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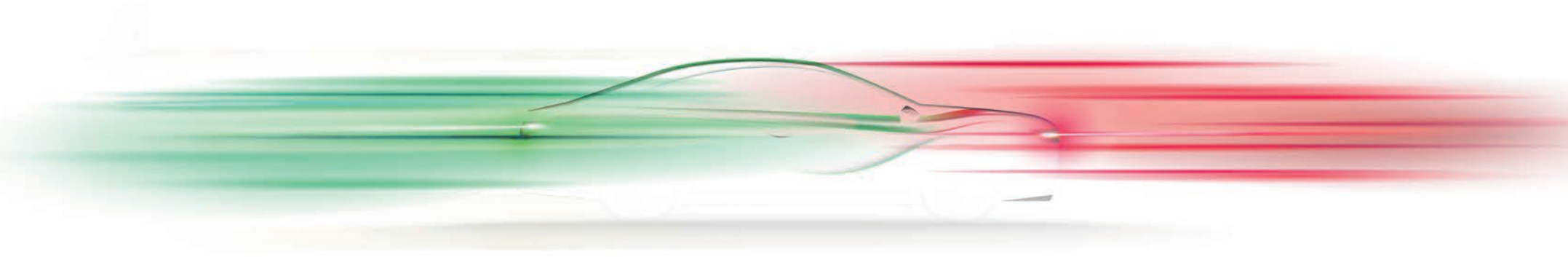
The Automotive Sector in China
with Special Focus on Aftermarket



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Contents

Introduction

This research dedicated to the Automotive sector in China, with a particular focus on the Aftermarket, has been coordinated by ITA Office in Guangzhou, as part of the promotional activities of ITA Agency.

The opening chapter has been prepared by prof. Sergio Paba of the University of Modena and Reggio Emilia, whose department has been following the evolution of the Automotive sector in China for several years.

The main analysis dedicated to the Aftermarket was developed by the specialized company Automobility which boasts a consolidated experience in the analysis of the Automotive sector in the Chinese market.

The Italian Chamber of Commerce in China has actively contributed to the work, taking care of the final chapter of the paper, in which the cases of five Italian companies that shared their experiences in China are reported.

The realization of this report was possible thanks to the collaboration of Anfia and AutoPrometec that helped to define the field of interest of the survey, and it is aimed to offer to the Italian companies a tool to deepen and better understand the Chinese market where the importance of electric vehicles and new local brands is constantly growing.

This analysis is intended to provide more information on what is happening in China in the Automotive sector and also to understand what kind of future strategies could be adopted in Europe and in Italy to face the impending challenges posed by the technological and digital transition and avoid the risk of a loss of competitiveness of an entire production sector.

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Foreword

Over the last three decades, China's economic growth has brought about a significant improvement in the country's manufacturing quality. In the automotive sector, this improvement in industrial capabilities has been particularly accelerated through numerous joint ventures between seldom state-owned Chinese organizations and foreign brands. With the growth of local manufacturing skills and know-how, home-grown Chinese brands emerged, some of which are already making in-roads into the international export market. Nowadays, it is the next generation of electric car makers in China that are set to make the biggest impact on the global automotive market. In fact, it is in the electric vehicle (EV) arena where the biggest changes are set to take place and, in this respect, China represents an "experimental lab", anticipating changes due to be occurring at a later stage in other parts of the world. And it isn't just established players with foreign partners that are making inroads either. Smaller Chinese electric car companies have all seen their sales surge over the last two years.

Connectivity, electrification, digitalization, smart technologies, and autonomous driving are the new modernization trends of automobile which are expected to accelerate innovation and further disrupt the future of the industry. Vehicles are increasingly viewed as "smartphones on wheels" by many customers. This implies that producers should stay ahead of the innovation frontier by designing appropriate strategies for technology applications and marketing strategies.

The growing penetration of electrification has created a paramount change in the global auto aftermarket value chain. As electric vehicles generally have lower maintenance compared to ICE vehicles, automotive aftermarket players are now struggling to develop effective strategies properly integrating EVs and their long-term effect on business.

The arrival of EVs on the global aftermarket is inevitably causing a large disruption, but it also presents unique, profit-making opportunities and proper incentives for businesses to innovate.

International players who want to learn from China's EV history must duly take note of the several scenarios and evolving business models that manifest how the aftermarket industry has shifted.

Against this backdrop, the Italian Trade Agency has produced this report aiming at analyzing the innovation trends occurring in China's auto aftermarket to provide Italian companies with an important analytical tool to foresee the changes happening in the huge Chinese market but that will also inevitably spill over in other major markets.

Moreover, our Guangzhou Office, has set up a permanent observatory on China's EVs market development to gather the necessary knowledge and information, while catalyzing a network of dedicated professional skills, to be able to assist the Italian auto aftermarket companies on how to deal with the challenges ahead.

I sincerely hope readers could appreciate the quality of this work.

Gianpaolo Bruno

Coordinator of the Italian Trade Agency's Offices in the P.R.C.

Foreword

Today, China is the second-large economy and the largest manufacturer of industrial products in the world. It has ranked first in the production and sales of new cars all over the world for 10 consecutive years. More multinational automobile companies are paying more attention to the needs of the Chinese market and consumers, and are seeking cooperation with Chinese partners to provide the Chinese market and consumers with tailor-made and world-class products and services.

Being one of the three major car production bases in China, Guangzhou is the national foreign trade transformation and upgrading base and a pilot city on energy-saving and new energy vehicle demonstration and promotion. Guangzhou is also a national application and demonstration area on intelligent connected vehicle and intelligent transportation based on broadband, mobile and Internet technologies, as well as a pilot city on coordinated development of smart city infrastructure and intelligent connected vehicles. Automobile industry has become the most important pillar industry of Guangzhou. In 2021, the output value of automobile manufacturing industry of Guangzhou was 611.8 billion yuan, accounting for 27.1% of its total industrial output value above designated size, and 64.5% of industrial output value of Guangdong's automobile cluster. Last year, Guangzhou produced 2.96 million cars, accounting for 87% of Guangdong and 11% of China. Guangzhou ranks first among domestic cities in terms of vehicle output for three consecutive years. Guangzhou's local automobile corporation GAC Group has been listed in Fortune Global 500 for ten consecutive years, and its subsidiary GAC MOTOR has been ranked first among Chinese automobile brands in the mainstream car market for many years. Nowadays, with new energy car and intelligent connected vehicle as the core， new forces of Guangzhou car manufacturing industry, such as GAC AION and XPENG, are gradually embracing the world with advanced technical advantages and are participating in international competition and cooperation.

At the same time, based on the advantages of comprehensive gateway city, international comprehensive transportation hub and international central city, Guangzhou Municipal Government puts forward the development idea of "building the city with manufacturing industry", persists on comprehensive reform of optimizing business environment, and introduces a series of reform policies and measures, such as deepening the reform of investment facilitation for foreign-funded enterprises in Guangzhou and institution reform on commercial affairs. The city improves its ability to serve foreign investment, creates a market-oriented and law-based international business environment, and has been successfully selected as the first batch of pilot cities for business environment innovation in China.

As a global major automobile producer, Italy has a complete automobile industry system, which is very few in the world. Italy is also an important global automobile market and its export automobile products are highly-competitive in international market. Italy is unique in design and manufacturing of complete vehicles and motors, and its automobile R&D capacity, manufacturing process and technology are also at the word advanced level. With world-class level, Italy takes the lead in manufacturing of supercars. Many supercar models of the world's major automobile manufacturers bear the unique mark of Italian designers.

Guangzhou and Italy are both growing automobile manufacturing bases. We have our own respective advantages in automotive industry chain cooperation as well as new energy automobile products and services. We hope to enhance business contact with our Italian counterparts, dig deep cooperation potentials and make joint efforts to deepen market cooperation by means of economic and trade exchanges, policy explanation and project docking. Let us work together to invest in and cultivate high-quality enterprises in automobile industry, which features volatile innovation, high-profits and high-added value. We are also ready to join hands with our Italian friends to create intelligent manufacturing industry clusters, promote high-quality and in-depth economic and trade exchanges between Guangzhou and Italy, and achieve win-win development.

Mr. Yang Yong
President of
China Council for the Promotion of International Trade
Guangzhou Committee
(CCPIT Guangzhou)

Chapter 1: Overview and Future Prospects of the Chinese Automotive Industry

Prof. Sergio Paba

based on: S. Paba “The Chinese automotive industry at a turning point. An Overview”, DEMB Working Papers, n.198, 2022, Marco Biagi Department of Economics, UNIMORE.

1.1 Introduction

China is by far the largest car manufacturing country and the world's biggest auto market. Despite this, Chinese brands and companies are almost unknown in Europe and in other advanced markets. The international car oligopoly is still dominated by a group of historical companies and brands.

However, the recent development of the electric car and the growing emphasis on sustainable mobility could fundamentally change the picture and open the doors to new companies and manufacturers, even coming from outside the traditional automotive industry. This is a great opportunity for China. Backed by the government, Chinese companies can exploit the new technology by investing in research and development, developing new products, and proposing new business models in order to enter international markets with their own companies and brands.

