices, the breakdown of bureaucracy, and policies for raw materials and trade that strengthen resilience and keep markets open. Only an economically strong, confident, and thus relevant Europe can hold its own on the international stage and play a decisive role in the world.

Another important topic that must be addressed is infrastructure. Defects in infrastructure, from overloaded railway networks to dilapidated roads and bridges, and woefully insufficient digitalization are major barriers for our member companies. The network of charging stations must be expanded at a more rapid pace, both for trucks as well as with regard to the electrification of commercial vehicles. This applies to Germany, and in particular to large portions of Europe if we hope to achieve an international lead up to electrical mobility. In addition to the creation of new charging points, power and hydrogen grids must also be expanded and there must be a sufficient infrastructure for hydrogen tanks. We must not lose any more time, as a sufficient charging infrastructure is one of the key criteria for drawing consumers to electrical mobility. Of course, the digital infrastructure must also be expanded to facilitate interconnected mobility and Industry 4.0. An infrastructure offensive that addresses all modes of transport is needed.

Europe must continue on its path of international networking in spite of the crises, and reinforce its cooperation with other regions of the world. This is especially true in light of the fact that it will not become easier to work with some established partners in the future, such as the United States. It is thus all the more important that free trade agreements as well as raw material and energy partnerships are formed with new partners. Only then will it be possible to act with new technology in the future.

Germany and Europe find themselves at a critical juncture where it will be decided which actor will shape the future of the industry. For this reason, Germany and Europe must not only react to the challenges of our time, but act to address them. We must show that our country, our continent, remains a beacon of employment, growth, wealth, and innovation. This requires a strong EU that tackles the challenges together, and a strong industry backed by the political frameworks it needs. We at the VDA are working alongside our member companies to achieve this. This annual report will make that clear to you, our readers.

I wish you an exciting and fascinating read, and look forward to speaking with you again!

Sincerely,



Hildegard Müller



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Topics that shaped 2023

The automotive industry is undergoing an unprecedented transformation. The transition from combustion engines to alternative drivetrains, digitalization, and sustainable production must be achieved simultaneously.

- **How we ensure competitiveness.**
- **How we can facilitate resilience and diversification.**
- **How we are shaping the transformation (globally).**

Read about this and more in the following chapters.

Germany becomes less internationally competitive

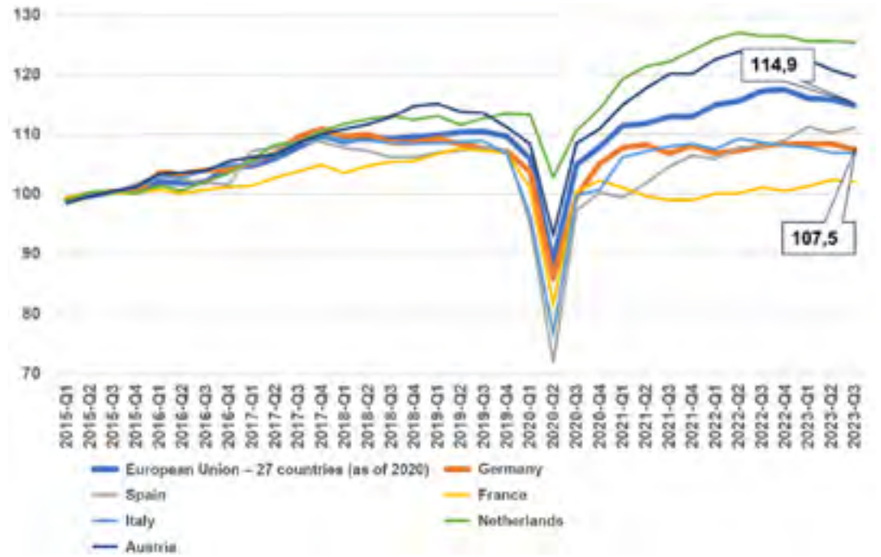
Germany‘s economic output shrunk by 0.3 percent in 2023, leaving it as the only one of the 20 largest economies worldwide to recede—with the exception of Saudi Arabia, whose economic output only decreased because it had deliberately reduced oil production to stabilize the price of oil.

In part, the poor output can be attributed to economic headwinds: Domestic consumption in 2023 was primarily impacted by a high inflation rate of about 6 percent coupled with equally high nominal wage growth, resulting in virtually constant real earnings.

This was exacerbated by a murky foreign economic environment: The global tightening of monetary policies significantly inhibited the demand for investment. The Chinese economy also reported much slower growth than expected following the end of China‘s Zero-Covid Policy.
However, a considerable portion of the economic issues are homegrown and cannot be attributed to the current global economy.

The image to the right showing this development illustrates that gross value added of the German manufacturing industry has not increased since 2018.





Development of GVA of the manufacturing industry

Source: Eurostat

This is not (yet, at least) deindustrialization in the sense that industrial GVA has decreased. Yet it does clearly show that Germany‘s manufacturing industry is lagging far behind the EU average. Germany seems to be increasingly suffering from a location problem.

This is also shown by Germany‘s continuous drop in the international location ranking. For example, the World Competitiveness Index has downgraded Germany from 17th to 22nd place since 2019, among a total of 64 countries. According to the ZEW Country Index of Family Enterprises, Germany fell from 14th place (2018) to 18th (2022) out of a total of 21 countries.

The marked decreased in foreign direct investments in Germany from 2020 to 2023, from 138.9 billion to 21.9 billion euros, could also indicate a loss of appeal.

This also applies to the poor growth of domestic capital investments in general. These have developed more poorly in Germany since pre-pandemic levels compared to major reference countries such as the United Kingdom, Japan, and the USA. Weak investment is not exclusively a sign of no confidence in the location and its prospects for growth. Indeed, it worsens these future prospects because the domestic capital stock—in essence, the substance of the economy—is not being sufficiently modernized, meaning that no sufficient productivity gains can be achieved. It becomes all the more critical when one considers that the ecological transformation will require additional funding in the next two decades, because the production framework will not only have to produce an increased quantity of goods, but do so with less CO_2 output.

Need for action in Germany: a problem of implementation, not awareness

The German Federal Ministry for Economic Affairs and Climate Action (BMWK) presented a National Industry Strategy in October, 2023. It outlines what the Ministry believes to be the need for action by German policymakers with regard to location-related conditions, resilience, and support for the transformation process. The analysis of the current challenges is accurate and comprehensive, and the Germany‘s weaknesses as an industrial region are described honestly and objectively. The alignment of the strategy is also correct: It primarily addresses the strengthening of the location itself. In addition, it calls for a breakdown of strategic dependencies. Fortunately, the strategy clearly notes multiple times the necessity of supporting industry during this „transitional decade“ under certain conditions without creating permanent subsidies. This funding will aid in facilitating the transformation and in dismantling strategic dependencies and competitive disadvantages. However, closer inspection of the strategy also reveals its flaws. In particular, it focuses heavily on that which was already implemented or started in the first half of the legislative period. There are only few entirely novel suggestions.

Furthermore, the strategy does not provide answers to important questions although it explicitly addresses them. It is clearly stated that Germany has one of the highest business tax rates in the world, and yet no conclusions are drawn from this.

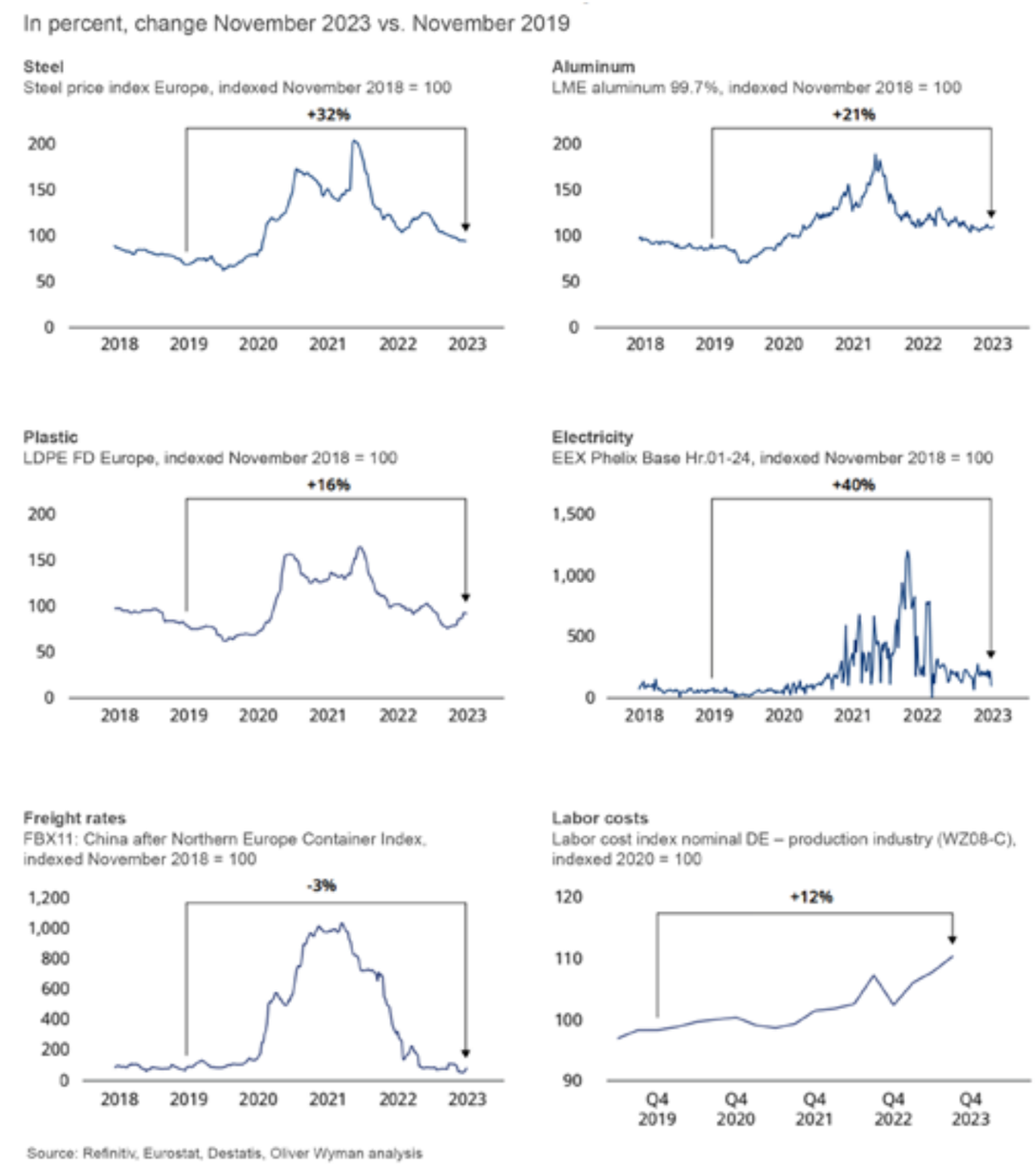
It also addresses the German federal government‘s 2030 targets of 15 million electric cars and 1 million public charging stations, but does not formulate any measures for how to achieve them. In fact, the federal government—with its truncation and subsequent suspension of the environmental premium as decreed by the Federal Constitutional Court—even put a hard stop on the rollout of electric cars.

On November 15, 2023, the Federal Constitutional Court decreed that the law concerning the second supplementary budget in 2021 is illegal. As a result of the verdict and in light of greater need for investment in infrastructure and transformation, the federal government is tasked with the enormous challenge of drafting budgets that are compliant with the Constitution in the future. The VDA takes a constructive role in these ongoing conversations via the BDI. In addition to foregoing tax increases, comprehensive criticism of expenditures in the regular federal budget is required. With long-term investment needs for the transformation, it may also be prudent to examine further debt limit options.

VDA polls show which measures are most urgently required to strengthen the location

In the polls that VDA regularly conducts among *its mid-sized member companies*, they list „bureaucracy“, „power costs“, „tax burdens“, and „workforce shortage“ as the greatest obstacles for automotive companies in Germany.

Development of costs for raw materials, energy, and labor



There is urgent need for action to strengthen the location. In particular: power costs are not competitive

In the first half of the legislative period, the federal government took measures to counteract the high costs of energy, first by integrating EEG financing into the climate and transformation fund (KTF) as of late 2022. In November of 2023, it passed the power cost package.

The reduction of the electricity tax to the minimum EU level for the production industry relieved a broad range of companies, with SMEs also benefiting from the cut.

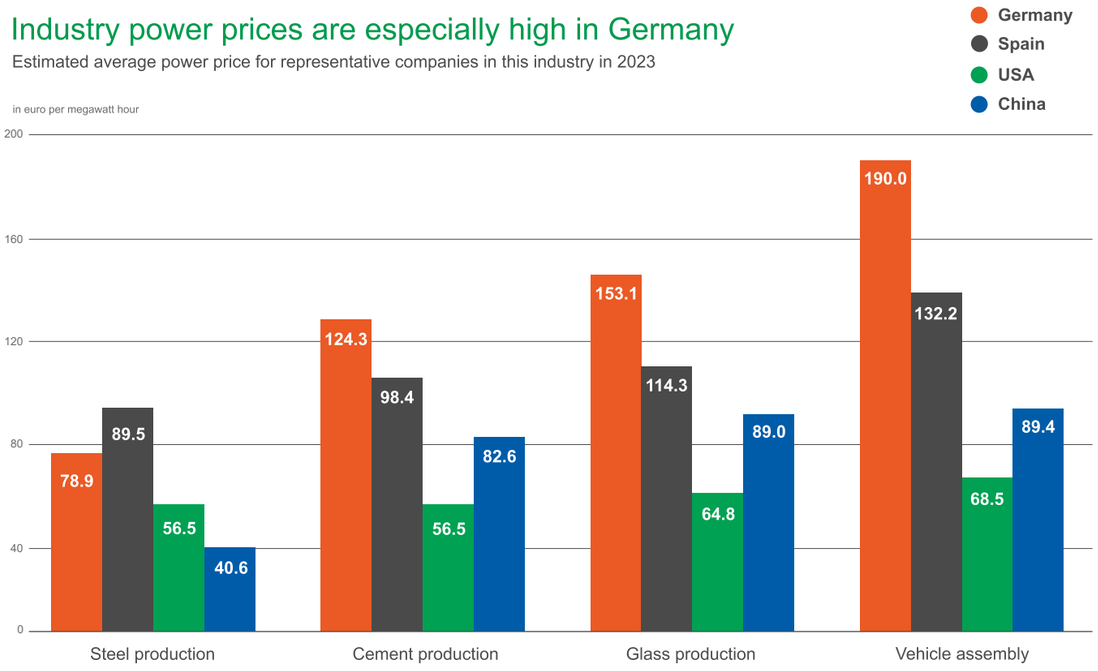
However, the discontinuation of the state allowance for transmission network charges for power as of 2024 has had a negative impact.

Overall, power costs may increase for the industry. The price for the industry was already higher in 2023 than in most important competitor countries (as shown below: „Industry power prices are especially high in Germany“).

It is believed that this competitive disadvantage, in particular for automotive SMEs, will remain. This is also confirmed in the *report* on the topic of power price development published by the Boston Consulting Group as commissioned by the BDI.

Industry power prices are especially high in Germany

Estimated average power price for representative companies in this industry in 2023



Sources: BDI, BCG, IW

Excessive red tape leads to extraordinarily long permit approval times

Despite the introduction of the „One in, one out“ program to reduce red tape, as well as three laws that aim to cut back on bureaucracy, companies have continued to strain under bureaucratic requirements throughout the years. Increasingly tight regulation induced by more reporting obligations reflects the government‘s lack of trust in market economic processes. Companies in the automotive and supply industries complain about the resulting decreases in capacity and the high costs. According to the 2023 Annual Report from the Regulatory Control Council, bureaucracy for the economy alone cost 65 billion euros—money that companies are unable to invest. In addition to this, says the report, permit processes for investment projects are often time-consuming and complicated, and there is a dire lack of digital solutions. This unnecessarily inhibits the realization of investment projects required for the transformation. This tool for improving the location must be appealing to policymakers, as there are no costs associated with it, says the report.

The federal government hopes to combat this problem with two initiatives: „practice checks“ will serve to identify obstacles and possible solutions for individual cases in the event of excessive bureaucracy and permit procedures, in synergy with legislation, enforcement, and companies themselves. In so doing, the federal government—up to this point, the Federal Ministry for Economic Affairs and Climate Action (BMWK) on its own—is implementing a long-recommended suggestion from businesses that seeks to include companies not just in existing laws, but in planned laws as well. This inclusion of business expertise will allow better assessment of bureaucracy costs and development of more practical solutions.



VDA was involved in workshops with the BMWK and members for the first round of the „practice checks“. Fortunately, the BMWK has already announced that it will continue with this program and hopes to expand it to other segments (such as sustainability reporting and data protection).

The other solution pursued by the federal government is a Fourth Bureaucracy Reduction Act. Unfortunately, the planned dismantling of reporting and information obligations continues to lag behind the requirements as well as the announcements by the federal government itself from its meeting in Meseberg in August, 2023. This is not the final blow that would be required to relieve companies, and it will hardly make any palpable difference in making Germany more appealing as a location.

VDA was constructively involved in the *consultation process* on the Fourth Bureaucracy Reduction Act and also provided *various suggestions for amendments*.

Labor shortage inhibits economic growth and transformation

The labor shortage is posing a challenge for the industry in all European countries, especially Germany. This shortage will become an economic risk for Germany as an automotive location if young people lose faith in the industry‘s sustainability and seek out apprenticeships and careers in other fields.

This inhibits not only companies‘ growth, but also their ability to withstand the transformation. The problem will become drastically worse in the coming years, as the generations with higher birth rates increasingly enter retirement and the following generations become increasingly smaller. All measures must be taken to at least alleviate the labor shortage. This includes activating the domestic workforce potential, increasing qualified immigration, and promoting internal company education and advanced training. The latter will aid employees whose current jobs are affected by the transformation in gaining the qualifications for new jobs that will open up within their companies.

Tax burden on companies worldwide almost at its peak – blocking instead of boosting investment

In scarcely any other country are the profits earned by corporations taxed as heavily as they are in Germany. The nominal overall burden on corporations in Germany is 29.9 percent, consisting of corporate tax, commercial tax, and solidarity tax. Within the EU the burden is higher only in Malta, and outside of the EU only in Japan. This high tax burden is not only a disadvantage for domestic companies on the international competitive stage, but it also impairs their liquidity and restricts the room for financing the investments needed for the transformation even though Germany has been suffering from low investment for years (see above). It is thus urgently required that the tax burden be reduced to an internationally competitive level.

The „investment premium for climate protection and digital economic goods“ earmarked in the Coalition Agreement, and which was initially included in the Opportunities for Growth Act, would have helped promote investment. It is all the more disappointing that the negotiations concerning the law in the mediation committee of the German Bundestag resulted in the investment premium being cut entirely.



The plans for offsetting losses implemented by the Opportunities for Growth Act also fall too short. They do not offer companies, including automotive suppliers, the flexibility and relief they need for their liquidity in the face of recession and the transformation. The limitation of the reimplementation of the degressive allowance for depreciation for economic goods to nine months is also insufficient.

Germany‘s poor state with regard to investment cannot be overcome in this way.

European initiatives for improving competitiveness, resilience, and transformation progress are not yet sufficient

In the first quarter of 2023, the EU Commission presented its Green Deal Industrial Plan. At the heart of this plan are a new EU subsidy framework, a draft for the *Net-Zero Industry Act*, and another draft for the *Critical Raw Materials Act*. The new subsidy framework allows member states, by the end of 2025, to fund investments that serve to create production capacities for “CO2 net-zero technology.” It took effect immediately upon being presented. The Net-Zero Industry Act aims to reduce the permit times for applications for creating or expanding such production capacities by imposing strict time limits on permit authorities within the member states. This act was negotiated via trialogue after being presented, and was passed and became law in early 2024. The Critical Raw Materials Act seeks to make the EU less dependent on non-EU countries to source critical raw materials by defining clear benchmarks for self-subsistence with strategic resources and recycling. After the Commission had published the Critical Raw Materials Act in March of 2023, the *trialogue negotiations* were concluded in record time by November that year.

The EU is pursuing three goals with these initiatives: The reduction of strategic dependencies in the supply of certain raw materials, pre-products, and end products; the acceleration of the transformation; and hampering of the politically induced competitive disadvantages of companies within the EU versus companies outside of it. These EU initiatives thus make a necessary, yet insufficient, contribution.

With the Green Deal Industrial Plan, the Commission advances and further realizes its plans—originally outlined in the revised industry strategy from May, 2021—for supporting the industry on its path toward climate neutrality. This is occurring against the backdrop of the political events that have transpired in the meantime: Firstly, Russia‘s assault against Ukraine has further reinforced the knowledge gained during the coronavirus pandemic that supply chains are vulnerable and that the industry‘s supply of wholesale products must be made more resilient and resistant to geopolitical risk. Secondly, other players like the USA and China have prioritized climate protection and the development of clean technology in their political agenda much more than they previously have (USA: Inflation Reduction Act – IRA, 2022; China: Five-Year Plan 2021–2025). They are using state investments as well as some protectionist measures in this area to challenge EU competitiveness. For example, the US-IRA‘s large-scale funding programs are very aggressively calling for investments worldwide.

New EU subsidy framework

The EU‘s new subsidy framework is a novelty in that it marks the first time that member states to also issue allowances for production. Until now, it was not possible to fund the manufacture of products that are already available in a global market with a certain degree of technology or quality. With the new version of its subsidy framework, the EU Commission is explicitly responding to „unequal competitive conditions due to subventions abroad.“ This is a reference to the US-IRA, which will earmark 369 billion USD for investments in climate protection in the next ten years, including for the repurposing of automotive plants to produce clean vehicles. This would be a clear competitive disadvantage for companies located in the EU. The new EU subsidy framework thus lets member states to fund the creation or expansion of production capacities to produce a wide range of “CO2 net-zero technology”, including batteries and electrolyzers (as well as their pre-products and the resources needed for them). Company investments can be funded with 15 percent and a maximum amount of 150 million euros per company and member country. Higher rates and sums are only possible in designated EU funding regions, in which case the amount may even be up to the total required to achieve the same funding sums that a state outside of the EU grants to a company for the same investment project. This shall ensure that companies that wish to create or expand production capacities for transformation technology can do so within the EU.

In essence, VDA welcomes this revision of the EU subsidy framework. It serves multiple goals: the removal of competitive disadvantages and thus the safeguarding of the EU as a production location; the acceleration of the transformation; and the reduction of strategic dependencies in the supply of technology relevant to the transformation.

However, VDA also has some critiques for the EU Commission. The main problem lies in its time limit of the end of 2025. This neither does justice to its ultimate goal of sustainably accelerating the transformation, nor does it serve to sustainably hamper the cost-competitive disadvantages faced by the EU compared to production locations outside of it. It would not be possible for the run-up to investments for the transformation-related sectors in the EU to finish by 2025. The new subsidy framework was also conceived as a response to the new funding opportunities in the USA due to the IRA. However, this is in effect until 2030. As such, the new EU subsidy framework requires a sensible follow-up regulation after 2025. Another critical point in the current EU subsidy framework is that it does not at all address the new technology that is indispensable for the reduction of vehicles‘ CO2 emissions. This includes but is not limited to fuel cells, electric engines, permanent magnets for electric vehicles, electric steering, electric axle drives, inverters, electric energy management, and interim products for raw materials (i.e., processed raw materials) used to manufacture the aforementioned components. These technologies should be considered in the drafting of a follow-up regulation to the new subsidy framework.

Adjustments must also be made with regard to the requirement that an exceedance of the funding intensity of 15 percent and the maximum funding amount of 150 million euros per company and member state—apparently for reasons pertaining to the regional economy—is limited to designated EU funding areas. These higher funding opportunities are not available for the upscaling of the transformation technology in the existing EU industrial centers because these are generally not located in particularly disadvantaged regions. Yet this is not a suitable response to the current challenge, namely that the EU‘s competitor locations, with their industrial policy agendas, are calling for investments to a massive degree.





Other European initiatives

The Commission under Commission President Ursula von der Leyen (2019—2024) was shaped—in addition to the coronavirus pandemic and the Russian invasion of Ukraine—by the European Green Deal.
In this regard, the European co-legislators have introduced a range of climate, energy, and transport policy measures in over the years that have significant impacts on the transformation of the automotive industry and pose massive challenges for it.

Aspects relating to industry policy were initially neglected and regulatory burdens increased. The Commission President‘s announcement at the beginning of the election period that an existing regulatory burden would be dismantled for each new one („One in, one out“) was not consistently implemented.

At the end of the 9th legislative period and looking toward the 10th, there are signs that political decision-makers are increasingly focusing on questions of European competitiveness.

In her address on the state of the European Union in September, 2023, Commission President von der Leyen made announcements on the dismantling of bureaucracy, such as a 25 percent reduction in reporting requirements. Against the backdrop of increasing economic challenges, the announcement of an SME Advisor who reports directly to the Commission President is a positive sign and this position must be filled quickly.

Trailblazing economic policy impetuses for the 10th legislative period shall also result in two high-level reports. Enrico Letta has already submitted his report on the future of the European domestic market. The report by Mario Draghi on European competitiveness is expected before the summer recess.

Net-Zero Industry Act

In addition to the new subsidy framework, the Net-Zero Industry Act ensures acceleration of the permit process for the expansion and construction of plants for the production of certain technologies and their pre-products. These include but are not limited to battery technology, hydrogen technology (including electrolyzers and fuel cells), power grid technology (including electric charging technology for transport), sustainable technology for alternative fuels, technology for renewable, non-organic fuel, and electric drive technology for transport. In the future, the respective authorities in the member states must decide on permits within 18 months. This is a clear acceleration of the processes, as permit processes sometimes take years. VDA has thus explicitly welcomed the draft of the Net-Zero Industry Act and called for its prompt implementation.



Critical Raw Materials Act

With the Critical Raw Materials Act, the EU outlines a strategic plan for reducing dependencies in the supply of critical raw materials. Ambitious benchmarks for self-subsistence and diversification along the entire value-added chain of strategic raw materials are defined, from extraction to processing and recycling. Projects along the value-added chain of strategic raw materials can tout themselves as strategic projects and thus benefit from faster permit process: a maximum of 27 months for mining projects and 15 months for processing and recycling projects. Companies that consume large quantities of strategic raw materials are obligated to conduct stress tests for their supply chains in order to better assess the risk of dependencies. The recycling of permanent magnets will also be simplified. Distributors or products containing permanent magnets will be obligated to provide information on the chemical composition, localization, and installation of magnets via a data storage device.
VDA welcomes the intention of the Critical Raw Materials Act, although it does not address key problems of raw material extraction and processing. If the high energy costs and financing of mining projects are not addressed with concrete measures, the benchmarks cannot be achieved. VDA‘s demands for a European Agency for Strategic Resource Project is just as neglected by the regulation as the establishment of a raw materials fund for financing the identified strategic resource projects.

