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The Chinese challenge to the European automotive industry

Executive Summary



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- **The shift to battery electric vehicles is a game changer for the European automotive industry.** Alternative energy vehicle sales reached a record-breaking 4.4mn units in 2022, representing 47% of all new vehicle registrations in Europe. Battery electric vehicles (BEVs) led the way, with sales booming by +28%, representing 12% of all new vehicle registrations. With the 2035 phase-out of internal combustion engines (ICE) looming, the automotive sector is on the cusp of a complete shake up, facing a transformation of its supplier base, changing customer needs, competition from new entrants and the reality of a less car-centric society.
- **But the number one risk is China.** Having recognized the potential of electric vehicles 15 years ago, China has since invested vast resources in building a competitive electric vehicle ecosystem. As a result, it now leads the global EV landscape, selling over double the number of BEVs in 2022 compared to Europe and the US combined, while also holding a competitive edge in nearly all aspects of the BEV value chain. Because they account for more than 80% of EV sales in their country, Chinese brands have seen their market shares climb from less than 40% in 2020 to close to 50% in 2022, while the country's automotive trade balance went from a -USD31bn deficit to a +USD7bn surplus over the same period. At the same time, already in 2022, three of Europe's best selling BEVs were Chinese imports. As BEVs eventually grow to account for all new car sales in Europe, Europe-made cars are likely to be substituted by those made in China – irrespective of whether they are manufactured by a Chinese, American or European company.
- **European carmakers could collectively lose more than EUR7bn in annual net profit by 2030.** If Chinese manufacturers increase their domestic market shares to 75% by 2030, total sales in China by European carmakers would fall by -39%, with local production falling from an estimated 4.4mn units to 2.7mn in 2030. We also find that if European imports of China-made cars reach 1.5mn vehicles in 2030, equivalent to 13.5% of the EU's 2022 production, the value added impact on the European economy would stand at EUR24.2bn in 2030 for the automotive sector, the equivalent of 0.15% of the region's 2022 GDP. But the automotive-dependent economies of Germany, Slovakia and Czech Republic could face an even bigger hit (0.3% to 0.4% of GDP).
- **What can policymakers do?** Given the strategic importance of the automotive sector for the European economy, policymakers could seek reciprocal trade terms with China and the US, as well as promote BEV adoption through improved charging infrastructure. Moreover, allowing Chinese investment in local car assembly could have more value added generated in the region, while increasing self-sufficiency in raw materials critical for battery manufacturing and investing in next-generation battery technologies will further help Europe's automotive sector prepare for tomorrow's challenges.





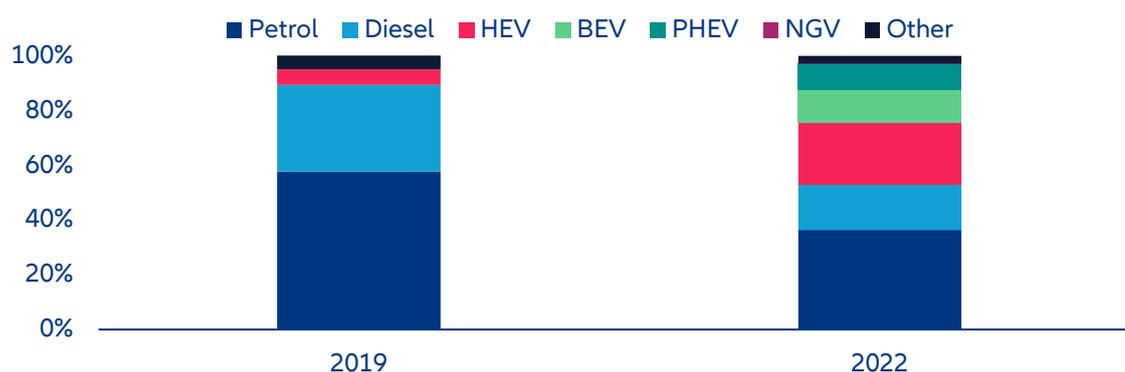
Electric vehicles: Reshuffling cards in the global automotive game?

Europe is decarbonizing its automotive industry at a record pace

2022 was a record-breaking year for alternative energy vehicles in Europe, with sales soaring to 4.4mn units (+11% vs 2021) despite an overall -5% decline in new vehicle registrations. Between 2019 and 2022, the market share of alternative energy vehicles climbed from 11% to 47% (Figure 1). Facing a potential ban on selling internal combustion engine cars (ICEs) by 2035 and targets to cut emissions, carmakers have introduced a record number of new models in Europe. At the same time, consumers are increasingly seeking out less polluting options, and the government subsidies for low-emission vehicles are boosting demand further.

Battery electric vehicles (BEVs) in particular are leading the way, with sales booming by +28% and now representing 12% of all new vehicle registrations, far above the 6% reached in the US.

Figure 1: EU new vehicle registration by fuel type (%)



Sources: ACEA, Allianz Research

Box 1: How the shift to electric vehicles is reshaping competition in Europe

Despite its success, Europe's approach towards alternative energy vehicles represents a risky gamble for its domestic car industry. It entails a complete shakeout of the sector by transforming its supplier base, changing the needs of its customers, leaving the door open to new entrants, redefining the competitive game and preparing for a less car-centric society (Box 1). The stakes are high for Europe's automotive industry: four out of five cars sold in Europe are assembled locally (i.e. the coverage ratio is higher than 80%). Europe is also the world's export powerhouse in the sector, with car trade generating between EUR70bn and EUR110bn in trade surplus for the European economy every year over the past decade. Along with Japan and South Korea, the region dominates global car exports, serving the trade deficits of major economies such as China and the US.

At a macro level, the automotive sector is Europe's largest single industrial sector, accounting for 10% of the value added of the manufacturing industry, with even higher percentages in countries such as Germany (15%), Hungary, Czech Republic and Slovakia (close to or above 20%). The industry also has a strong impact on upstream industries such as metals, plastics and electronics.