Will the Chinese auto industry be able to achieve this? Will it be able to compete on a level playing field with the powerful foreign multinationals in the global markets? This work tries to offer an answer to these questions by reviewing the Chinese car industry, the main characteristics of its development and its future prospects in the context of the great changes promised by sustainable mobility.

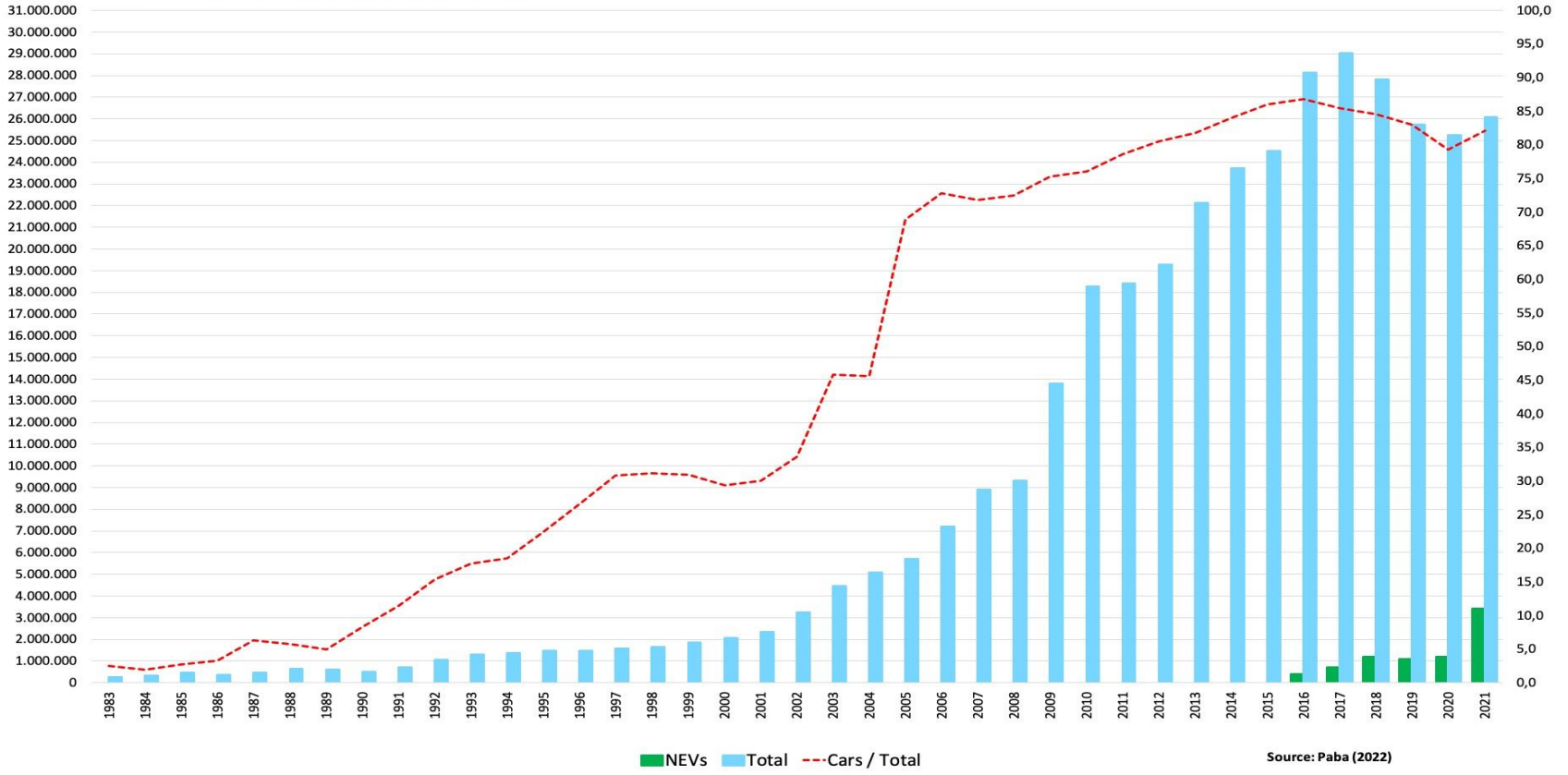
1.2 Industry evolution shaped by state intervention and industrial policies

In the space of four decades, China has gone from producing just a few thousand vehicles, mostly trucks, to over 26 million vehicles produced in the last year (Figure 1), 82% of which are passenger cars, close to the sum of the output of Europe, Japan and US. An impressive growth, and a great success for China.

The state played a fundamental role in the formation and development of the industry, through the ownership of the main companies (SOEs, State Owned Enterprises) and a long series of industrial policies and policy measures at central and provincial levels.

Two main phases characterized the history of state intervention in the automotive industry. The first lasted from the mid-1980s to the end of the first decade of the 2000s. The start of the second can conventionally be placed with the rollout of the 2009 car industry adjustment plan. The turning point was the advent of electric cars and the focus on sustainable mobility. As we will see, the consequences on the structure and prospects of Chinese companies of this change have been significant.

Figure 1 - China. Production of vehicles
Units and Ratio passenger cars/total (%)



Source: Paba (2022)

In the 1980s, the automotive industry was characterized by fragmentation and deep technological backwardness. Labour productivity was particularly low compared to international standards. The car market was underdeveloped, especially private demand, and heavily protected from imports and competition.

For a quarter of the last century, the main tool used by the government to build a competitive industry, promote demand growth and reduce the technological gap with foreign producers, was the **promotion of joint ventures** between a selected number of Chinese state-owned groups (SOEs) and foreign multinationals. This policy had profound consequences for the evolution and current state of the industry.

China adopted a *JV-based import substitution policy*, as has been called by a scholar, Wan-Wen Chu. The basic idea was to trade market access and market protection in exchange for technology transfer. Foreign companies were welcomed into the domestic market, protected from imports and the entry of other competitors, but at the same time they were expected to transfer technology to Chinese firms. Through the JV partnerships, Chinese companies hoped to accumulate the experience, knowledge and skills necessary to build over time an independent and competitive industry, with innovation capabilities and own brands.

The **first wave** of joint ventures, actively promoted by the government, occurred in the decade 1984-1993. The main Chinese companies involved were the so-called "Big three" (FAW, SAW-Dongfeng, SAIC) and "Small three" (BAW-BAIC, Guangzhou-GAC, Tianjing Automotive Industry TAIC), all owned by the state. The foreign partners were the American Motor Corporation-Chrysler, VW, the French group PSA-Peugeot-Citroen, the Japanese Suzuki and Daihatsu.

However, at the end of this period, the outcome was not what the government expected. Protected from domestic and international competition, foreign partners had no incentives to transfer advanced technology to Chines firms, improve efficiency, and innovate models.

The government reacted with the first specific policy for the automotive industry, which was adopted in **1994** *(Formal Policy for the Development of the Automobile Industry)*. The aim was to substantially strengthen the efficiency and technological level of the industry. The government encouraged the formation of additional JVs with foreign companies, this time subject to more stringent constraints. First, foreign multinationals were asked to develop and produce updated models and to stimulate innovation activity. Second, the plan required that the Chinese stake in the JVs could not be less than 50% and foreign companies could not set up more than two JVs to produce similar models of cars (50% + 2 rule).

This plan promoted a **second wave** of JVs, from the end of the 1990s to the first decade of the new millennium. New international partners were involved, previously excluded from the agreements. These were the main Japanese companies (Toyota, Honda, Nissan, Mitsubishi and Mazda), the German Daimler-Benz and BMW, the American General Motors and Ford, the Korean group Hyundai-KIA, and lastly Fiat-Chrysler and the Indo-British Jaguar-Land Rover. On the Chinese side, the second wave involved the same large SOEs of the first wave, joined by the two previously independent companies Brilliance and Chery.

At the end of the 1990s, passenger cars represented 30% of total vehicles' production, a marked increase compared to fifteen years earlier, but still below what the government hoped for in 1994 (50%). However, with few exceptions, the industry was still inefficient, and only few plants reached the minimum efficient scale of production (MES).

A crucial step was the entry of China into the WTO in 2001. Import tariffs were progressively reduced, projecting the Chinese manufacturing sector into the global market. This meant the threat of increasing import volumes that would put Chinese companies and technologically backward joint ventures at risk. The opening up of the Chinese market to international trade demanded a strong and competitive automotive industry. The structural adjustment and upgrading of the industry became a priority.

Increasingly aware of the shortcomings of joint ventures, the government changed course in **2004** with a new policy for the automotive sector *(Policy on Development of Automotive Industry)*. Building on the technology introduced by foreign companies, the promotion of Chinese brands, heavily penalized in the previous period, were now emphasized. However, the JV policy was not abandoned. After 2004, eight new JV agreements with foreign multinationals were signed by Chinese companies.