Facilitating resilience and diversification



It is just as important that Germany improve its location-related factors and its own competitiveness as it is that it, like all other EU countries, reduces its strategic dependencies on raw materials, preproducts, and end products from non-EU countries. The difficult supply chain disruptions during the coronavirus pandemic and the beginning of the Russian invasion of Ukraine laid bare the vulnerability of the German economy. Increasing geopolitical tensions around the world are amplifying this. It is thus only appropriate that Germany take measures to make its own subsistence more resilient. It is important that this occurs in close cooperation with our European partners in particular.

The two approaches to this end are increased self-production or the establishment and expansion of European value-added networks in strategic technology fields, and diversification of the supply chains by forming new trade and resource agreements.

Expanding value-added chains for future technologies in Germany and Europe. Increased domestic production is the goal, such as for producing battery cells or semiconductors

In early January, 2024, the EU Commission—based on its new subsidy framework— approved the intended federal and state subsidy for the creation of a battery factory near the city of Heide in Schleswig-Holstein, Germany. The federal and state governments were involved in the two „Important Projects of Common European Interest“ (IPCEI) for microelectronics for the run-up to the factory‘s commissioning. The subsidy permit by the EU Commission in June, 2023 cleared the path for the federal and state governments to fund companies based in Germany that work in micro-electronics. This serves as an incentive for company investments in the upper double-digit billions. Corresponding funding approvals in 2023 also allowed the creation of two semiconductor factories in Magdeburg and one in Dresden. These are also important projects from the perspective of the automotive industry. At the same time, it is clear that we need a modern mixture of market-oriented economic policy and formative industrial policy, especially in light of international developments.

Subsidies can be necessary supplementary measures, such as for funding future technologies like semiconductors or battery factories, or for strengthening resilience. However, fighting the symptoms instead of strategically resolving the structural causes of poor competitiveness is not a long-term transformation strategy.

Funding research and innovation

With R&D making up over 6 percent of the profits (2020) and over 50 percent of global patents for future issues (such as networked and automated driving and electrification), the automotive industry in Germany is one of the country‘s most innovative. In order to ensure Germany‘s competitiveness as a technology hub in the future and increase its resilience, we need the right conditions for innovation and research policy. The holistic funding of large-scale projects from research to application with interagency programs is one of the most effective measures. In light of the high administrative complexity of the projects, the complete digitalization of the administrative project processing would provide urgently needed relief and simplification. For the companies‘ various needs, it would be helpful if the funding programs were tailored to SMEs and devised with practically relevant requirements. An overall concept for the European funding landscape and pan-European location conditions is needed instead of competition between individual programs.

Free and fair trade as a prerequisite for diversification

Dismantling customs and intensifying trade relations are especially important in a time marked by geopolitical uncertainty. Expanding partnerships and forming new alliances—trade, resource, and energy agreements—are essential for Germany and for the EU.

These diversification measures can reduce dependencies and make supply chains more resilient. Yet important agreements, such as those with Mexico, India, and other ASEAN states, are not progressing well. After December of 2023, negotiations on MERCOSUR once again foundered in March of 2024. The ratification of CETA is also uncertain after France‘s rejection. One major factor for the successful formation of agreements is that negotiations not be overloaded with issues not related to trade such as special climate protection measures or sustainability standards. These make agreements on free trade negtiations much more difficult and prolonged. Rather, these topics that are also important for the automotive industry should primarily be negotiated outside of trade and investment agreements. The EU Commission and member states should not give up on cooperating and dismantling obstacles to negotiations as part of an active, pragmatic, more flexible trade policy.

Europe must keep up in the geopolitical competition for critical strategic raw materials. Agreement on the Critical Raw Materials Act (CRMA) sends a strong signal for more European sovereignty and resilience in resource supply (see above). The CRMA‘s success hinges on its concrete implementation, i.e., when the strategic projects begin and actally provide results.

The commitment to shorter permit processes is a step forward. Societal acceptance presents an obstacle. Support from the federal and state governments is crucial to touting projects along the entire resource value-added chain. In Germany, this requires close integration with the amendment to the Federal Mining Act that has been announced as well as increased staff for public offices.

In spite of everything, Germany and Europe will remain dependent on imported resources. Diversification to strengthen supply chains is paramount in order to keep supply security of strategic resources high. Strengthening cooperation with strategically important regions in the form of resource and energy partnerships must be decisively advanced at the national and European levels.

It is very regrettable that the EU has not yet been able to form a Critical Minerals Agreement with the United States. With the Raw Materials Club that was announced in the Critical Raw Materials Act, the EU strives for better connections with partner countries and the expansion of partnerships
for raw materials. VDA explicitly welcomes this initiative. It will be important that there are no conflicts of interest with existing projects such as the Minerals Security Partnership.

Funding the circular economy

Another lever for strengthening resilience is the funding of the circular economy. However, a realistic overview of the topic is helpful here: As products, vehicles have incredible longevity that go through many cycles before being recycled due to the fact that they can be repaired. We will remain dependent on the import of raw materials and their processed interim products, especially with regard to electric mobility and the raw materials required for their batteries or rare earth elements. Despite all investments in recycling capacities and the increase of recycling efficiencies, we only expect a notable contribution to secondary materials for covering the demand for raw materials in the 2030s.

We will not achieve climate neutrality without the circular economy

In spite of the establishment of alternative drive technology, CO_2 hot spots will still exist within the vehicle life cycle. There are hardly any CO_2 emissions during operation, but considerably more in the extraction of the necessary raw materials and their processing, logistics, and in the production of components and vehicles. The vehicle value-added chain is highly complex, with production and material supply chains for around 7,000 components and parts.

Strategies for CO_2 reduction must extend beyond the service life of vehicles. This holistic consideration of all value-added phases and their effects on the environment is reflected in the Design for Sustainability strategies of the automotive industry.

These include concepts for extracting raw materials, production, repairs, remanufacturing, and recycling, and are perpetuated in the debate around the further development of the circular economy.



Five pillars for more sustainability

The following five pillars are paramount for a sustainable automotive industry with an integrated circular economy:

Resource conservation
Material efficiency plays a key role in vehicle assembly. Material efficiency strategies include resource-friendly product design, optimized production processes, storage that conserves materials, and circulation of materials. The selection of the source for the resources is also critical. Attention must be paid to the method used to extract, process, and transport raw materials.

Longevity
Vehicles are made to operate for over 124,000 miles. Some of them are used for over 20 years and are thus among the most long-lived consumer products. With new simulation methods in component development and innovative production processes, parts can be made to be even more durable and long-lasting.

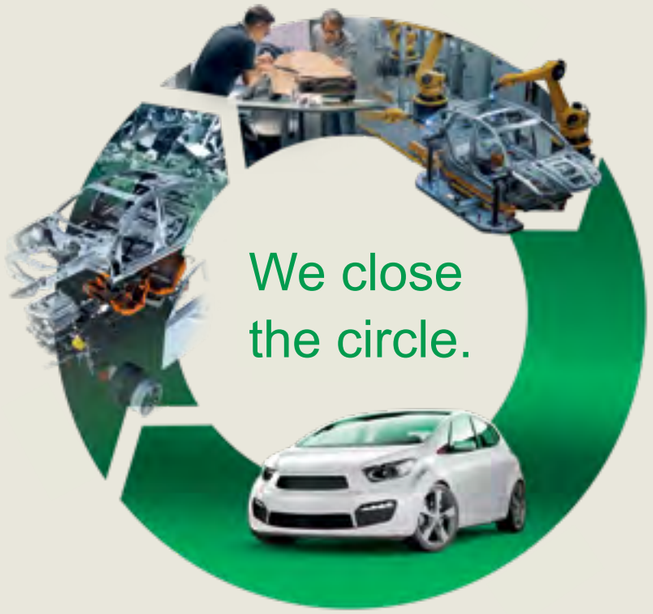
Reparability
During the vehicle development process, it must be ensured that the cars can be repaired with as little effort and cost as possible. The incurred repair costs often decide whether a vehicle will be replaced or remain in use. This includes a reliable supply of recycled replacement parts up to 15 years after the end of a vehicle‘s production.

Recyclability
After its service life, a vehicle (as of now) is at least 85 percent recyclable. This is higher than other consumer products. This number must be increased by ensuring that recycling is considered even during the development of new vehicle components. How can the raw materials used in the vehicle be most easily and efficiently separated from one another during recycling? Which new dismantling methods can be used, and which processed can be automated?

Processing and reuse
Based on the data from national metal associations, about one third of a vehicle consists of secondary materials. This value can also be increased in the future. In particular with regard to the run-up to electric mobility, however, it is also crucial that batteries be reused and lithium, nickel, and cobalt are re-extracted for new batteries when possible.

Stakeholders in the circular economy

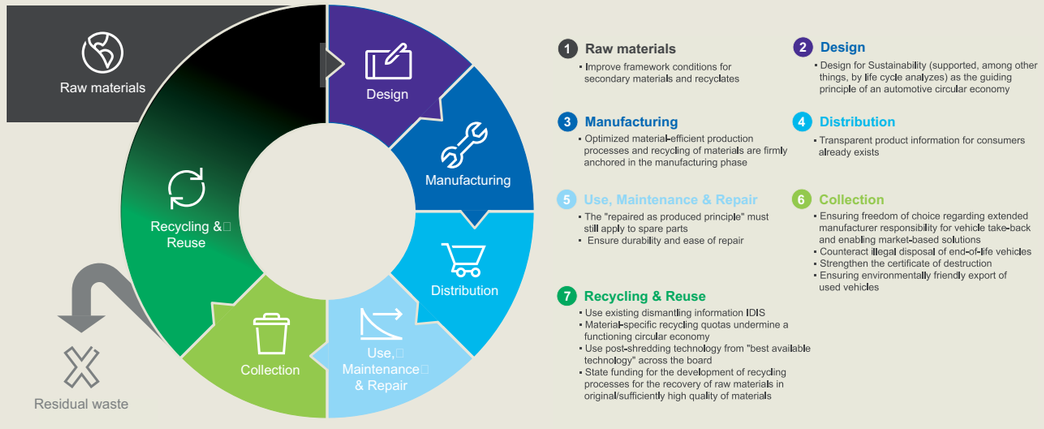
Various stakeholders must work closely together and be able to share data in order to keep a functioning circular economy running. This starts with information on the necessary raw materials and their extraction, both for manufacturers as well as for suppliers and development service providers. The latter must also know how to design and manufacture the components requested by the manufacturers. Customers must also be involved. Even now, transparent information on product sustainability is available. With regard to after-sales, workshop partners must have all the relevant information and parts for repairs and services. At the end of the vehicle life cycle, recycling partners are needed who efficiently dismantle the vehicles and thus return as many raw materials and components that meet the current quality standards as possible to circulation.



1/3 consists of **secondary raw materials**

Service life of over **20 years**

85% are **recycled**



Source: VDA

Automotive SMEs: backbone of our economy in the international competitive landscape

The supplier industry in general—consisting of suppliers, development service providers, start-ups, and numerous service providers along the automotive supply chain—and in particular automotive SMEs are a critical pillar of the German economy. Suppliers stand out for their creativity and innovation, and are responsible for up to 75 percent of the added value of a vehicle. The many SMEs often specialize in their respective field and play a crucial role in the global competitiveness of the German automotive industry as important suppliers for manufacturers.

In 2022, the German automotive industry invested 28.7 billion euros (+11 percent) in internal research and development. It thus surpassed the R&D expenses of the electrical industry, machine engineering, and chemicals (excluding pharmaceuticals) combined.

An *erstellte Auswertung* made exclusively for VDA shows that suppliers based in Germany established nearly 10,000 production sites around the world by 2022. According to the evaluation, most of these are located in Europe (approx. 3,000 excluding Germany), followed by Asia (approx. 2,700) and North America (approx. 2,600) (source: Dun & Bradstreet).
New production capacities are continuously being established internationally. The main motives for this are to strengthen the resilience of the value-added chain as well as the increasing erosion of conditions for production in Germany.

The ongoing economic weakness in many parts of the world, as well as difficult conditions for industrial SMEs in Germany and Europe, are hitting automotve suppliers hard: Low unit numbers, fluctuating consumer demands, high energy prices, above-average labor and tax costs, and the effects of inflation are amplifying the challenges faced by suppliers due to the transformation. They must often develop new business models in alternative drive technologies parallel to ongoing business with technologies for combustion engines, in addition to the digitalization or automation of products and production.

SMEs need an ambitious location program

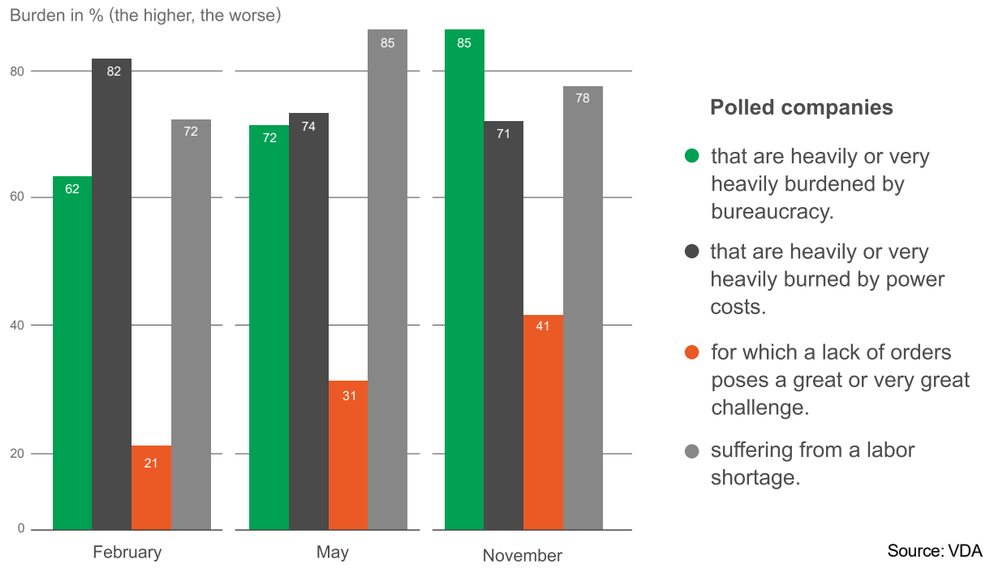
VDA and the Federal Ministry for Economic Affairs and Climate Action (BMWK) thus engaged in a structured dialogue to identify six areas of action for supporting automotive SMEs for the transformation:

1. Reducing high costs in Germany,especially for labor and energy
2. Ensuring reliable access to capital for investments in transformation technologies
3. Combating shortages in labor and professionals
4. Devising SME-friendly funding programs
5. Accelerating planning and permit processes for investments and dismantling bureaucracy
6. Creating an (at least) Europe-wide level playing field for legal requirements and regulations for ensuring ecological, social, and corporate sustainability

In 2023, VDA presented these areas of action to the expert task force Transformation of the Automotive Industry; the BMWK SME, Climate Protection, and Transformation dialogue and work process; and the federal government's Transformation of the Automotive and Mobility Industry strategy platform, and urgently called for action by policymakers for competitive location conditions in Germany and Europe. VDA also presented additional concrete suggestions that were devised in the VDA SME Forum.

Poll of automotive SMEs

Difficult location-induced conditions persist in Germany



Source: VDA

Study by VDA and Oliver Wyman: improve access to financing for SMEs in the transformation

The financing of investments has become one of the biggest challenges for suppliers in the transformation, and thus for SMEs in particular. This has been shown by polls regularly conducted among VDA members. As a result, various VDA task forces have spoken with suppliers and banks to determine how to improve the conditions for access to capital so that investments in climate-neutral products and production can be made in the long term. The results were compiled in a study conducted by VDA and corporate consulting firm Oliver Wyman in 2023 and published in March, 2024. One of the major insights provided by this was that financers have to take a much more detailed and nuanced look at the supplier landscape. This must be flanked by transparent, long-term economic conditions. At the same time, companies with a clear strategic alignment can form the basis for the financial feasibility of the transformation. A targeted diversification of the financing, active steering of the interest charge, and improvement of companies‘ ESG performance can increase the chances of financing.

You can find the study here:

”The next hurdle:
How will automotive suppliers finance the transformation?“

Cooperation in the automotive industry: key to global competitiveness

Current market conditions are enormously challenging for all stakeholders in the automotive supply chain: Low profits, new players in the manufacturing market, increasing global competition, high location costs in Germany and Europe, increased costs of raw materials, the labor shortage, and the extensive investments that manufacturers and suppliers are spending on the transformation are leading to high cost pressure throughout the entire automotive supply chain.

Cooperation among manufacturers, suppliers, and development service providers in accordance with trust laws is thus all the more important in order to ultimately continue offering globally competitive and innovative vehicles with regard to technology, quality, and cost. In 2022, VDA‘s members thus documented their joint concept of sustainable cooperation in the supply chain with the title, „Working together toward success: fundamentals of cooperation between automotive manufacturers and their partners“, and intensified their communication on the basic challenges of the automotive supply chain in 2023.

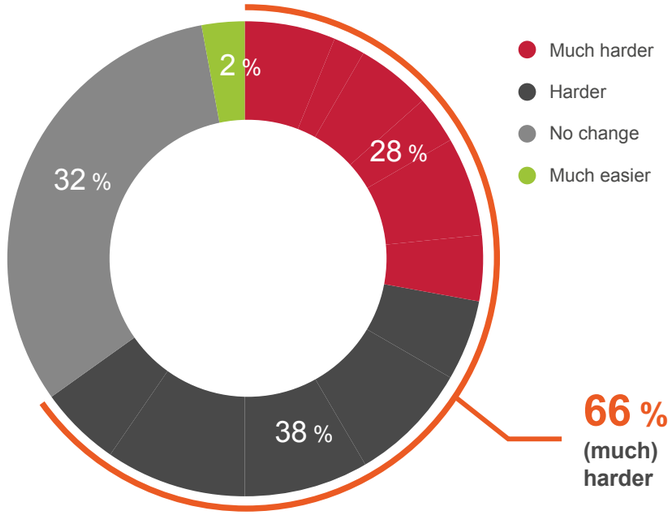
Development service providers become increasingly important in the automotive industry

In addition to manufacturers and suppliers, development service providers are playing an increasingly important role in the development and validation of components and systems.

Some of them develop entire vehicles or derivatives. Against the backdrop of shorter development times and product life cycles with simultaneously high model variety, these highly specialized companies are taking on ever-expanding scopes of development.
VDA and the development service provider task force worked together to draft a guideline for service partnerships that provides initial legal orientation for a partnership so that smaller development service providers can also be included in large orders.

Change in access to bank financing

in the last three years (2021–2023)



Source:
VDA / Oliver Wyman poll of 74 German automotive suppliers on financing conditions In the automotive supply industry, October / November, 2023

VDA strengthens regional cooperation with the initiatives Länderdialoge (State Dialogues) and VDA vor Ort (VDA on Site)

With the regular VDA State Dialogues, VDA has created a format that offers the relevant ministers of the federal states and their automotive clusters a platform to discuss important topics concerning state-specific regulations and funding. This discussion helps promote communication between the states and regional automotive clusters. Participants use the opportunity to talk about best practices and current challenges facing the automotive industry.

In 2023, VDA initiated the new format „VDA on Site“ to invite interested members, suppliers, and regional representatives from
the areas of policy, unions, clusters, and science to Germany‘s automotive regions to
discuss the specific conditions on site. The goal is to deepen the dialogue with the local
VDA members and directly take on their ideas and suggestions where they are active. The suppliers‘ individual needs and challenges shall also be discussed. In addition, VDA takes this opportunity to introduce itself to its contacts on site and in person, and to facilitate comprehensive dialogue on matters of concern to automotive SMEs.

How we are shaping the transformation (worldwide)

The innovation of the automotive industry is manifested in its continuous ability to research, develop, and integrate new technologies into its products. This helps it adapt to changing needs and societal demands. This willingness to innovate is especially clear in areas like electric mobility, autonomous driving, vehicle networking, security technology, recyclable products, and sustainable production.

National and international cooperation is paramount to successful global transformation of the automotive industry

Close national and international cooperation between authorities, industry, research institutes, and civil society is required in order to successfully implement the global shift in the automotive industry. By sharing knowledge, best practices, and resources, we can develop joint standards, guidelines, and regulations that aid in the transformation.

Investments in research and development are crucial to advancing innovative technologies and developing new business models.

These investments allow the industry to find new solutions for current and future challenges, such as in the areas of electric mobility, artificial intelligence, connectivity, or sustainable production technology.
der Konnektivität oder der nachhaltigen Produktionstechnologien.

The development of sustainable mobility requires investments in infrastructure as well as clear regulatory conditions. This includes expansion of the charging infrastructure for electric vehicles, the creation of incentives for alternative drivetrain technologies, the funding of smart transport systems, the development of standards for inter-operability, the security of networked vehicles, and a forward-facing regulation for old vehicles that facilitates a self-sufficient, innovative, and open automotive circular economy, among other things.

The German automotive industry will invest **280 billion** euros in research and development by 2028 – focus on electric mobility and digitalization.

From 2024 to 2028, manufacturers and suppliers in the German automotive industry will invest approximately 280 billion euros in research and development worldwide. These investments will focus on electric mobility, including battery technology, autonomous driving, and digitalization. Our manufacturers and suppliers are thus investing 56 billion euros globally every year during this period, thereby further increasing their spending on R&D.



Overall implementation of the transformation requires qualified workers with the necessary expertise to develop, implement, and maintain these new technologies.

One challenge in this regard is the labor shortage. Companies are competing domestically and internationally for specific qualification profiles. According to one VDA poll in November, 2023, a total of 71 percent of participating SMEs reported that the ongoing labor shortage is a challenge. However, in May of 2023, the number was 85 percent.

We wanted to know from our SME members what strategies they are using to combat the current labor shortage.

The poll revealed that there are numerous creative initiatives and successful change processes being implemented within and outside of the companies themselves. The automotive industry is not only addressing the current challenges, but is proactively tackling them and doing all it can to successfully maintain its current workforce on the path toward the transformation.

Mission Climate Neutrality: How we facilitate and advance climate-neutral mobility



The automotive industry is driving the transformation

Making road transport climate-neutral: For automotive companies and workers, the transformation toward climate-neutral road transport is both a challenge and an impetus. We aim to achieve climate-neutral mobility in Europe by the year 2050, in accordance with the Paris Agreement.

In past years, policymakers have formulated highly ambitious climate goals at the national and European levels. According to the European Green Deal, traffic and transport on European roadways must be made entirely climate-neutral in less than 30 years, not only in Germany but also all throughout the EU.

In Germany, CO_2 emissions from transport must be nearly half the value from 1990 by the near 2030, according to the national Climate Protection Act.

There are additional obstacles to achieving the climate goals when it comes to road transport. Despite the automotive industry‘s considerable efforts and enormous progress in the efficiency of new vehicles, CO_2 emissions from traffic and transport have not decreased to the required level. This is largely due to the spike in traffic density, with road traffic having doubled in Germany since 1990.

The transformation of the German automotive industry is in full swing, and the industry has long been moving toward a digital and sustainable mobility of the future. Investments in research and development (R&D) are crucial in order to advance developments in areas like autonomous driving, data-driven business models, digitalized and sustainable production, and the transition to alternative drivetrains.

In this regard, the innovative strength of companies in the German automotive industry is unique in the world: Manufacturers and suppliers will invest approximately 280 billion euros in electric mobility, batteries, digitalization, and other areas of research between the years 2024 and 2028.

Run-up to e-mobility is the key to success

E-mobility remains the key technology for achieving the climate goals in transport. Thanks to manufacturers‘ model offensive, a rapidly growing range of electric vehicles is making the shift easier:
There are currently 130 electric vehicle models from German corporate brands that consumers around the world can choose from. Technologically, these vehicles have matured and are leading in terms of charge duration, range, efficiency, and durability.

In the future, electric cars as a form of mobile energy storage will help compensate short-term fluctuations in the power grid and integrate more forms of renewable energy:
Even now, smart charging tariffs let customers charge their car when power prices are at their lowest. During these times, the proportion of renewable energy is especially high. Bidirectional charging will become increasingly present on the market in the coming years. It will be possible to charge electric cars in a manner contingent on flexible power prices and time-dependent net fees in times of high renewable power generation and low local grid strain, so that the power stored in the interim can then be fed into the home grid (vehicle-to-home, or V2H) or the public grid (vehicle-to-grid, or V2G). In this way, electric cars in the future will help make the use of renewable energy more efficient and reduce the economic costs of the energy system.



The range of solutions is expanding in all segments. In the commercial vehicle segment, alternative, climate-neutral drivetrains are on the verge of a debut on the mass market. Electric city buses are already becoming more common. E-trucks that can cover over 300 miles with one charge, making them suitable for long-distance journeys, are about to undergo serial production. In the coming years, they will be successively supplemented by electric fuel cell trucks, which means that climate-neutral alternatives will be available for all use cases of roadway cargo transport. This is due to hard work and very high investments:
The repurposing of automotive factories is happening at an unprecedented speed in order to scale the production of increasingly more heavily electrified plug-in hybrids and fully electric vehicles, as well as of the necessary components and parts for these. By the year 2028, the automotive industry will invest an additional 130 billion euros in the construction of new factories and the repurposing of existing ones. Thanks to strong joint efforts, we are catching up in Europe in an area where we have been lagging behind, namely in the area of traction batteries, which was previously the domain of mainly Asian and American companies: Over 30 giga-factories will be constructed throughout Europe for battery cell and module production in the coming years, many with direct or indirect involvement from German automotive companies.

Suitable conditions are required for the transformation to succeed

Despite this promising start, the transformation is faltering. Due to the federal government‘s erratic funding policies, the turnover from battery-electric vehicles in Germany will likely sink in 2024 for the first time. This starkly contradicts the federal government‘s target of reaching at least 15 million electric cars on German roads by the year 2030. The German automotive industry has met every requirement to achieve this: By 2030, German vehicle manufacturers alone will produce far more than 15 million electric cars. The fact that Germany is the second largest producer of electric cars in the world, behind China and ahead of the USA, underlines our manufacturers‘ aim of significantly shaping global automotive markets in the electric age. However, the markets these vehicles are sold in and where they are built depends on the respective conditions and locations.

There are two areas in particular in which Germany needs to catch up: Firstly, the success of e-mobility is made or broken by the expansion of the charging infrastructure.

People need the certainty of being able to charge anywhere and anytime with ease. Yet an Allensbach poll commissioned by VDA (July, 2023) shows that there is much still to be done: The charging infrastructure remains the greatest obstacle for consumers in the transition to an electric vehicle. Secondly, e-mobility must become more financially appealing after the abrupt end of the purchase allowance (environmental bonus) in December, 2023.

In addition to the market debut of vehicle models in the lower price segments, competitive power prices are also necessary. In light of the very high costs of power compared to other countries, there is much to be done with regard to state power price components and grid fees in particular.

