



How is China Shock 2.0 affecting German industries?

Through a technological offensive, government subsidies, and price advantages, China is increasingly attacking global markets with high-quality products. This “China Shock 2.0” poses massive challenges for German industry sectors that go beyond structural “location problems”. Innovation, hybrid production and the courage to embrace a new product mix in manufacturing are urgently needed.



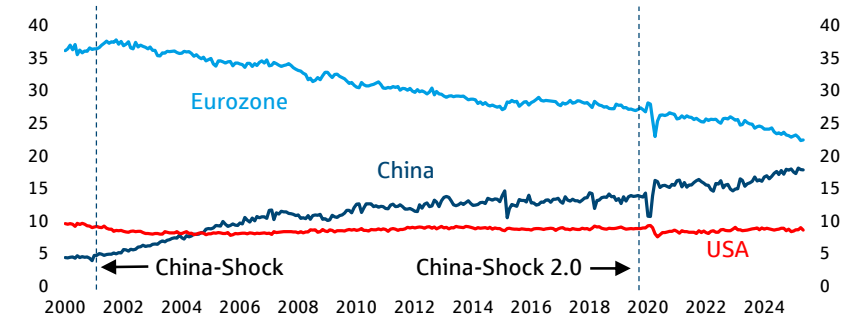
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The **first China Shock** refers to the economic consequences of China's entry into the World Trade Organization in 2001. With trade liberalization, Chinese exports rose abruptly and so did their **global market share**. In the US and some European countries, this led to job losses in the manufacturing sector, while **Germany experienced positive economic effects**. This was because China was gaining importance at that time primarily in less complex industries such as consumer electronics, furniture, and textiles. Although German production shifted, China remained a **growing major customer for the core of German industry**: capital goods. In addition to cars, Germany supplied the machinery and equipment that China needed for its industrial rise. As a result, not only did imports from China increase in the 2000s, but German exports to China also rose significantly (see figure on p. 2).

In 2015, the Chinese State Council launched the “Made in China 2025” plan. It aims to shift production from consumer goods to capital goods, **promote high-tech industries**, and **increase competitiveness**. As part of this agenda, China is heavily subsidizing its industry.¹ Combined with weak domestic demand and intense domestic competition in promising industries, this has led to oversupply and, in some cases, unprofitable business areas.² Surplus production is increasingly flowing into export markets. This large, inexpensive, and competitively priced supply of capital goods and tech products is referred to as **China Shock 2.0**. In contrast to the first China shock, this one is now hitting **Germany's core industries**: automotive, machinery, and high-quality electrical goods. Its beginning is difficult to determine; most sources cite the end of the 2010s, when the capacities built up and increasingly reached global markets. The increase in productivity of the Chinese industry and the **now high quality of its products** should not be underestimated.

China shocks increase China's global market share

Global merchandise export shares, %



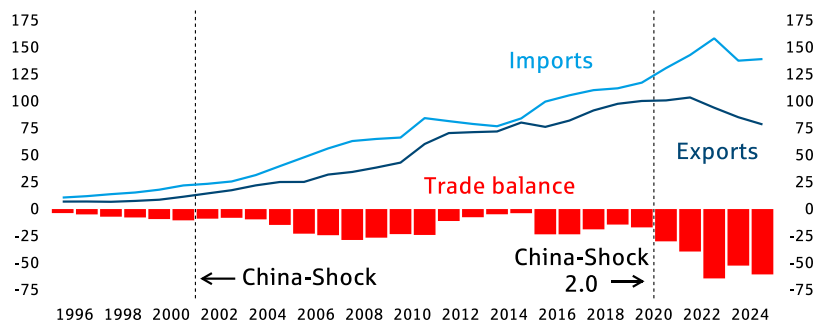
Sources: CPB, Helaba Research & Advisory

¹ See Bickenbach et al. (2024): „Foulspiel? Zu Höhe und Umfang der Industriesubvention in China“, Kiel Institut für Weltwirtschaft

² We avoid the controversial term “overcapacity”. “Oversupply” is more appropriate, as production significantly exceeds domestic sales opportunities. Global demand growth for products could mean that capacity proves to be adequate in the future. However, fierce competition within China, combined with highly automated production, is initially leading to low, sometimes unprofitable prices, making supply on world markets appear excessive.