In the 2004 plan, the promotion of research and industrialization of battery-electric, hybrid and other energy-saving vehicles was mentioned for the first time. However, we have to wait for the *Auto Industry Adjustment and Revitalization* plan of **2009** for a real turning point.

With a clear indication to “take new energy vehicles as a breakthrough”, this plan marks an important change from the past and inaugurates a new season of industrial policies. With the term New Energy Vehicles (NEVs), the government refers to plug-in electric vehicles (BEVs, PHEVs) and FCEVs powered by hydrogen. The plan set production and sale targets for NEVs and promoted pilot projects for the diffusion of this type of vehicle in a selected number of large municipalities (a program called *Ten Cities, a thousand vehicles*). The government began to see in the development of NEVs not only the possibility of curbing pollution, but also the opportunity to free Chinese industry from technological dependence on foreign multinationals.

In **2012**, the government launched the first specific plan for electric and energy-saving cars (*Energy-saving and new energy automobile industry development plan 2012-2020*). The main point was to enhance China's automobile industry overall level of technology by supporting the development, industrialization and innovation of NEVs.

The ambitious program **Made in China 2025**, launched in 2015, records this fundamental change of direction towards sustainable mobility. The "energy-saving and new energy vehicles industry” is listed as one of ten strategic industries, and the development of electric technology is considered a priority.

Alongside the actions aimed at firms and industry, the government implemented a wide set of policies at central, provincial and municipal level, to encourage the development of the electric vehicle market. These include substantial purchase subsidies, facilities for those who own electric cars, and support for the construction of an extensive network of infrastructures necessary for the circulation of new vehicles, mainly charging stations.

In September **2017**, the Chinese government rolled out a market-based regulation scheme inspired by the experience of California’s Zero Emission Vehicle Mandate program (ZEVM) and European Union Emission Trading Scheme (EUETS), the *Parallel Administrative Measures for Passenger Vehicle Corporate Average Fuel Consumption and New Energy Vehicle Credits*. This policy sets specific corporate targets for average fuel consumption (CAFC) and for the production of NEVs, as a percentage over total annual conventional-fuel passenger car production.

At the same time, due to the ineffectiveness of financial incentives in promoting NEVs demand, the policy of financial and fiscal subsidies began to be phased out from mid-2019, and the program will be terminated by the end of 2022.

1.3 The Impact of State Intervention: Lights and Shadows

There are three main effects of nearly four decades of state policy and intervention.

The **first** is certainly positive and in some ways surprising. Starting out as a complete outsider, China has grown into the world's leading vehicle manufacturer and largest car market.

The current structure of the industry is characterized by three main groups of firms, which reflects the two phases of state intervention (Table 1). Large SOEs, all of them involved in JVs with foreign multinationals, play a dominant role in the industry. With 5.4 million cars produced in 2021, SAIC is among the top ten automakers in the world and the most important Chinese company, followed by FAW, Dongfeng, Changan, GAC and BAIC. These firms accounted for 3/4 of the total industry output in 2021.

The second group includes a set of independent producers, whose growth has not been based on partnerships with foreign producers. However, the output size of these firms is lower compared to the first group. Geely, a private company, is by far the most dynamic, followed by two other public companies, Great Wall and JAC, and by the state-owned Brilliance and Chery.

The last group contains firms and start-ups specialized or strongly committed to NEVs. These are the results of the last phase of industrial policies aimed at promoting a more sustainable mobility. BYD and the start-ups NIO, Xpeng, Li-Auto, Hozon and others are the most important companies. These firms are technologically innovative, and clearly aim at international markets, even if they still have small-scale productions. Some of these are listed on the New York Stock Exchange and enjoy the support of major international investors.

Table 1- Main Chinese Automotive Groups. Production of Vehicles

Legal status	Chinese Group	JV partner	2021	
			Units	%
SOE	**SAIC**	VM,GM	**5.375.000**	*20,6*
SOE	**FAW**	VM,Toyota,Mazda	**3.351.000**	*12,8*
SOE	**DONGFENG**	Nissan,Kia,Honda	**3.205.000**	*12,3*
SOE	**GAC**	Honda,Toyota,Stellantis,Mitsubishi	**2.138.000**	*8,2*
SOE	**CHANGAN**	Suzuki,Ford,Mazda	**2.296.000**	*8,8*
SOE	**BAIC**	Hyundai, Daimler	**1.642.000**	*6,3*
Private	**GEELY**	Daimler	**1.520.000**	*5,8*
Public	**GREAT WALL**	BMW	**1.265.000**	*4,9*
SOE	**BRILLIANCE**	BMW	**928.000**	*3,6*
SOE	**CHERY**	Jaguar-Rover	**938.000**	*3,6*
Public	**JAC**	VW	**527.000**	*2,0*
Public	**BYD**	Daimler,Toyota	**752.000**	*2,9*
Public	**NIO**		**91.000**	*0,3*
Public	**XPENG**		**98.000**	*0,4*
	Other total		**1.956.220**	*7,5*
	TOTAL CHINA		**26.082.220**	

Source: Paba (2022)

Second and despite the impressive growth of the industry, Chinese companies, technology and brands still do not play a leading role, not only in global markets, where they are substantially unknown, but also domestically.

The large state groups of SAIC, FAW, and Dongfeng, for example, produce respectively a small share with their own marques, while the bulk of production is placed by the JVs under VW, General Motors or Toyota brand names. Total foreign brands in China accounted for the majority of total sales (55.3% of 2021). The top three best-selling brands are VW, Toyota and Honda, with a combined share of 25.3%. Not surprisingly, Geely, the first Chinese brand (5.1% market share), is a privately owned and independent company, with no history of JVs with foreign companies.

If we look at the conventional technology with combustion engines, there might still be a technology gap between Chinese and foreign companies. In 2013, according to some estimates, the technology level of Chinese firms was far behind their global competitors. The best company, SAIC, had a technological level estimated at 70% of VW, taken as a reference. FAW, Dongfeng (DFM), BAIC and Changan were ranked at 40%, despite the long experience of partnerships with multinationals in the sector. Things have probably improved in the last decade, but there is no longer any interest on the part of Chinese companies to continue to invest in the old technology in order to catch up with foreign OEMs. The future is elsewhere, driven by NEVs and sustainable mobility.

More generally, China has no “national champions” that can compete in global markets with major foreign OEMs in terms of quality, technology, innovation and market appeal. From this point of view, the development of Chinese industry differs profoundly from the experience of Japan and Korea, whose car multinationals are well recognized in world markets.

This evidence suggests that the goal of building a technologically advanced, autonomous and competitive industry capable of challenging foreign multinationals in both the domestic and international markets has largely failed. The policy of favoring JVs is partly responsible for this. The continuous search for partnerships and collaborations with foreign companies has prevented a real competitive pressure in the domestic market. This has discouraged the necessary investments in technology, brands and innovation.

On the other hand, independent firms have struggled to grow in a market dominated by large SOEs and foreign companies. Their share of production in China in 2021 can be estimated between 10-12%. For a long time, the government has hindered them with barriers to entry, constraints and discrimination, penalizing their development and market penetration. Only recently, firms like BYD, Geely or Great Wall have been able to show their dynamism and market appeal.

The third effect is the most important for the future of the industry. Thanks to the second phase of industrial policies, China currently represents the world's largest market of electric vehicles, with 3.5 million NEVs sold in 2021 and a share of 56% on total world sales of NEVs (6.7 million, 9% of total car sales).

In relative terms, electric vehicles corresponds to 16% of total domestic car sales in 2021 (from 5% in 2020). NEVs are still relatively more important in Europe, with 17% of total car sales, particularly in countries like Norway (86% of total sales), Sweden (43%), Netherlands (30%), and Germany (25%), while USA is lagging behind with 4.5%.

What is more striking is that, unlike what happens with ICE vehicles, Chinese manufacturers and brands play a leading role in the production and sales of NEVs. Tesla, at the moment, is the only powerful foreign competitor. Chinese brands accounted for a remarkable 78.5% of the domestic market for this type of vehicles in the first half of 2022, led by BYD, SGM-Wuling, GAC (Aion), Chery and Geely. A growing role is played by the EV startups Xpeng, Li Auto, NIO, Hozon Auto (Meta), and others.

1.4 Electric Cars: An Opportunity for the Chinese Auto Industry

For Chinese companies, the reversal of market positions in the NEV market compared to what happens with conventional vehicles is explained by the new opportunities opened up by the new technology. Electric vehicles represent a significant and radical technological leap, which changes the prospects of the entire automotive industry. China can now follow a leapfrogging strategy, bypassing the first-mover advantages enjoyed by foreign companies in the past, and entering the new market with technologies and car models developed independently, and with own brands.

This strategy is having great success in China, thanks also to government's support. Can the same happen in global markets where competition is much stronger and where foreign OEMs are firmly established? China currently enjoys some important advantages over other competitors, which can give the country a good chance of success.

First, China has a strong government capable of implementing sound and effective policies. As we have seen, state intervention for NEVs began in 2004 and the results in terms of development of the NEV market are remarkable.