Store of renewable fuels for climate protection

The market run-up for electric vehicles alone will not be sufficient to achieve the climate goals. Even if the federal government‘s target of 15 million e-cars by 2030 is achieved, there will still be over 35 million cars with combustion engines on German roads. Renewable fuels are playing an increasingly important role against this backdrop. These fuels can be produced from biogenic sources, and synthetically from renewable electricity. The focus should not rest solely on e-fuels, but also be considered in the possibilities of renewable fuels in the Renewable Energy Directive.

Synthetic fuels will likely only be available in large quantities as of the early 2030s. Biofuels, on the other hand, are already available in significant quantities and can thus be used. However, it is clear that synthetic fuels should not be used on an industrial scale in Germany. The meagre quantity of green power in Germany is most efficiently used for direct electrification.

Market-economic steering measures and corresponding press reporting must aid in the shift to climate-friendly technology and energy sources. Only cross-sector emissions offsetting with a CO2 cap will be capable of ensuring that the climate policy goals are achieved in the long term. And only with such offsetting can CO2 emissions be reduced where this would be the most affordable. The implementation of European emissions offsetting for road transport as of 2027 is a first, important step in this regard.

Making road transport climate-neutral: For the automotive industry, the transformation is a concrete task and not an abstract objective.



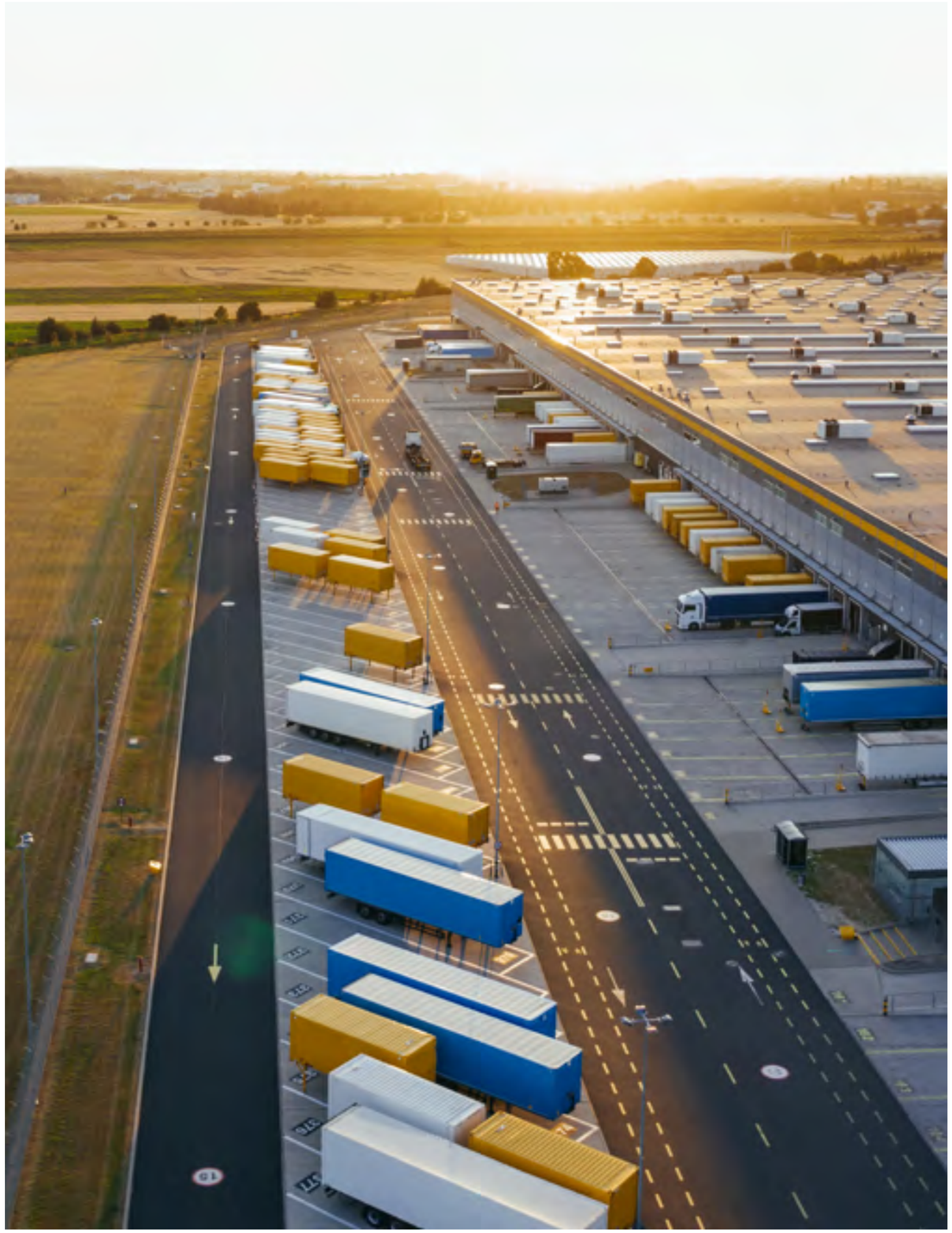
Transport & logistics: how we move people and goods in a secure, climate-neutral way

The automotive industry is committed to sustainable urban and rural mobility: climate-neutral, secure, and profitable

The automotive industry is committed to achieving sustainable mobility. The mobility of the future must be climate-neutral, resource-efficient, secure, and efficient with regard to use of space. However, people must be provided with affordable mobility suited to their own needs in both urban and rural settings. The economy‘s requirements of the transport infrastructure of the future must also be considered. Reliable and efficient freight traffic is a core pillar of Germany‘s competitiveness. Sustainability in traffic and transport can only be achieved with cars and trucks. Road traffic will remain an indispensable aspect of the transport system of the future.

The multi-modality of freight traffic: how different means of transport complement each other and secure the flow of goods

When it comes to freight transport, roadways are by far the leading mode of transport. In Germany, trucks perform around 72 percent of the transport output, with trains providing 19 percent and inland waterway vessels 6 percent. Because of their flexibility and their ability to connect various modes of transport, trucks are of great importance to the transport of goods. It is thus often indispensable for other modes of transport like railways, such as by covering the run-up and follow-up in combined transport. Railways and inland waterway vessels are especially competitive when transporting high-volume or heavy cargo across large distances. One good example of this is the transport of brand-new cars. The German automotive industry chiefly uses railways for this.
The modes of transport for cargo thus compete with each other much less than is often assumed due to their system-related advantages and disadvantages. Rather, they complement each other.



EU introduces stricter CO_2 reduction targets for commercial vehicles by 2040: drivetrain shift and new regulations for achieving climate neutrality

Commercial vehicles are responsible for about one third of the greenhouse gas emissions generated by German road traffic. In order to achieve the European climate neutrality targets, commercial vehicles will have to be powered by CO2-neutral drivetrains in the future. The corresponding technical solutions can aid in this in numerous ways. Battery-electric or fuel cell drivetrains are just as feasible as hydrogen engines or the increased use of CO2-neutral fuels. The EU Commission laid the regulatory groundwork for this shift several years ago. Regulation (EU) 2019/1242 defines the current and future CO2 fleet cap for heavy commercial vehicles.
In order to issue regulations for all commercial vehicles, including omnibuses and trailers, the Commission presented a new draft of Regulation (EU) 2019/1242 that includes numerous new vehicle categories as well as the CO2 cap until the year 2040. The following CO2 reduction targets have been set for trucks, coach buses, and tractor trailers: as of 2030 (-43 percent), as of 2035 (-64 percent), and as of 2040 (-90 percent). Center-axle trailers and pony trailers are subject to -7.5 percent, and semitrailers -10 percent, as of 2030. City buses are subject to a -100 percent reduction of CO2 as of 2035, with an interim target of -90 percent as of 2030. In order to be able to certify the CO2 values of each new vehicle, the software tool VECTO was expanded so that omnibuses and trailers can be assigned

The VECTO tools are the basis for the entire CO2 certification and provide transparency of all vehicle classes and manufacturers throughout Europe.

For a sustainable future: expansion of infrastructure for trucks and electric vehicles is paramount

Trucks need suitable conditions in order to fulfill its role as the driver of the economy while meeting the ambitious CO2 reduction targets. These include expansion of roadway infrastructure as well as truck parking areas along highways. A public charging and hydrogen fueling infrastructure must also be expanded throughout Europe. The corresponding availability of sufficiently usable charging locations must be ensured in a timely fashion in light of the need for parking and charging. Because electrically powered heavy-duty commercial vehicles used for long distances have to be recharged during normal driving and idle times, strong charge performance and charging columns that meet the MCS standard are required. This also means that large charging areas need a connection to the medium-voltage grid or, in some cases, the high-voltage grid. This must be considered when planning the expansion and clarified in advance with the grid operators. The Charging Infrastructure Master Plan II defines the necessary steps for this.

As a result of the high battery weights and resulting axle strain, the EU Commission has suggested a revision of Council Directive 96/53/EC for weights and measurements in international transport. The Commission would like to increase the masses of vehicle combinations by 4 tons and the drive axle loads by 1 ton when using zero-emission vehicles. Both measures are necessary to compensate for the drawbacks of modern e-vehicles with regard to reduced cargo load. This revision creates a necessary level playing field with modern diesel vehicles.

Using CO_2 toll revenues to decarbonize roadway cargo transport

Truck tolls also play an important role in regulating roadway cargo transport in Germany. CO2 emissions have been considered in the truck toll since December 1, 2023. This sets effective incentives for investments in zero-emission trucks, but this effectiveness can only be fully realized if the other conditions, such as expansion of the charging infrastructure for trucks, are properly met. It must be noted that of the additional income of over 7 billion euros per year from the CO2 toll, nothing has been earmarked for decarbonization of roadway cargo transport. It would be urgently required that at least a portion of the additional income returns to the sector that generates it.



Cars remain the uncontested leader with nearly 80 percent of all personal traffic output

In Germany, cars remain the most important means of transport for personal traffic, making up almost 80 percent of all traffic. Nearly 80 percent of German households own at least one car, and nearly a quarter have at least two. Cars are particularly invaluable in rural areas, yet they also remain popular in cities.



Variety and sustainability through multi-modal services and innovative technologies

The range of mobility services has increasingly diversified and expanded in recent years. Many people are no longer bound to one mode of transport, and are able to choose from a variety as needed. There is a wide range of mobility options, including carsharing and ride pooling. These can provide a convenient alternative to using one‘s own car, and help to close the gap between public transport and a personal car. The automotive industry plays a crucial role in the promotion of sustainable mobility and the development of multi-modal mobility concepts. Through innovative technologies and services, such as its own ride pooling services, the industry is furthering its commitment to modern mobility solutions. Autonomous transport systems known as „people movers“ could also supplement existing public transport technology.

The bus as the backbone of public transport

Public transport is an indispensable component of a sustainable mobility system, and buses play a key role. Over 40 percent of public transport trips are made by bus. Its particular strength lies in the fact that it can serve less frequented routes in a profitable manner. As a result, it is often the only relevant form of public transport in rural areas. Yet even in cities, buses usually offer the most dense network of connections. Long-distance buses have offered an affordable alternative for personal transport since they were introduced in Germany.

Plattform Urbane Mobilität

Plattform Urbane Mobilität – cities and automotive industry in dialogue

The urban mobility of tomorrow requires cooperation among all stakeholders. For this reason, VDA initiated the Plattform Urbane Mobilität (PUM) in order to deepen the dialogue between cities and the automotive industry.

The PUM serves to communicate visions and ideas, identify areas of action, and share best practice solutions.

It also aims to initiate the improvement of framework conditions.



Germany as an e-car hub? Where we stand with electromobility

The successful run-up to electromobility for cars and commercial vehicles largely hinges on the expansion of the charging infrastructure and affordable charging power costs

The German automotive industry is taking on a leading role in the market for electric cars. It currently offers 130 e-models around the world and enjoys a strong presence in the domestic market: Six out of ten electric car buyers in Germany opt for a model from a German manufacturer. An increasing variety of models is expected in the coming years that will cover all vehicle segments, including compact cars.

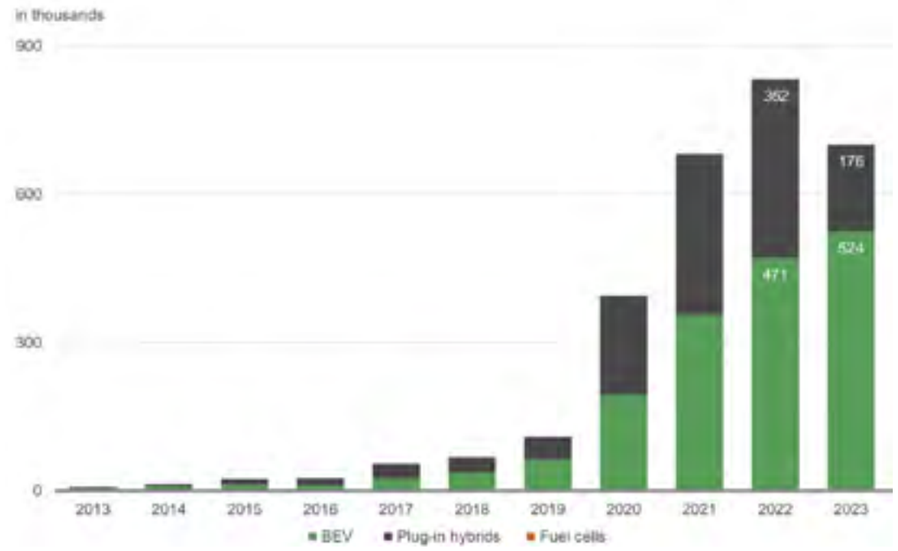
Around 4.8 percent of cars are electrically powered as of early 2024

New permits of purely electric cars (BEV) increased by 11 percent to 524,219 from 2022 to 2023 (following fig.).

On the other hand, there has been a 51 percent reduction of plug-in hybrids (PHEV) to 175,724 vehicles due to the termination of the environmental bonus for PHEV on January 1, 2023. On January 1, 2024, the number of electric cars was estimated at 2.33 million, of which approximately 1.41 million were BEV. This means that about 4.8 percent of existing cars were electrically powered, of which 2.9 percent were BEV.

Inflation pressure and termination of the environmental bonus hamper consumer acceptance – still, German manufacturers claim to be second largest producer worldwide

General inflation and the termination of the environmental bonus in late 2023 have led to increasing hesitation to purchase, and jeopardize the run-up to electromobility. Yet even though the market for electric vehicles is temporarily weaker, the figures are promising: German manufacturers alone will produce well over 15 million BEVs by 2030. This means that Germany is the second largest producer of electric cars, behind China and ahead of the USA.



78 percent of electric cars produced in Germany in 2023 were exported. The markets these vehicles are sold in depend largely on the respective conditions.

Expansion of the charging infrastructure must be accelerated

The establishment of the charging infrastructure and the necessary power grids remain key to the success of electromobility. People need the certainty of being able to charge anywhere and anytime with ease. According to the Allensbach study „Mobility and Sustainability“ from October 12, 2023, 68 percent of respondents have a critical view of the availability of charging opportunities in their area. 61 percent have a similar perspective of charging opportunities in shopping areas, while 49 percent see deficits along highways and rural roads. Two fifths of all municipalities currently have no charging points at all, and over three quarters of all municipalities have no fast charging points.

By November 1, 2023, 115,308 charging stations for electric cars were registered in Germany by the Federal Network Agency. 22,047 of these offered output of over 22 kW. Particularly of note are the 13,679 high-performance charging points with output of 150 kW and more, which are experiencing considerable growth. In order to meet the federal government‘s target of 1 million charging points by 2030, the rate of expansion seen over the past 12 months would have to be nearly tripled. The population generally expects a notable impact on the expansion of the charging infrastructure from the energy economy, federal government, and gas station operators. The necessary expansion of the charging infrastructure requires state support. This requires swift and ambitious implementation of all measures of the Master Plan II, including the Deutschlandnetz and the EU AFIR and EPBD requirements. The obligation to construct charging stations at gas stations promotes the comprehensive establishment of the charging infrastructure and its presence at known locations, which is a crucial factor when it comes to user acceptance.

Low prices for charging power make electromobility more appealing

With regard to total cost of ownership (TCO), BEVs are generally more affordable than conventional vehicles even now. The price advantage has become much smaller since the purchasing allowance ended, however. Prices for charging power are key to the financial appeal of e-mobility. Germany has room to improve here. The development of grid fees in particular is reason for concern.

Electrification of the commercial vehicle sector

BEV trucks are market-ready and are on the verge of serial production. BEV city buses are already becoming increasingly common. Manufacturers need long-term planning security with CO_2 targets, infrastructure, and state support.



Expansion of charging infrastructure for commercial vehicles in Germany urgently required

Currently, there is virtually no publicly accessible charging infrastructure with high connection output for heavy commercial vehicles, which provide 70 percent of freight transport in Germany, or for coaches.

Charging in depots and a public charging infrastructure are required for the use of electric trucks. The focus should thus rest on the quick tendering and creation of an initial grid of publicly accessible charging stations along highways for electric heavy-duty transport.
It is also important that financing for this project is ensured as of 2025 and the following years.

Run-up to electric trucks requires state backing: urgent need for funding programs and tax incentives

The run-up to electric trucks is still in its early stages. The acquisition costs are thus significantly higher than they are for conventional vehicles. State funding programs are imperative for supporting this run-up. The funding program for climate-friendly commercial vehicles and infrastructure (KsNI) should be revised in the 2025 budget to be less bureaucratic, and amended with fiscal incentives for switching to BEV/FCEV vehicles for fleet operators. The tax exemption for zero-emission vehicles in the truck toll should also be extended.



Bidirectional charging makes electromobility more appealing

Bidirectional charging is a core aspect of climate-neutral mobility of the future and the energy transformation, as it makes electromobility more appealing, promotes the expansion of renewable energy, and has the potential to support the stability of the power grids. Germany must be a pioneer and tech leader in bidirectional charging technology.



The automotive industry is working hard to implement bidirectional charging

The first BiDi-ready electric cars (i.e., they are bidirectional charging-compatible) are already being produced, or at the very least they can be charged and discharged via a compatible wallbox. A marked increase in electric cars on the market as well as their range of functions is expected in the coming years. Now the proper conditions must be met to successfully introduce them on the market. Abolition of the double burden on additional power costs is a crucial factor in this regard. A cooperative approach by the automotive and energy industries is needed in order to realize data solutions in the customers‘ interests.

Digitalization in the automotive industry: what must be done now

Digitalization has revolutionized the automotive industry, which comes with its own new opportunities and challenges. Success hinges on various key factors, especially the connection to cyber security in vehicles, artificial intelligence, and the use of vehicle-generated data.

The growing importance of cyber security in interconnected vehicles

In light of the increasing interconnectedness and complexity of modern vehicles, as well as an increasingly tense security landscape, cyber security has become an important field. Manufacturers are taking action to protect their vehicles against cyberthreats ranging from the theft of sensitive data to the manipulation of vehicle systems. These measures include implementing security measures in hardware and software as well as regular security updates. It is crucial that both the vehicle and user data as well as the vehicle‘s own functions are protected against unauthorized access and manipulation. This prevents potential cybercriminals from negatively influencing driving safety..
Es ist daher erforderlich, mögliche Gefahren bereits in den frühen Entwicklungsphasen neuer Fahrzeugmodelle zu erkennen und zu berücksichtigen.

It is thus necessary to identify and consider potential dangers in the early development stages of new vehicle models.
The automotive industry is working continuously to develop ongoing measures for improving security, and is adapting cyber security to its ever-changing needs. The Federal Office for Information Security (BSI) is working closely with VDA to ensure digital security in Germany as an economic and automotive hub.

Opportunities and challenges of artificial intelligence

AI offers enormous opportunities for the automotive industry, from the development of autonomous driving functions and the improvement of vehicle security to additional comfort functionalities and increasing personalization. As a result, it is currently being heavily used throughout the entire automotive value-added chain. AI applications in the automotive industry will only expand further in the future. Companies must ensure that AI systems are secure, reliable, and transparent in their decision-making.

Robust training datasets and mechanisms for monitoring and troubleshooting AI algorithms are needed. Automotive companies have already taken the corresponding precautions.

Secure and fair availability of vehicle data

In December of 2021, VDA developed the *ADAXO Concept (Automotive Data Access, Extended and Open)* in order to facilitate secure and fair use of data throughout the entire value-added chain. This concept covers the entire process from data generation in the vehicle to the provision of new data-based services for the consumer.

The ADAXO Concept aims to create a framework that facilitates trustworthy and transparent data provision between the various stakeholders in the automotive industry. Implementation of ADAXO allows manufacturers, suppliers, service providers, and end users to benefit equally from the advantages of efficient data processing and use, while data protection and data security remain guaranteed. VDA is actively committed to implementing and further developing this concept in order to proactively shape the future of mobility through responsible and innovative data use.

Modern vehicles generate a wealth of data that can be used for various applications, from hazard warnings and predictive maintenance to optimization of driving behavior. Companies must develop strategies for logging, storing, analyzing, and using these data securely, whereby data protection and data security are the top priorities. This includes adhering to data protection laws, implementing encryption technology, and ensuring vehicle owners‘ consent to data processing.

Overall, it comes down to automotive companies holistically addressing these key areas and integrating them into their strategies and processes. This requires close cooperation between manufacturers, suppliers, regulatory authorities, and other stakeholders in order to ensure that the opportunities offered by digitalization are utilized without compromising on security, privacy, and ethics.



Autonomous driving: how we can defend our leading position



The German automotive industry and federal government share the goal of establishing Germany as a pioneer and global trailblazer in autonomous driving. As a leading driver in this area, the German automotive industry strives for inter- and multi-modal mobility and has already laid the course for this. German automotive companies are investing in the development of technology to secure the leading position in automated driving. Germany's automotive industry is already a world leader in systems for autonomous driving beyond Level 3. The DRIVE PILOT Level 3 from Mercedes-Benz for the S-Class as well as the EQS and Personal Pilot L_3 in the BMW 7 Series (G70) are the only of their kind in the world.

Mercedes-Benz & Bosch receive world's first permit for Level-4 automated valet parking at Stuttgart Airport

In late 2022, Mercedes-Benz and Bosch received the world's first permit for automated valet parking, a Level-4 system in which the vehicle parks itself at Stuttgart Airport without the driver being present.

Creation of important regulations for autonomous driving in Germany

With the Act to Amend the Road Traffic Act and the Compulsory Insurance Act – Act on Autonomous Driving from July 28, 2021, nationally important regulations were created for facilitating autonomous driving on public roadways in Germany. National requirements from the law on autonomous driving were further specified in 2022 with the Autonomous Vehicle Permit and Operation Regulation (AFGBV).



In February of 2024, the Federal Ministry of Transport and Digital Infrastructure (BMDV) announced in the Verkehrsblatt 3/2024 the assessment guideline with requirements and evaluation criteria for approving specified operating areas pursuant to §§ 7 et seqq. of the AFGBV.

European legal framework for vehicles with fully automated driving systems

With the Implementing Regulation (EU) 2022/1426 from July of 2022, a European framework for vehicles with fully automated driving systems was enacted and a report on the technical interpretation of the framework was published in early 2024 (see also the section on international regulation, page 118).

The assessment guideline describes the next step with the requirements that must be met from the regulatory package, the Act on Automated Driving (Amendment to the Road Traffic Act), and the AFGBV, as well as those pertaining to the approval of an operating area for autonomous vehicles.

The regulations send an important signal and aid in the swift establishment of innovative technology, functions, and services in Germany and throughout Europe, and are a major component in the transition to autonomous driving.

The technology for automated functions will continue to develop dynamically in the coming years. Autonomous vehicles will shape the mobility of the future.

Project Digital Loop: virtual simulations for accelerating software updates

Innovation is at the core of the German automotive industry, as exemplified by the project „Digital Loop“, which premiered at IAA MOBILITY 2023 in Munich. Digital Loop uses virtual simulations to accelerate the approval of over-the-air updates and make them more efficient. This approach leads to considerable time and cost savings in the type approval process and helps to ensure product conformity throughout the entire life cycle of highly automated and autonomous vehicles.

Initiated by a cooperation between Kontrol, dSPACE, FEV.io, TÜV SÜD, Microsoft Deutschland, T-Systems, and Berylls, Digital Loop demonstrates how the German automotive industry is able to claim its leading position in the development and implementation of autonomous driving system technology through innovative and cross-sector partnerships.

The virtual approach addresses the complex challenges of software validation for vehicles by simulating true-to-life scenarios in a digital space.

This significantly reduces the necessity of physical tests and increases the reliability and security of software updates.

Against the backdrop of the great challenges of further advancing the technological solutions and future scenarios for efficient type approval, the topic is being actively tackled by OEMs, tier-1 suppliers, and public authorities. Germany is clearly illustrating that authorities are promoting and, in some case, even demanding innovation.

VDA members drive innovations: active ISO standardization support sets new standards in AV industry

Our members actively support the International Organization for Standardization (ISO). For example, the ISO 23374 AVPS (automated valet parking systems) was enacted in 2023, and the ISO 12768 AVDS (automated valet driving systems) is currently in progress. The state of technology for AVDS and AVPS is thus described as a means of orientation independent of competition.





IAA Mobility: Podium discussion with Richard Damm, President of the Federal Motor Vehicle Authority (4th from right) and Kai Grünitz, Brand Chairman of Technical Development at Volkswagen (3rd from right)

Through various projects, VDA members prove how innovative they are in both the domestic market and North America:

- **ANITA**
  Autonomous container transshipment, 2019–2023
- **ATLAS L_4**
  Hub-to-hub; with testing pursuant to AFGBV 2022–2025
- **TRATON und Plus Zusammenarbeit**
  Accelerator; hub-to-hub in practice, as basis for serial introduction, as of 2024
- **ALIKE Hamburg**
  Autonomous shuttles
- **ID BUZZ AD Testing**
  in Hamburg, Munich, and Austin (Texas) 2022, 2023, 2024

International visibility is achieved through projects like the ID BUZZ AD Testing in the USA, the partnership between Torc Robotics and Daimler Truck in the area of autonomous trucks, and the partnership between Continental and Aurora for commercially scalable, autonomous trucking systems in the USA.

The German automotive industry thus demonstrates its determination and decisiveness in the field of autonomous mobility.

On track for Fit for 55: Will the European project be a success?

The European Union has set a goal of achieving net greenhouse gas neutrality (net zero) by 2050 at the latest. One major milestone is the reduction of greenhouse gas emissions by 55 percent by the year 2030 compared to 1990. In order to align the various sectors with this goal, the European Commission presented a comprehensive bundle of legislative and non-legislative initiatives in July, 2021.

The German automotive industry supports the goal of making road traffic climate-neutral by 2050. It relies on innovations and technology to facilitate this shift. A long-term, stable European regulatory framework that is open to new technology is required. The measures set forth in Fit for 55 include new CO_2 emission standards for cars and vans, a regulation for the charging and fueling infrastructure (AFIR), a revision of EU emissions trading and the Energy Tax Directive, an amendment to the Renewable Energy Directive (RED), and a suggestion for a CO_2 Carbon Border Adjustment Mechanism (CBAM). The package was later supplemented by additional climate policy measures, such as new CO_2 emission standards for heavy-duty commercial vehicles and buses.