Germany also feels the impact of the China Shock 2.0

Foreign trade with China, 2015 prices*, bn. euros



*Price adjustment using German export/import price indices
Sources: Macrobond, Helaba Research & Advisory

Since the 2000s, **foreign direct investment** has brought jobs, knowledge transfer, and technological learning processes to China, while investors have benefited from low costs and direct access to the growing domestic market (see figure below). A **growing capital stock, knowledge, and intensive research** led to strong productivity growth. Low wages by international standards³, massive domestic competition, and government intervention further strengthened the competitive

advantage. Added to this is China's central role in global supply chains, especially for rare earths.

The development of direct investment also shows **China's growing independence from foreign countries**. While inflows increased sharply in the 2000s, the stock has been stagnating since 2020 – roughly since the beginning of China Shock 2.0. At the same time, China itself is increasingly investing abroad, relocating its less complex production, and opening up new sales markets.

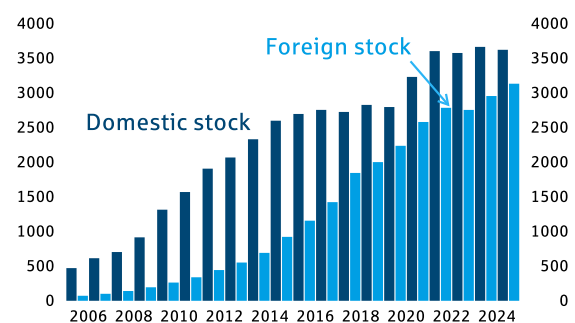
The China Shock 2.0 poses **two key challenges** for the German manufacturing sector: First, China is displacing Germany in traditional segments by combining competitive quality with low prices. Second, China is striving for global market leadership in technologies that are crucial to Germany's future.

Machinery and equipment: Succession already underway?

In **machinery and equipment**, foreign trade relations already shifted in the 2010s. Exports to China, for example, have not been able to grow sustainably in price-adjusted terms since 2018 and declined particularly sharply from 2021 onwards. Imports rose almost continuously, accelerating since 2020. Accordingly, the trade surplus fell from 13 billion euros (2011) to 4.2 billion euros (2024) in price-adjusted terms. Particularly striking in machinery and equipment are the **movements in global market shares by segments**. According to the German Mechanical Engineering Industry Association (VDMA), the number of sectors in which Germany is the global market leader fell from 13 to 8 between 2019 and 2022.⁴

Trend reversal for Chinese direct investment

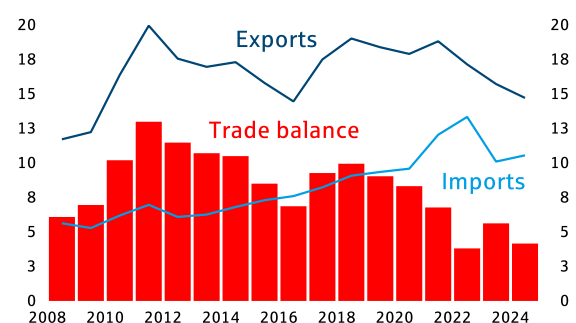
Foreign direct investment* (FDI) (stock), bn. USD



*Foreign stock refers to Chinese FDI abroad
Sources: Macrobond, Helaba Research & Advisory

China Shock 2.0 accelerates succession

Machinery/equipment foreign trade with China, 2015 prices*, bn. euros



*Price adjustment using German export/import price indices (NACE 28)
Sources: Macrobond, Helaba Research & Advisory

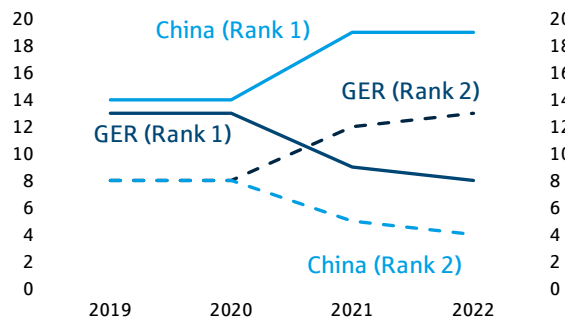
³ Low based on exchange rates. In terms of domestic purchasing power, Chinese industrial wages are not as low.

⁴ In 2022, the following segments still held German leadership: machine tools, measuring and testing technology, agricultural machines, process engineering, printing and paper technology, cleaning systems, drive technology and fluid technology.