Some recent policy measures promise to accelerate the transition towards the new era of sustainable mobility. At the end of 2020, the Chinese government launched a new plan for NEVs (BEV, PHEV, FCV), the *New Energy Vehicle Development Plan for 2021-2035*, much more ambitious than the first. The explicit aim is to establish a globally competitive, technologically advanced electric car industry with Chinese brands.

Furthermore, China is committed to boost the development of autonomous vehicles (AVs) and the intelligent connected vehicle (ICV) technology. In February 2020, the National Development and Reform Commission (NDRC) and 11 ministries jointly issued the *Strategy for Innovation and Development of Intelligent Vehicles*. The ambitious goal is to make China a global ICV ("smart car") leader.

These programs are consistent with the guidelines of the 14th Five-Year Plan (2021-2025), formally adopted in March 2021 but drafted during the fifth plenum of the 19th Central Committee in October 2020. The 14th FYP indicates new energy vehicles and intelligent (connected) vehicles as a new, strategic pillar of the industrial system.

China's **second** strength is world leadership in the production of **batteries**, a key component of electric cars, a market traditionally dominated by Korean (LG, Samsung, SK Innovation) and Japanese (Panasonic) companies. The Chinese CATL is the world's largest supplier of lithium-ion batteries, with a market share of 32.6% in 2021. The company supplies all major Chinese automotive groups and has supply relationships with many important foreign OEMs, such as VW, Daimler, BMW, Tesla, and Stellantis.

Another Chinese company, BYD, is currently the fourth-largest producer of batteries in the world (8.8% market share in 2021). BYD installs most of the batteries on its own vehicles. The company recently developed the innovative blade battery and is in talks with Tesla and other OEMs for the supply.

However, battery technology is constantly evolving and several options based on different chemistries are currently available on the market. New, more radical, possibilities are being explored for the future. What the future scenario will be is still uncertain. Nickel based lithium-ion batteries (NCM and NCA) are the prevailing technology, widely used by global automakers for mid-range and high-end electric vehicles. However, these batteries are expensive and depend on strategic minerals that are experiencing increasing supply difficulties.

An alternative chemistry is lithium iron phosphate (LFP). LFP batteries have a lower energy density and are bigger and heavier as compared with other lithium-ion batteries. However, they are cheaper, safer and more durable, and do not rely on critical minerals. China is the world leader in the development and production of this technology, led by CATL and BYD. LFP batteries are becoming increasingly attractive to many global carmakers, due to rising prices and supply problems of strategic minerals.

The **third** strength is the control over some **strategic minerals** -lithium, cobalt, rare earth- required for the production of lithium-ion batteries and other key components of electric cars According to International Energy Agency (IEA), China produces more than 60 per cent of global lithium chemicals and plays a dominant role in cobalt refining for battery application. Cobalt production and reserves are concentrated in the Democratic Republic of Congo, but the majority of cobalt mining capacity is controlled by Chinese companies. Lastly, China currently processes more than 87% of global rare earth minerals.

Fourth. In addition to the electric motor, **connectivity** is the other great technological advance that defines the car of the future, the intelligent connected vehicle (ICV). Software and sensors become key components, for the connection of the car with mobile devices, the satellite, and the cloud. Artificial intelligence is needed to analyze real-time data on road, atmospheric or traffic conditions and communicate them to the driver. All of this requires partnerships and collaborative arrangements between automotive companies and a broad array of technology and information technology (ICT) companies.

On this ground, Chinese companies still lag their US competitors in the development of the ICV technology. However, China is not far from the United States and is certainly ahead of Europe and Japan. Tech giants such as Tencent, Baidu, Huawei, Alibaba, Didi, Xiaomi have entered into many collaboration agreements with various Chinese car manufacturers to explore the potential of autonomous vehicles and sustainable mobility and propose new business models.

1.5 What is the future for the Chinese Automotive Industry?

After decades of relative stability, the global auto industry is currently in a phase of a **major transition**, marked by profound technological change, the evolution of mobility models, change in consumer behavior, and government policies that dictate the agenda and timing of the ecological transition in each country.

In this scenario, trying to predict the future structure of the industry on the basis of market data from the last few years or months is probably misleading. The real and decisive battle has yet to begin. This will happen when the electric car will no longer be a niche and very expensive product, but will affect the mass market. This step is crucial to understanding the future configuration of the oligopoly.

In China, as we have seen, Chinese OEMs currently enjoy first mover advantages and are leading the growth of the NEV market. However, foreign OEMs are not standing by and are trying to catch up. China represents a critical and strategic market for many global players, and foreign OEMs will certainly do their best to challenge the current leadership of local producers in the growing EV market. The recent major investments in new NEV plants by the historic JVs involving VW, Toyota, Honda, the three leading companies in China, testify to this trend.

Another sign is a new wave of joint ventures between Chinese groups and foreign OEMs in recent years, this time only related to electric cars. The aim is to replicate, with the new technology, the same success that foreign OEMs had in the past with conventional cars. Examples are the agreements between BYD and Daimler (BYD-Daimler New Technology Automotive), BYD and Toyota (BYD-Toyota EV Technology), Geely and Daimler-Mercedes-Benz (Smart Automobile Co.), JAC and VW (JAC-Volkswagen Automotive), Great Wall and BMW (Spotlight Automotive), FAW and VW-AUDI.

In Europe and other advanced markets, the scenario is completely different. Major global OEMs dominate the scene and strictly control the development of the NEV market. These companies are trying to transfer their strong market position gained with conventional vehicles to the fast-growing NEV market. The most important players have expanded their product range with various types of electric models, and are investing heavily in sustainable mobility, albeit in different ways and intensities.

The market share of Chinese brands is still negligible. In the European Union, no Chinese marques appear among the top 25 battery electric passenger cars registered in 2021. Chinese companies are clearly lagging behind in these markets and have a hard time selling their products. They should develop highly effective and smart strategies for successfully entering the rich European market. Two main options are available, both of which are not easy to follow.

The first is **direct entry** with own brands. This strategy was followed in the past by some Chinese firms with conventional vehicles, but it failed. For a long time, the cars made in China were perceived by consumers as being of low quality and reliability. Sales of Chinese cars in Europe have always been negligible.

Things are starting to change with NEVs. More opportunities for Chinese companies are opening up in Norway, the country most committed to sustainable mobility, Sweden, Germany and other European markets. NIO, Xpeng, BYD, and Li Auto ship an increasing numbers of electric cars in Europe, in direct competition with Tesla, VW and other top manufacturers. Other Chinese EV carmakers are ready to follow. However, although the product and brand image of these firms and start-ups is much better compared to the past experience, competition is very tough and market shares are still low.

An alternative option is to gain reputation and market recognition by **acquiring brands and companies** already rooted in European markets. SAIC and Geely are successful examples of this strategy. SAIC sells growing units of cars in UK and Europe with the historical MG brand, acquired in 2007. Geely, with the acquisition of Volvo Cars in 2010, is probably the first Chinese company trying to become a global carmaker. Together with Volvo, Geely is pursuing the strategy of launching a specific brand for the electric car. Polestar, a premium brand developed by Volvo in the late nineties, offers high-end electric models made in China. Link&Co, another recent car brand jointly developed by Geely and Volvo, offers SUV crossovers with a new business model: connectivity, direct online sales and the possibility of subscription services. In 2017, Geely acquired a controlling stake in Lotus, a historic British sports car maker. With another specialized brand, Zeekr, the company intends to compete globally with Tesla in the premium EV segment.

Mergers and acquisitions can certainly be an effective strategy to gain a quick access in mature markets dominated by strong incumbents. Some opportunities for new acquisitions may arise in the future with other struggling historical brands or companies in Europe or elsewhere. However, the most valuable brands are in the pocket of leading multinational groups and, in the new competitive scenario, it is quite unlikely that these will be sold to Chinese competitors.

Concluding Remarks

Recent business history has shown that Chinese companies can successfully challenge large multinationals in established, apparently untouchable consumer goods oligopolies in advanced markets. This is testified by the experience of Haier, Hisense, Huawei, Xiaomi, Oppo and many others, all firms with a good quality reputation and a competitive price.

More importantly, business history suggests that radical technological changes can favor a reorganization or even a disruption of existing oligopolies, with the emergence of new competitors and a new geography of production. This is what happened, for example, with the transition from vacuum tubes to transistors in consumer electronics in the mid-1960s, when established and well-known US and German companies were forced to give way to Japanese firms.

Can this happen in the automotive industry? The major OEMs that have so far dominated the global industry are certainly aware of these risks. It is therefore very unlikely that they will remain rooted in the conventional technology, leaving the development of the electric car and the future of the rich automotive market in the hands of new entrants.

For sure, costs will play a major role. The cost of the battery in the first place, the most important component of the electric car. From this point of view, companies operating in China have an edge, because the production volumes guaranteed by the size of the NEV market allow them to test models and technologies on a large scale and to achieve economies of scale and learning advantages before others.

