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Asleep At the Wheel: Europe's Cars and the Electric Revolution

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Having clung to the technologies that built its past fortunes, Europe's car industry missed the electric revolution. Now, just as the EU considers a tougher stance on Chinese competition, German and European carmakers are teaming up with Chinese companies for cutting-edge components and software. Can Europe protect industrial jobs while catching up on technology?

This article will feature in the Green European Journal's winter 2026 print edition, dedicated to the rise of China and its implications for Europe. Subscribe now and be among the first to receive a copy in December.

There is a story about the German car industry I keep hearing again and again. Most recently, one of Germany's best-known economists told me that story again. It is a comforting story. The car industry had a big crisis in the 1990s and came out of it with flying colours. It has hit more crises since and always bounced back. Sure, the current crisis is big, maybe the biggest ever, but there is no reason to think that this time is different.

I beg to differ. This is not the usual competitiveness crisis. Nor have German automakers fallen behind the competition in the product cycle. What is happening to the European car industry is that the motorcar from the analogue era is being replaced by products that look increasingly like digital devices.

A good analogy is the story of typewriter producer Smith Corona, one of the great US manufacturing success stories. It successfully managed several technological transitions. Mechanical typewriters became electric. Electric typewriters became electronic. In the 1980s, when the personal computer was launched, the company added word-processing functions to the typewriter, and turned it into a miniature computer. But Smith Corona could not imagine a world in which the typewriter itself disappeared. The personal computer was not a better typewriter; it was able to do what a typewriter did, but it could do so much more.

The German car industry has reached a Smith Corona moment – with some differences. An electric car is still recognisably a car. It has four wheels, seats, and a steering wheel. However, this superficial similarity disguises the scale of the technological change that is under the hood. The combustion engine, transmission, exhaust system, and much of the mechanical complexity around them disappear. In their place come batteries, power electronics, electric motors, sophisticated thermal management, and, increasingly, a software architecture controlling the entire vehicle.



An electric revolution

A German engineer, Gottlieb Daimler, invented the car – which he named after his daughter, Mercedes. Another engineer, Nicolaus August Otto, had earlier invented the combustion engine. Based on those two 19th-century inventions, one of the most successful industries on earth grew stronger and stronger, creating healthy profits well into this century. But the components that generated most of those profits – engines and transmission systems – are precisely the ones that are now disappearing.

In the electric era, the most important and commercially most lucrative technologies are battery chemistry and manufacturing, semiconductors, power electronics, software, and artificial intelligence. The competitive advantage consequently shifts.

Chinese producers supplied almost three-quarters of the batteries installed in electric cars worldwide

Batteries illustrate Europe's problem. According to the International Energy Agency (IEA), China produced about 70 per cent of the world's electric vehicles (EVs) in 2025 and more than 80 per cent of its battery cells. It also produced about 85 per cent of cathode active materials and more than 90 per cent of anode active materials, the primary chemical ingredients in a battery. Chinese producers supplied almost three-quarters of the batteries installed in electric cars worldwide.

Scale has translated into cost efficiency. The IEA estimates that in 2025, battery-pack prices in China were about 35 per cent lower than in Europe. Chinese producers benefit from a combination of supply-chain integration, accumulated manufacturing experience, higher production yields, and intense domestic competition. This matters because the battery is one of the largest single costs in an electric vehicle. This is not a disadvantage Europe can bridge.

The technological frontier is also moving rapidly. In April 2026, the Chinese battery maker CATL announced a third-generation battery with an energy density of 280 watt-hours per kilogram and a claimed range of 1000 kilometres. One version even claimed a 1500-kilometre range. It also announced a new battery capable of charging a car in six minutes. I have not tested this myself, and there is no doubt some marketing hype surrounding these claims. But it is also clear that the innate disadvantage of electric cars – limited range and the time it takes to charge them compared to filling a petrol tank – is slowly disappearing.

Europe is not technologically absent. Germany produced 1.67 million electric cars in 2025, making it the second-largest EV production location after China. Forty per cent of German passenger-car production was already electric. BMW recently said its new generation of battery cells increases energy density by 20 per cent, and charging speed and range by up to 30 per cent. The problem is therefore not that Germany cannot manufacture electric cars. The problem is where the technologies, intellectual property, supply chains, and economies of scale surrounding those cars reside.