The figure on the left below shows that China was able to increase its number of segments with global market leadership from 14 to 19, almost perfectly mirroring this development.⁵ China thus increasingly knocked Germany off its throne, which is also evident from the fact that the development of the second-place rankings in terms of global market share was also mirrored. The figure on the right also illustrates that this is **more a phenomenon of Chinese strength than German weakness**. The dots show the change in global market share of various segments in percentage points between 2019 and 2022. Except for one segment (agricultural machines), Germany lost global market share everywhere. China gained share in all segments, but by significantly more than Germany lost. Thus, China also gained shares from other countries.

Battle for dominance in machinery and equipment

Number of sectors* with highest (second highest) global market share

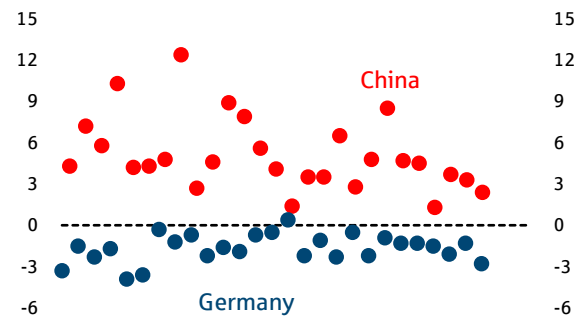


*VDMA classification

Sources: VDMA, Helaba Research & Advisory

A clear winner across all categories

Change in global market shares*, 2019-2022, percentage points



*VDMA classification

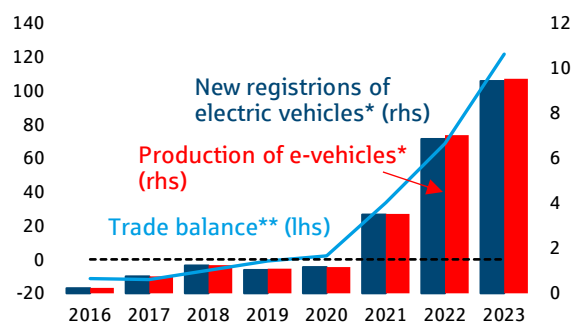
Sources: VDMA, Helaba Research & Advisory

Automotive: Don't cry because it's over, smile because it happened

In the 2000s and 2010s, German automobile exports to China rose rapidly, while imports played hardly any role until 2020. This resulted in large trade surpluses, which contributed significantly to German GDP growth (see figure). Since 2020, however, **China itself has been building up massive export surpluses**, mainly thanks to its successful **electric car production**. German imports from China have been rising sharply since then, while exports have been slumping since 2022. In addition, China dominates almost the entire value chain of lithium-ion batteries, thus taking over the former German advantage in **vertical integration**. China's competitive strength in the automotive sector is therefore based on several factors: electric vehicles of competitive quality, supply chain advantages, and **subsidy-supported competition**. In 2024, only two manufacturers – BYD and Li Auto – were profitable, while around 30 others posted losses despite rising sales.⁶

Electric vehicles make China a net exporter

Trade balance in bn. USD, New registrations/Production in million

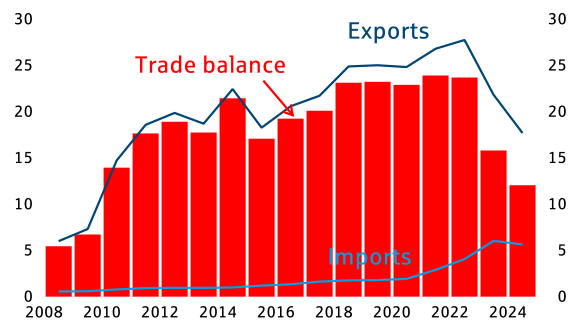


*BEV & PHEV, **China vs. rest of world, Vehicles & parts thereof (HS classification)

Sources: Macrobond, Helaba Research & Advisory

A German growth driver is fading

Automotive foreign trade with China, 2015 prices*, bn. euros



*Price adjustment using German export/import price indices (NACE 29)

Sources: Macrobond, Helaba Research & Advisory

⁵ We do not have more recent data. We assume that this trend continued in 2023 and 2024.