The impact of electrification on the automotive industry in Europe is significant and far-reaching, affecting every aspect of the industry. Using Michael Porter's framework identifying the five forces shaping the intensity of competition within an industry, we outline below how the shift to EVs is reshuffling the competitive game for the European automotive ecosystem.

Relationships with suppliers

Historically accounting for 25% to 30% of a car's total cost, powertrain components (engine, transmission, exhaust and fuel systems etc.) are by definition the most impacted by the shift to electric vehicles. Electric powertrains are typically much simpler, requiring considerably less parts (no fuel tank and injection systems, no exhaust system, generally a single-speed transmission etc.), but far more expensive (30-40% of total vehicle cost), with batteries alone representing 20-30% of the total vehicle cost. Technology substitution has so far been the most obvious and critical challenge for the European ecosystem, with providers of legacy technologies (turbo-compressors, fuel injection systems, exhaust systems) facing an existential threat. The shift away from diesel engines is particularly notable as Europe was the only major market where passenger cars used to run on diesel, creating a natural barrier to foreign competition more used to petrol engines. While carmakers are learning to work with new suppliers, increasing supplier concentration is becoming a cause for concern: Six out of the 10 largest battery manufacturers are based in China and control about two-thirds of the global market. The strategic importance of the battery has prompted some carmakers to invest heavily in their own capacities, most often through partnerships with specialized players.

Relationships with customers

Electrification is also reshaping the industry's relationship with its customers – in particular, fleet customers (car rental and corporate leasing companies), which account for over 50% of all car registrations in Europe. Because they have their own ESG agendas, rental and leasing companies have committed to reduce their carbon footprints and abide by Europe's growing regulation. In this respect, carmakers failing to adapt to the changing needs of fleet customers face the risk of losing market share in the near future.

Threat of new entrants

Electrification is a major opportunity for aspiring new entrants, whether they are starting from scratch (hundreds of electric vehicle companies have been launched in the past years) or moving from ICEs to electric powertrains to increase their market shares. The threat of new entrants has already materialized in Europe: While Tesla was virtually unknown in the market 10 years ago, it now has a 2% share of the overall European market and a 20% share of the battery electric vehicle segment. After making a strong impression at the 2022 Paris Motor Show, Chinese carmakers are also ramping up their commercial presence in Europe and bringing new models to the market.

Threat of substitutes

Irrespective of their powertrain technologies, private vehicles are expected to play a lesser role in the European transport mix in coming years. Governments are likely to enact additional policies and regulations that will make owning and using private cars less appealing (restrictions on their use in urban areas, greater incentives for public transport and alternative mobility options), thereby reducing overall demand for new vehicles.

Competitive rivalry

Cars are complex consumer goods, with competition based both on prices (value for money) and differentiation (perceived attributes) – analysts often distinguish between the low cost, mass market, premium, performance or luxury segments. Here again, electrification is a game changer as regards non-price competition by challenging the traditional features on which carmakers and brands have built their competitive advantages:

- **Performance:** Electric cars are redefining performance because of the characteristics of electric engines. Of all characteristics, range is arguably the most critical because of the comparatively low performance of EVs vs ICEs and the substantial gap between entry-level and high-end EVs as regards maximum range. Potential range needs to be considered together with charging speeds, charging infrastructure compatibility and energy efficiency. Carmakers lagging behind competition in terms of performance face the risk of losing market shares. Reflecting the potential advantage from a comparatively wider and faster charging network, carmakers have already invested billions in proprietary charging infrastructure in Europe.
- **Design:** Electric vehicles look similar for a reason – in particular, positioning the battery on the floor allows cars to have a low center of gravity and optimal weight distribution at the cost of a generally higher stance compared to ICEs, coming on top of higher ground clearance to protect the battery from potential shocks. To compensate for the adverse impact on vehicle aerodynamics and performance, EVs often have a slick look to reduce air resistance. Overall, car design may make less of a difference than it used to until the industry comes up with battery designs that allow greater flexibility.
- **Reputation and brand image:** The extent to which carmakers and their brand portfolio can continue to leverage attributes built over time with ICEs while selling EVs remains to be seen. Common values used by carmakers include performance, technology, reliability, safety and design – as discussed above, those product attributes are being challenged by the adoption of electric technologies. Anecdotal evidence from the Chinese market shows consumers are willing to pay prices more typical of foreign, premium vehicles from well-established brands for high-performance vehicles from companies with little to no brand history. The fact that the vast majority of carmakers are coming up with new car names for the successors to their historical ICE models, and sometimes with new car brand names, also suggest that electrification really is a game changer for reputation and brand image.

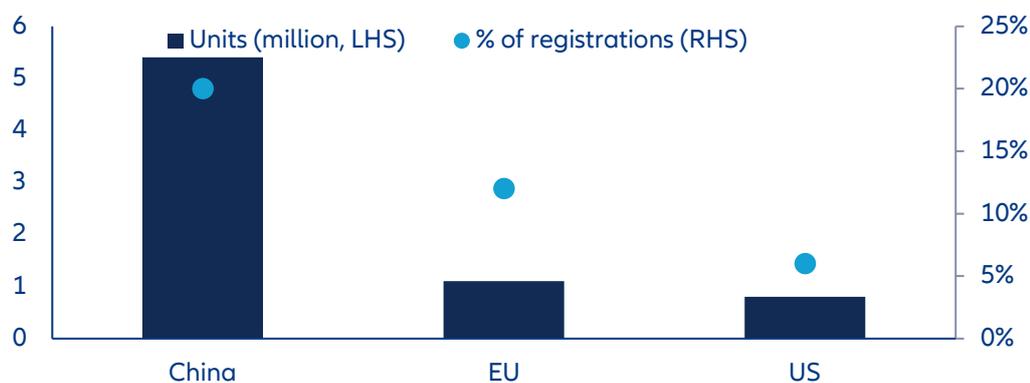
Because of new entrants, competitive will increase in the coming years, forcing carmakers to invest even more to better differentiate their cars. Meanwhile, price competition will also intensify as electric vehicles will no longer be a niche segment commanding a substantial price premium to the standard offering.