In this scenario, Chinese companies, backed by a strong government, have certainly the opportunity to play a leading and prominent role with their own brands and innovative car models, not only in the large domestic market but also globally. Based on cost advantages, efficient supply chains, new connectivity solutions, and new business models, Chinese companies can aspire to be strong competitors especially in the mass market and in the segment of urban mobility vehicles.

From the Chinese point of view, the past experience of South Korea, and formerly of Japan, is encouraging. Since the 1970s, Japanese cars have invaded the global market, where they were virtually unknown until then. In the last decades, South Korean companies have made huge progress in the automotive industry. Thanks to electric cars and sustainable mobility, China can follow the same path and achieve similar results in world markets. Given the size of Chinese industry, the impact on international markets could be even stronger. If geo-political factors do not put a spanner in the works, it's probably just a matter of time.

The future prospects of the Chinese industry and the growth of the electric car market will have an impact not only on the competition between large groups on a global level but also on the entire automotive supply chain and on the aftermarket. The lithium-ion battery pack is by far the most important component, up to 40-50% of the whole value of the car according to some estimates. Electric motors are much simpler than traditional ICEs and require far fewer components. Other ICE parts, like exhaust systems, turbocharges or superchargers, 12v batteries, are not needed in the EV. Conversely, electronic components for car connectivity and driver assistance technology will be increasingly important. As a consequence, many suppliers will see a contraction in their market, new opportunities will arise for other suppliers, and all the supply chain, including the aftermarket, will have to prepare for the new challenge.

Chapter 2: Understanding China's Automotive Market and Aftermarket

Automobility (Shanghai) Ltd.

Executive Summary

After several decades of rapid and continuous expansion, **China's automotive market is by far the world's largest car market** (in production and sales) and has become the **main source of profitable growth for the global automotive industry**. In 2009, China surpassed the US to become the world's largest market in new vehicle sales, and despite peaking at 28.9 million units in 2017, it remains by far the leading auto market in the world. Today, China accounts for more than 30 percent of global vehicle production.

Global automotive manufacturers and their suppliers almost universally seek to deepen their participation in the China market as it represents the key battleground for dominance of the global auto industry. As a result, **the center of gravity of the global automotive industry has shifted eastward** to markets with the highest global population and economic growth potential.

While the period of rapid new car sales growth has passed, **automakers, upstream suppliers, and downstream service providers must now seek opportunities to unlock a more diversified mix of profit streams to drive growth**.

Electric vehicle sales have recently experienced a dramatic increase, making China the global leader. Although the first half of 2022 was severely impacted by lockdowns and supply chain disruptions, **new energy vehicle[1] (NEV) sales achieved 21.6% market penetration**, rising over 120% from last year.

China's auto aftermarket will develop fast and will be skewed in favor of independent aftermarket (IAM) players. One of the unique characteristics of China's car population is that, owing to the rapid market expansion in recent years, **the car population is younger (on average) than in mature markets like the United States and Europe**. A new car tends to be owned by its primary owner, is likely still covered by a warranty, and requires less service. In addition, cars in warranty are typically taken to the original equipment supplier (OES) dealership for service. As warranties expire and cars are re-sold, their owners typically seek more efficient and convenient methods for servicing their older vehicles, which draw them from OES to IAM service providers. **All these factors contribute to a unique and explosive growth opportunity for China's automotive aftermarket**.

[1] New Energy Vehicles include Battery Electric Vehicles (BEV), Plug-in Hybrid Vehicles (PHEV) and Fuel Cell Electric Vehicles (FCEV)

Digital and mobile internet technology are introducing new efficiencies across the automotive maintenance and repair market. Technology-oriented firms are entering the aftermarket with new business models that compete with the traditional IAM players. Internet giants are introducing online solutions that complement and bring new efficiencies that improve value to the consumer. This will disrupt the traditional multi-level IAM channel, further transforming the industry business model.

Moreover, several waves of supply chain disruptions have impacted the industry in China. Since 2019, the automotive value chain has been disrupted by a trade war with the US, the COVID-19 pandemic, a shortage of semiconductors, the Russia-Ukraine war and COVID-related lockdowns. As a result, **distributors, carmakers and suppliers are seeking opportunities to de-risk their over-reliance on China for parts sourcing**. Significant players in China's existing automotive supply chain are seeking global partnerships to diversify their global supply footprint, and new global alliances and partnerships are being formed.

This report provides an overview of the outlook for China's automotive market and the automotive aftermarket in China, based on observational research and analysis of the industry, which incorporates inputs derived from in-depth interviews with industry experts.

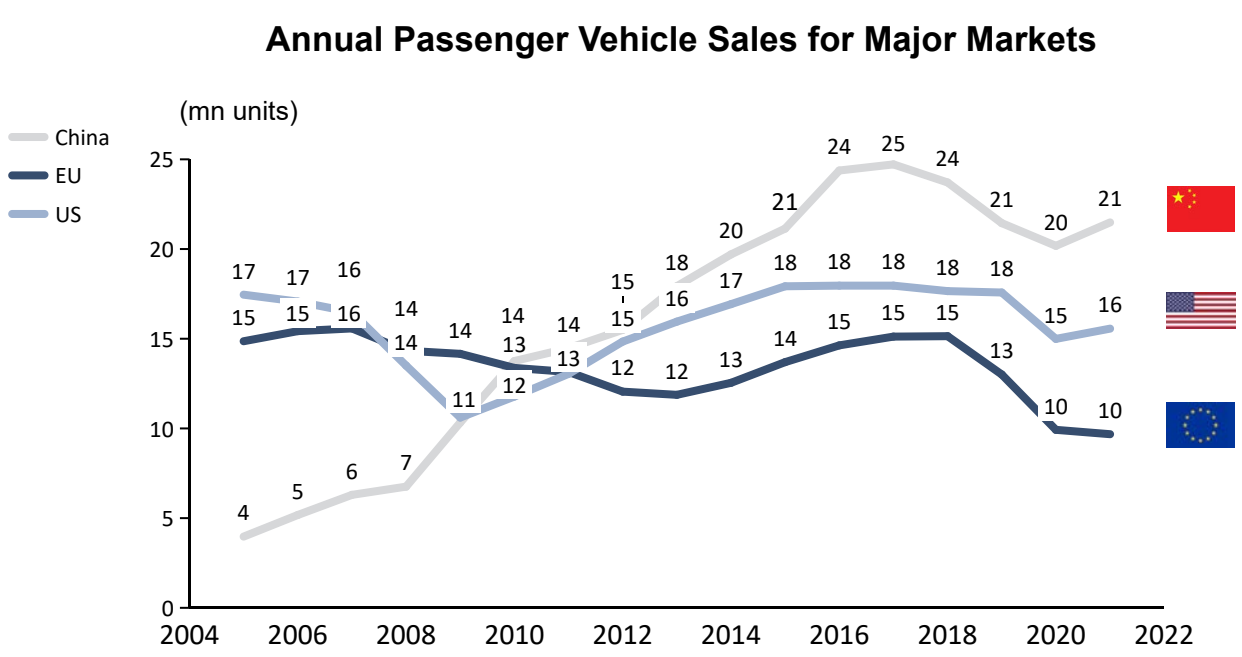
2.1 Understanding China's Automotive Market

2.1.1 Current Status of China's Automotive Industry

China's Automotive Market Growth in Recent Years

China's automotive market has grown over the course of the last two decades to become the largest car market in the world. Passing the US in 2009, China has become the growth engine for the global automotive industry.