⁶ See Tordoir and Setser (2025): „[How German industry can survive the second China shock.](#)”, Center for European Reform

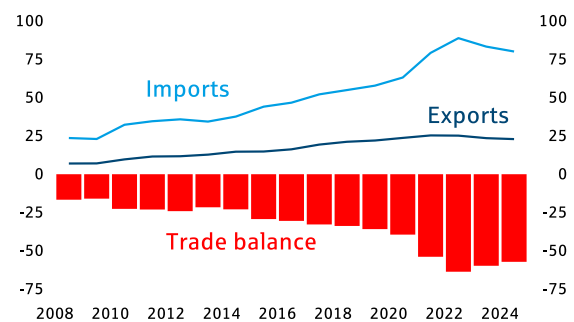
The problems facing the German automotive industry are **not so much due to structural disadvantages in terms of location**. The industry neither is energy-intensive, nor have wage levels been an obstacle to date, as high-margin vehicles have primarily been produced in Germany for some time now. In the future, it will not necessarily be cost reduction that will be decisive on the global markets, but rather **innovation and technological leadership**. Germany missed the opportunity to establish electric car production superior to China's at an early stage. Instead, China now has a competitive automotive industry of its own. Typically, the development of a country's own production capacities is followed by strong domestic demand for local vehicles. This means that German manufacturers' sales opportunities in China are dwindling permanently. The long-standing export success in the People's Republic was obviously not a sustainable advantage, but only a temporary effect – or, as the saying aptly puts it: *“Don't cry because it's over, smile because it happened.”* Now it is important to ensure, through innovation and technological superiority, that China does not also dominate further markets in the future.

Electrical industry: We want it, they can do it

Germany has long had a trade deficit with China in the electrical sector, partly due to consumer electronics. The China Shock 2.0 widened this deficit: from 2020 onwards, imports rose even stronger, while price-adjusted exports declined. Although weak domestic demand recently dampened imports, the deficit has nevertheless widened considerably. **China now dominates the electrical world market:** according to the German Electrical and Electronic Manufacturers' Association (ZVEI), China accounted for 38 % of global trade of electrical goods in 2023, followed by the US (15 %) and the rest of Asia (12 %). Germany only achieved 3 %.

Expansion of the electrical goods trade deficit

Electrical goods foreign trade with China, 2015 prices*, bn. euros

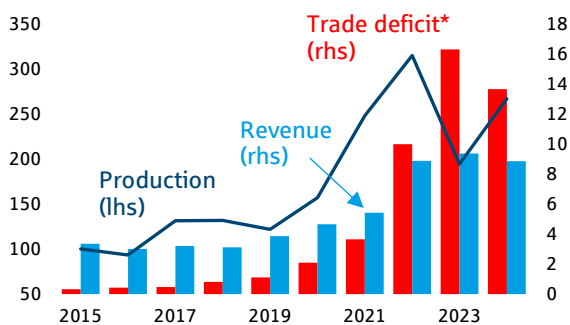


*Price adjustment using German export/import price indices (NACE 26/27)
Sources: Macrobond, Helaba Research & Advisory

For the German electrical industry, competitiveness will be determined above all **by future technologies** that are in demand because of digitalization, artificial intelligence, and green transformation. Strong domestic demand is already evident in the future-oriented sectors⁷: production has recently developed significantly better than the industry average and the electrical industry as a whole (see figure on the right).⁸

Batteries in demand – but increasingly abroad

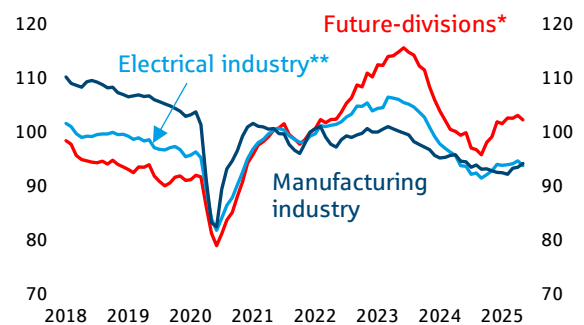
Batteries/Accumulators: Production (2015 = 100), Revenue & Trade deficit* (bn. Euros)



*Difference between imports and exports
Sources: Macrobond, own calculations, Helaba Research & Advisory

Future sectors are currently outperforming

Production, 2021 = 100, calendar and seasonally adjusted, smoothed



*NACE 26.1, 27.1, 27.2, weighted by sales shares, **NACE 26+27
Sources: Macrobond, Helaba Research & Advisory

Nevertheless, Germany remains heavily dependent on other countries in this field. The trade deficit for batteries and accumulators amounted to 13.7 billion euros in 2024 – significantly more than domestic sales of 8.9 billion

⁷ Future-orientated sectors here include: 1) electric motors, generators, transformers and electricity distribution and control apparatus, 2) batteries and accumulators, and 3) electronic components and boards.