The contrast is clearest in China itself. Electric cars accounted for almost 55 per cent of Chinese new-car sales in 2025, compared with 28 per cent in Europe. That gives Chinese manufacturers an enormous home market in which to develop products, reduce costs, and gather experience.

Price competition is brutal. In 2025, nearly 70 per cent of battery-electric cars sold in China were already cheaper, before subsidies, than their combustion-engine equivalents. In Europe, by contrast, fewer than 10 per cent of available battery-electric vehicle (BEV) models cost less than 30,000 euros.

Software adds another dimension. The car is increasingly becoming a software-defined product whose functions can be changed after manufacture. Driver assistance is part of this transformation. As of October 2026, Tesla reports more than 15 billion miles driven using its self-driving system. It is not autonomous, but driver-supervised. Still, Tesla is years ahead of all of its European competitors.

Germany retains an important lead in one narrower category. In December 2024, Mercedes-Benz received German approval for Drive Pilot, a Level 3 autonomous driving system that can operate at up to 95 km/h on German motorways. BMW also offers Level 3 driving under more restrictive conditions. China approved its first Level 3 production vehicles in December 2025. But these systems are not to be confused with fully autonomous driving. It is incomparably easier to let a car drive on a motorway than in a city, where children and animals step into the street and must be identified immediately.

Different systems operate at different automation levels and under different regulatory conditions. The strategic question is who develops the software platforms, computing architecture, artificial intelligence, and data ecosystem from which increasingly automated cars will evolve. This is in many ways not fundamentally different from the old fuel-driven car, where the big money was earned through patented technologies.

Employment and joint ventures

It is telling that European manufacturers are increasingly seeking partnerships for precisely these value-added technologies. In September, Stellantis' Chinese joint venture agreed to work with Chinese autonomous-driving developer Momenta. BMW's new strategy similarly envisages greater reliance on Chinese partners for autonomous-driving and integrated software technology.

We can already see the economic consequences of the shift in the value-added supply chains away from Germany. German passenger-car production was 4.15 million vehicles in 2025 – slightly higher

than in 2024, but still 11 per cent below 2019. During the first half of 2026, production remained 15 per cent below its 2019 level. Employment figures are more revealing. Germany's automotive workforce fell from 772,949 in 2024 to 731,928 in 2025. Employment among parts suppliers fell by 11.1 per cent in a single year. Hardly a day passes without some news that a well-known car supplier company has to close down.

This is where the electric transition becomes socially important. A simpler drivetrain needs a different supply chain. An industry organised around engines, transmissions, exhaust systems, and thousands of specialised components cannot simply substitute batteries for petrol tanks while leaving everything else unchanged.

The German manufacturers' difficulties in China add to the problem because China had become their second home market. China was the big story in German industry in the last decade. That's where they invested. Volkswagen delivered 2.69 million vehicles in China in 2025, 8 per cent fewer than in 2024. More strikingly, the company's Chinese BEV deliveries collapsed by 44 per cent to 115,500, even as its electric sales grew strongly in Europe. This is an important distinction. Volkswagen is capable of selling electric cars. What it struggles to do is compete in the world's largest and most technologically aggressive electric-car market.

BMW's China sales fell from about 848,000 vehicles in 2021 to 626,000 in 2025, a decline of roughly 26 per cent. Mercedes sold 552,000 cars in China in 2025, down 19 per cent in a year. Its passenger-car adjusted return on sales fell from 8.1 per cent in 2024 to 5 per cent in 2025, with the company citing lower volumes, particularly in China, alongside tariffs and pricing pressure.

By 2026, restructuring moved from warning to implementation. Volkswagen's operating margin fell to 3.8 per cent in the first half of the year, compared with 7.9 per cent in 2022. In September, its supervisory board approved 50,000 job reductions, bringing the total agreed under successive restructuring measures to around 100,000, while the future of four German plants remained unresolved. BMW, traditionally the strongest of the three German premium manufacturers, announced around 8000 job cuts in July after its automotive operating margin fell to 2.3 per cent in the second quarter.

BMW's response contains another indication of where the industry is heading. It intends to increase localisation in China and use more Chinese technology, while considering exports from China to Southeast Asia. In other words, a German car company can remain successful while progressively shifting parts of the technological and manufacturing centre of gravity away from Germany.