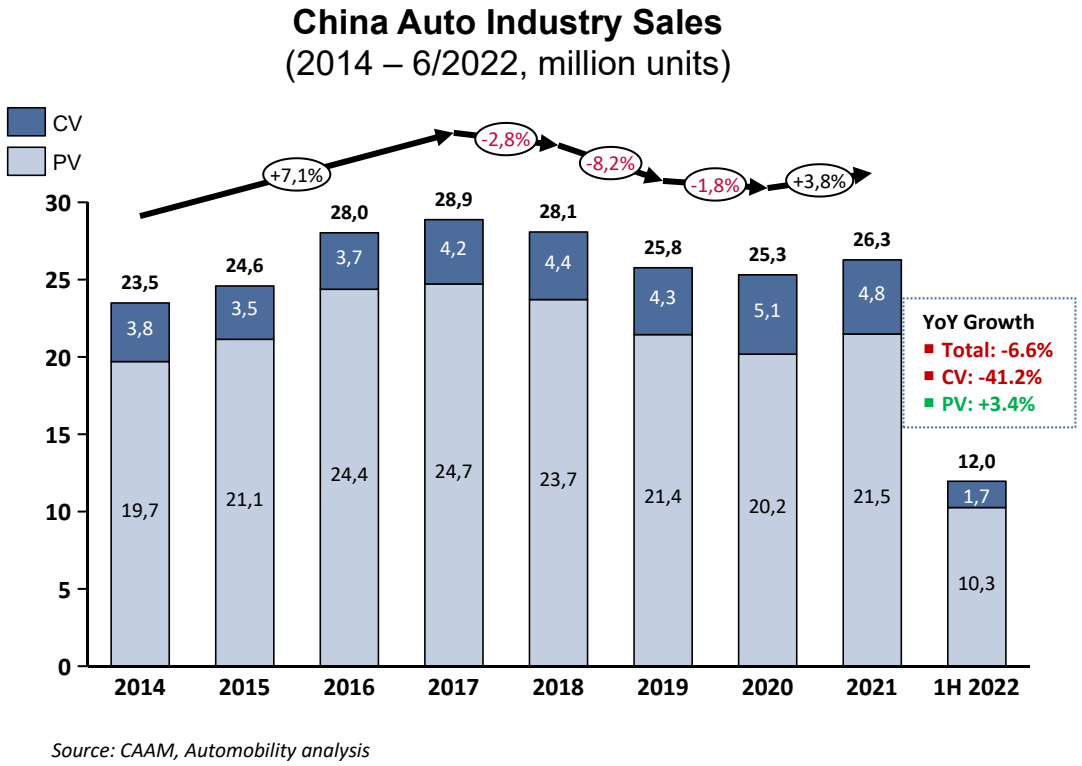
China has become a major player in the global automotive market not only in terms of vehicles sold and produced each year, but also in its strong position in the global automotive supply chain. This growth has been fueled by China's opening-up, joining the World Trade Organization (WTO), rapid economic development, and urbanization with corresponding rise in income levels. China's passenger vehicle (PV) sales surpassed the U.S. in 2009, and has remained the world's largest single market since then (see Figure 1). China's emergence happened at a time when other major automotive markets, mainly the European Union and North America, reached their saturation point and the markets have become cyclical. This has made China the main growth engine for the global automotive market for the past several decades.



Source: MarketLines, ACEA, Automobility analysis

Figure 1 Annual Passenger Vehicle Sales for major markets (2005 – 2022)

China's total automotive sales peaked in 2017 at 28.9 million units. PV sales also peaked in the same year with 24.7 million units sold. China's economy entered a "New Normal" pattern of single digit growth since 2011, with growth moderating to below 7% year-on-year (YoY) since 2015. The cooling of economic growth has had a significant impact on China's automotive market. However, the auto market still offers room for growth when considering that vehicle ownership penetration in China remains far below mature markets. Several factors contributed to the sluggish market from 2017 to 2020. First, the rapid expansion of on-demand mobility (ODM) in China that was led by Didi Chuxing, providing an alternative to car ownership, and reducing the attraction of vehicle ownership among the younger generation living in densely populated urban environment. Second, a number of top tier cities started limiting license plate registrations to ease urban traffic congestion.



Source: CAAM, Automobility analysis

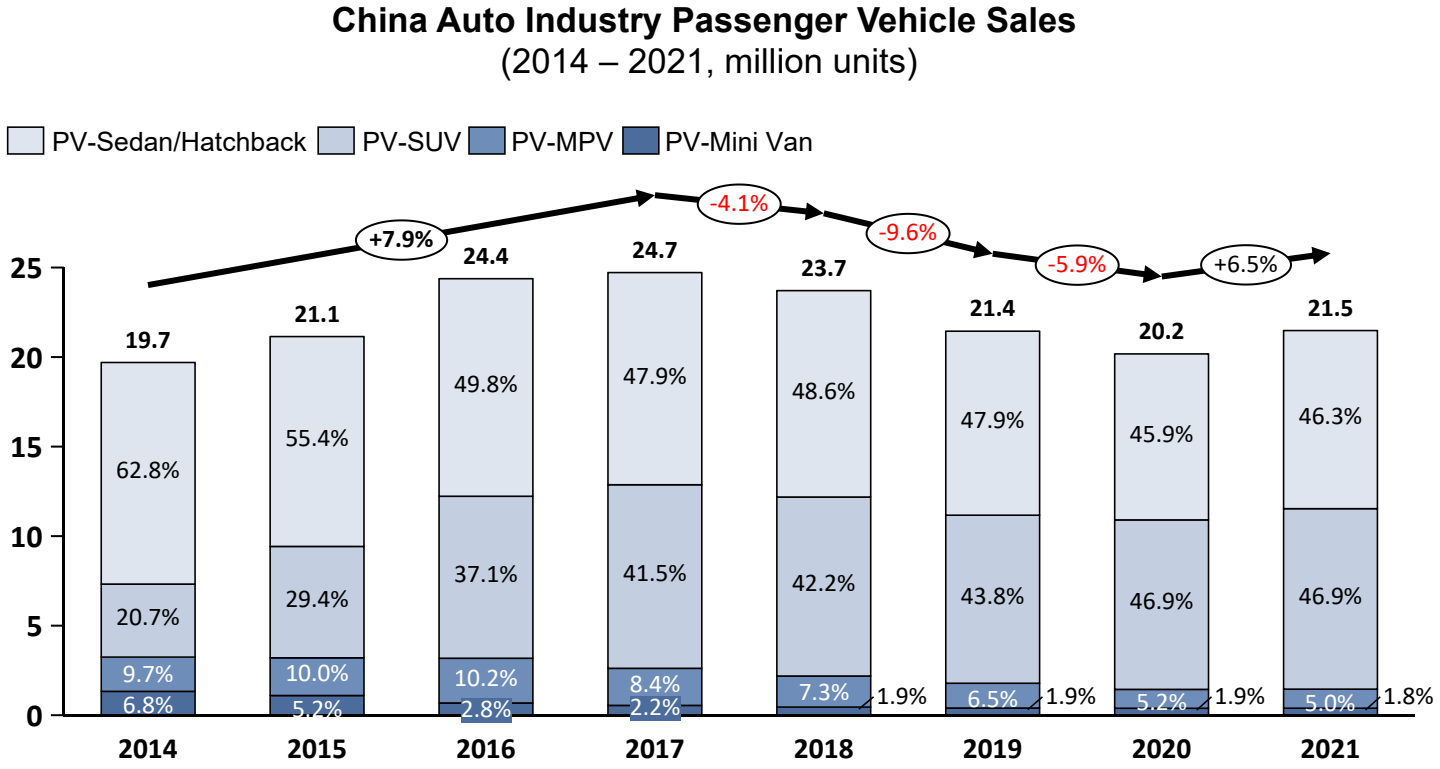
Figure 2 China Auto Industry Sales (2014 – 6/2022, million units)

Since 2017, further cyclical declines have occurred, with annual PV sales dropping from 25 million (in 2017) to 20 million (in 2020), despite a temporary bounce back in 2021 as China recovered from the impact of the COVID-19 pandemic (see Figure 2).

Massive lockdowns in response to a new outbreak of COVID-19 in several places in China have added new challenges for the market in 2022. The first half year of 2022 has seen a 6.6% decrease in new vehicle sales versus last year. Regarding of the split between Commercial Vehicle (CV) and Passenger Vehicle (PV) sales from 2014 to 2022, the CV segment continued its steep decline during the first half year of 2022 which underscores economic weakness in China. PV sales were up 3.4% in the first half year of 2022 with sales of new energy vehicles as the main bright spot. **Year-to-date, electric vehicle sales are up 120.4% compared with the first half of 2021**, a gain of 1.4 million units in

the first half. This compares with a 19.4% decline in gasoline powered vehicle sales, a year-over-year loss of 2.3 million units in the first half.

Looking more closely at the breakdown of China PV sales in recent years (2014 - 2022), there is a significant shift of pattern towards more SUV purchases. In 2014, Sedan/Hatchback (62.8% in 2014) sales was almost three times that of SUV (20.7% in 2014). Only a few years later, SUVs had become equivalent in sales to Sedan/Hatchback (see Figure 3). This is an indication of how quickly the market mix can shift to new types of vehicles: Chinese consumer preferences are not deeply rooted and can change rapidly.