⁸ For a detailed analysis, see our [Focus on Sectors: Electrical industry: A sluggish “future-sector”](#) from August 4, 2025.

euros. A significant proportion of these imports stem from China. While this is hardly surprising for simple products such as button cells, complex, higher-quality batteries and over 80 % of the main components of solar systems now also come from China.

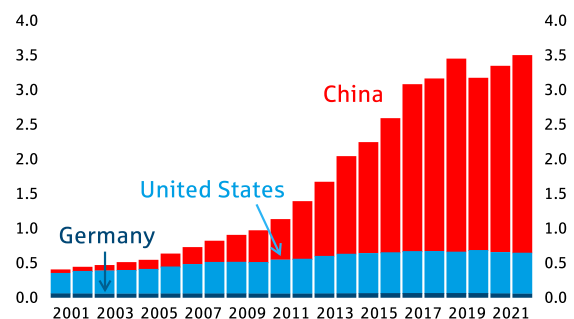
The future sectors deserve their name twice over: on the one hand, they are segments with growing demand, and on the other, they are the promising areas of the German electrical industry. “Simple” technologies, where high unit labor costs are a disadvantage, have little chance in this country – China has absolute competitive advantage on global markets. **Knowledge-intensive, complex segments**, on the other hand, offer potential, as in machinery and equipment. This requires **investment in research and development (R&D) and innovation** to strengthen domestic production and increase productivity. The industry is showing ambition in this regard: with a 14.2 % share of total R&D expenditure, the electrical industry ranked second behind the automotive industry in 2023.

New sales markets, government support, and competitiveness through innovation rather than cost

In the future, the segments most at risk from China's export strategy will be those where price is the decisive factor. Even with improved structural “location factors”, **Germany will not be able to compete with Chinese prices** for comparable quality. Germany's manufacturers must therefore not engage solely in cost competition for existing technologies. Instead, it must **focus more on quality, innovation, and unique selling points**. Traditional domains will remain viable in some cases, but competition from China is growing. Opportunities exist primarily in knowledge-intensive, complex composite technologies that enable high margins and are compatible with German wage levels. This can be seen in the machinery and equipment sector, where global market leadership in the remaining sectors is partly attributable to the necessary expertise and high productivity.

Lion's share of patent applications from China

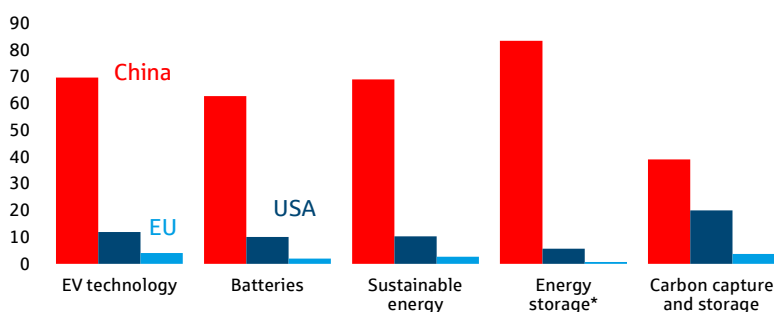
Patent applications (residential and non-residential), million



Sources: Macrobond, Helaba Research & Advisory

China dominates patent applications for future technologies

Share of global patent applications, 2021, %



*General storage excluding batteries

Sources: Our World In Data, Helaba Research & Advisory

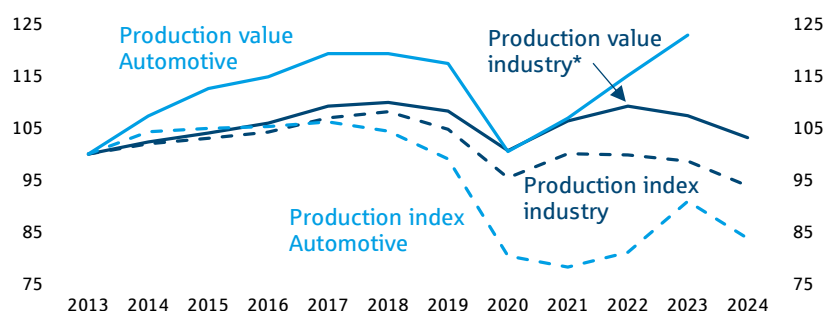
That is why investment in **research and development** is essential. At over 3 % of GDP, Germany invests proportionally more than the EU and China (around 2.2 to 2.4 % each) and is only slightly behind the US (3.4 %). However, the proportion is falling, and the absolute amounts are smaller due to lower economic output. This makes it even more crucial to translate R&D into successful innovations. Germany lags significantly behind in terms of **patent applications**: in 2021,