The same pattern is visible outside Germany. Stellantis provides perhaps the most interesting European example. While it previously invested heavily in electrification, under its current CEO Antonio Filosa it has retreated from the idea of a rapid transition to electric cars. In February 2026, it announced approximately 22.2 billion euros of charges associated with a strategic reset towards what it calls customer "freedom of choice" – a euphemism for failing to keep up with the latest technology. Stellantis has not quite exited electric cars, but it has recognised that its earlier assumptions about the speed of electrification proved too expensive.

The paradox is that Stellantis is simultaneously becoming more dependent on Chinese electric technology. It has pursued production with Chinese partners in Europe, including plans involving Dongfeng's Voyah brand in Rennes. Chinese BYD has discussed acquiring underused European factories, including plants belonging to Stellantis and other manufacturers.

Volkswagen is moving in the same direction on batteries. In September 2026, China's Gotion agreed to

invest 1.1 billion euros for a 49 per cent stake in Volkswagen's battery plant in Valencia. These investments may preserve European manufacturing employment. But ownership of a factory and ownership of the underlying technology are not the same thing.

What tariffs can't do

As European car companies lose market share, profitability, and jobs, governments are taking notice. The German government of Christian Democrats and Social Democrats even created a special section on cars in its coalition agreement, defining it as a key industry worthy of protection. At EU level, a discussion is raging about whether to increase tariffs on Chinese cars.

This debate comes after the EU imposed countervailing duties on Chinese-made BEVs in October 2024, based on a finding that Chinese producers benefited from subsidies that threatened injury to European manufacturers. The additional duties range from 7.8 per cent for Tesla's Chinese production to 17 per cent for BYD, 18.8 per cent for Geely, and 35.3 per cent for SAIC, on top of the EU's normal 10 per cent car tariff. In 2026, the European Commission began accepting price undertakings as an alternative in individual cases, including an agreement covering Volkswagen's China-built Cupra Tavascan.

Tariffs can change prices and the geographical location of production. They can make Chinese imports less competitive and give European factories more time. They can also encourage Chinese manufacturers to build inside Europe, which is already happening. What they cannot do by themselves is create battery chemistry, manufacturing expertise, software platforms, or competitive products. Nor can an EU tariff protect Volkswagen, Mercedes, or BMW in China, Southeast Asia, Latin America, or other export markets. Protection can therefore defend a domestic market without restoring global competitiveness. On the contrary, the history of protectionism has not been an encouraging one. It helps over short periods, but the innovation gap usually widens.

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This is why the distinction between a cyclical crisis and a structural one matters. Germany will continue making cars. Volkswagen, BMW, and Mercedes will not disappear like Smith Corona. Premium brands may prove more durable: Rolex survived the digital watch because at the luxury end the purpose of a watch is not to tell the time. The same may be true of a Mercedes S-Class, a Porsche 911 or a top-end BMW. But the big money in the German car industry comes not from these models, but from the Volkswagen Golf and Polo ranges, the BMW 3 series, and the Opel Astra.

The German car industry is not simply a collection of famous brands. It is a network of factories, engineering companies, chemical producers, machine-tool manufacturers, component suppliers, research laboratories, and highly paid skilled workers spread across the country. In 2025, more than 730,000 people were still directly employed in Germany's automotive industry. Its economic significance extends far beyond that number.

The way ahead

The Smith Corona question is not whether Germans will still build cars in 20 years from now. It is about

who will own the technologies, where the high-value-added components will be produced, where the software will be written, and how many German and European workers will be needed.

The German car industry managed to exert regulatory influence that exceeded its size precisely because it was commercially so successful, and because it fed a large value chain. This is how it kept competitors out of the market – by getting the EU to impose safety and quality standards on components, on which German suppliers specialised. This form of regulatory control was also one reason successive German governments, even those with participation of the Green Party, never introduced a speed limit on motorways. Components need to be a lot more durable if the car has the theoretical ability to drive at 250 km/h. You can still speed on German motorways, but the car industry failed to teleport its past successes into the new era of electric cars and autonomous driving.

The German car industry still has a lot of engineering know-how that will be relevant in the age of the electric car

Europe has never experienced industrial decline on this scale before. When industries die, the best long-term strategy is not to protect them, but to let them settle down and find their own way to maximise value. The German car industry still has a lot of engineering know-how that will be relevant in the age of the electric car. The best outcome would be for it to build new commercial relationships, including foreign joint ventures, rather than forcing it to stick to its existing business models. Protectionism turns second-rate companies into third-rate companies. Instead of investing in new growth sectors, we are wasting money protecting the unprotectable.



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