China is doubling down on electric vehicles...

Despite its rapid growth, Europe's adoption of alternative energy vehicles comes only second in the world – and a distant second at that. In 2022, more than 5.4mn battery electric vehicles – two-thirds of the world total – were registered in China, +83% from 2021. Alternative energy vehicles account for 20% of total registrations (Figure 2).

Much like in Europe, soaring EV penetration reflects a mix of growing consumer interest in electric cars, national and regional purchase-subsidy schemes and new models coming to the market, covering the city and compact-car segments.

Figure 2: Battery electric vehicle registrations in top markets (2022)



Sources: ACEA, CAAM, Allianz Research.

Box 2: 40 years playing catch-up with international competition

China's oldest carmakers trace their roots back to the 1950s and 1960s but only gained traction in the 1980s when, following the example set by South Korea, they began to learn from foreign firms through the assembly of knock-down kits supplied by European and US automotive companies. The 1994 Industrial Automotive Policy went further by allowing greater foreign investment in the sector with the possibility for international manufacturers to have a maximum of two 50:50 joint ventures with a domestic manufacturer. The policy was well received by foreign investors, with Japanese, European and US companies investing massively and helping propel domestic production from 1.4mn vehicles in 1994 to 13.8mn in 2009, the year the country overtook Japan and the US as the world's largest producer of motor vehicles.

However, for all their success in boosting local production, and despite technology transfers and substantial import tariffs (25%) on foreign vehicles, in the early 2010s, Chinese carmakers still suffered from a significant technology and quality gap, translating into a USD25bn trade deficit and foreign competitors controlling 70% of domestic car registrations.

Electric vehicles were identified as the future competitive battleground in the late 2000s

Chinese authorities recognized the potential of EVs to address other critical issues such as air pollution and energy security. But support to EVs was also clearly identified as a major opportunity for the domestic industry to leapfrog from being a tier-two country in legacy engine technologies to a leader in alternative energy technologies.

A major milestone was a pilot program launched in 2009 called "Ten Cities, Thousand Vehicles" encouraging the adoption of EVs and the development of the domestic EV industry by providing financial incentives for EV buyers, encouraging government fleet purchases, supporting the development of charging infrastructure and promoting research and development in EV technology. Initially rolled out in five cities, the pilot was found promising, progressively extended to more cities and ultimately implemented nationwide. By placing a specific emphasis on the development of what it called "new energy vehicles" (hybrid electric, battery electric, fuel cell vehicles), the 12th five-year plan (2011-2015) and the 2015 Made in China 2025 plan have also been instrumental in shaping the current Chinese EV ecosystem. Much like for the other nine critical industries identified, the objective was to move away from low value-added manufacturing and to increase the share of Chinese inputs in exported goods through a mix of financing and fiscal tools favouring domestic companies. The plan initially set non-binding objectives of 1mn new energy vehicles to be produced by 2020 and 3mn by 2025, bringing the share of new energy vehicles to 20% of all vehicles sales. All three targets were met in advance in 2017, 2021 and 2022, respectively.

... and recapturing the domestic market...

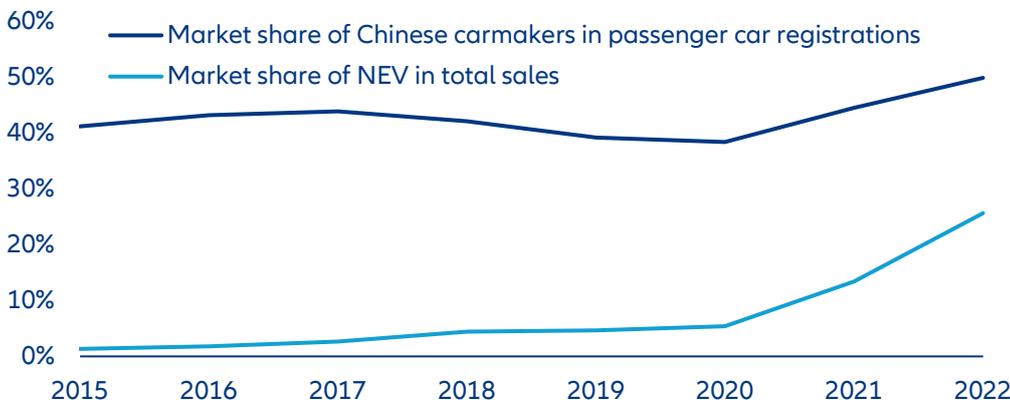
China's rapid advancements in electric vehicles are transforming its domestic market, where foreign auto-makers have traditionally held a dominant position. In a historic first, Chinese automakers reached parity with foreign brands in 2022 and surpassed them in Q4, capturing 51% of the market share (Figure 3). Their share in electric vehicles alone stood at 80% and showed no sign of abatement in Q1 2023.

The main factors explaining the growing popularity of Chinese brands in the Chinese market include:

- A strong cost advantage for BEV manufacturing based on the bigger volumes of the Chinese car market and a competitive supplier base (critical metal refining, battery cell and module manufacturing etc.). Past purchase-subsidy schemes were also restricted to China-made vehicles.

- A wider range of available BEVs (city and compact cars in particular) compared with international competitors, which have so far mostly focused on large and expensive sedans and sport utility vehicles. China's most popular BEV is a four-seat city car manufactured by a US-Chinese joint-venture that is available for the equivalent of EUR4,300.
- Positive product reviews and customer reception for China-branded EVs resulting in good brand recognition, in contrast to the more negative perceptions associated with Chinese internal combustion engine vehicles in the past.