CO_2 fleet targets for cars and light commercial vehicles as well as heavy-duty commercial vehicles, buses, and trailers

The political decision with the greatest ramifications was the CO_2 fleet regulation for cars and light commercial vehicles. The regulation stipulates EU-wide fleet targets for average CO_2 emissions of new cars and light commercial vehicles as well as manufacturer-specific targets. The EU has agreed to greatly tighten the reduction targets for 2030, and decided that new cars and light commercial vehicles cannot emit any CO_2 as of 2035. This means a de facto exit for vehicles with combustion engines.

Table 1: EU-wide CO_2 fleet targets for cars and light commercial vehicles

	Cars	Light commercial vehicles
2020–24 (NEFZ)	95 g CO_2/km	147 g CO_2/km
2025–29 (WLTP)	93,6 g CO_2/km	153,9 g CO_2/km
2030–34 (WLTP)	0 g CO_2/km	90,6 g CO_2/km
As of 2035	0 g CO_2/km	0 g CO_2/km

Source: *Implementing decision (EU) 2023/1623*

However, the CO_2 fleet regulation contains a recital according to which the Commission is required to provide a legal framework so that vehicles that are exclusively powered by carbon-neutral fuels can be approved as from 2035 onward.

The discussion around the technical configuration of this new class of vehicles is ongoing.

With regard to the stricter EU climate target for 2030, the European Commission also suggested a revision of the 2019 CO_2 fleet targets for heavy-duty commercial vehicles in 2023 (not formally as part of the Fit for 55 package). The member states and European Parliament agreed on a new law before the end of the legislative period. The reduction targets for heavy-duty commercial vehicles are extraordinarily ambitious and earmark 2025, 2030, and 2035 as milestones toward achieving a CO_2 reduction of 90 percent by the year 2040. City buses are subject to a 100 percent reduction by the year 2035 (with an interim target of 90 percent by 2030). The CO_2 values calculated with VECTO for semitrailers must be reduced by 10 percent by 2030, while center-axle and pony trailers are subject to a 7.5 percent reduction. The CO_2 fleet regulation also defines low- and zero-emission vehicles (ZLEV) with 3 g CO_2/t km.

Table 2: Reduction targets for heavy-duty commercial vehicles

2025–29	–15 %
2030–34	–45 %
2035–39	–65 %
As of 2040	–90 %

AFIR and Energy Performance of Buildings Directive: Expansion of charging and H_2 fueling infrastructure

A sufficiently dense network of charging and hydrogen fueling stations all throughout Europe is crucial to achieving the ambitious CO_2 reduction targets for cars, light commercial vehicles, and heavy-duty commercial vehicles. We are not even close to having such a network for heavy-duty commercial vehicles in particular. With the Alternative Fuels Infrastructure Regulation (AFIR), the Commission presented a legislative recommendation that aims to expand the charging and H_2 fueling infrastructure at central traffic hubs in the EU: Fit for 55. The negotiations on AFIR have already concluded and the regulation was published in the Official Journal. The law stipulates fleet-based targets for light electric vehicles—1.3 kW per BEV and 0.8 kW per PHEV—as well as distance-based targets. Charging stations with at least 400 kW shall be installed every 60 km (37 mi) by 2025, and with at least 600 kW by 2027. For heavy-duty electric commercial vehicles, charging stations with a minimum output of 350 kW must be installed at every 60 km along routes in the TEN-T core network, and all 100 km (62 mi) in the full TEN-T network, whereby full network coverage must be achieved by 2030. An H_2 fueling infrastructure for light and heavy-duty vehicles must also be installed every 200 km (124 mi) along the TEN-T core network by 2030.

In addition to an ambitious configuration of the public charging and H_2 fueling infrastructure, a progressive charging infrastructure is also needed in private, public, and commercial buildings.

Although not a formal part of the Fit for 55 package, the Energy Performance of Buildings Directive (EPBD) is especially important. The EPBD contains provisions for the charging infrastructure in residential and non-residential buildings, and defines specific requirements for the number of charging points and for pre-wiring. It also aims to remove obstacles for the installation of charging stations to reinforce the right to a charging point.

Renewable Energy Directive

Another component of the Fit for 55 package was the updated Renewable Energy Directive (RED III), which regulates the run-up to renewable energy in all sectors. For the transport sector, this means a 29 percent proportion of renewable energy, or a greenhouse gas reduction of 14.5 percent, by 2030. Each EU member state must opt for one of the two targets. The new RED III includes road traffic as well as maritime and air traffic in the „transport sector“. There are two options for achieving the aforementioned targets: charging power and renewable fuel. These include conventional and progressive biofuels, waste-based biofuels, and synthetic fuels. Due to the currently limited availability, renewable fuels shall be increasingly mixed in with conventional fuels to gradually decarbonize the pre-existing fleet of vehicles. The two delegated legislative acts of RED III for defining green hydrogen (RFNBO) are especially important for the transport sector.

EU emissions trading and CO_2 Border Adjustment Mechanism

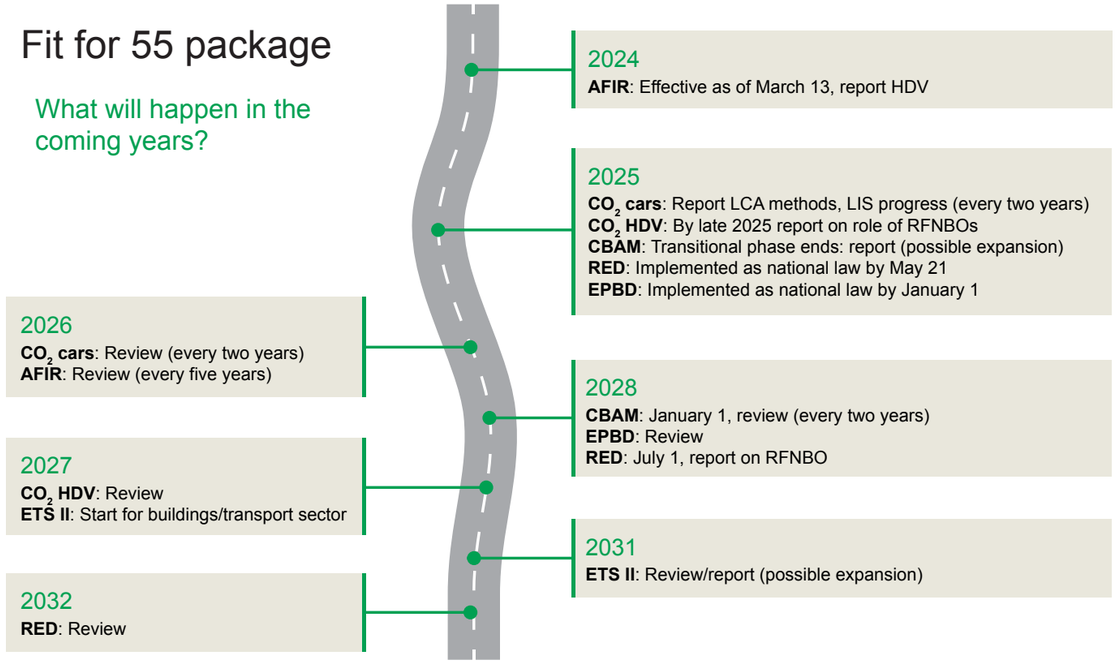
The emissions trading system (ETS) is the central and verifiably most efficient method for reducing CO_2. One of the most important tasks and greatest challenges is establishing CO_2 emissions trading as a guiding tool in sectors where it was previously not present. With Fit for 55, the Commission had suggested a revision and expansion of the EU ETS. The EU Council and Parliament were able to agree on the implementation of an ETS II for buildings and transport in 2027. Implementation of the ETS II will subject the CO_2 emissions in transport and the heat supply to a clearly defined CO_2 reduction target with a cap on all emissions by 2050. This ensures that European road traffic will achieve its climate targets. The negotiations on a CO_2 Border Adjustment Mechanism (CBAM) were also concluded. The CBAM aims to create a level playing field and prevent carbon leakage (meaning the move of CO_2-heavy industries to other countries). At the same time, the price of imported goods shall be more heavily reflected in the CO_2 generated by their production. However, the configuration of this instrument is complex as it must be ensured that it is compatible with the regulations of the World Trade Organization (WTO). It must not result in any protectionist import restrictions that will have a unilateral, adverse effect on imports.

Outlook

The Fit for 55 package was an important milestone on the path toward climate neutrality. It contained core regulations for the automotive industry with the CO_2 fleet targets, the AFIR, the RED, and emissions trading. Aside from a few exceptions (like the revision of the RED), the dossiers have been concluded and some have already come into effect. The next step is implementation. However, room for adjustments is required here.

The various laws stipulate a number of reports, status reviews, and evaluations at different points in time, some of which overlap or are duplicates of each other. Particular emphasis is placed on the review of the CO_2 fleet regulation for cars and light commercial vehicles in 2026, in which the pertinent conditions must be reviewed and improved if necessary. Here, too, the anticipatory expansion of the charging infrastructure must be the main focus, without which the ambitious fleet regulation goals cannot be achieved via a swift run-up of electromobility. Furthermore, the AFIR earmarks a report on the technology- and market-readiness of heavy-duty commercial vehicles by late 2024 and a review by 2027.

In addition to the implementation of the Fit for 55 package, the next climate policy milestone is coming up: Following the EU elections, the new Commission will put forth a climate target for 2040 and have to adjust its climate, energy, and transport policy framework for 2030 and the years following.



Free and fair trade as a guarantee of wealth

The extent to which free trade and globalization are still success factors for sustainable economic growth is becoming increasingly uncertain. From the perspective of the automotive industry, they have always been and remain the driver and guarantor of sustainable success. Despite the enormous expansion of international production, the export rate of German locations has not decreased.

Two trends are becoming clear:

- The German automotive industry is globally successful, but increasingly localizing.
- A high rate of domestic production is still being exported, so market access is an important success factor.

The global success of German manufacturers and suppliers also shows that they are attractive, agile, innovative, and globally competitive, although the conditions in Germany and Europe must be improved in order to maintain production there.

Geopolitical developments are increasingly impacting foreign trade and trade policy

The increasing influence of geopolitics and the correlation between commerce and other important issues like the environment or human rights comes with additional risks and challenges. One consequence is the increase in protectionism and unilateral measures, as well as the tethering of trade matters to security interests. New economic regions such as RCEP, USMCA, and the pan-African free trade zone AfCFTA are forming, while there is also a trend toward global economic blocs with growing barriers to trade.

In 2023, VDA explicitly committed itself to expanding international cooperation and breaking down obstacles to trade and investment. The companies are considering geopolitical developments, diversifying their supply chains, and adjusting their risk strategies where necessary. Scenario-based thinking is a matter of course for global industrial companies.

Year	Domestic car production	International car production	Export rate in %
1990	4.660.657	1.638.308	55,7
2000	5.131.918	3.698.244	67,3
2010	5.552.409	7.108.600	76,3
2020	3.515.488	9.810.848	75,3
2023	4.109.371	9.997.899	75,7

Important EU free trade agreements for VDA

Little progress in improving market access (as of: February, 2023)

Free trade agreement with	Start	Current status
1. Mercosur	1999	After additional EU demands, agreement still uncertain despite resumption of talks after pause in December (Argentinian election). Mercosur placed additional demands on BEVs (slower duty reduction to protect domestic industry). President Macron calls for re-negotiations
2. India	2007	India reticent with market access, difficult negotiations
3. Mexico (Update)	2016	Text complete, ratification currently blocked by Mexican energy policy
4. ASEAN* (total)	2007	EU-ASEAN agreement priority for VDA. There are only working groups
5. Indonesia	2016	17th round in late February, 2024
6. Thailand	2013	Paused 2014, relaunched 2023, 3rd round in June, 2024 in Brussels
7. Australia (luxury tax!))	2018	Agreement failed dramatically in Oktober, 2023. Possible return in 2025?

* Member states are Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam

For the automotive industry, policy is king. We continue to call for international cooperation that promotes mutual understanding and can sustainably increase global wealth. International cooperation is paramount to the success of the transformation, achieving the climate targets, and protecting the environment.

Free and fair market access and free trade agreements with a dismantling of tariff and non-tariff obstacles are essential for over 75 percent of the automotive industry. Furthermore, free trade agreements also aid in the diversification that policymakers are calling for. It is thus extremely problematic that the EU is currently barely able to negotiate and form agreements with important partners.

The main difficulty in forming free trade agreements lies in the tightened requirements for forming policy agreements that concern other targets like the environment and sustainability.

Even though the automotive industry supports these goals, they should chiefly be pursued with alternative instruments aside from trade agreements so that the agreement partners are not overloaded with EU requirements, thereby jeopardizing the formation of the agreements.

Conversely, an increasing number of concessions are being demanded from the EU that can in turn affect market access for the automotive industry. This is currently the case with the Mercosur agreement, where the partners are demanding a slower duty reduction for electric automobiles than had previously been negotiated.

Important agreements, such as those with India or other ASEAN states and Mercosur, are not progressing well. Agreements that were announced in 2023 such as that with Australia did not come to fruition and are not expected to proceed in the foreseeable future. Fundamental agreement was achieved in the important FTA with Mexico in 2018, although it has not since been ratified, initially due to the complex EU processes („splitting“) and now due to a dispute over energy. The ratification of the CETA agreement by the federal government, which VDA strongly championed, provided a silver lining this past year. However, the prospects for this are somewhat murky due to France‘s refusal to ratify. We expect more pragmatism from the European Commission in the negotiations for free trade agreements and a leading role by the German federal government.

This is coupled with the increasing tendency of EU trade policy to use unilateral instruments (such as CBAM, the anti-sanction instrument, the anti-deforestation instrument, or the regulation on foreign subsidies distorting the internal market). This is done at the expense of multilateral and bilateral cooperation, which the automotive industry has always championed.

One example of unilateral instruments of particular relevance to the automotive industry is the anti-subsidy inspection of BEV imports from China enacted ex officio by the EU Commission in 2023.

VDA is committed to free, fair, and rules-based trade that concerns both exports and imports from third countries

VDA has monitored the process and made it clear that anti-subsidy measures will not resolve the challenges facing the European and German automotive industries. Regardless of the outcome of the process, we call for both parties to deepen their dialogue and set aside any differences at the negotiating table. The potential increase in customs will not aid in alleviating the challenges concerning European competitiveness. Furthermore, the risk of potential reactions and an ongoing or escalating trade conflict must be considered.

The global trade landscape has been shaped by EU, US, and international sanctions induced by the Russian assault on Ukraine. The EU‘s extensive sanctions against Russia have created challenges for VDA‘s member companies with regard to export controls.

The German automotive industry condemns Russia‘s inhumane assault on Ukraine, and strongly supports the EU‘s sanctions against Russia. In 2023, the list of sanctions was further reinforced by sanction packages 10, 11, and 12. The companies are continuing to work hard under these conditions and are devoting considerable resources to implement the restrictive measures against Russia in order to ensure full compliance with the sanctions.

VDA works to ensure that state authorities further aid its member companies in implementing the sanctions against Russia

In particular, the companies require a clear regulatory framework (with as little opaque legal terminology as possible), practical guidance, and greater use of lists of (suspicious) organizations in the sanction packages. For example, VDA was able to aid in publishing more practicable verification regulations at the national and European levels, which helped achieve the ban on imports from third countries containing Russian steel.



Multilateralism under pressure

Most international trade is subject to the rules of the World Trade Organization (WTO). As the monitor of global trade and investments, however, the WTO is being increasingly weakened by the lack of functionality of the dispute settlement mechanisms. The USA and other WTO members are demanding a fundamental reform of dispute settlement at the WTO. Necessary judge positions are not being filled, which means that the WTO‘s arbitration awards can no longer be effectively implemented. VDA supports a reform of the WTO and is actively involved in the WTO‘s work.

Multilateral regulations are especially important to the automotive industry, which is why VDA is also an active member in the „Trade and Investment“ work group of the B20. The B20 represents the consolidated interests of the economies of the G20 states. The Group of 20 (G20) was founded in 1999 as an alliance of 19 states, the European Union, and (as of 2023) the African Union. The countries of the Global South are becoming stronger and demand more concessions from the industrialized nations, such as foregoing strict subsidy frameworks.

Trade-related investment measures are thus being discussed or implemented in many countries, such as in Africa. With these measures, for example, duties are relaxed in return for investments. India announced such a measure before the election this year and declared that it would reduce EV import duties in conjunction with local content requirements in the form of new investments for funding BEV production on site.



VDA is committed to free and fair trade

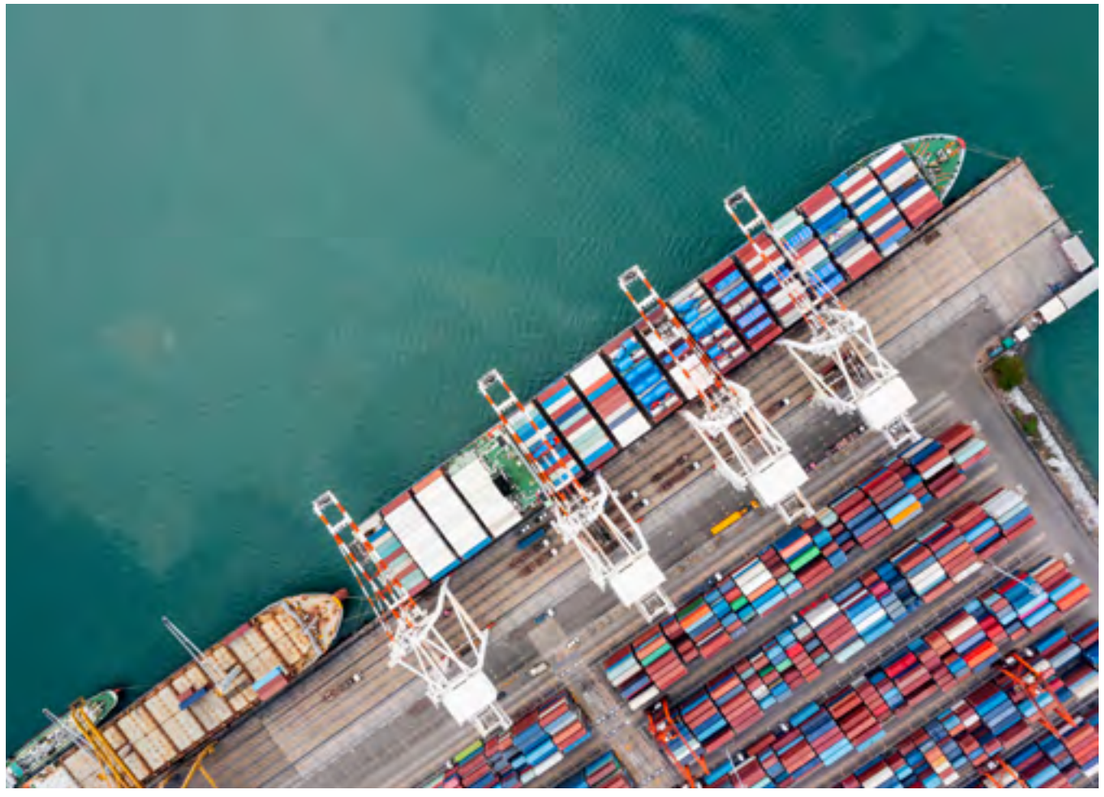
Incentives for the run-up to electromobility are a positive sign. VDA believes that such measures must ensure a WTO-compliant level playing field that all manufacturers and suppliers can participate in equally without adversely affecting certain investments or disregarding investments that have already been made. VDA thus aims to work with the Indian government to make improvements and prefers the funding of electromobility through comprehensive duty reductions as part of a free trade agreement.

IRA regulations in the USA, which largely earmark funding for vehicles manufactured in the USA, are another sign of increasing protectionism

This past year, the US government was able to obtain extensive concessions for leasing vehicles. However, these increasingly protectionist policies are unlikely to change with the US election on November 5, 2024—on the contrary.

Following the US election, it is likely that adjustments will be made to the USMCA (United States-Mexico-Canada Agreement) to further fund the US net product, which could have negative effects on Mexico in particular. Regulations concerning net product from China may also be tightened.

The EU-US Trade and Technology Council (TTC) gives the EU the opportunity to discuss important topics such as the outstanding Critical Materials Agreement (CMA) and the Aluminum and Steel Agreement. VDA is committed to a firm institutionalization of the TTC and the establishment of a secretariat for ensuring the long-term existence of this body for as long as possible.



UK: Duties on electric vehicles as of 2024 averted

Foreign economic conditions are making it increasingly difficult for EU locations to be internationally competitive. Value-added chains altered by the transition to electromobility could place further strain on the EU, as shown this past year with regard to the trade in electric cars between the EU and the UK. The Trade and Cooperation Agreement (TCA) stipulated a tightening of the requirements of European and British net product in electric vehicles. However, it became ever more clear last year that the automotive industry‘s needs could not yet be met by European battery projects for various reasons. The rules of origin that will be intensified from 2024 onward could not have been followed, and the immediate result would have been duties on trade with electric cars between the EU and the UK as of January 1, 2024.

VDA was very active in this matter and called for the rules of origin for electromobility to consider the real circumstances in the establishment of battery value-added chains. The federal government was correct and decisive in supporting this matter and appealing to the EU Commission and other member states to extend the applicable rules of origin. Duties on international trade in electric vehicles with the United Kingdom was thus essentially averted in the last minute.

We remain in close contact with our British automotive partners about this issue and others. VDA took Brexit as an opportunity to form the UK-German Automotive Working Group with the British automotive association SMMT. We are supported by the economic ministries in London and Berlin.





Economic strength of EU as requirement for global influence: more active trade policy needed

The EU Commission and member states should continue to look toward cooperation and the dismantling of trade obstacles for purposes of active trade policy. This must be one of the priorities of a new EU Commission following this year‘s election. Otherwise, investments in third countries will be increasingly appealing and the EU‘s exports and net product will decrease. The ongoing trend of automotive net product toward „local-for-local“ approaches hinges on these changing conditions, but has a considerable impact on Germany and Europe.

An economically strong Europe can also play a global role and assert European interests and values. Poor competitiveness in international markets due to increasingly protectionist tendencies will impair wealth and employment in the EU. The economic benefits of the international division of labor are lessening and production is often becoming more expensive.

The existing legal instruments for dismantling trade and investment obstacles should be used more heavily, with special focus on the industry‘s competitiveness. The WTO‘s legal framework must be reinforced and the arbitration courts must become functional again.

VDA and AAAM strengthen cooperation: Africa as a growing market

Africa remains a burgeoning market for VDA and its members. As part of the project between VDA and the African Association of Automotive Manufacturers (AAAM) funded by the Federal Ministry for Economic Cooperation and Development (BMZ), delegations were sent to Ghana, Cameroon, Senegal, Tunisia, Morocco, Ethiopia, and Kenya in 2023. The VDA President visited member companies in South Africa in January, 2023 and met with representatives of the South African government. A joint automotive forum by VDA and AAAM at the pan-African trade fair IATF in Cairo, as well as at IAA MOBILITY in Munich, brought automotive associations from throughout Africa together and presented new sales and production channels to the respective member companies.

Various themes were addressed in 2023, including support for new laws to promote trade and production in different African countries, the diversification of value-added chains, and the processing of critical and strategic raw materials on the continent. VDA has contacts in Berlin and South Africa for further expanding and deepening partnerships in Africa.



German automotive industry strengthens partnership with India

India is an important partner and future market for the German automotive industry, especially with regard to diversification, bilateral trade, and cooperation in the areas of electromobility and digitalization.

German manufacturers and suppliers currently have over 1,400 locations and production sites in India. Exports from the EU to India are also significant. The Indian car market was once again the third largest single market for cars in the world behind China and the USA in 2023, with a market volume of 4.0 million cars. Profits increased by 5 percent over the previous year. Automobile production in India also grew last year, with 4.6 million cars produced in 2023 (5 percent over the previous year). VDA supports cooperation with India through the Indo-German Working Group on Automotive between the German and Indian governments, as well as through a separate association partnership between VDA and its Indian partner associations ACMA (suppliers) and SIAM (OEMs).

External funding for this partnership by the BMZ expired in June, 2023 after six and a half years of successful project work. The partnership set the tone through a booth at the Auto Expo New Delhi, hosting the Indo-German Working Group on Automotive, accompanying the negotiations on the EU-India Free Trade Agreement, assisting the VDA member companies with their market access (such as with quality control regulations), and conferences and workshops on increasing the competitiveness of Indian supplier companies.



VDA is working intensively to continue the partnership even after the funding period expired. Together with the project partners, the cooperation is being kept alive in order to work with the partners in India to contribute to climate protection and technological advancement. The partners in India held a joint final workshop in Delhi and defined four areas for future cooperation: hydrogen, circular economy, electromobility, and interconnected and automated driving.

VDA members continue to benefit from the supply of information, delegation visits, and contacts with relevant stakeholders in India.



Competitor and partner: strategy for China

In July, 2023, the German federal cabinet passed its first „China Strategy“, in which the federal government defines its three-dimensional view of China as a „partner, competitor, and systemic rival“. We at VDA welcome the fact that the China Strategy considers strategic interests and economic opportunities, as we made clear in our brief assessment of the China Strategy in September, 2023. China is not only a major sales market and innovation hub for the German automotive industry, but also an increasingly important source market.

At the same time, the strategy paper illustrates a strong shift in the perception of China in Germany. For this reason, it is important to re-establish trust and address differences through direct dialogue. This also explicitly applies to critical topics like adherence to human rights or the matter of Taiwan. The China Strategy is now in the implementation phase after having been passed by the cabinet.

VDA has formulated the following recommendations for implementing the China Strategy

Dialogue instead of isolation
Ongoing cooperation with China is a basic requirement for successfully implementing the China Strategy. This includes intensification of climate policy coordination; cooperation in the area of electric and hydrogen mobility as well as interconnected and automated driving; standardization; and additional personnel capacities in German visa offices in China.

We also call for the federal government to work with Beijing toward the security of international business data flows.

De-risking with good judgment
VDA‘s members strive for a high degree of diversification and resilience in their supply chains.