Source: CAAM, Automobility analysis

Figure 3 China Auto Industry PV Sales (2014 – 2021, million units)

Comments

In China, mini-van usually refers to MPV with smaller size and lower price

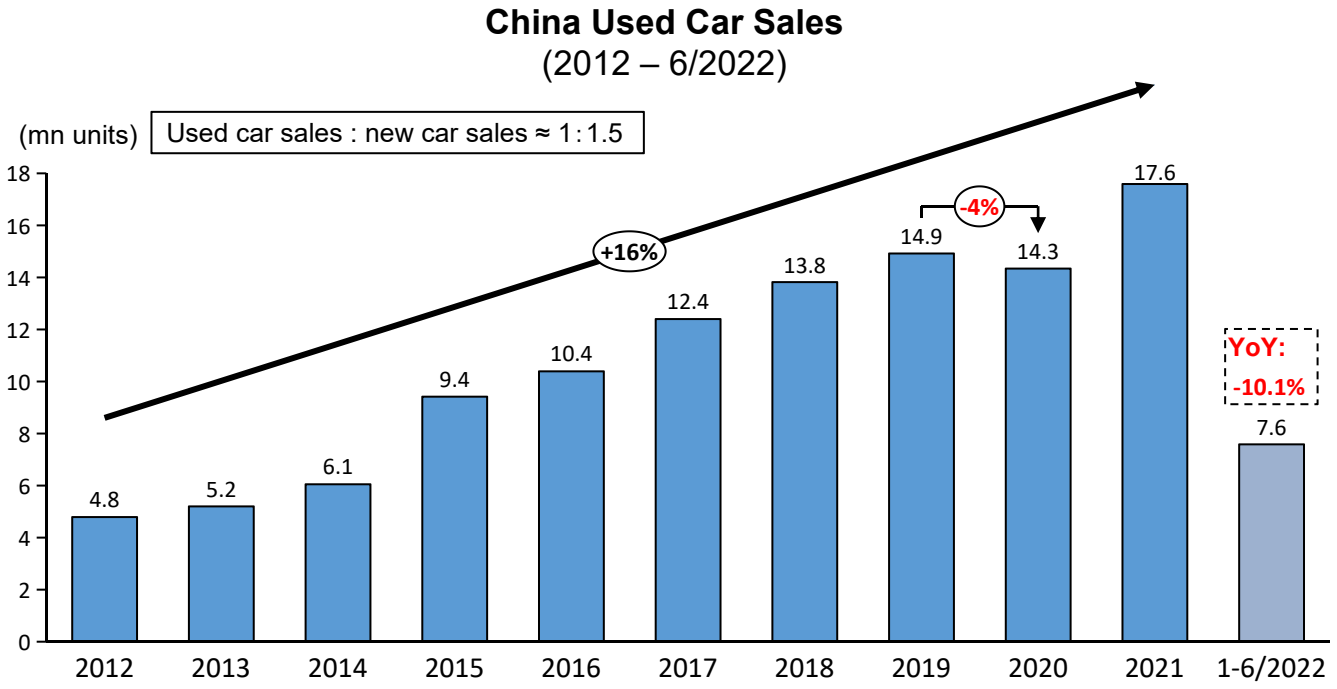
Best-selling MPV in 2021
Roewe Ei5

Best selling Mini Van in 2021
Wuling Zhiguang

Used Car Sales in China

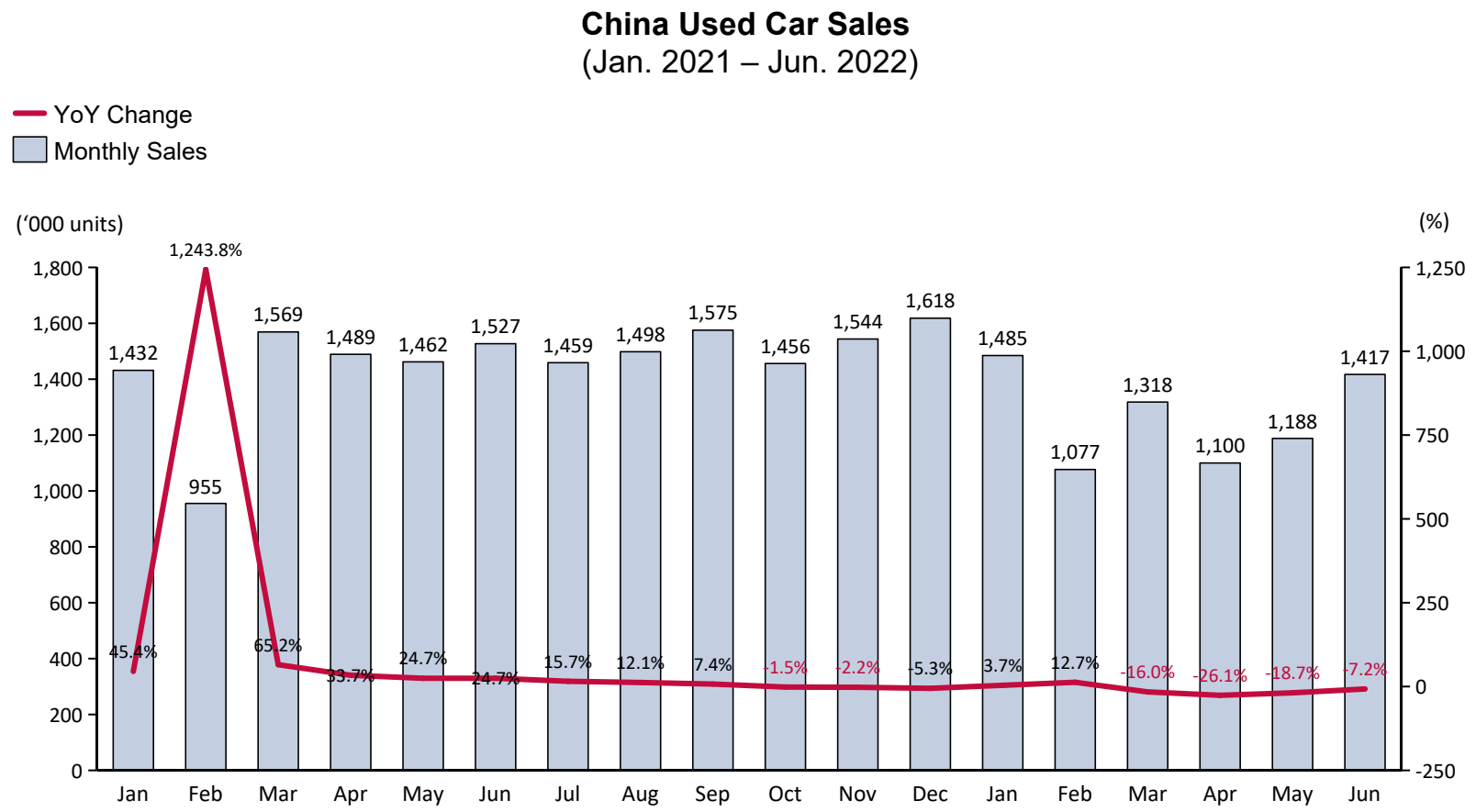
A further indication of demand-side weakness in 2022 can be seen in recent used-car sales performance. In spite of measures recently taken to ease the transfer of cars between cities in China, which has long been a constraining factor on sales, used car transactions remain down 10.1% year-to-date, and were down 7.2% in June (see Figures 4 and 5). **This is an indication that consumers are holding on to their cars longer, which is positive for aftermarket parts sales and services as older vehicles require more maintenance.**

A moderate increase in new car sales, combined with continued weakness in used car sales in June resulted in a shift in demand mix which is directly linked to stimulus measures implemented post-lockdown. Recent stimulus measures favor smaller Internal Combustion Engine (ICE) vehicles (which tend to be sold to first-time buyers in lower-tier markets), which undercuts used car sales.



Source: China Automobile Dealers Association, Auto.sina.com, Automobility analysis

Figure 4 China Used Car Sales (2012 – 6/2022, million units)

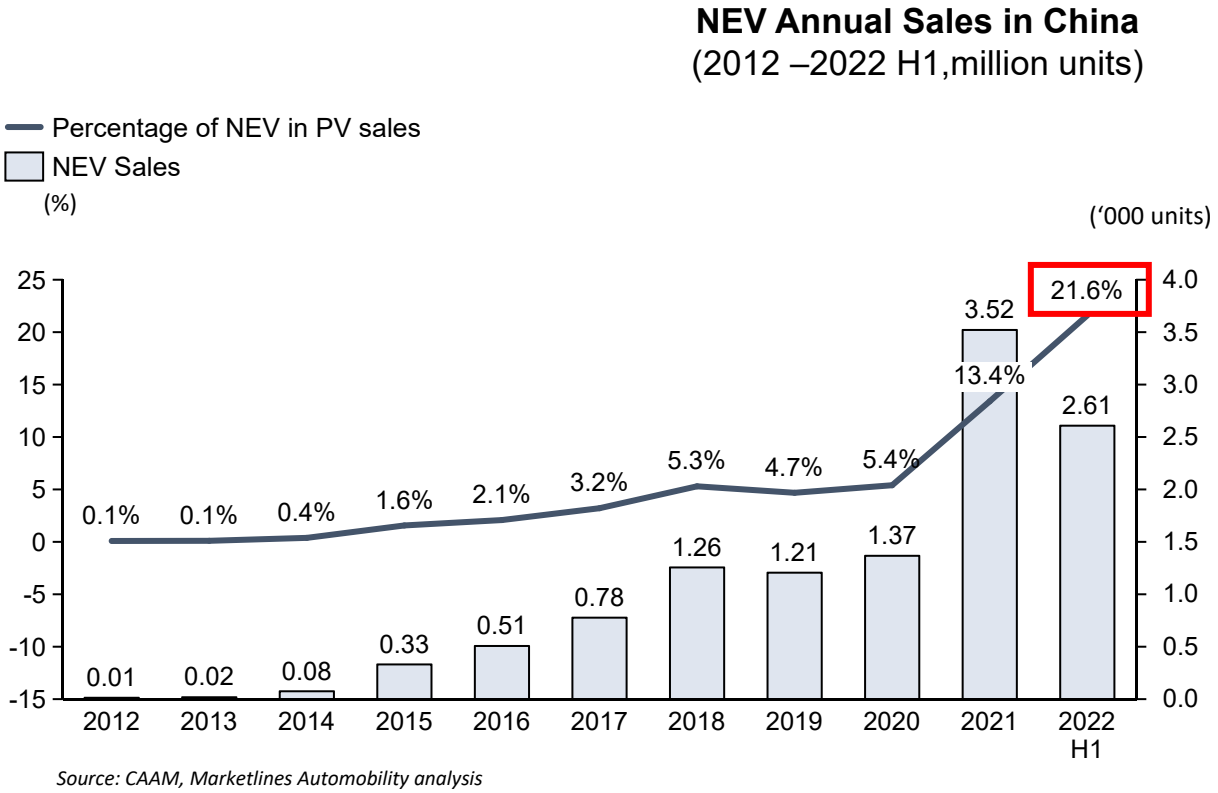


Source: China Automobile Dealers Association, Auto.sina.com, Automobility analysis