Figure 3: Battery electric vehicle registrations in top markets (2022)



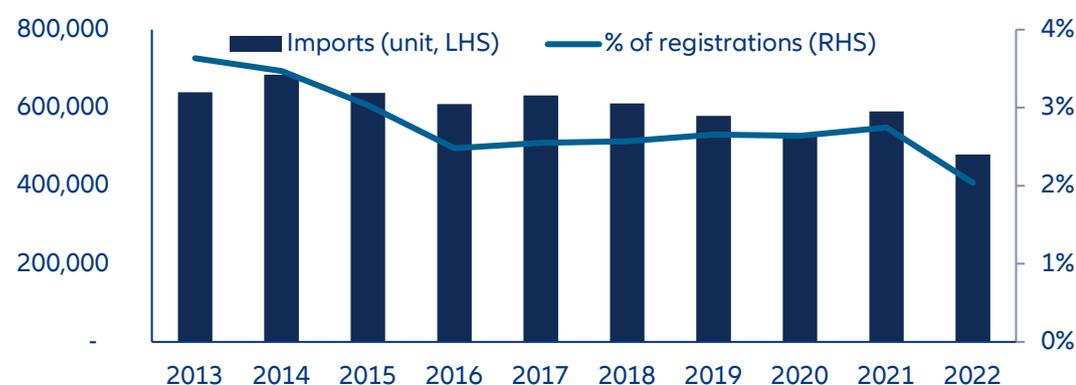
Sources: CAAM, Allianz Research

... putting EUR24bn of European car exports at risk...

As the popularity of electric vehicles grows, Chinese companies are expected to expand their market share accordingly by 2030 and squeeze foreign car imports. Because they represent more than half of China's car imports, European automakers face the greatest risk. European trade figures can be somewhat deceptive – exports did hit a record high of EUR24bn in 2022, but this surge was mainly due to a catch-up effect and favorable pricing. Analyzing Chinese car registration

data for imported models from major European automakers tells a different story: Imported volumes have been declining in recent years, dipping below 500,000 in 2022 (Figure 4). Over the past decade, the market share of European imports has dropped from an estimated 2.9% to 1.8% of total registrations.

Figure 4: Chinese registrations of imported European vehicles



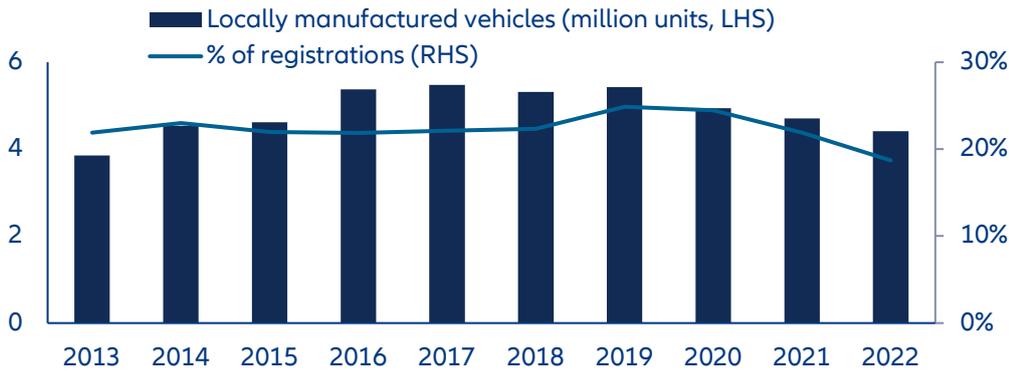
Sources: Bloomberg, Allianz Research

... and more than 4mn vehicles from Sino-European joint-ventures

The surging popularity of Chinese pure-play automakers is also jeopardizing the operations that European carmakers have established in China – mostly joint ventures, but also a few majority-controlled subsidiaries. Accounting for 85% of European automakers' sales volumes in the Chinese market, local subsidiaries have generally lagged in adopting electric vehicle technology compared to their pure-play counterparts: Of the 20 most popular electric vehicles sold in China in 2022, only

one is manufactured by a Sino-European joint venture. In the face of flat, then declining market shares (Figure 5), European carmakers have taken opposite stances, considering the Chinese market too difficult to crack and withdrawing entirely, or conversely doubling down on local manufacturing to improve local competitiveness.

Figure 5: Chinese registrations of locally manufactured European vehicles



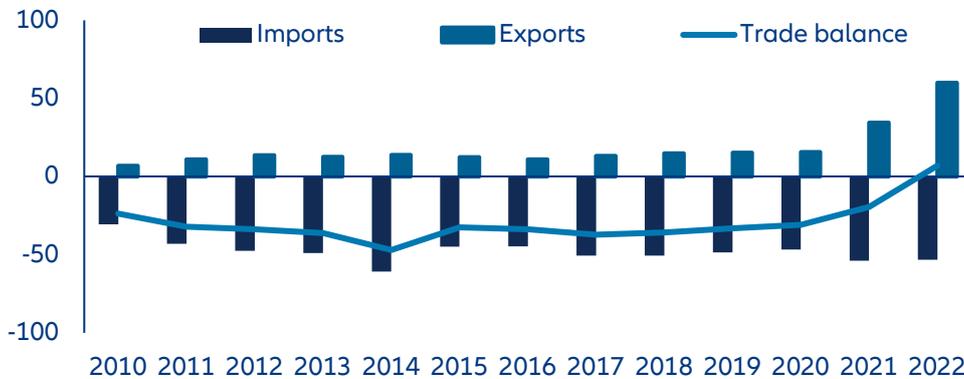
Sources: Bloomberg, Allianz Research estimates

Trade data shows growing Chinese competitiveness in international markets

The growing competitiveness of China’s automotive industry is best reflected in its bilateral automotive trade with the rest of the world. Looking at product-level data provided by Chinese customs, we find confirmation that Chinese car imports fell from 1.2mn units in 2017 to 0.9mn units in 2022 – a -30% drop in a market down by only -6%. Even more striking, the trade balance in value terms went from a USD37bn trade deficit to USD7bn trade surplus over the same period, showing that rising Chinese competitiveness is not only allowing the country to become more self-reliant, but also to expand in international markets (Figure 6).