around 59,000 are from Germany, 591,000 from the US, and just under 2.9 million from China. Admittedly, for political reasons, the motto here is often “quantity over quality.” Nevertheless, there are also innovations that lead to enormous technological advances. China recently displaced Germany from the top 10 in the United Nations' innovation ranking. China's dominance is particularly evident in the future technologies that are central to Germany (see chart above left). According to Our World In Data, around 70 % of patent applications in electric vehicle technology come from China, 62.7 % in batteries, 69 % in sustainable energies, and 83.4 % in general energy storage. Only in carbon capture and storage technologies is the share lower, at 39 %.

Another possibility lies in **hybrid production** – supplementing industrial production with additional value creation such as services. The ifo Institute has analyzed that such a development can already be observed in the German manufacturing sector.⁹ This is reflected in the production value, which captures the total value added and thus the actual industrial “output”. It is developing better than the production index, which primarily includes the physical volume of production.

The industry's production value exceed production index

Production index, production value of the national accounts, 2013 = 100

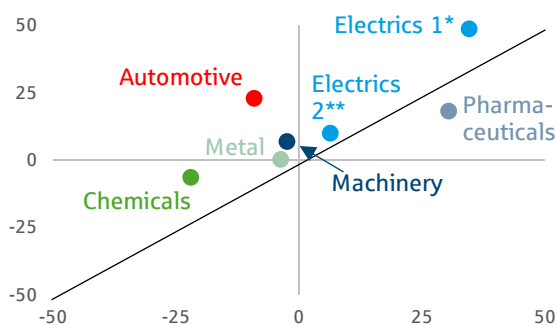


*Industry here refers to manufacturing

Sources: German Federal Statistical Office, Helaba Research & Advisory

Automotive industry pioneers hybrid production

Change in production index (horizontal) & production value (vertical), 2013-2023, %



*Computer, electronic and opt. products (NACE 26), Electrical equipment (NACE 27)
Sources: German Federal Statistical Office, Helaba Research & Advisory

Our analyses show this to be **particularly pronounced in the automotive industry**.¹⁰ There, services, IT integration, and licensing models are increasing margins and reducing substitutability by Chinese production. The adjacent figure also indicates success for other sectors: if a point lies above the diagonal, the growth in production value was better than that of the production index. In machinery and equipment, for example, consulting services, plant planning, and cloud services are partially offsetting the decline in volume production. Such “non-tradable” **services can enhance products and make them less substitutable**: a machinery producer who also offers on-call on-site plant checks is more attractive if he is located a few hours' travel away rather than in Shanghai.

In addition, German industry must **diversify its sales markets** in order to compensate for the likely continuing decline in exports to China. The greatest potential lies in Europe which already is the most important export market. The modernization of Western European industry and growth in Eastern Europe are opening up opportunities. However, these **cannot be realized through cost competition alone, but above all through quality and innovation**. The industry must also be prepared to adapt its product mix to megatrends such as mobility and energy transition or digitalization.

A more active role for the state should also not be taboo. In view of the massive subsidies provided by China and the US – such as the Inflation Reduction Act – Germany and the EU could also consider providing greater support for future-oriented sectors. A joint European approach could succeed by strengthening the internal market and also help to stabilize the eurozone economy. Trade barriers are another means – the EU has already taken such a step with the EU tariffs on Chinese electric vehicles introduced in 2024. However, these measures carry risks: although they protect European markets from Chinese production, they do not help in third markets and may reduce incentives to respond to superior quality products and processes such as automated production in China. We must not relieve industries and companies of the need to have the **courage to establish a new product mix and technologies themselves**. China's competition, future orientation, and technology will not wait for us.

⁹ See Lehmann, Linz & Wollmershäuser (2025): [Strukturwandel im Verarbeitenden Gewerbe](#). ifo Schnelldienst digital, 5/2025.

¹⁰ See our [Focus on Sectors: German Automotive – Downfall or structural change?](#) from June 10, 2025.



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