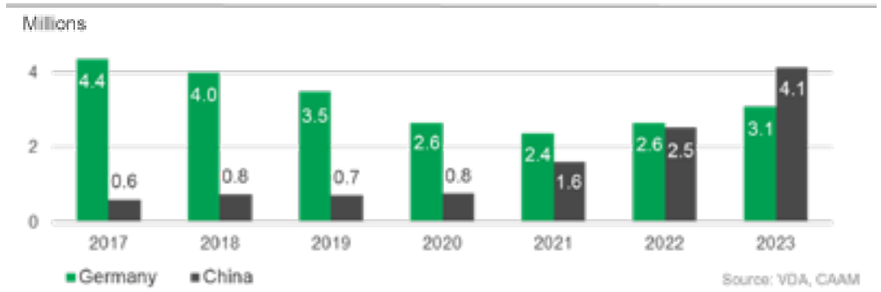
The EU Commission‘s planned instrument of outbound investment screening, which has now once again been postponed, should avoid sluggish inspection processes and not limit entrepreneurial freedom. This also applies to the amended investment inspection law planned by the federal government. VDA believes it is important that such a reform not have a negative impact on Germany‘s attractiveness as a location for investment and that it is not firmly aimed against companies from individual countries. The diversification of the raw material supply chains can only succeed if new options (such as in Africa, South America, or the Pacific) are included.

In order to support the companies‘ efforts to diversify as much as possible, we need to form new trade agreements with Mercosur, Mexico, ASEAN, India, etc.

Making Germany fit as an industrial location:
Internationally competitive local conditions are the best guarantor against growing competition, and they strengthen resilience. The China debate is important but it cannot divert our attention from the tasks at home: The federal government must accelerate the energy transition, create a competitive taxation and expenditure system, alleviate the (skilled) workforce shortage, dismantle bureaucracy, and consistently implement digitalization.

Comparison of car exports

Car exports from Germany and China



- Nearly 3 out of 10 cars sold worldwide are sold in China. The market share of German OEMs in China was 17.4 percent in 2023.

Car sales of German OEMs in China

Car sales in China



- China surpassed Germany in the number of car exports for the first time in 2023.

Economic Performance and Markets

Growth in the German automotive industry in the relevant markets in 2023

Automotive year 2023

As in past years, 2023 was a difficult period for the automotive industry. The Russian assault on Ukraine and the resulting economic and societal consequences still pose challenges for us. Geopolitical risks have worsened as a result of Hamas‘ attack against Israel and the subsequent war in the Gaza Strip, and the attacks by Houthi rebels against commercial ships in the Red Sea, to name two examples. Jeopardized trade routes significantly impair an international industry like automotive.

Germany also finds itself under great pressure: New framework conditions have weakened Germany‘s competitiveness. Energy prices, which spiked in the previous year, have fallen from their record values but are still high. Coupled with this is weak economic development overall. The gross domestic product fell by 0.3 percent this past year. In addition to 2020 (the year of the coronavirus) and 2009 (the year of the financial crisis), this marked the first real decrease in German economic performance in 20 years.

Let‘s consider the automotive markets: Some of the largest sales regions recorded considerable growth in 2023. Trade in new cars in Europe and the USA grew at double-digit rates after a weak 2022. Car sales also experienced a marked increase in China. High demand this past year stemmed from order backlogs that had built up in prior years. However, this buffer has since diminished.

While the run-up to electromobility experienced a downturn in Germany in 2023, demand continues to rise around the world, especially in the other leading automotive markets in China and the USA. The environmental allowance, which was decreased at the turn of the year 2022/2023, had a major impact on new approvals. Nevertheless, Germany remains the third largest sales market for electric cars worldwide, behind China and the USA.

Car production in Germany benefited from a palpable slacking in the supply chains. The shortage of pre-products in years prior was the main obstacle to production according to many companies. Other factors, such as the availability of skilled workers, have since become more important than before. However, domestic car production experienced strong growth of 18 percent in 2023.





The transformation in the industry continued unabated: Domestic production of electric cars increased by 43 percent in 2023, and as a result, three out of ten cars produced in Germany had an electric engine.

The most important export destination for German-produced cars was the USA once again, closely followed by the United Kingdom. The latter long sat at the top of the list, but lost this position as a result of Brexit. China ranked third.

The big international markets for heavy-duty commercial vehicles mainly grew in 2023 over the previous year. After a weak performance in 2022, China turned around and grew by one third. Sales of heavy-duty commercial vehicles also grew in Europe and the USA. The improved supply situation in the supply chain had clear effects, allowing backlog demand to be met.

Market developments 2023

Car market in Germany

The car market in Germany grew by 7 percent in 2023 and achieved a market volume of about 2.8 million new approvals. However, this still leaves the market 21 percent behind the 2019 level when 3.6 million cars were newly approved in Germany. The year was primarily shaped by the slackening shortage of pre-products in production, in particular the semiconductor shortage that massively impaired the markets in 2022. This resulted in a base effect in 2023 that induced two-digit rates of growth at times (Q_2: +19 percent; Q_3: +18 percent). The reduced / slashed environmental allowance caused some market upheaval. The change in funding led to a pull-forward effect into 2022, and thus to a reduced number of new approvals at the start of 2023 (Jan: -3 percent; Feb: +3 percent). The slashing of the environmental allowance for commercial new approvals in September 2023 created a new effect (Aug: +37 percent; Sep: ±0 percent). At the end of 2023, there was another pull-forward effect as the environmental allowance was to be further reduced at the turn of the year 2023/2024. The pull-forward effect in December, 2022 was much stronger, and as a result the more recent instance was significantly overstated (Nov: -6 percent; Dec: -23 percent). The slashing of the environmental allowance in December of 2023, announced shortly before it occurred, likely had barely any impact on new approvals in 2023.

Owner groups

New approvals underwent different dynamics in 2023 depending on owner group. While private owners registered 2 percent fewer new vehicles, new approvals for vehicles belonging to commercial owners increased by 12 percent. 2021 marked the only year since Germany‘s reunification that there were fewer new approvals of privately owned cars. Every sub-group in the category of commercial owners grew, with rental car companies experiencing the greatest increase in new approvals (+15 percent).

Engine type

While new approvals of cars with a combustion engine benefited from the improved supply situation (gasoline: +13 percent; diesel: +3 percent), sales of cars with electric engines decreased (–16 percent). The market dynamics of electric cars was initially recessive (-16 percent), with 700,200 electric cars newly approved in 2023. Growth was heavily shaped by the multiple changes to the funding regime. Sales of plug-in hybrids (PHEVs), which have not been eligible for funding since January of 2023, fell by 68 percent. New approvals of battery-electric cars (BEVs) decreased in January, November, and December due to changes around the turn of the respective years, but increased considerably throughout the rest of the year. Overall, 11 percent more BEVs were approved in 2023 than in the previous year. Vehicles containing fuel cells also played a minor role at fewer than 300 units.

Vehicle segments

The increase in new approvals in 2023 was distributed among many segments. Compact, mid-size, upper mid-size, large executive, off-road, SUVs, and sports cars each experienced double-digit growth. The large executive class underwent the most growth at 13 percent. Minivans (-18 percent), minicars (-3 percent), and „other“ cars (-16 percent) were the only segments to experience a decrease. Off-road vehicles and SUVs remained the largest segment in 2023. This diverse segment, which includes vehicles of many different sizes, made up 41.5 percent of all new approvals.



Commercial vehicle market in Germany

Heavy-duty commercial vehicles

A total of 88,200 heavy-duty commercial vehicles weighing over 6 tons were newly approved in Germany in 2023, equaling nearly 24 percent more than in the previous year but falling 4 percent short of the pre-coronavirus level in 2019 (91,400, the highest sales volume since 2008).

With the exception of February, new approvals were in the black for the first eight months with consecutive, two-digit rates of growth. A peak was reached in August at 11,800 new approvals, the highest value since June, 2019. This was primarily due to earlier new approvals in conjunction with the incorporation of Smart Tachograph 2, which is obligatory as of August 21, 2023. September marked the beginning of significantly hampered market growth, with decreases in September (-6 percent) and December (-4 percent), as well as relatively weaker rates of growth in October (+10 percent) and November (+2 percent). The high overall growth rates in 2023 were shaped by the comparatively low reference level from 2022, which was influenced by restrictive factors such as the challenges posed by the Russian invasion of Ukraine, the resulting uncertainties in the markets, supply chain problems, material shortages, and generally poor economic growth. New approvals in the segment for vehicles over 16 tons increased by 25 percent (nearly 69,000 units, almost 14,000 fewer than the previous year and a new record).

The proportion of commercial vehicles over 16 tons among all new approvals of heavy-duty commercial vehicles over 6 tons in Germany was 78 percent, slightly above the level reached in 2022.

Light commercial vehicles

The German market for light commercial vehicles grew significantly in 2023. New approvals of commercial vehicles under 6 tons grew by 13 percent to 266,000 units, equaling an increase by 29,800 vehicles. In the previous year, the market had shrunk by 13 percent or 36,000 units. This was still 46,000 units (15 percent) shy of the pre-coronavirus level in 2019 when the German market for light commercial vehicles surpassed the milestone of 300,000 units for the first time. This was followed by a three-year period of decreases in market volume (2020: -12 percent; 2021: -1 percent; 2022: -13 percent), partially due to the coronavirus pandemic and its effects on the economy.
The change in course that began in Q_4 2022 continued well into 2023. High growth rates were achieved in the months from May to August in particular (May: +25 percent; Jun: +28 percent; Jul: +31 percent; Aug: +31 percent). By the end of the year, the market volume was below the values from 2022 (Nov: -3 percent; Dec: -17 percent), though it must be noted that the market in late 2022 reached relatively high sales rates similar to those in 2019. Weak economic dynamics also inhibited growth in late 2023.





Trailers and buses

German bus market

In Germany last year, new approvals of buses weighing over 8 tons increased by 11 percent to 4,831 units, leaving the market somewhat above the level reached in 2014. The German bus market numbered over 5,500 units from 2016 to 2021, largely due to the liberalization of long-distance buses from 2013. The coronavirus pandemic more or less paralyzed long-distance bus transport. Short-distance bus transport only reached the pre-coronavirus passenger mile levels in the first three quarters of 2023, while long-distance bus transport recorded 42 percent fewer passenger miles than in 2019.

The Clean Vehicle Directive regulates the acquisition of city buses by public buyers in the European Union. As fleets modernize, it defines the increasing minimum quotas for alternative drivetrains (especially e-buses). This has had a positive impact on the proportion of alternative drivetrains in new bus approvals.
In order to make urban traffic more climate-friendly, the funding directive from the Federal Ministry of Transport and Digital Infrastructure (BMDV) from September 7, 2021 is funding the market activation and run-up of buses with climate-friendly, alternative drivetrains in public transport.
The new approvals from 2023 show that the funding has been fruitful and alternative drivetrains are becoming more prevalent.

The number of battery-electric buses increased by 15 percent (prior year: 13 percent), and alternative drivetrains now make up 43 percent (prior year: 36 percent). At the same time, the number of diesel-powered buses fell from 64 to 57 percent. High rates of growth were achieved from May to August in particular (May: +25 percent; Jun: +28 percent; Jul: +31 percent; Aug: +31 percent).

German trailer market

The German trailer market experienced a considerable downturn in 2023. New approvals of trailers numbered 272,400 units, which is 39,400 fewer than the previous year (-13 percent). This was the second consecutive year of negative growth. 2014 was the last year that fewer trailers were newly approved (271,300). The economy was one of the factors that influenced the market dynamics for trailers. Semitrailers performed even more poorly: At 32,200 new approvals (-17 percent), market volume was at the same level as it was in 2021 and equivalent to the average from 2010 to 2019. In 2023, semitrailers made up nearly 12 percent of all new trailer approvals in Germany just as they did in the year prior (2022: 12 percent).

Car markets in Asia

Chinese car market

The Chinese car market grew for the fourth consecutive year in 2023. Retail sales grew by 5 percent to 21.7 million cars, marking the greatest market dynamics since the last market downturn in 2019. China was thus the central pillar in the global market and remains the largest single market worldwide. Unlike in most Western nations, China‘s car sales are significantly higher than the pre-coronavirus level in 2019 when 20.1 million cars were sold. China‘s share in the global market was at 29 percent in 2023.

The beginning of the year was shaped by sluggish growth. The cumulation of the first two months allows us to calculate out the New Year‘s effect, which is significant in China; the market was down 21 percent. This was influenced by the end of the fiscal funding from July up to and including December of 2022, namely the 50 percent cut in sales tax (5 percent instead of 10) on cars with an engine size of less than 2 liters and a sales price of no more than 300,000 yuan (about 41,000 USD).
The tax decrease aimed to boost sales of vehicles with combustion engines. The expiry of this incentive resulted in a pull-forward effect and reduced sales figures in early 2023. Significant growth was then achieved in April (+58 percent) and May (+30 percent). The primary reason for this was a base effect due to coronavirus lockdowns that led to a downturn in the car market in the Shanghai metropolitan region, for example.

German manufacturers held a market share of 17.6 percent in the overall market last year.

The market share of German manufacturers underwent a negative trend due to its market share in electromobility being lower than its share in the overall market. About one in every 20 new e-cars in China last year bore the logo of a German maker.

Electromobility grew considerably once again last year, with sales of electric cars (BEVs, PHEVs, FCs) growing by 38 percent to 7.3 million vehicles. The proportion of electromobility in the total Chinese market thus increased to 33.7 percent. Plug-in hybrids in particular benefited from this market growth, with plug-in hybrid sales growing by 84 percent to 2.3 million vehicles and thereby performing more strongly than the sale of battery-electric cars (+23 percent to 4.9 million units). The Chinese government backs the sale of electric cars by reducing the sales tax on them. The market was also influenced by a price war in the competition for market shares in electromobility. Subcompacts in China in particular are heavily electrified, and nearly 100 percent of minicars are now electric.



Japanese car market

4.0 million new approvals were registered in the Japanese car market in 2023, equaling above-average growth of nearly 16 percent compared to the global market. The main drivers for the more stable demand and improved supply of vehicles were progressive economic recovery from the coronavirus pandemic as well as improvements in the supply of semiconductors and other components for vehicle assembly. However, 7 percent more vehicles were sold in 2019, the last year before the pandemic. The low total volume of car sales (relative to a historical comparison) led to a base effect that justified the high rate of growth and was only able to partially hedge the persistent domestic economic crisis. Japan‘s overall economy is struggling with ongoing poor growth, especially with regard to domestic demand and a weak national currency, and this has a costly impact on necessary energy imports. Stagnancy in the Chinese economy is hampering Japanese exports. Japan also still has considerable backlog demand in electromobility. Only 96,600 electric cars were newly approved in Japan in 2023, although this was 38 percent more than the previous year. However, the very low baseline only rose slightly as a result. The share of electric vehicles in the overall Japanese market in 2023 was about 2 percent, though it must be noted that Japanese manufacturers make much greater use of full hybrid electric vehicles (FHEV). These make up about 30 percent of the total market in Japan. This category of vehicles is not covered by the local definition of electric vehicles, and so they are statistically categorized as combustion engine vehicles.

South Korean car market

The South Korean car market had a mixed year in 2023. The first half of the year was marked by solid, positive rates of growth due to low figures in 2022. Due to the strong economic focus on foreign trade, the effects of the coronavirus pandemic were still present in the first half of 2022 in the form of logistics issues and material shortages, which in turn limited car sales and led to poor performance. However, these situations improved in the second half, with the reference values in Q_3 and Q_4 being unequally higher. Growth increasingly receded throughout 2023, although it remained slightly in the black for the entire year. A total of 1.5 million cars were sold in South Korea in 2023, equaling moderate growth of 3 percent. The market for electric cars was no longer dynamic. 116,900 cars with electric engines (BEVs, PHEVs, FCs) were sold in 2023, about 12 percent fewer than one year prior. The high rates of growth from the previous two years were not continued. The proportion of electric drivetrains on the total market fell to nearly 8 percent (prior year: 9 percent).

Indian car market

4.1 million cars were sold on the Indian car market in 2023, an 8 percent increase from the previous year. As a result, the Indian car market was the third largest single car market in the world for the second time in a row. This was the third consecutive year of growth, and India surpassed its record level set one year prior. While growth was positive in the first half of the year at 10 percent, it fell to 6 percent in the second half. However, these lessened dynamics in the second half of the year were due to the higher reference values from the previous year.

While positive economic growth led in turn to positive car sales, especially as the growing middle class creates new consumer groups, implementation of the exhaust standard Bharat Stage VI 2.0 in April, 2023 inhibited sales as an additional cost factor.

The proportion of utility vehicles, which mainly comprise SUVs, was 57 percent, marking the continuation of the trend toward larger vehicles in the Indian market. Electromobility does not play a major role in India, however, with a market share in the single digits.



Commercial vehicle markets in Asia

Chinese commercial vehicle market

The trade in trucks in China in the year 2020 was, unlike the rest of the world, immensely dynamic and achieved an unprecedented volume of nearly 1.8 million units. A state program for fleet renewal and the new, nationwide China VI exhaust standard initiated in the middle of the year were two of the factors that played a major role in this. However, the expected correction took effect in the Chinese commercial vehicle market in 2021 and intensified considerably in 2022. As a result, the Chinese market fell to a volume of 767,800 units in 2022, which equates to a near halving of the market within just one year. The trend changed course in 2023, with strong 33 percent growth for the entire year. After the crash, China registered just over 1.0 million units in 2023, but was still far behind the record level. The heavy-duty truck segment in particular benefited with an above-average growth rate of nearly 36 percent. The Chinese market for heavy-duty commercial vehicles remained the largest truck market in the world by far in 2023.

Indian commercial vehicle market

Since the downturn in new approvals as a result of the coronavirus crises in 2020, new approvals for heavy-duty commercial vehicles have in India have increased every year in spite of the traditionally high volatility of sales in India. This positive trend continued in 2023.

The market for heavy-duty commercial vehicles increased by nearly 11 percent last year, to a total of 357,700 units. This far exceeds the pre-crisis level in 2019 (+38 percent over 2019), but falls 14,400 units short (-4 percent) of the record level from 2018.



Car markets in Europe

Domestic EU market (EU27), European Free Trade Association (EFTA) comprising Iceland, Liechtenstein, Norway, Switzerland, and UK market

New approvals on the European car market (EU, EFTA, and UK) remain at a low level after a few challenging years. In the majority of markets observed, they are well below the reference level from 2019, but were able to achieve positive growth compared to the prior year. Weak figures from the prior year led to a base effect that explains a relevant proportion of the growth. 2023 as a whole was also marked by notably low volatility. Value-added and logistics chains recovered throughout the year from the aftereffects of the coronavirus pandemic as well as from geopolitical conflicts. Material bottlenecks only impacted a minority of the previously heavily affected companies in the automotive industry. Two-digit rates of growth were achieved in the first three quarters of the year compared to that same period in the prior year, which somewhat reduced the difference from the pre-crisis level. The market performed less well in the fourth quarter, in particular due to weaker months of growth in Germany. While both the market and production had been strained in previous years due to the aforementioned supply-side limitations, an increasing number of demand-side effects became more relevant throughout the year. The business environment for the automotive industry was and remains challenging.

Macro-economic uncertainties in Europe resulted in hampered aggregate demand, and thus to subdued economic growth. The ongoing high energy and consumer costs inhibited car sales. Improved availability of vehicles over previous years led to the new approval of about 12.8 million vehicles in the European car market in 2023, equating to 14 percent more than the prior year. However, recovery compared to the pre-crisis level remains sluggish: The European car market is still about one fifth (-19 percent) behind the number of new approvals from 2019. Equivalent to the overall market, the five largest individual European markets developed positively over the prior year: While Italy (+19 percent), the United Kingdom (+18 percent), Spain (+17 percent), and France (+16 percent) achieved growth in the double digits, Germany (+7 percent) was only able to enjoy restrained growth.

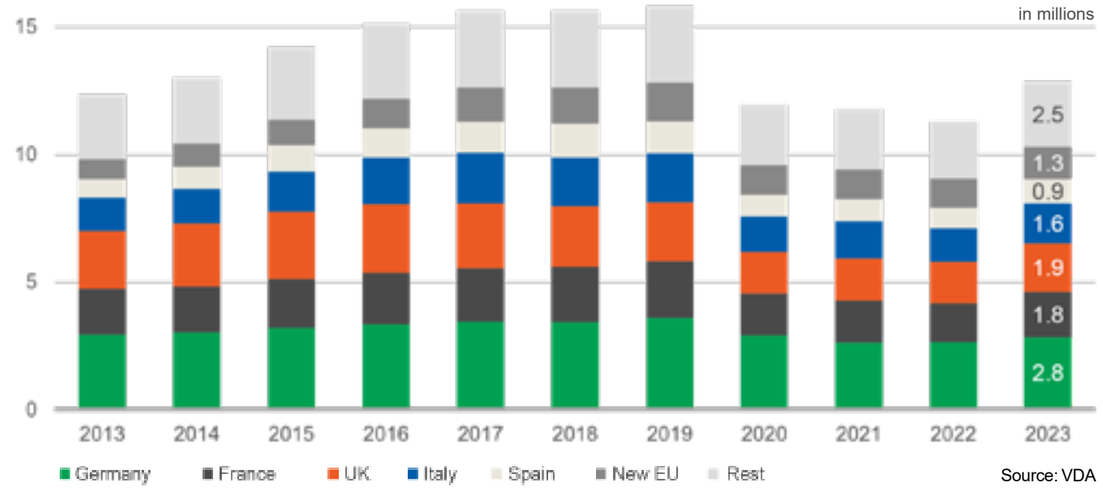
The difference from the pre-crisis level is especially great in Southern Europe, leaving room for recovery. The base effect was particularly strong here over the past year. Growth in the traditional vacation destinations of Italy and Spain was boosted by an increase in rental vehicles. The pandemic continued to play only a minor role in the minds of many consumers, allowing tourism in these countries to recover and palpably increase. Car rental companies, who expanded their fleets due to increased demand, were able to benefit from this development.

One reason for the rather moderate growth in Germany was a special effect in the electricity segment in late 2022 (amendment to the funding of electric cars), which resulted in a marked distortion of the growth rate in Q4 of 2023 (see also the section on the development of the German market).

Eastern European nations performed slightly below average (+12 percent) compared to the total European result. The Polish market remained by far the largest single market in Eastern Europe in 2023 with 475,000 registered units (+13 percent), followed by Czechia and Romania, with 221,400 (+15 percent) and 114,600 (+12 percent) new cars sold, respectively.

New car approvals in Europe

E28 & EFTA: Top 5 + new countries



Source: VDA



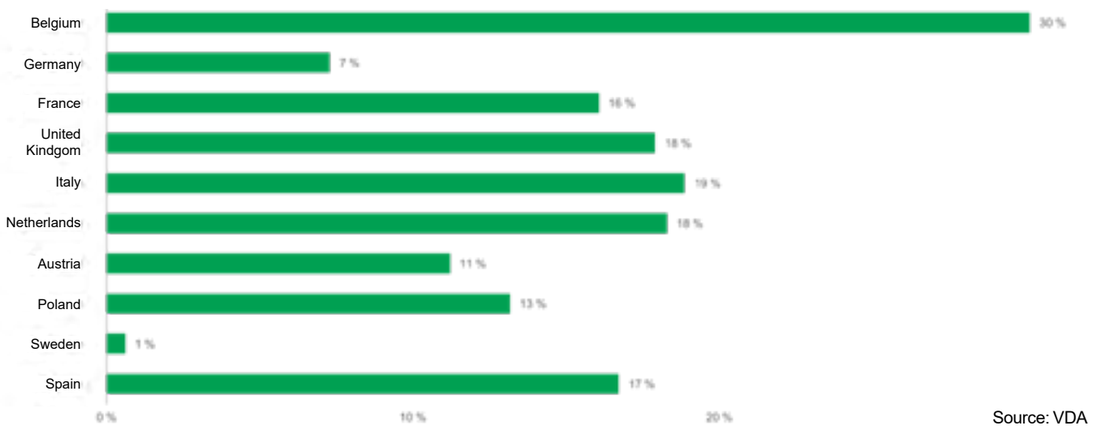
In spite of a complicated environment, the European market for electric cars was able to achieve a volume of about 3 million units, a marked increase of 16 percent. The proportion of electric cars among all new approvals in 2023 was at 23.4 percent. This was driven by BEVs, which were able to increase by 28 percent over the previous year. New approvals of PHEVs slipped into the red, however, and remain about 4 percent below the prior year‘s level. Growth in this segment was primarily prevented by poor market growth in Germany, where the environmental allowance for PHEVs expired at the turn of the year 2022/2023. This greatly reduced demand, which impacted the growth dynamics in Europe. After Germany, France and the United Kingdom are the strongest markets for electric cars in Europe by volume.

As usual, the Nordic countries reported the highest proportion of electric cars in 2023: Norway (90 percent), Iceland and Sweden (60 percent each), Finland (54 percent), and Denmark (46 percent) stand out with the highest market shares. They are followed by the Netherlands (44 percent), Belgium (41 percent), and Luxembourg and Portugal (32 percent each). Eastern European markets performed considerably below average in this segment, with some markets well under 10 percent.

Turnover of German OEMs in Europe markedly increased and grew approximately proportionate to the overall market. In all, about 5.9 million cars from German makers were sold in Europe, 14 percent more than in the prior year. Because the overall market and turnover of German OEMs developed in tandem, the German market share in 2023 remained constant. As in the previous year, 46.2 percent of newly approved cars in Europe bore the logo of a German maker.

10 largest car markets in Europe

Select countries – difference in 2023 over 2022



Source: VDA



Russian car market

Following the invasion of Ukraine, resulting sanctions, and international isolation of the country, the Russian light vehicle market took a major blow. It was able to slightly recover to a low level in 2023. About 926,600 light vehicles were sold. Because of the very poor figures from the previous year, this marked a 35 percent increase over 2022.

European heavy-duty commercial vehicle market

The turnover of heavy-duty commercial vehicles (weighing over 6 tons) in Europe (EU, EFTA, and UK) spiked by 16 percent over the previous year to nearly 392,800 units. Of the five largest individual European light vehicle markets in the Americas, France (+12 percent; 48,600 units), the United Kingdom (+12 percent; 45,400 units), and Italy (+13 percent; 28,000 units) exhibited positive rates of growth.

In spite of a decrease in volume in 2023, the Polish market remained the strongest in Eastern Europe in 2023 (-1 percent; 32,000 units). The German market, on the other hand, rallied after a more subdued 2022, recovered strongly (+24 percent; 88,200 units), and is thus the largest single market in Europe by far. The Western European submarket (EU14, EFTA, UK) grew by 18 percent over the previous year, partially due to the strong German performance, and thus performed somewhat stronger than the total European market. Next to Germany, France, the United Kingdom, and Italy, Spain is one of the five largest single markets in this subsegment. 27,800 heavy-duty commercial vehicles were sold in Spain in the past year, about as many as in Italy. The Spanish market grew strongly in 2023. Overall, it registered about 22 more heavy-duty commercial vehicles than in the prior year. With a turnover volume of 306,000 units, the Western European heavy-duty commercial vehicle market returned to the pre-crisis level in 2019 for the first time, when 306,500 units were approved—marginally fewer than in 2023.