While Chinese manufacturers used to focus on the needs of other emerging economies in Asia, the Middle East and Latin America, it is European markets that contributed the most to booming exports, jumping from an estimated 8% share of exports in 2017 to a 28% share in 2022. Looking at European statistics to check for consistency, we find confirmation of a significant boom in imports of China-made cars, with, for the first time ever, Europe’s vehicle trade balance moving into negative territory in December 2022.

Figure 6: China’s automotive international trade (billion USD)



Sources: China Customs, Allianz Research

European and American carmakers are pushing made-in-China cars in Europe...

To assess the penetration of China-made cars at a micro-level, we study the best-selling vehicles of 2022 for Europe's largest automotive market, Germany (Box 3). Looking at their respective countries of assembly,

we find that three out of the 10 best-selling BEVs were fully or partially imported from China, and just five models from four European and American carmakers dominate registrations of China-made BEVs in Europe.

... while most Chinese brands are only ramping up their operations.

Only one China-branded BEV made it to Germany's top 50 best-selling models in 2022: Most Chinese carmakers are still at an exploratory stage in Europe's largest automotive market. Looking more closely at data for Q1 2023, however, we find that progress is clear, with six Chinese companies now selling BEVs in Germany compared to only two one year ago, and the market share of those companies now accounting for 3.7% of all BEV sales in Germany, vs 1.2% one year ago. With Chinese players accounting for 15 out of the 90 BEVs

available in the German market, sales are poised to grow at a fast pace in 2023 and in coming years. Tapping into a new market in the automotive industry requires time as carmakers must navigate through typical ramp-up phases including regulatory compliance, localization, establishing sales networks with importers and dealerships and building brand awareness.

Box 3: Mapping the current BEV offering in Germany, Europe's largest car market

#1 EVs available from city to sports cars through SUVs and compacts. As of March 2023, 90 different models were available for order in Germany, priced between EUR22,000 and EUR218,000. Half of them are compact cars or smaller.

#2 Only a fraction of available models are EVs. EVs are sold under 37 different brands, meaning the average brand offers two to three different electric models. Brands affiliated with dominant automotive groups in Europe tend to have a broader offering.

#3 New technology means new entrants. Out of the 37 brands, nine offer battery electric vehicles exclusively in Europe and had little to no commercial presence in the market 10 years ago.

#4 New entrants mean new origins. Five full-electric brands are Chinese, three are American and one is European with a parent Chinese group. 19 out of the 90 cars are exclusively assembled in China, and another 11 have assembly operations both in China and Europe or North America.

#5 Many Asian-imported EVs among best-sellers. Out of the 10 best-selling EVs in Germany in 2022, one is imported from South Korea, one from China and two both manufactured in Europe and North America as well as China.

#6 EVs come with a high price tag. The median price tag for one of the 90 EVs available stands at EUR51,000 – compared with an average EUR30,000 to EUR40,000 for a new vehicle in Europe's largest markets. Affordability will be crucial to meet EV penetration targets by 2035.

Chinese competition will pave a bumpy road for Europe's automotive industry

We identify two main channels by which China's rise as a competitive automotive manufacturing hub could impact Europe's automotive industry:

- **Growing competitiveness will help Chinese manufacturers gain a greater share of their domestic markets, jeopardizing the sales and profits of foreign companies operating in China, either through lower exports or lower sales from their Chinese subsidiaries.** As evidenced by the 80% market share controlled by Chinese brands in Chinese electric vehicle registrations, most international competitors have been too slow to embrace the shift to EVs in China. Looking at their announced EV pipelines for the Chinese market, we observe that only a handful of carmakers are planning increasing commitment to the Chinese market. As scale and technology help EVs reach price parity with ICEs over time, we do not see a business case for a foreign carmaker selling substantial volumes of ICEs in the country. Rather, we would expect more international carmakers to withdraw from China in coming years – a trend already at play.
- **The mandatory shift to a product mix where battery electric vehicles will account for virtually all new car sales by 2035 in Europe will favour a partial substitution of Europe-made cars by China-made cars – irrespective of whether those cars are manufactured by a Chinese, American or European company.** A look at the product pipelines of European and American carmakers point to a minimum of 11 new mass-market, China-made BEVs to be launched in Europe by 2025, and an additional three Chinese carmakers have announced they will begin commercial operations in Europe as early as 2023, bringing the total to nine. As discussed in Box 4, the openness of the European market makes it far most interesting for Chinese exports than the American market.

Box 4 – How the US Inflation Reduction Act (IRA) makes Europe a target for Chinese exports

A key reason for the growing penetration of China-made and China-branded vehicles in Europe is its comparatively greater openness for imported electric vehicles. Despite being the world's second-largest market for motor vehicles and running a huge trade deficit for cars, the US is set to be a much tougher market to crack for Chinese vehicles in light of the US Inflation Reduction Act (IRA), which will greatly encourage automotive manufacturing in North America through two main provisions:

- Production tax credits for the manufacturing of a wide range of clean energy components and critical minerals ("New Advanced Manufacturing Production Tax Credits") including electric battery cells and modules used in electric vehicles.
- Tax credits worth up to USD7,500 for the purchase of an EV assembled in North America and meeting certain domestic content requirements for minerals and components and, starting in 2024, exclusive to so-called "entities of concern" (including China).

While the former provision will only play out progressively as domestic and foreign companies invest in local manufacturing capacities, the latter is creating a strong and immediate advantage for locally assembled vehicles and an explicit barrier to Chinese suppliers and carmakers. IRA provisions come on top of a significant import duty gap: Chinese vehicles face a 10% import duty rate in Europe but a 27.5% rate inherited from the Trump Administration in the US.