Light vehicle markets in the Americas

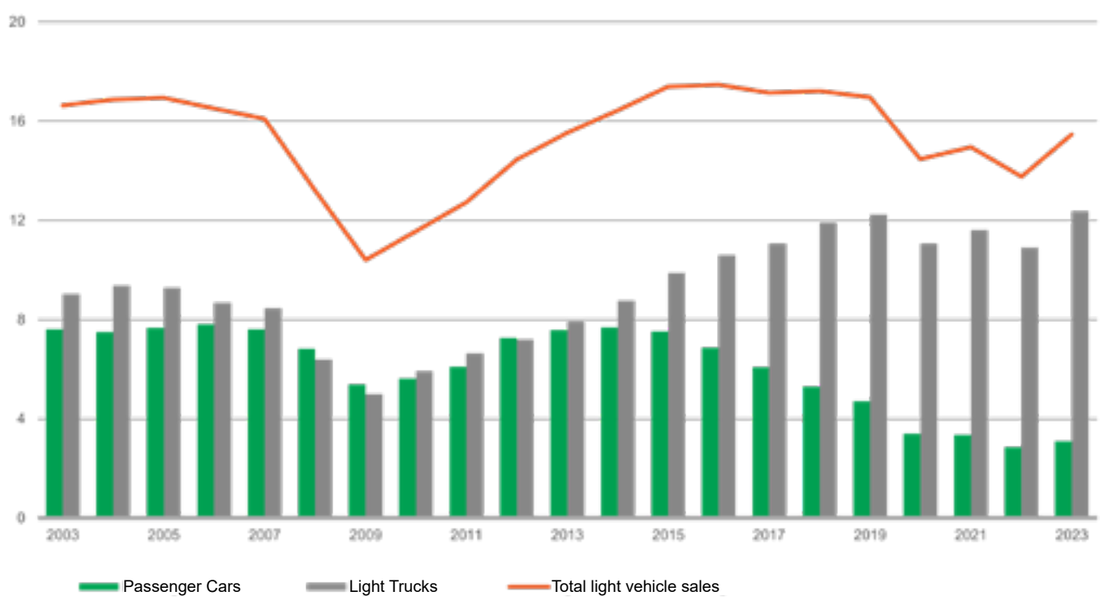
USA

Sales of light vehicles in the USA in 2023 increased by about 12 percent to 15.5 million units. This was the largest growth by percent in market volume since 2012. These dynamics were aided by the low starting figures of the prior year. Turnover in 2023 was still 9 percent behind the level from the last year before the coronavirus, 2019. Still, the market grew in each individual month of 2023, even with two-digit rates of growth throughout the summer. The market exhibited growth of 17 percent in both the second and third quarters. The main driver for this was the supply of new vehicles. After the material bottlenecks in the prior years manifested in markedly reduced production and turnover figures, this factor is still binding. Low storage stock also exhibited clear signs of recovery in recent months. Locally manufactured and imported vehicles were also able to benefit from the positive market growth. The US market was most recently supplied up to 56 percent by factories in the USA, while about 16 percent of new vehicles in the USA are produced in Mexico and 7 percent in Canada. About 22 percent of new vehicles do not come from a factory in USMCA. The sale of electric light vehicles become somewhat more dynamic in the past year. At 1.4 million electric light vehicles, turnover was 52 percent over the prior year‘s level. This was evenly distributed among BEVs (+51 percent) and PHEVs (+55 percent).

The purchase of electric vehicles in the USA is currently being promoted with a tax credit of up to 7,500 USD. The criteria for this tax credit include vehicle characteristics (such as place of final assembly, list price, battery capacity, weight, manufacturer) and consumer characteristics (income). The long-standing trend in the USA of light vehicle buyers away from the traditional car and toward light trucks continued unabated in 2023. While the sale of basic cars increased at a below-average rate of 8 percent, light trucks grew by 13 percent. The proportion of light trucks thus increased to 80 percent, setting a new record. The largest single segment within light trucks, and the biggest winner of recent years, were cross-utility vehicles / crossovers (CUVs). In Germany, these are classed alongside SUVs. CUV sales increased by 19 percent in 2023 to about 7.4 million units, stronger than any other segment. Their market share thus grew from 45.3 to 47.9 percent. With their greater external dimensions and off-road characteristics compared to the CUV, SUVs reached a market share of 9.4 percent. Their sales increased by 4 percent to about 1.5 million units.



Long-term light vehicle sales in the USA



Source: VDA

The turnover of electric light vehicles increased by 51 percent this past year to 184,800 units. The proportion of electric vehicles in the light vehicle market was thus 10.9 percent. With a production volume of 1.5 million light vehicles (+26 percent), Canada remains an important automotive producer. While production in the basic car segment increased by 30 percent in 2023, 24 percent more light trucks were assembled in Canada than the prior year. Production was 37 percent shy of the record year of 2012.

Mexico

The Mexican light vehicle market grew strongly in 2023 as it did in the previous year. 1.36 million units sold equated to volume growth of 25 percent. This past year, both the basic car and light-duty segments similarly benefited from the run-up, with the light-duty segment performing somewhat more strongly. 777,800 units equated to an approximately 28 percent increase over the prior year. The basic car segment increased by 22 percent to 582,300 vehicles. 57.2 percent of all sales were in the light-duty segment, which became more relevant than in the previous year when it was at 55.9 percent. The high growth in 2023 led to the Mexican market surpassing its turnover from 2019 for the first time since the coronavirus crisis. However, it still fell about 241,700 vehicles shy of the record value from 2016. German manufacturers were able to slightly expand their share in the Mexican light vehicle market. With an increase of 29 percent and a market volume of about 182,000 new approvals, German makers performed better than average compared to the overall market. A market share of 13.4 percent (prior year: 13.0 percent) was achieved in 2023.



Canada

The Canadian light vehicle market grew by 11 percent to 1.7 million vehicles in 2023. Sales of basic cars increased by 4 percent over the previous year at 268,600 vehicles. Light truck sales increased by 13 percent to 1.4 million units. The proportion of light trucks in total new light vehicle approvals reached a record level of 84 percent. This still falls 12 percent short of the sales volume from 2019. While growth in the first half of the year was in the single digits, the dynamics markedly improved in the second half (H1: +8 percent; H2: +14 percent). Market-inhibiting factors (especially material shortages and high credit costs) had increasingly less impact on turnover. Sales of electric light vehicles increased in the past year by 51 percent to 184,800 units. The share of electric vehicles in the total light electric vehicle market was thus 10.9 percent.
With a production volume of 1.5 million light vehicles (+26 percent), Canada remains an important automotive producer. While production in the basic car segment increased by 30 percent in 2023, 24 percent more light trucks were assembled in Canada than in the prior year. Production still fell 37 percent short of the figures from the record year of 2012.

Mercosur

Turnover of light vehicles in the Mercosur economic region (a trade bloc in South America comprising Argentina, Brazil, Paraguay, and Uruguay) grew by nearly 11 percent in 2023. While 2.39 million vehicles were sold in 2022, 2.64 million were sold in 2023. This still failed to achieve the pre-crisis level from 2019, when nearly 3.08 million light vehicles were approved, or 14 percent more vehicles than in 2023. All Mercosur markets recorded marked increases in sales volume over the prior year.

The Brazilian light vehicle market achieved a volume of nearly 2.2 million vehicles this past year. Sales were 11 percent above the level from 2022. With a share of 82 percent of the Mercosur sales, Brazil remains the dominant market in the region. However, it still lags miles behind the record levels from past years. For example, 60 percent more light vehicles were sold in the record year of 2012 than were sold last year. Nevertheless, the country‘s economic growth has been positive.



Stable growth, openness to reform, and new investment programs stimulate the economy, infrastructure, and labor market, and have led to increased sales of light vehicles. However, caution is advised due to the volatile inflation. The Central Bank reversed interest rates around the middle of last year and gradually reduced the base rate from 13.75 percent to the current 11.25 percent, although any further reductions are still uncertain. The government‘s expansive fiscal policy could stimulate prices and compel the Central Bank to take a more restrictive course with regard to monetary policy in the near future. This would mean a deterioration of financing conditions and place strain on the vehicle market.

Light vehicle sales also underwent positive developments in Argentina. 406,900 newly approved units meant approximately 8 percent growth over the prior year. However, the Argentinian economy is in the midst of a deep crisis with extremely high inflation, a correspondingly high interest level, and low consumer purchasing power. For example, over twice as many light vehicles were sold in 2017 than in 2023.

Javier Milei has been the country‘s president since December, 2023. His libertarian approach may alter Argentina‘s economic and social policies significantly. In the event of new economic prosperity and a broader opening up of the economy, the vehicle market will be able to benefit as well in the interim.

The third largest market in Mercosur, Uruguay, also recorded marked growth in 2023. 57,600 newly approved vehicles meant a 10 percent increase over the prior year, as well as a new sales record for the small South American nation.

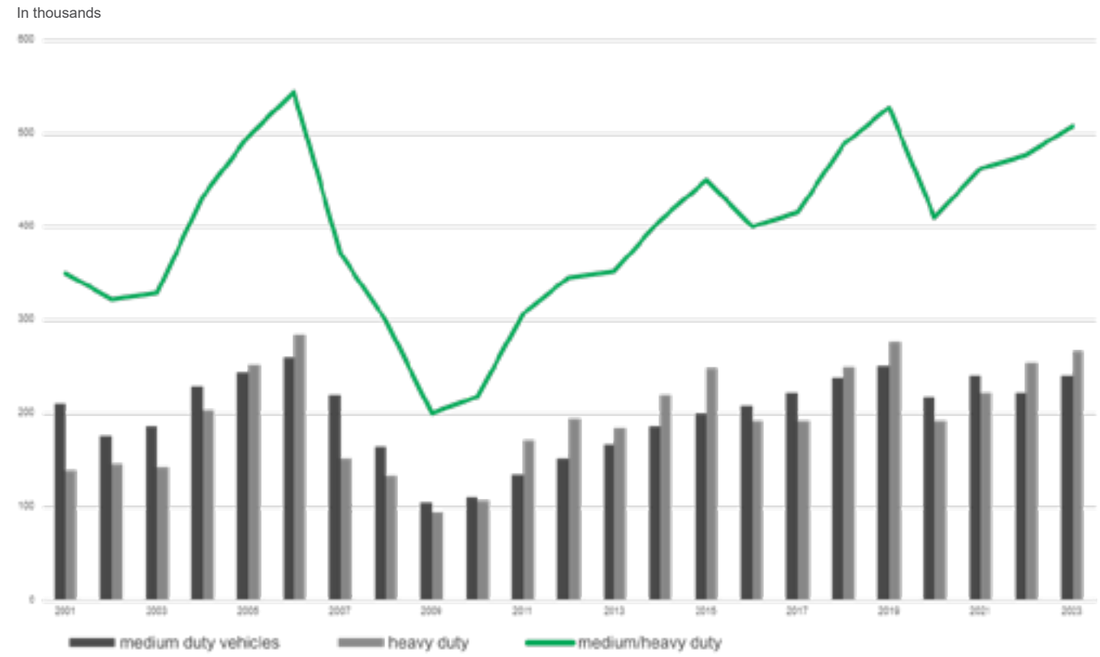
US commercial vehicle market

The American market for heavy-duty commercial vehicles took a strong hit from the coronavirus pandemic in 2020 and fell to its lowest level since 2016. Nevertheless, the market was very quickly able to palpably recover as of 2021. This recovery continued into 2022, and now into 2023. Sales grew particularly strongly in the first half of the year (+15 percent over H_1/2022). The market slightly decelerated in the second half of the year (-1 percent over H_2/2022), although this was primarily due to higher reference values from the previous year. The market experienced marked growth in the second half of 2022. For the entirety of 2023 the US commercial vehicle market experienced growth of 7 percent, equating to turnover volume of 507,300 units.

Both the heavy-duty segment (class 8 / > 15 tons) and the medium-duty segment (weight classes 4–7 / 6.3–15 tons) underwent positive growth. The former achieved growth of 5 percent over the previous year, 8 percent for the latter. Despite another year of strong economic growth, 2023 fell 4 percent short of the figures from 2019 (527,100 cars sold), which was itself the most high-volume year since 2006 (544,600 units).

Heavy-duty commercial vehicles in the USA

Turnover of medium and heavy trucks



Source: WardsAuto



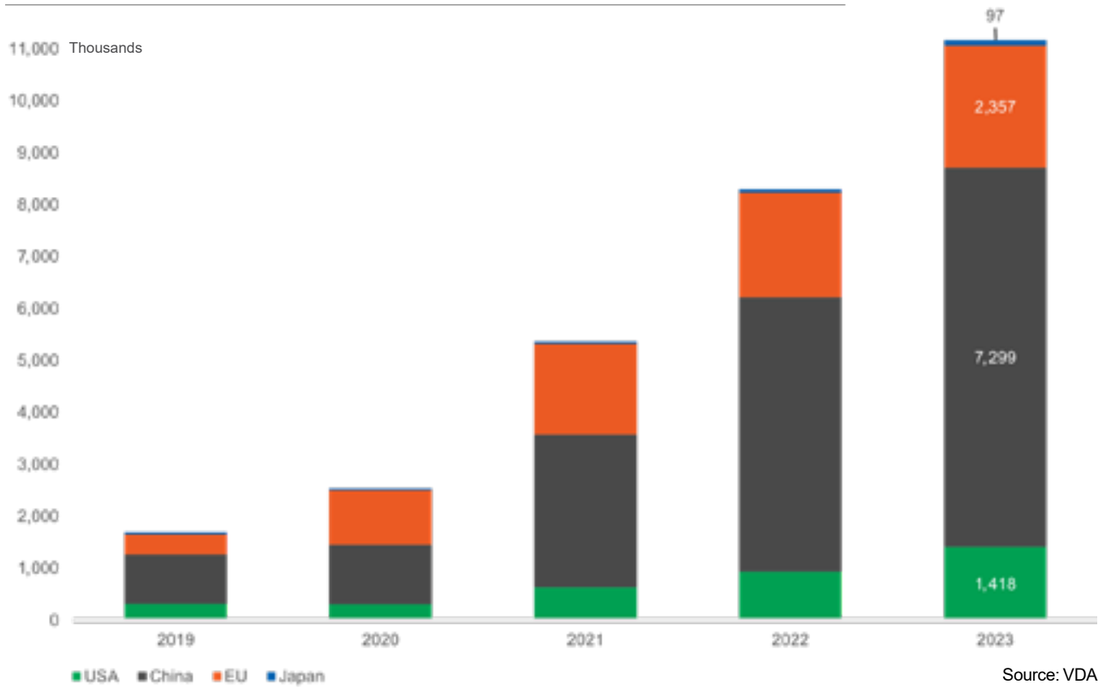
Electromobility: an international comparison

The global lead-up to electromobility continued in 2023 with new car approvals. At around 12.6 million newly approved electric cars (BEV, PHEV, or FCEV) around the world, 2023 far exceeded the previous year‘s record of 9.4 million units. E-car sales thus increased by about one third, which is a slower pace than the previous year in which sales increased by over one half. This is entirely normal due to the significant unit numbers with the launch of a new drivetrain technology. About one in every six cars sold around the world is currently powered by electricity. 8.7 million of these, or 69 percent (prior year: 71 percent) are purely electric BEVs.

Fuel cells (BFCEV) are on the downturn again and are now hardly of relevance at less than 10,000 units. The rest are plug-in hybrids (PHEV), which have become relatively more popular in 2023. The transformation from combustion engines to electric engines, which is necessary in light of the ambitious UN climate target, is fully underway in the automotive industry. It must be considered that development in the individual markets is quite heterogenous, and overall there is a more or less distinct correlation between wealth and market penetration with electric cars. Incentives and legal regulations, such as CO_2 caps, play a major role.

Run-up to electric

Sales figures by countries and regions



Source: VDA

Deutsche Pkw-Produktion im internationalen Vergleich

Domestic car production

Domestic production could be expanded last year, as in the year prior. After growth of 12 percent in 2022, production grew by another 18 percent in 2023. Domestic production is thus still 12 percent, or over 0.5 million vehicles below the level from 2019. One important reason for the growth was the ongoing high number of orders that were being processed throughout the year at normal levels, thereby sustainably supporting production. E-car production in Brandenburg was also high and aided in the growth of domestic production.

Supply bottlenecks prevented an even better result, although the semiconductor shortage was not quite as palpable as it was in the two years prior. Yet growth was hampered by the strong orientation toward premium products that, like electric-powered cars, require an above-average number of chips for assistance systems, screens, controls, etc. Last year, the proportion of premium products grew to 71 percent (2019: 62 percent).

The transformation toward climate neutrality is illustrated by the fact that, in 2023, more BEVs were produced in Germany (23 percent of domestic production) than diesel (20 percent) for the first time. If one includes the nearly 8 percent of plug-in hybrids, Germany was the second largest producer of electric cars last year with 1.27 million e-cars, after China.

Gasoline-powered cars, the proportion of which sank from 52 to 49 percent, were not spared by the shift toward e-mobility. Germany is the leader in Europe for the transformation, although traditional combustion engines are still a major mainstay for buffering the abrupt shift toward CO_2-free mobility with drastic consequences for workers, and for suppliers in particular. At 1.53 million units, all-terrain vehicles and SUVs (+41 percent) were the most important segment last year, ahead of compact cars at 1.01 million vehicles (+22 percent), mid-size cars at 0.64 million units (-2 percent), and upper mid-size cars at 0.36 million units (+5 percent). Production of the last subcompact model in Germany ended last year. The high labor and energy costs, coupled with declining demand after Brexit, make production in this segment unappealing in Germany.

In the global country rankings by unit numbers, Germany worked its way up to 5th last year behind China, the USA, Japan, and India, and surpassed South Korea. However, it must be considered that the premium proportion in Germany is higher than average. Germany is by far the most important production country in Europe.

Overseas car production

As in the previous year, the production of German manufacturers‘ cars at overseas locations continued to stabilize. The prior year‘s figure was exceeded by 4 percent with 10.0 million cars. However, this production level is still well below the pre-crisis figure in 2019, when international assembly lines produced 11.4 million cars. In addition to the transformation toward climate-neutral drivetrains, inflation was another important issue as it inhibited an even more tangible recovery. The semiconductor shortage also hampered production, although not as severely as in prior years.
18 percent of all new cars around the world in 2023 bore the logo of a German maker.

An intercontinental overview shows that the situation was quite heterogenous in the individual countries, and the various regions underwent different degrees of growth. Europe contributed significantly to this growth, where overseas car production of German OEMs grew by 9 percent in 2023 to 3.18 million units. Eastern Europe exhibited an increase of 17 percent to 1.64 million units, which is far more dynamic than Western Europe (excluding Germany), which only exhibited 1 percent growth at 1.55 million units. For the first time in ten years, production in Eastern Europe exceeded that in Western Europe. The most important overseas location was Czechia, which increased its production by 25 percent to 865,000 units, ahead of Spain at 804,000 units (+9 percent). These were followed by two other Eastern European locations, namely Hungary (+9 percent, up to 351,000 units) and SUV hub Slovakia (+22 percent, 329,000 units), which were able to do so through attractive labor costs, among other factors.

The overseas production of cars underwent stronger growth in the Americas than in Europe. Production grew by over 10 percent to 1.98 million vehicles. Production in Mexico grew by 13 percent to 716,000 cars.
In the USA, production grew by 10 percent to 908,000 vehicles. This is a new record, especially for SUVs, which are produced for both the domestic and international markets. Over twice as many cars from German manufacturers are now being produced in the USA than are exported from Germany to the USA.
Production also grew by 5 percent to 317,000 vehicles in Brazil, where German car manufacturers have long been present.

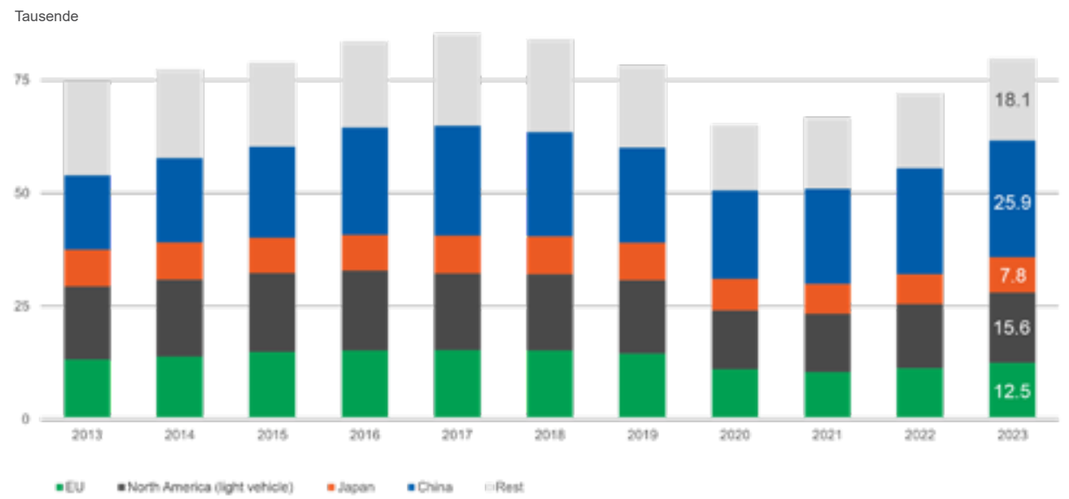
The transition from combustion engines to electric power is becoming increasingly clear in German manufacturers‘ international business. Last year, they produced more electric cars abroad than in Germany (1.06 million e-cars, +19 percent). This growth primarily stems from battery-electric vehicles (BEVs), production of which increased by 39 percent to 714,200 units. The production of plug-in hybrids (PHEV) decreased by 9 percent to 349,700 units.

The production of cars outside of Germany has doubled since 2009, and it exceeded domestic production in 2010. Today, more than seven out of ten cars from German manufacturers are assembled abroad. One important success factor was the focus on premium models. While one out of every five cars produced overseas in 2006 was a premium model, it is now one out of every two. This global orientation is also illustrated by the fact that German manufacturers now produce over 5 million premium models abroad, 85 percent more than in Germany.



Production country growth

Production by countries / regions



Source: VDA

International car production

The development of global automobile production this past year was shaped by a number of factors. Material bottlenecks, which especially affected semiconductor production after the coronavirus pandemic, are slowly fading into the background.

Russia‘s assault on Ukraine led to long-term spikes in energy prices and inflation not seen since the 1970s, the second-round effects of which placed additional strain on budgets. Global automotive demand has thus developed at a weaker pace than it could, and worldwide automobile production has only been somewhat stimulated. The increasing production of electric cars in Europe and China in particular, but also in the USA, has benefited from affordable state conditions; politically stipulated and strict CO_2 caps for achieving the transformation toward climate-neutral electric engines



are having the desired effect. Positive growth in production in 2023 is partially due to the run-up to electromobility.
As in the previous year, these circumstances have led to a global production surplus of 11 percent to 79.8 million cars. This once again surpasses the pre-crisis level of 78.2 million vehicles in 2019. However, global production capacity is still higher, with production in 2017 a good 5 million units higher at 85 million. Prior to this, car production increased by 5 percent per year on average between 2009, during the financial crisis, and 2017.
There was marked growth in nearly all important production countries last year.

Asia experienced the greatest growth. Japan led in this regard, the third largest production country worldwide with a plus of 18 percent to reach a total of 7.8 million cars. However, Japan is still 7 percent below its pre-crisis figures in 2019. Production in South Korea, which ranks 6th worldwide, grew by 14 percent to 3.9 million units, thereby once again exceeding its pre-crisis level from 2019. South Korea is less than 10 percent away from achieving its record figures from 2011. In China, which is by far the most important automotive hub in the world, production increased by 10 percent to reach a new record of 25.8 million cars. Nearly one third of all cars produced around the world now come from the Middle Kingdom. India, which ranks 4th worldwide, grew by 8 percent to reach an output of 4.8 million cars.
Europe also experienced a marked increase in production at 12 percent. However, at 14.8 million units, it is still one fifth behind its production volume in 2019. This is not solely due to Russia, whose production has been reduced to one third and produced 1 million units less. Overall, the European market is saturated and the pre-existing stock of cars is only slowly being refreshed as the average age increases. This is also the case in Germany, which was able to increase its production by 18 percent over the previous year at 4.1 million units (no. 5 worldwide), but which is still 0.5 million units below the 2019 level. Electric cars (BEV and PHEV), which now make up over 30 percent of production, have been especially successful in Germany.
Germany is the second largest hub in the world for electric vehicles, after China and ahead of the USA. This shows how seriously German manufacturers view the transformation toward climate-neutral cars.

Spain ranked 2nd in Europe with 1.9 million cars (+7 percent), ahead of Czechia’s 1.4 million (+15 percent).



France, once a major automotive nation, achieved a production volume of only 1.03 cars (+2 percent) in 2023, which is 38 percent below the pre-crisis level. This marked the first time France was surpassed by Slovakia (1.07 million, +10 percent).

Production in the three USMCA countries grew by 9 percent last year to 15.6 million light vehicles, leaving them 0.6 million units below the pre-coronavirus level in 2019. If one differentiates between vehicle types, light trucks (especially SUVs) experienced weaker growth than cars for the first time in a long time, with 8 percent and 14 percent, respectively. However, over four out of every five light vehicles produced are still light trucks. USMCA is the world‘s leading SUV hub. Growth varied in the three countries themselves. While the USA advanced light vehicle production by 6 percent, it increased by 15 percent in Mexico and even by 25 percent in Canada. Production in the US faltered in the second half of the year in particular.
Last year, the Mercosur countries experienced only weak growth last year with 4 percent and 2.8 million light vehicles.

Car exports from Germany

Car exports in 2023 increased by 17 percent to 3.11 million vehicles, and were thus 11 percent below the pre-crisis level in 2019. Exports were even 29 percent lower than in 2017. The two mutually reinforcing factors here are the transformation and the sharply increased inflation, which result in consumer uncertainty and real profit loss, which have led to the European markets in particular reaching a level below those from before the coronavirus pandemic. At the same time, the German automotive industry very heavily depends on exports. The export rate was over 76 percent last year as well and thus only marginally decreased. The tendency toward on-site production decreased somewhat in 2023, as in previous years, while the increase in overseas production by German manufacturers was, at 4 percent, considerably lower compared to exports.

This must be considered in the context of the massively reduced domestic production in recent years, which experienced another rebound in 2023. Nevertheless, German exports amount to about 31 percent of overseas production. Another factor for the success of made-in-Germany cars abroad is their high quality at suitable prices. The long-standing trend toward premium models remains high in 2023. These currently make up 74 percent of all car exports (prior year: 74 percent). This proportion is especially high in the overseas export markets. Car exports to Asia are about 92 percent premium, and even about 95 percent premium to the Americas. The transformation from combustion to electric engines among exports continued in 2023. At a proportion of 15.8 percent (prior year: 19.4 percent), diesel engines (including mild hybrids) continued to become less prevalent and reached their lowest level since 1990.