Photo by Obi @Pixel7Propix on Unsplash

Mapping the Chinese challenge for the European automotive industry

What if Chinese brands capture 75% of their domestic market and China-made cars 10% of the European market by 2030?

To help quantify the stakes at play, we simulate a possible 2030 scenario where Chinese manufacturers manage to increase their domestic market shares to 75% – consistent with the trend at play since sales of new energy vehicles began to soar and our expectations of foreign competitors leaving the market.

Meanwhile, imports from China climb to 10% of all car sales in Europe as the continent goes electric, with BEVs reaching an 80% market share for all passenger car sales. Exports are first pushed by international carmakers with a manufacturing foothold in China, then by Chinese

competitors that are finished building their commercial presence in Europe's largest markets. The precedents from Japanese carmakers in the US in 1970s (Box 5) or South Korean carmakers in Europe in the 2000s (Box 6) show exports alone can be enough for competitive carmakers to secure a significant market share in international markets

We emphasize that this scenario is not a forecast but rather a plausible case to illustrate potential developments in the automotive industry. Various factors, including changes in government policies and geopolitical influences, could significantly impact the actual outcome.

European car production in China could decline by 1.7mn vehicles (-37%) and threaten EUR7bn in annual net profits...

In this scenario, total sales in China from European carmakers would fall by -39%, with local production falling from an estimated 4.4mn units in 2022 units to 2.7mn units in 2030, and exports from 480,000 to 290,000 units. The impact in euro terms would be more difficult to assess as European carmakers do not report operating or net profit on a geographical basis. However, their combined Chinese sales amounted to about 22% of their global deliveries.

Assuming their operations in China are as profitable as those in other markets, 22% of their combined EUR67bn in net profit for 2022 brings the net profit at risk to EUR14.7bn. Because 50-50 joint ventures still account for the bulk of their local sales, at least EUR7.3bn of that EUR14.7bn can be attributed to European carmakers.

... and Chinese imports could climb to 1.5mn vehicles and threaten 13% of European production

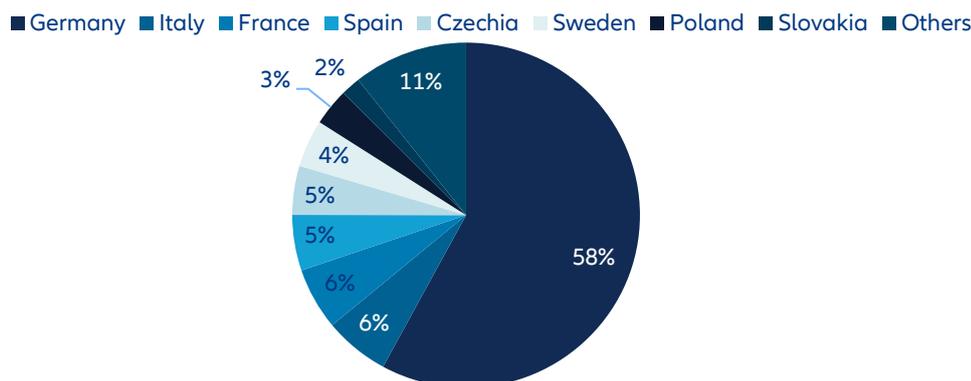
In the same scenario, Chinese exports would reach 1.5mn vehicles in 2030, equivalent to 13.5% of the EU's 2022 production or the combined output of the region's three largest automotive assembly factories. Since the European market is by and large autonomous, rising Chinese imports would take a bigger toll on local production compared with competing but modest imports from Japan and South Korea. Greater reliance on imports

would lower the capacity utilization rates of European factories, weigh on their profitability and encourage further capacity eliminations. Over the past 10 years, a dozen assembly sites were shut down in Europe, reflecting greater consolidation among carmakers and the exit of some American and Japanese manufacturers.

EUR24bn in direct automotive value added at risk, 0.15% of the region's GDP...

Adding export losses to domestic production losses, and factoring in EUR14,200 of value added per vehicle manufactured in EU in 2019 as a proxy, the value added impact on the European economy would stand at EUR24.2bn in 2030 for the automotive sector, the equivalent of 0.15% of the region's 2022 GDP. This EU average masks important value added concentration

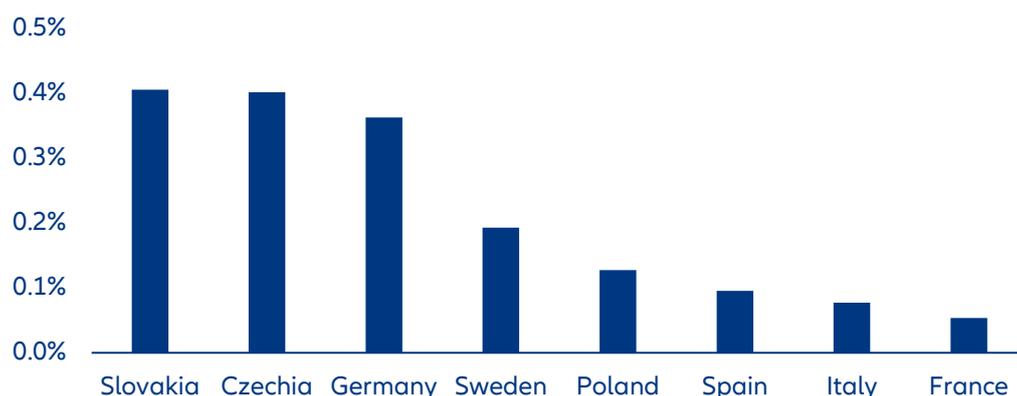
in just a few countries and regions. Breaking down European value added by country, we are reminded that Germany is the region's powerhouse, alone accounting for nearly 60% of the region's value added (Figure 7).

Figure 7: Value added from the European automotive industry by country (2019 data, %)

Sources: Eurostat, Allianz Research

In this respect, the same 0.15% impact on European GDP has a very different meaning for countries where the automotive industry plays a comparatively larger role in

the economy – the impact would be more than twice the European average for countries such as Slovakia, Czech Republic and Germany (Figure 8).

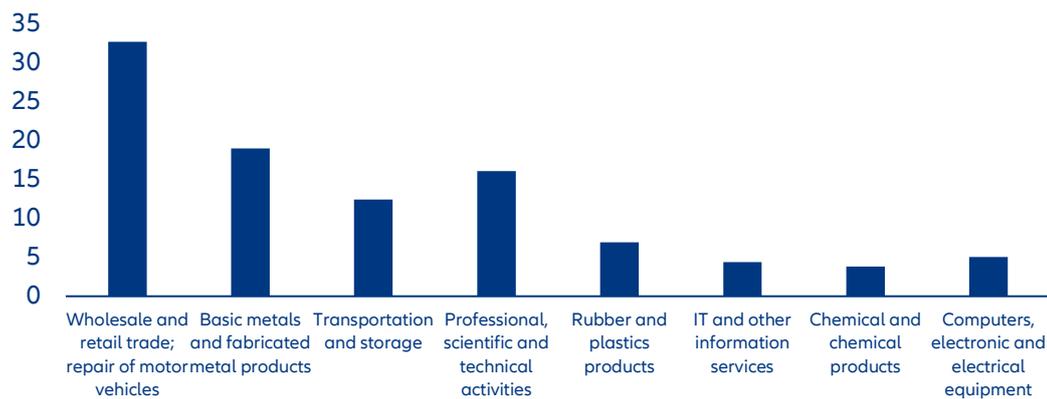
Figure 8: Lost automotive value added expressed as a percentage of 2022 GDP

Sources: Eurostat, Allianz Research

... and a good dozen more among suppliers of the automotive industry

Our estimate on the direct impact on the automotive industry does not factor in the strong knock-on impact the industry has on other industrial and services activities. Using the OECD Trade in Value Added (TiVA) database, we find that final demand generated by the European automotive industry generated EUR155bn of value added for other European sectors in 2018, of which:

- EUR53bn was for other manufacturing activities, including EUR19bn for metals, EUR8bn for machinery and equipment, EUR7bn for rubber and plastics, EUR5bn for electronic and electrical equipment and EUR4bn for chemicals.
- EUR102bn for services, including EUR16bn in support services (R&D, consulting etc.), EUR12bn in transport and storage services, EUR4bn in IT services etc. (Figure 9)

Figure 9: Value added from the European automotive industry for selected other European sectors (2018 data, billion euros)

Sources: OECD Trade in Value Database, Allianz Research

Eliminating the same 14% of lost automotive production on the value added generated by the automotive industry in other sectors would amount to an extra EUR21bn in lost value added for the European economy. Note, however, that this is an upper bound estimate, given that some services such as retail are provided irrespective of the actual place of car assembly. Conversely, because supply chains tend to be local, lost car assembly activities would be felt more on upstream industries (metals, plastics, chemicals, electronics etc.).

Box 5: The rise of South Korean brands in the European market

The South Korean motor vehicle industry grew in the 1960s, with the initial impulse coming from the 1962 Automotive Industry Promotion Law. Through a mix of trade policy and government-supervised licensing agreements and joint ventures, domestic carmakers emerged by assembling semi-knocked-down parts provided by Japanese and American carmakers. Government support was later instrumental to increase the share of domestic content in locally assembled vehicles – which materialized in the 1975 by the launch of the first Korea-designed (with international partners) and manufactured passenger car – and to encourage exports to North America and Europe in the 1980s.

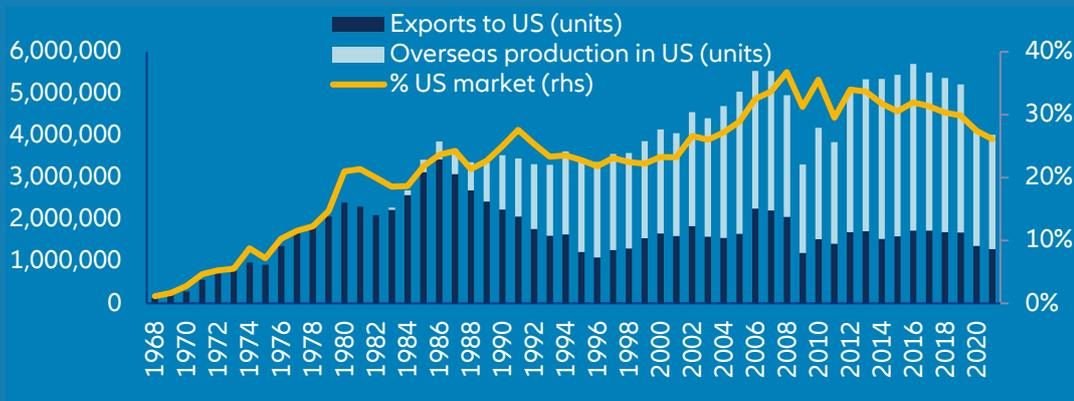
South Korean brands became mainstream in Europe in the second half of 1990s with the promise of affordable vehicles whose quality became close to the local entry-level offering. After going through consolidation in the aftermath of the 1997 Asian crisis, they managed to secure an estimated 4% share of the European passenger car market in 2005 just through exports. In the middle of the decade, they took major steps by opening European research and design centers, designing vehicles specifically for European customers and opening manufacturing facilities in Czech Republic and Slovakia. Combined with efforts to move upmarket and substantial investment in marketing, their strategy was met with commercial success, with their markets shares increasing gradually and reaching an all-time high of about 9% in 2021. Exports are estimated to account for over 40% of South Korean cars sold in Europe and were at record highs in 2022, partly driven by popular electric vehicle models primarily assembled in South Korea.