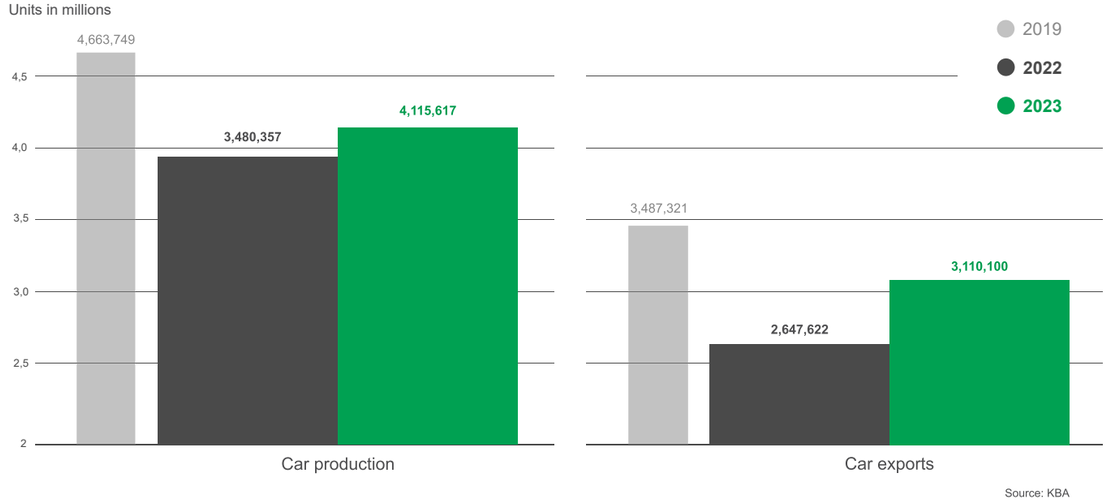
Cars with gasoline engines dipped further last year, and now sit at 52.4 percent (prior year: 57.9 percent). However, electric cars benefited from the decrease in combustion engines, reaching a record figure of 31.7 percent (prior year: 22.5 percent). Exports of pure battery-driven cars developed in a particularly dynamic manner, with growth of 82 percent and now making up more than three quarters of all exported electric cars (including plug-ins).

The drivers last year were car exports from German manufacturers to Europe, which increased by 23 percent to 1,778 million units. These were especially impacted by the crisis and fell by 38 percent from 2019 to 2021 alone. German OEMs in 2023 exported 506,000 units to the Americas, which is 14 percent more than in the previous year. The USA, which is the industry‘s most important partner in the world, recorded an 11 percent increase to 400,000 units.

In spite of this, exports to the USA have decreased by over 250,000 cars in the last ten years. This is due to the fact that German OEMs are increasingly producing vehicles for the US market in the NAFTA region directly. Exports to Mexico increased by 25 percent to 35,000 units, and to Brazil by 78 percent to 45,000 units. Exports by German manufacturers to Asia in 2023 decreased by 8 percent to 574,000 units. This is primarily because of China, the most important trading partner in Asia, where exports dropped by 15 percent to 216,000 units. South Korea also received 16 percent fewer exports at 123,000 vehicles. Japan, a primary export destination, increased its rate by 24 percent to nearly 95,000 cars. At 96,000 units (+17 percent), Australia and Oceania scarcely played a role as destinations for German car exports in 2023. Hardly any new vehicles are exported to Africa as well, with the majority of cars sold there being used vehicles.

Annual account 2023

Development of car production and exports in Germany



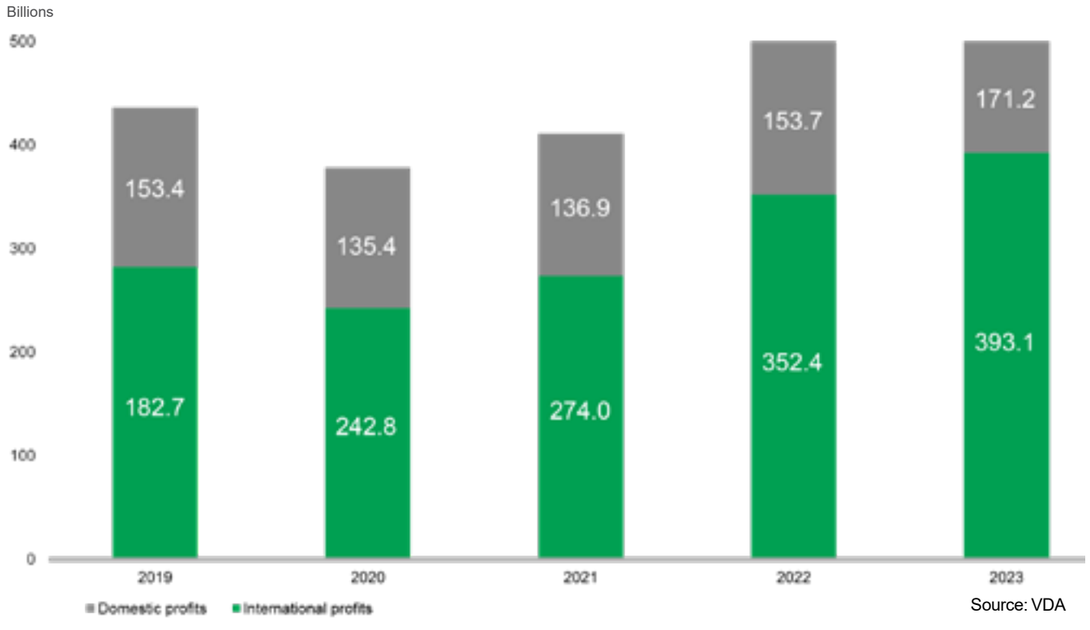
Source: KBA

Revenue of the German automotive industry

In spite of an economically tense environment, the automotive industry was able to increase its profits from domestic production in 2023. This past year it increased by 10 percent to nearly 558.1 billion euros. Part of this may be due to the ongoing high rate of inflation. The increase was somewhat proportionally divided among domestic (+11 percent) and international (+10 percent) business. Nearly 70 percent of the total profits were attributable to international business, about 30 percent of which was with countries in the Eurozone. Profits from business with customers in the Eurozone increased by 21 percent, considerably more than with customers outside of the Eurozone (+6 percent).

The revenue gain applied to all manufacturer groups, whereby the manufacturers of automobiles and engines were able to increase their profits most strongly at 11 percent, to 451.8 billion euros. Just over four fifths of the total profits were generated by domestic production by the OEMs. The manufacturers of car bodies, structures, and trailers increased their revenue in the past year by 3 percent to 14.4 billion euros. Suppliers recorded a revenue increase of 9 percent over the previous year. Manufacturers of parts for automobiles and automobile engines generated a total of 91.9 billion euros in revenue. This equates to nearly 16 percent of the total revenue in domestic automobile production.

Profit growth in the German automotive industry



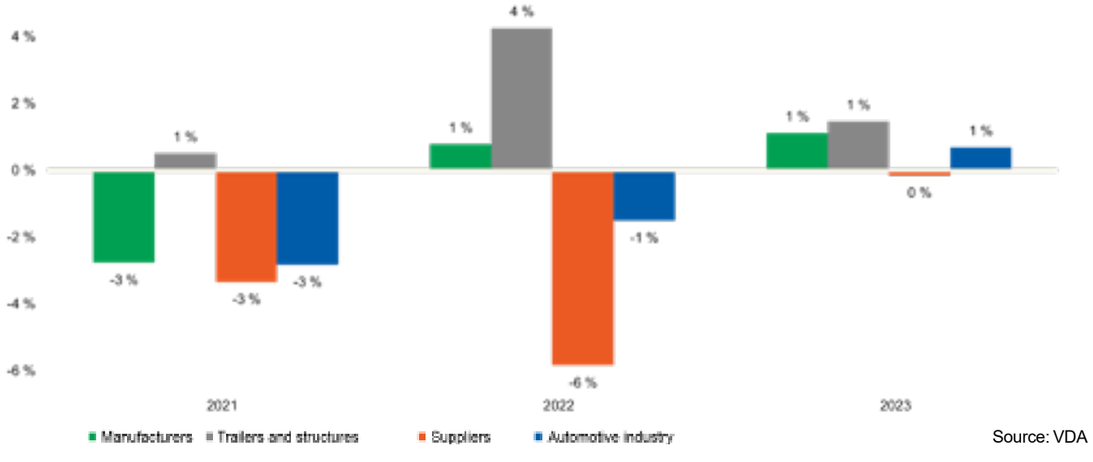
Source: VDA

Employment in the German automotive industry

The number of employees in the automotive industry in Germany consolidated in 2023. After four successive years of decreasing employment numbers, it grew slightly in the past year and reached an average number of 780,000 workers. This was nearly 1 percent, or 5,600 workers more than the previous year. As of 2023, employment in the automotive industry has receded by nearly 52,900 persons since the record high in 2018.
Employment among manufacturers of automobiles and engines increased by about 466,200 persons in the past year, 1 percent more than in the previous year and the second year in a row of growing employment. Almost 60 percent of employees in the automotive industry this past year were employed at an OEM. Employment growth among manufacturers of bodies, structures, and trailers was even higher.

Employment in these areas grew by 2 percent to 40,400 persons. This manufacturer group last enjoyed such high employment 30 years ago (1995: 44,100 workers). Around one third of employees in the automotive industry work with a manufacturer of parts for automobiles and automobile engines. Employment in these areas in 2023 was at 273,400 persons, and thus on the same level as the prior year (±0 percent). The supplier industry last had lower employment levels in 1997 (then an average of 255,600 workers). This illustrates how this manufacturer group is especially affected by the current transformation challenges. There is also a shift happening behind the cumulative employment figures. With new technologies and product requirements in the automotive industry, companies are drawing new types of employees.

Development of employment in the German automotive industry by manufacturing groups



Source: VDA

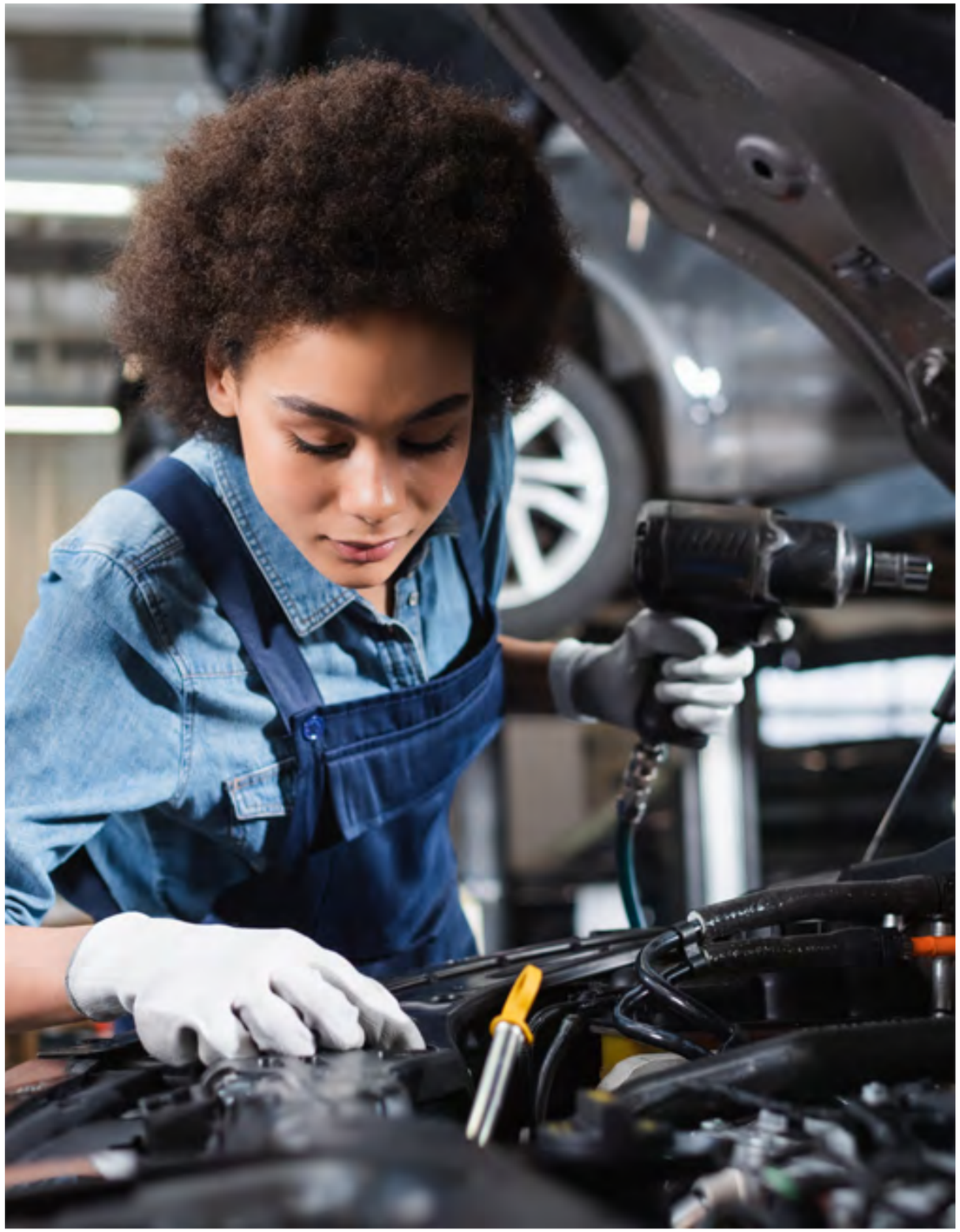
Labor costs in the automotive industry

The high quality and increasing complexity of modern cars produced in Germany due to sophisticated assistance systems and the increasing digitalization come with a price. This is coupled with the structural shift toward electromobility, which is fully underway. Automotive companies in Germany must offer appealing wages in order to remain interesting for the highly coveted workforce. In Europe in particular, the past year was shaped by significant growth in labor costs due to high tariff agreements against the backdrop of high inflation. In 2023, Germany exhibits the highest labor costs internationally at over 62 euros per hour (+4 percent over the prior year). This is followed by the Netherlands at 60 euros (+6 percent), whose labor costs have increased by over two thirds since 2016. Austria ranked 3rd with labor costs, which increased by 7 percent to 49 euros in 2023. The weakness of the Swedish krona led to another decrease in the domestic labor costs by 5 percent to about 47 euros.

Increases in labor costs in Germany over the past ten years have been relatively high at 31 percent. This has forfeited the competitiveness regained by the wage restraint induced by the Agenda 2030. Domestic production, which increased by 18 percent in 2023 but is still 1.5 million vehicles less than in 2017 with 4.1 million vehicles, remains strained.

France ranks 5th at 47 euros (+3 percent), followed by Belgium with about 46 euros (+8 percent). The first non-European country in the list is the USA with nearly 44 euros (±0 percent). This is due to the dollar, which is somewhat weaker than the euro. Labor costs in the United Kingdom increased by 4 percent in 2023 to 41 euros. The Brexit referendum led to a marked devaluation of the pound in 2016/2017, and the British currency has not yet substantially recovered. Labor costs in Italy grew by 4 percent last year to 33 euros. This is followed by Finland at 32 euros (+3 percent), where labor costs have scarcely increased in the past ten years, followed in turn by Spain with about 29 euros (+5 percent).

At the bottom of the rankings of labor costs are Eastern European countries with costs between 12 euros (Romania) and 23 euros (Slovenia and Czechia). These burgeoning automotive countries have exhibited considerable growth in the past ten years between 73 percent (Hungary) and 131 percent (Romania), so that the labor cost level is successively aligning with that of other EU countries. In Portugal, labor costs in 2023 increased by 5 percent to about 17 euros, thereby placing between Hungary (16 euros) and Slovakia (20 euros).



Research and Development

Extensive research and development projects are paramount to maintaining this leading position in innovation. Targeted investments in research and development can let the German automotive industry stake its claim as a leader and massively shape future technological advancements.



Automated disassembly of e-mobility traction motors

With regard to the industrial application of the disassembly of electric drive assemblies, there are many questions concerning economic as well as ecological optimization in spite of the advancements that have been made. Individual steps at the end of the disassembly process could prove to be very inconvenient, or particularly valuable materials and parts could be salvaged early in the process. This would not necessarily make complete disassembly at the end of the usage period of products the ideal solution. These considerations resulted in the question at the core of the project: What level of disassembly should industrial (automated) disassembly of electric traction motors achieve if the goal is a) the maximum ecological benefit, or b) maximum profitability?

This was addressed during a one-year research project from September, 2022 to August, 2023 with FAT funding at the CUTEC Clausthal Research Center for Environmental Technologies

Member companies of the FAT Task Force 17 „Lightweight“ provided researchers with two different drive assembly types. These were manually disassembled, and all steps were documented with regard to the automation of industrial assembly.

The insight gained from this was the starting point for devising design-for-re-X approaches (reuse, refurbishment, remanufacturing, recovery of parts, recycling of materials) to be applied to traction motors.

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By revising the product design, optimized utilization can ideally be considered during the construction phase of new model generations for drive assemblies

Examples of disassembly-friendly design are holistic screwheads that streamline the entire process by reducing the need to switch tools; a design geared toward robots with corresponding grip areas; electric plugs with automatically unlocked locking safeguards; and the foregoing of pressure and adhesive connections. With regard to profitability, simple extraction of valuable components early in the disassembly process must be ensured.

A wealth of information that covers knowledge gained from all phases of the product life cycle, from production and use to the recovery of parts and materials, must be considered when determining the optimal extent of disassembly of traction motors.

A computational logic for a linear disassembly sequence was developed for this purpose during the project and implemented in a user-friendly manner in the form of an Excel-based tool.
After detailed data on the disassembly steps for all parts contained within the product have been entered, the tool helps the user make decisions. The user can flexibly adapt the ecological and economic consideration to their objective in order to determine the optimal extent of the disassembly.

Achievable profits and emissions reductions are specified for each possible level of disassembly

In the end result, the project helps to shape the circular economy in the future e-mobility market by quantifying end-of-life value-added options of vehicle components and providing manufacturers with constructive suggestions for sustainable design-for-re-x. The full final report was published in FAT Series Volume 376.



Project FOMOS: Research Perspectives for Climate-Neutral Urban Mobility in 2045



The project „Research Perspectives for Climate-Neutral Urban Mobility in 2045“ (FOMOS from the German name of the project) was initiated by Task Force 7 of Forschungsvereinigung Automobiltechnik e.V. (FAT) and conducted in cooperation with the research partners Fraunhofer IAO and Öko-Institut e.V.

The first portion elaborated consistent and visionary images of the future for the year 2045 in an explorative scenario process with representatives from the automotive, supplier, and infrastructure industries, science, and municipal experts from the Platform Urban Mobility (PUM). The positive extreme scenarios were evaluated in multiple successive analysis steps for achieving these goals from today‘s perspective.

Through the supplementary accounting of the resulting strategies for their qualitative climate effects, necessary measures were derived and overarching innovation-policy conditions at the European, national, and municipal levels were identified for each scenario. The second portion included the specification of a total of 16 implementation measures for achieving the climate protection targets in mobility and urban development in a select district of the partner city Stuttgart. These were developed via an advanced feasibility study with the Stuttgart city administration. An evaluation of the individual measures‘ ecological, social, and economic effects in the city system itself was also conducted. The assessment of the measures shows that significant sustainability effects can be achieved only through the targeted combination of individual measures.

Because of their continuous growth and their function as economic, political, and social centers, cities play a central role in achieving global and local climate protection targets. The decarbonization of urban systems will lead to far-reaching changes for personal and commercial transport in the coming years. The correct strategy will allow this development to lead to new potential for cooperation, future prospects, and business models for the automotive industry. VDA has worked with its scientific partners to elaborate strategic future scenarios and feasibility studies.





Individual, geographically separated „island solutions“ in mobility must be foregone in order to take full advantage of the effects’ potential

In the case of Stuttgart, it became clear that the continuous electrification of the vehicle stock is the most important lever for achieving the climate targets in the transport sector. However, a systematic bundling of measures at the city district level is crucial for effective implementation. The results of the study show that districts must be used as integrated, large-scale test spaces for swifter implementation processes for sustainable mobility strategies in cities. Overriding climate protection targets must thereby be aligned with local aspects of quality of living, transport security, social justice, etc. Traffic law instruments must also be strengthened at the municipal level in order to facilitate more flexibly dynamic use of urban spaces for stationary and moving traffic. Standards and reference models can be used to subsequently scale and replicate the insight in other cities and make a significant contribution to the synchronized transformation of mobility and urban development on the path toward climate neutrality.

Based on the results, a concept was drafted for a national transformation showcase for climate-neutral mobility and innovative business models as a large-scale project with the involvement of industry, research, and municipal administration.

This approach is based directly on the measured identified in the study, the effects of which were also assessed. Partner companies that view themselves as technology or service providers, or who act as suppliers in this sector, shall now be involved in the following implementation phase. This project also offers additional direct and indirect potential for other industries, such as transport, construction, and energy. The planned large-scale test environment will focus on testing new, innovative business models, novel planning processes, the pilot run for data-supported services and mobility solutions, and the creation of new cooperation models between the public and private sectors.

Meta-analysis	Comprehensive analysis of the current state of research and derivation of major topic areas and challenges
Scenario development	Development of explorative environmental scenarios in a participatory process with interdisciplinary experts
Climate assessment	Evaluation of scenarios for ecological climate effects
Strategy development	Strategy development and derivation of cohesive measures as well as recommendations for funding and innovation policy
Feasibility study	Specification of key measures via a district in a model city (Stuttgart)
Evaluation of effects	Sustainability assessment and evaluation of effects of identified measures

FOMOS I 2022

FOMOS II 2023



Please direct questions and feedback to

Dr. Claudia Langowsky
Dept. Head Research & Innovation
claudia.langowsky@vda.de

Standardization at VDA



Standardization is a cross-sectional task that plays an important role for all economic sectors, as well as for society in general. The technical regulations describe the current state of technology with prompt consideration of current insights from science and research. Standards and norms are an indispensable element of product development, promoting rationalization and quality assurance.

To align with the importance of standardization, VDA e.V. and DIN e.V. formed a contractual agreement on the sponsorship of the DIN Standards Committee Road Vehicles & Mobility (NAAuto).

The association‘s members are given optimal conditions for involvement in standardization at the national, regional, and international levels. NAAuto creates standards for requirements, interoperability, interfaces, quality, and safety in the area of automotive and interconnected mobility as well as the associated mobility services. Its work also includes standardizing equipment of road-bound vehicles and their structures, as well as freight containers (ISO containers) and European swap containers.

Important work areas in the field of standardization are shown on the right.

Current major work areas

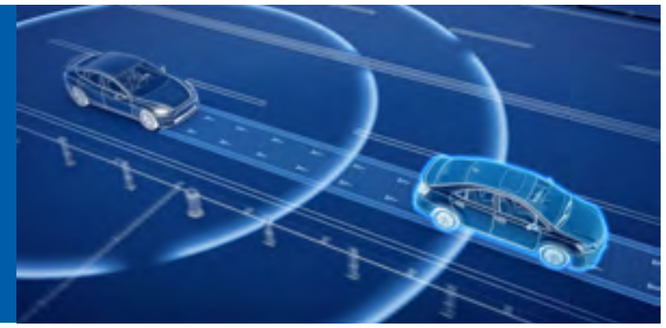
Alternative drivetrains

- Charging technology
- Energy recovery
- Battery technology
- Hydrogen technology



Alternative vehicle requirements

- Ergonomics, light & visibility
- Driving dynamics
- Data communication
- Vehicle safety



Smart traffic systems

- Assisted and automated driving



Sustainability of vehicles and mobility

- Vehicle AI



We would like to highlight some major projects in this regard.

The project ISO/SAE 12906 “Charging performance for electric vehicles” is being finalized on the basis of a DIN standard

This international standard describes tests for determining the time required to charge electric vehicles. It will be used to compare manufacturers‘ statements on charging performance, and can provide orientation for vehicle testers of publications or Internet portals. Because the determination of charging performance hinges on many factors, this international standard provides a foundation for comparing charging performance of vehicles by stipulating a globally uniform assessment procedure.

ISO/PAS 8800 “Road vehicles – Safety and artificial intelligence” concerns the use of AI in vehicles

It defines safety-related features and the failure mode behavior of artificial intelligence in vehicles during every state of the vehicle’s life cycle, from development and use to decommissioning. Requirements of functional safety and data quality are addressed, and the standard describes measures for containing errors.





Work has begun to revise the important ISO 26262 series on the “functional safety of road vehicles”

The revision of the 12-part series of standards will officially begin in 2024. Specifications on new and complex requirements have already been made in preparation and published for the interim period. These include the following major standards and reports:

- ISO/PAS 8926 “Road vehicles – Functional safety – Use of pre-existing software architectural elements”
- ISO TR 9839 “Application of predictive maintenance to hardware with ISO 26262-5”
- ISO TR 9968 “Application to generic rechargeable energy storage systems for new energy vehicles”

VDA is also involved in devising standardization roadmaps that will be used to help standardize new, cross-industry technologies and topics

These include the projects supported by the Federal Ministry for Economic Affairs “Standardization Roadmap on Artificial Intelligence” and “Standardization Roadmap on Hydrogen Technologies”.

VDA actively represents the interests of the automotive industry in the area of standardization policy by working in the German Standardization Forum (DSFS) initiated by the federal government, and is also helping to reshape governance through its involvement in the Standardization and Regulations Committee of Deutsches Institut für Normung DIN e.V.

The *Annual Report 2023* published by NAAuto provides information on its committees and the projects currently underway.

Technical regulations in the automotive industry

Euro 7 standard for improving air quality banks on a reasonable cost-benefit ratio

The EU Parliament and Council of Ministers passed the Euro 7 legislation on December 18, 2023. This legislation sensibly combines improvement of air quality with feasibility for the industry, and banks on a reasonable cost-benefit ratio. This ensures that many companies can focus on the important, sustainable, transformation-related projects on the path toward climate neutrality. Overall, the Euro 7 standard is a positive and balanced compromise, aided in part by a well-coordinated approach within the automotive industry.

The new regulations include conditions on battery durability as well as the reduction of brake dust and tire wear particles. We have supported this regulation since the start. Emissions caused by brakes are capable of surpassing exhaust emissions from modern combustion engines, which offers significant room for improvement. The regulation of brake dust and tire wear particles is an important step toward improving air quality.

Other new requirements concern on-board monitoring technology, the consideration of smaller particle sizes in the exhaust, and extended durability of emission-related systems.

With regard to the upcoming transformation by the year 2035, the regulation for personal vehicles is nominally less strict, but the additional requirements do mean a marked decrease in emissions compared to Euro 6. Stricter regulations apply to heavy commercial vehicles. Euro 7 aims for a clear tightening of the limit on nitric oxide, and in particular low engine load operation in city areas. This ensures that vehicles remain very clean even during extended idle periods in city settings.

Euro 7 will become binding for personal vehicles and light commercial vehicles at the end of 2026, and by mid-2028 for heavy commercial vehicles and buses. The timeframe for implementing Euro 7 is ambitious and manufacturers will have to work very hard to meet the deadlines, although it also offers clear planning security.

Vehicle interior: new seat designs and positions

Automated driving will allow passengers of the future to engage in activities while in a vehicle that are not possible today. Seating positions will also be made as comfortable as possible. But where are the limits currently?

There are a number of obstacles on the path toward new seating positions that can be adjusted while driving. One major aspect is passenger security. This must not be made any worse than current designs in the event of an accident.

The UN safety regulations considered here solely concern a „normal usage position“, meaning that new positions—such as an increased reclining angle—are not considered. VDA has evaluated various UN regulations for their need for amendment and discovered that the seat belt requirements from UN Regulation No. 14 do not allow greater reclining angles. The shoulder belt would be too far removed from the passenger, meaning that its purpose of keeping the passenger restrained could not be achieved with certainty.

As a result, VDA has devised a concrete suggestion that allows more flexibility in the positioning of the various components of the seatbelt within the vehicle interior. Yet this is only the first step: Other relevant UN regulations, such as the frontal impact addressed in UN Regulation No. 94, must now also be amended.





International regulation for automated and autonomous driving

In 2023, we became very actively involved at the EU level in interpreting the existing legal framework for small-scale series production (see Interpretation of EU Regulation 2022/1426 on the Type Approval of Automated Driving Systems). Now the challenge lies in effecting an expansion to large-scale series production and working toward a streamlined permit approval process in the member states.

In addition, VDA hosted the 43rd UN session on „Functional Requirements for Automated Vehicles“ in September, 2023, which included numerous experts from the industry and governmental representatives from Canada, China, Finland, Japan, the UK, and the USA. An international guideline for the safety of autonomous driving was finalized during this session, and it will serve as the basis for a UN regulation by autumn of 2026.

Electromechanical braking systems (EMB)

An electromechanical braking system is an independent braking system with an electrical steering transmission mechanism without a mechanical fallback level that makes redundant electrical energy storage systems necessary. Requirements of redundant electrical energy storage systems in the UN regulations (in particular UN R13, UN R13-H, and UN R79) must be amended so that innovative EMB systems can be approvable in the future.

VDA is working on a suggestion that foresees the omission of a mechanical connection between the controls and the braking system in order to amend the correlation between UN R13 and UN R13-H accordingly. The steering, steering transmission, energy transfer, brakes, and parking brakes, among other features, are being examined more closely for this purpose.

In 2023, the UN founded a Special Interest Group Electromechanical Braking (SIG EMB) in which VDA works closely with its members. The goals of the SIG EMB include amendment of the UN R13-H to include redundant electrical energy storage systems, the removal of any inconsistencies with regard to redundant electrical energy storage systems from UN R13-H, and the conception of an approach to formulate requirements of braking systems for automated and autonomous vehicles.

New regulations for artificial intelligence (AI) come with challenges and opportunities

The *AI Act*, which will have considerable impacts on the industry’s entire value-added chain, must also be mentioned as it regulates the key technology of artificial intelligence.

The Artificial Intelligence Act is part of a larger European regulatory package for digital technologies and pursues a horizontal approach that aims to regulate AI across various sectors. It is based on a risk model that categorizes AI products depending on their risk level. For the automotive industry, this means greater compliance requirements and legal uncertainties, especially due to the unclear definition of AI.

National implementation of the AI Act in Germany will also be decisive, and foresees the creation of different institutions. VDA will aid its members in contributing to the legislative process with their own expertise.

UNECE R 155

Directives for cyber security in vehicles

UNECE R 155 defines the cyber security requirements and testing procedures that apply to type approvals for vehicles.

Implementation of the cyber security management systems (CSMS) defined therein shall prove that manufacturers have taken sufficient action to ensure the cyber security of interconnected vehicles.

This includes both the prevention of cyberattacks and the security of sensitive data in vehicles.

VDA supports the implementation of UNECE R 155 and CSMS through various measures, such as the development of industry-specific directives and best practices for CSMS in cooperation with other automotive associations and organizations, or through offering workshops for member companies to learn about the UNECE R 155 requirements and get support in implementing CSMS.

Through these activities, VDA and its member companies actively assist in the implementation of effective CSMS in accordance with the UNECE R 155 requirements, as well as in making interconnected vehicles more secure.

Events in the Automotive Industry

VDA events – a platform for discussing current topics, industry developments, market tends, and challenges.

VDA events







24th Technical Congress in Berlin: innovation and sustainability

The theme of the 24th Technical Congress of the Verband der Automobilindustrie (VDA) was “Innovative. Digital. Sustainable.” It was held on March 28 and 29 in Berlin, with leading industrial and political representatives among its approximately 400 attendees.

The agenda contained over 50 keynotes, technical presentations, and podium discussions. Prominent speakers such as Federal Minister for Transport Dr. Volker Wissing; Parliamentary State Secretary for the Minister for Education and Research Mario Brandenburg, and Senator for Transport and the Mobility Transport for Hamburg Dr. Anjes Tjarks were also in attendance.

Due to the wide range of topics covered, participants were able to learn about the latest information and technology during the breaks. The evening was spent at renowned event venue Spindler & Klatt directly on the Spree, where attendees were able to network and make connections.

Spring Reception, Berlin: networking at Tipi am Kanzleramt

On April 27, 2023, the VDA invited several Hundred guests to a Spring Reception at Tipi am Kanzleramt in Berlin. The event brought together representatives from industry, business, policy, and media so that they could network and engage in conversation with one another.

The Spring Reception was an ideal Hundred guests to a Spring Reception at opportunity to make connections in a Relaxed atmosphere and discuss the latest developments and challenges facing the industry today.







SME Day in Bonn: focus on risk and resilience

The VDA hosted the 23rd VDA SME Day in Bonn on May 24 and 25, 2023. About 200 professionals, managers, and executives from small and medium-sized member companies in the supplier industry (Manufacturer Group III) and manufacturers of trailers, truck bodies, and buses (Manufacturer Group II) attended the two-day conference to take a close look at the most pressing issues facing the industry today. The theme of the event was, “Risk and resilience: supply chains put to the test.”

The exhibition area gave attendees a multifaceted look at SME-specific services and opportunities for cooperation. Automotive start-ups presented their own innovations.

In his opening address, Federal Minister for Finance Christian Lindner appealed to automotive SMEs’ inventive and innovative spirit. The evening reception was hosted by Tim Höttges, Board Chairman of Deutsche Telekom, with a keynote about the challenges and opportunities offered by the green and digital transformation.

Dr. Michael Hüther, Director of the German Economic Institute in Cologne; Dr. Axel Niemeyer, General Manager of Purchasing and Supplier Network Risk Management at the BMW Group; and Dirk Große-Loheide, member of the Volkswagen management board for procurement as well as member of the extended executive team for corporate procurement, were among the speakers.





Automotive Logistics Forum in Herzogenaurach

The Automotive Logistics Forum (ALF), hosted by Schaeffler, was held in Herzogenaurach on June 22, 2023. The FAL is organized by Bundesvereinigung Logistik (BVL) e.V. and the VDA. It serves as an annual meeting place for logistics professionals and manufacturing supply chain managers (OEM), suppliers, and automotive experts from logistics, IT, packaging, service, and consulting forms.

Every year, the coveted VDA Logistics Award is given out. This year, it went to Volkswagen AG for its concept of „MEB battery logistics“.

Future Tech Day, Berlin: innovation platform for start-ups and SMEs

The VDA Future Tech Day was held at the Festsaal Kreuzberg in Berlin on September 16, 2023. This event aimed to provide a platform for automotive start-ups and SMEs to discuss strategies for the future and expand their networks and partnerships. VDA organized the Future Tech Day in close cooperation with the family enterprise network Alphazirkel.

he Future Tech Day provides a platform for new and existing players with major benefits for both sides: start-ups from the tech industry and established companies from the automotive industry. Together, they found opportunities for cooperation to address digital and technical challenges. These partnerships have the potential to drive the automotive industry's transformation forward and develop innovative solutions for the digital and climate-neutral mobility of the future.







VDA at party conventions

Intensive discussions about the future of mobility are happening right now, especially among and within political parties, where various interests, perspectives, and visions for the future collide. This is why VDA is seeking dialogue and constructive discussions at the party conventions.

We discuss topics that move us and what we will do to make mobility more environmentally and climate-friendly. Our guiding vision is that individual mobility must remain accessible and affordable for everyone.



FDP



Bündnis 90 / Die Grünen

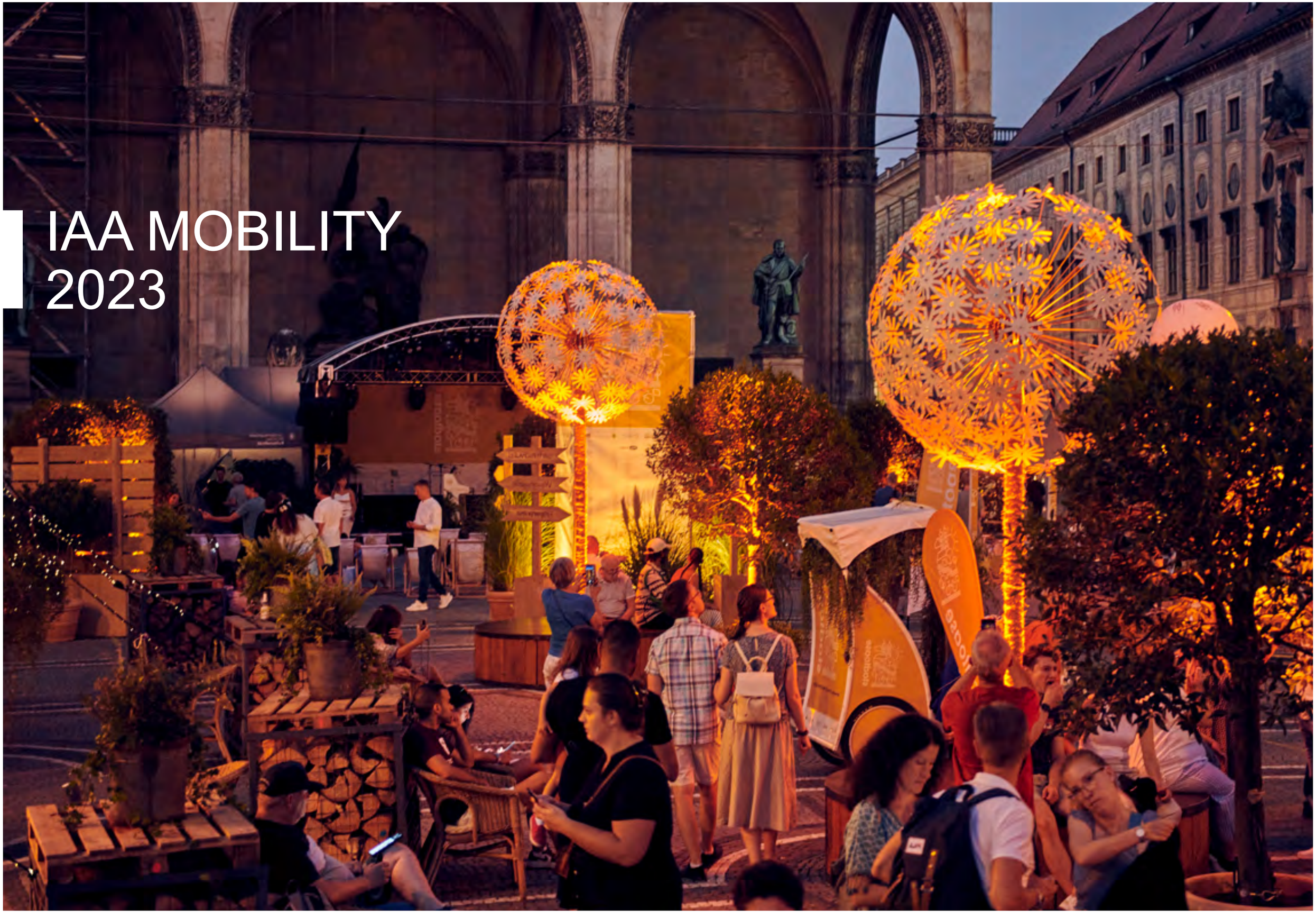


CDU



SPD

IAA MOBILITY 2023



Great success in Munich: IAA MOBILITY 2023

IAA MOBILITY 2023, the festival of mobility, was a huge success and enthralled over 500,000 visitors in Munich from September 4 to 10. The theme of the event was „Experience Connected Mobility“, with the aim of bringing all players in the world of future-facing mobility together to underline its status as the world‘s leading platform for mobility, sustainability, and technology.



The concept, revised in 2021 due to new requirements induced by the coronavirus, was successfully adapted and improved. B2B and B2C groups were separated, with the Summit being geared toward a trade audience while the Open Space gave exhibitors the chance to present to the general public. A total of 750 exhibitors from 38 countries presented over 300 world premieres and innovations at IAA MOBILITY 2023. Half of all exhibitors came from abroad. This high international presence was reflected in the attendees as well: Nearly 30 percent of the visitors were international and came from 109 countries. Over 3700 journalists from 82 countries were accredited to attend IAA MOBILITY. The rate of international reporting increased by 70% from IAA MOBILITY 2021.

The newest IAA mascot LIAA quickly became a crowd favorite for all ages, even among international trade visitors at both the Open Space and the Summit.

The World New Energy Vehicle Congress (WNEVC) was held in Munich during IAA MOBILITY, marking the event‘s first occurrence outside of China. The WNEVC has evolved into an internationally renowned annual conference on the topic of electric mobility, and is the most successful global platform in this field. This partnership marks an important step in German-Chinese cooperation, with the aim of advancing climate-neutral mobility and strengthening the international alignment of IAA MOBILITY.



IAA Open Space – mobility event in downtown Munich

The Open Space in downtown Munich was the fairgrounds for sustainable mobility, conversation, and testing all in one. It was the perfect stage for user-relevant urban mobility and the forum for dialogue between brands, initiatives, and enthusiasts, motivating 38 percent of attendees to make a spontaneous trip to the Open Space. Surrounded by cultural activities, gastronomy, and free open-air concerts, the Open Space was the optimal location for the mobility of tomorrow.

All activities were publicly accessible and free of charge. It was a delight for families, as one fifth of the visitors brought their children to experience IAA downtown. IAA MOBILITY also focuses on dialogue and constructive communication with the public. The Citizens Lab at Marienplatz hosted 65 panels and workshops on the future of mobility and urban development.

Space made it possible to access a wide range of brands and mobility solutions of all sorts so that attendees could view, discuss, sit in, and try them out. The presentations of the latest car models, in particular battery electric vehicles (BEV) and plug-in hybrids (PHEV) were of great interest and highlight the rapid advancement of sustainable drivetrain technology.









IAA Summit – visions, innovations, and dialogue at the Messe

From September 5 to 8, 2023, the IAA Summit served as the most important industry meeting for visionaries, stakeholders, and decision-makers in the mobility world, all across seven convention halls. In addition to many important exhibitors from the automotive and mobility industries, this platform provided forums for discussion among international trade visitors. Stages, themed areas, and prominently displayed start-up areas created a location where pioneering innovations and developments from leading international companies met with trade experts from the world of mobility. The latest car models with advanced assistance systems and autonomous driving functions were a particular highlight. Press conferences and exclusive product premieres ensured remarkable visibility on press day.

After the successful partnership with international climate protection organization myclimate in 2021, sustainability was once again the focus this year, and the resulting CO_2 emissions were compensated. 68 exhibitors were able to implement this CO_2 balancing, as is required for all exhibitors in the Open Space. 5 myclimate climate protection projects were supported with approximately 7600 tons in volume of climate protection contributions. One of these was a regional project in Bavaria: „Climate-tolerant forest rebuilding for long-term, stable, natural CO_2 reduction.“ Exhibitors weren‘t the only ones who got to get involved in the GoGreen audit: Attendees were able to purchase a „GoGreen ticket“ for 4 euros more so they could play their part in sustainability. It was a resounding success, with 23 percent of attendees opting for this ticket.















IAA Conference – platform for visionaries

Over 500 top-class, international speakers gave exclusive insight into the future of mobility at the IAA Conference. CEOs, experts, scientists, and visionaries from around the world came together to discuss the latest developments and innovations in the mobility industry in front of over 21,000 attendees. Many were leading automotive and tech CEOs as well as representatives from the cycling, public transport, and railway sectors; international celebrities like Oscar-winning actress Natalie Portman; aspiring Mars explorer Alyssa Carson; and Sophia Kianni, founder of a climate protection initiative and youngest UN advisors in the history of the USA.

Nine out of ten visitors gave the Conference a positive review, and 44 percent of trade visitors reported it was a must-do for their visit to IAA. In addition to exhibitors from the automotive world like BMW, Bosch, Continental, Mercedes-Benz, Kirchhoff Automotive, Opel, VW, and ZF, many other established companies such as Amazon Web Services, Accenture, Allianz SE, PWC, LG Electronics, Microsoft, Google, and other sponsors and partners were in attendance. This not only showed the great trust that IAA MOBILITY enjoys, but also illustrated the relevance of the event in the field of technology and mobility of the future.



Start-ups: fresh innovation at IAA

EA network of 92 start-ups—more than any IAA MOBILITY event ever—met with interested attendees at the prominently displayed start-up areas. The direct proximity to OEMs, suppliers, and global players in the mobility industry helped „accelerate“ the young companies. The 14-day IAA Mobilitython competition gave creative teams the opportunity to develop solutions for challenges facing established companies on site. Many start-ups presented their innovative solutions for cars in particular, from new battery and charging systems to advanced driving assistance.



IAA Smart City Area: future of urban mobility

Visions for sustainable, mobile cities were presented to attendees at the Smart City Area. The Bundesverband Smart City set up a community stand and engaged in discussions about sustainable urban planning with emphasis on mobility requirements. This marked the debut of this important segment for the mobility of the future and it will be expanded in the future.





IAA Experience – the world of mobility

The numerous test drives during the IAA Experience were a major highlight. More than 8500 test drives of cars—over 1000 more than in 2021—allowed visitors to experience the latest mobility innovations in person. The IAA Experience gave attendees many opportunities to experience the climate-neutral mobility of the future, not only testing the latest BEVs and PHEVs, but also learning about advancements in charging infrastructure and the user-friendliness of new charging systems.

31 percent of attendees took part in the IAA Experience activities. Approximately 4000 rides with bicycles and e-bikes show that the cycling test courses in the English Garden were also a huge success.

The many presentations and test drives, as well as the high international presence, underlined the innovation and global significance of the German automotive industry. The event‘s success illustrated the relevance of IAA MOBILITY as a central platform for the mobility of the future. Considerable advancements were presented, especially in the car segment, that will further drive the transformation toward climate-neutral and digital vehicles.





VDA QMC
Quality Management

Service offer & development 2023

The bodies of VDA QMC set standards for the automotive industry. The QMC is steered by the Quality Management Commission (QMA), the superior quality commission of VDA.

Quality management is crucial in the automotive industry, where highly complex products have to meet strict security standards and where customers have high expectations of reliability and performance. German car brands must meet a premium standard based on a comprehensive concept of quality in terms of development, planning, production, and sales.

VDA QMC develops new methods and techniques for quality management in cooperation with manufacturers and suppliers. The Quality Management Commission (QMA) of VDA sets and further develops standards. It consists of VDA members, automobile manufacturers, and suppliers and serves as a platform for harmonized quality strategies and methods.

The QMC office implements the QMA's decisions and devises definitions, regulations, and quality management requirements in project groups. These are published as standards in special publications and sold. VDA QMC also offers training to manufacturer and supplier representatives for applying the quality standards along the entire supply chain.

VDA QMC offers its own training and education services and works together with select, qualified licensing partners that offer VDA training seminars nationwide and internationally. VDA QMC also serves as a contract partner and supervisory body for certification firms.

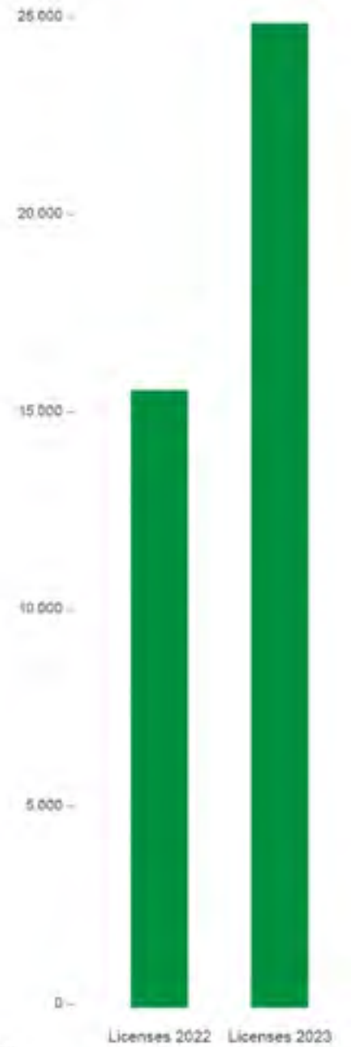
The certification firms assess the quality management systems of automotive companies worldwide in accordance with the specific criteria of VDA QMC and the International Automotive Task Force (IATF), of which the QMC is a member. They issue certificates for implementation thereof. Adherence to VDA QMC standards and processes is a prerequisite for becoming a supplier in the international automotive supply chain.



Development VDA QMC publications



Development VDA QMC software licenses



Source: VDA QMC

VDA QMC training

Open training

Highly qualified instructors lead the VDA training sessions nationwide, primarily in event hotels. These specialists are educated in methodology and social skills, and impart established technical knowledge on promoting quality management. The contents of the sessions are largely devised in the VDA QMC task forces, with involvement from the trainers themselves.

Live online training

Learn in real time, anywhere and as flexibly as possible: VDA offers live online training without compromising on quality. Participants are able to incorporate their learning into their daily routine without having to commute to the seminar.

If you are interested, please contact

Dr. Yuliya Prakopchyk, Team Lead
VDA QMC Training and Education
✉ yuliya.prakopchyk@vda-qmc.de

In-house training

VDA does not limit its training services to Germany, and holds them on site around the world. Companies can book these sessions at affordable rates. The contents include the standard program as well as specific, individually devised quality management information. In-house training is a great choice for companies, not least because of the financial benefits: Sessions with at least six participants can be much more affordable than if everybody were to join an open seminar.

Training with licensed partners

VDA holds events worldwide with support from select cooperation partners. Due to the constantly increasing demand for training, VDA also works with competent, licensed partners in Germany. The global network undergoes continuous evaluation by the VDA QMC in order to ensure that the licensed training sessions meet the high quality standards. Thanks to these partners, the training can be held in the respective national language with qualified trainers, and in accordance with local requirements and norms.

VDA QMC Quality Management Center (Beijing)

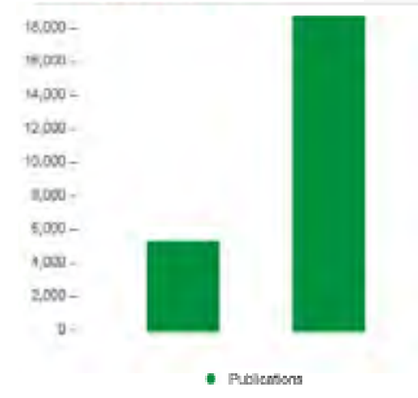
The VDA QMC office in China plays a critical role in supporting and advising our members on site. The VDA QMC China is also key to advancing and improving quality with regard to quality standards and practices, such as through training services and publications in the Chinese market. In 2023, the VDA QMC China reported a spike in training sessions and publications sold directly in the Chinese market.

The number of open training sessions rose to nearly 6,000, with in-house training well above 10,000. Sales of VDA QMC publications in China have undergone a remarkable trend: The number of publications in 2023 was triple that of the previous year. These numbers illustrate the increased demand for advanced training and that quality assurance is crucial for progress and competitiveness in the automotive industry.

Development VDA QMC China training

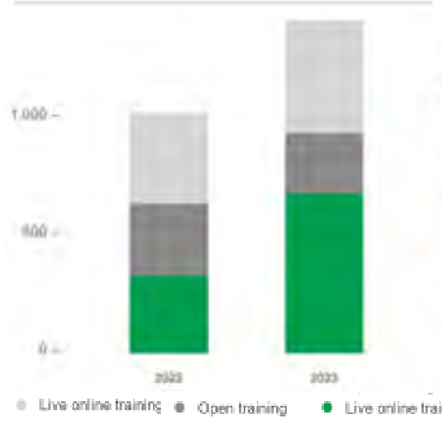


Development VDA QMC China publications

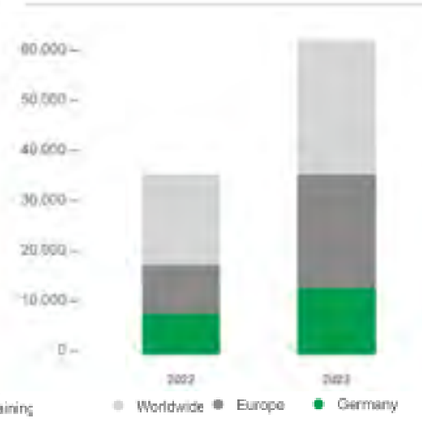


Source: VDA QMC

Development VDA QMC training



Development VDA QMC training with licensed partners



Source: VDA QMC

VDA QMC events

Quality Management Symposium of the Automotive Industry

May 25–26, 2023, Dortmund



VDA Automotive SYS® Conference

July 10–12, 2023, Berlin



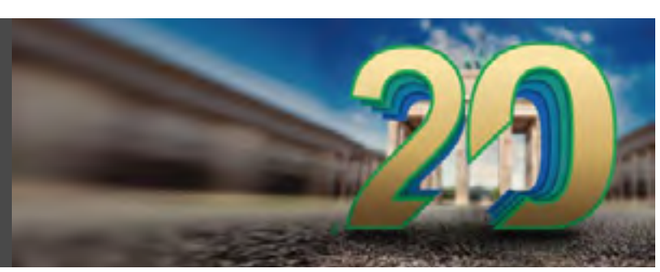
VDA QMC Expert Forum at IAA MOBILITY

September 5–10, 2023, Munich



20th Quality Summit of the Automotive Industry

November 15–16, 2023, Berlin











The Verband der Automobilindustrie (VDA) unites approximately 620 manufacturers and suppliers under one roof. Members develop and produce cars and trucks, software, trailers, buses, parts, equipment, and an ever-expanding range of mobility services.

We represent the interests of the automotive industry and stand for modern, forward-facing, and multimodal mobility on the path toward climate neutrality. VDA represents its members‘ interests to policymakers, media, and societal interest groups.

We work for electric mobility, climate-neutral drivetrains, implementation of climate goals, resource conservation, digitalization, networking, and German engineering. We are committed to making Germany a competitive location in terms of business and innovation. Our industry creates wealth in Germany: Over 780,000 people are directly involved in the German automotive industry.

VDA organizes the world’s largest and most important platform for the future of the commercial vehicle industry, IAA MOBILITY and IAA TRANSPORTATION.

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