Box 6: Japan's foray into the American market

Japan began exporting passenger vehicles to the US in the late 1950s, but it was not before the end of the 1960s that Japanese manufacturers grabbed a sizable share of the local market. A major turn of event was the 1970 Clean Air Act, which set forth a mandatory 90% cut in polluting emissions from new cars by 1975. Together with soaring gasoline prices in the wake of the 1973 oil crisis and the subsequent economic recession, this shift in legislation provided a huge boost to Japanese carmakers whose lighter, more compact and fuel-efficient vehicles proved popular among US customers. Their share in US registrations jumped from 3% in the 1970s to 7% in 1975 and 20% in 1980 despite imports tariffs and no local manufacturing presence. Meanwhile, US employment in the motor vehicles and equipment sector fell from a high of 1.1mn in 1979 to a low of 650,000 in 1982.

The implementation of so-called voluntary export restraints at the request of the US Administration in 1981 contributed to cap Japanese car exports and encourage the creation of "transplant" factories owned by Japanese carmakers on American territory starting in 1982. The move did not prevent Japanese cars from becoming even more popular, with their market share oscillating between 19% and 25% through the decade. Japanese manufacturers invested heavily in their American manufacturing facilities. By the end of the decade, vehicles assembled locally accounted for nearly 40% of Japanese car sales in the country and employment returned to about 80% of its past peak.

Figure 10: Sales of Japan-branded cars in the US



Sources: BEA, Jama, Allianz Research

In an industry characterized by long product-development and commercial cycles, it is clear that China's lead in the global EV race will not be bridged by 2030. However, the extent to which Europe can keep pace with growing Chinese competition is up to European policymakers and the industry itself:

- As explained previously, Europe's BEV market is comparatively far more open than those of China and the US, where national or regional assembly is a prerequisite to qualify for purchase subsidies and import duties on foreign vehicles are higher. Seeking reciprocity in trade terms, not just with China but also the US, should be a priority to have a more level playing field for the European industry.
- Because China's cost advantage lies in part in the size of its domestic market, Europe should also ensure the best possible environment for the adoption of BEVs – not just through subsidies, but also with extensive and high-performance charging infrastructure that would allow electric vehicles to use smaller, lighter and less expensive batteries. Well-performing charging infrastructure would lower the price tag for the average BEV and convince users in less urbanized areas to make the switch. In our previous report, we estimated the necessary investment in charging infrastructure at EUR13.4bn per year to meet Europe's Fit For 55 target¹.
- If Europe struggles to compete with China the short run, it could seek to join it – much like the US did with Japanese carmakers in the 1980s, if only too late. Allowing Chinese investment in European car assembly should not be a taboo despite the symbolic dimension of such a decision and the likely opposition of some European carmakers. All else unchanged, it would be far more beneficial for Europe to have China-branded vehicles on its roads if they were assembled locally rather than imported. Evidence from European electric-battery-assembly projects, where China is the largest investor, and the interest expressed by Chinese carmakers in European automotive factories due to be closed show deals would have high chances to materialize.
- As raw materials constitute about half of battery costs, increasing self-sufficiency in this area could reduce Europe's reliance on imported electric powertrain components and strengthen the domestic value chain. Europe should also consider prioritizing the development of mining and refining capacities when possible, and establishing trade deals with partner countries when not, to secure its economic and strategic interests. In this respect, the European Critical Raw Material Act (CRMCA) is a step in the right direction whose specifics will need to be communicated and enforced as soon as possible.
- Late in current battery technology manufacturing, Europe should also prepare for what lies ahead as both China and the US are heavily investing in next-generation battery technologies. Lithium-ion chemistries, particularly NMC (nickel, manganese, cobalt oxide) dominate the current battery market due to their advantageous blend of energy density, power and safety features. However, the reliance on constrained metals such as cobalt necessitates the exploration of alternative battery technologies to mitigate supply risks and develop different types of batteries for different needs. Emerging alternatives, such as solid-state batteries, present promising prospects for enhanced energy density, safety and sustainability.

¹See [Transport in a zero carbon EU: pathways and opportunities](#)

Appendix

Scenario assumptions

The assumptions used for the 2030 scenario are as follows:

- A compound annual growth rate of +2.5% for the Chinese passenger car market by 2030, bringing annual registrations to 28.6mn units, and a linear progression of the market shares of Chinese carmakers to 75% of total passenger car registrations.
- A compound annual growth rate of +6.3% for the European passenger car market by 2030, bringing annual registrations to 15.1mn units. Higher growth for the European market does not reflect greater potential, but the historical low in registrations reached in 2022 and a progressive return to the peak registration levels of the 2010s. BEV penetration would stand at 80%, which is close to the weighted average of the pledges made by leading carmakers present in Europe for 2030 (81%).
- Value added per vehicle of EUR14,200. Value added data were retrieved using Eurostat's national accounts aggregates by industry database, using value added for 2019 rather than 2020 or 2021, which are often incomplete and reflecting the highly unusual pandemic years, and the NACE code C29, which encompasses both carmakers and automotive suppliers. Vehicle production data are those provided by OICA and collected from national trade bodies. Vehicle definition may differ between countries.

Data from the OECD's Trade in Value Added database also cover the NACE C29 activity code. The latest data are for 2018.

Industry data sources

Data on the automotive market used in the report come from the following sources:

- OICA (International Organization of Motor Vehicle Manufacturers): time series on global vehicle production.
- ACEA (European Automobile Manufacturers' Association): time series on vehicle production, registration, import, export etc.
- KBA (Kraftfahrt-Bundesamt): time series on car registrations for the German market
- just-auto.com: time series on European automotive factory production (data retrieved from a Bloomberg terminal)
- China Automotive Information Net: time series on China automotive sales (data retrieved from Bloomberg terminal)
- China Automotive Technology and Research Center (CATARC): time series on China automotive retail sales (data retrieved from Bloomberg terminal)
- ev-database.org: database on the BEV available on the European market



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