Figure 5 China Used Car Sales (1/2021 – 6/2022, million units)

The Exponential Rise of China's New Energy Vehicles

China's New Energy Vehicle (NEV) market has expanded rapidly with an exponential rise in the past 2 years (2020 – 2022). China's NEV market share stood at below 5% before 2018, with a relatively slow growth of NEV sales from 2012 to 2020 (see Figure 6). However, after 2020, NEV retail sales in China have rapidly accelerated. The opening of Tesla's Shanghai Gigafactory in mid-2020 was the event that sparked retail consumer interest in electric vehicles, and the outlook for continued expansion is very positive as more carmakers commit to electrification.

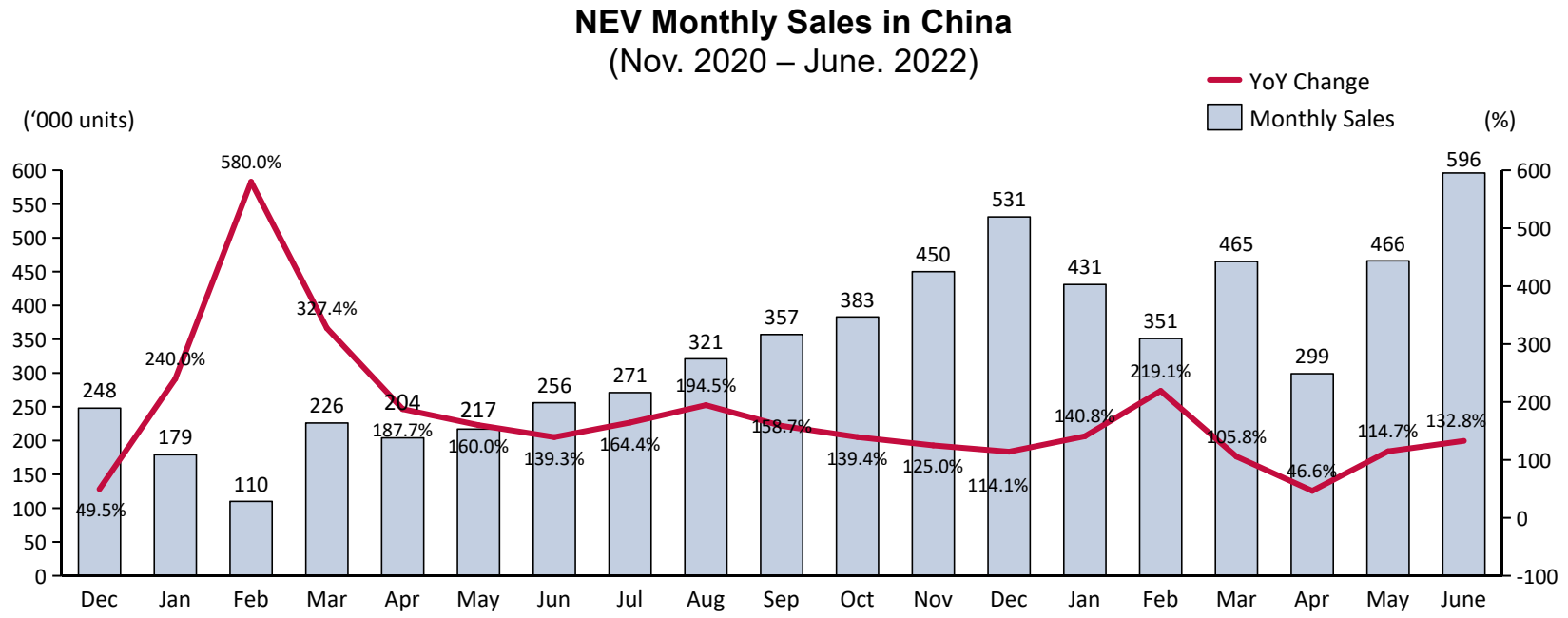


Source: CAAM, Marketlines Automobility analysis

Region	NEV Sales in 2021(million, units)	NEV penetration rate in 2021
Global	**6.5**	**10.2%**
China	**2.93**	**13.4%**
U.S	**0.66**	**4.44%**
Gemany	**0.69**	**26.32%**
Italy	**0.14**	**9.62%**
South Korea	**0.13**	**8.67%**

Figure 6 NEV Annual Sales in China (2012 – 6/2022, million units)

Recent NEV monthly sales (Jan. 2021 – June. 2022) also show a promising trend. NEV sales set a record of 596,000 units in June, rising 132.8% year-over-year (see Figure 7). This is the main bright spot and growth story in the China market. As a highly vertically integrated local supplier of batteries and vehicles, BYD is the clear local champion in the NEV game, which further underscores their supply chain strength and traction among EV consumers. BYD makes 5 of the top 10 selling Electric Vehicle (EV) nameplates sold in China.



Source: CAAM, CPCA, Automobility analysis

Figure 7 NEV Monthly Sales in China (1/2021 – 6/2022, million units)

Global OEMs Are Losing the Electrification Race in China

Most foreign brands such as Volkswagen (VW) and General Motors (GM) have suffered from declining sales in the China market in recent years, as these **global car manufacturers are falling behind in the electrification race.** Mid-market brands have been hit badly

(including Ford, Chevrolet, and Hyundai, among others), while premium European (BMW, Mercedes-Benz, and Audi) and Japanese brands have maintained stable sales during this period. Toyota was one of the very few global brands that achieved an increase in volume between 2020 and 2021.

While foreign brands are losing market share, several local brands are increasing market share. If we divide the market shares by brand country of origin, local Chinese brands grew sales their sales volume by 11% versus 2021 (see Figure 8).

Across-the-board, global brands have experienced double-digit decline in the first half of 2022. This is mainly attributable to Chinese dominance of the NEV segment, along with recent stimulus measures which are mostly favorable to local carmakers. This is also largely because Korean brands were positioned at the entry-level of foreign brands, and such a position is most vulnerable to the rise in competitiveness of China's local original equipment manufacturers (OEM).

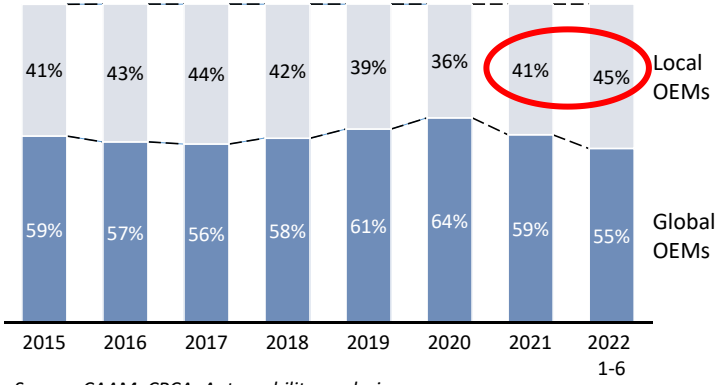
China's market is critically important to the global auto industry. For example, China is the largest and most profitable market for the Big 3 German automakers. Global automotive players cannot afford to lose the race to the future, and they will need to figure out a to reverse the recent unfavorable sales trends if they are to remain viable in China.

From January to June 2022, over 78.5% of NEVs sold in China are locally branded. So far, Tesla is the only real success story of global OEMs in the China EV market. Tesla's performance in 2022 was severely impacted by the COVID-19 lockdown in Shanghai, but regained its footing in June and remains the only foreign brand on the leaderboard year-to-date in 2022 (see Figure 9). Tesla benefitted from pent-up demand from consumers unable to obtain vehicles during the lockdown period but may struggle to recover full-year volumes.

China PV Sales by Brand Origin
(1-6/2022)

Brand Origin	Total Sales Volume (units, 1-6/2022)	YoY
Local	4,193,382	11.0%
USA	796,799	-18.7%
Japanese	1,960,512	-13.9%
German	1,996,527	-19.5%
Korean	159,731	-43.6%
Others	145,568	-23.3%

China PV Sales by Brand Origin
(2015 – 2022 1-6, % in terms of sales volume)



Source: CAAM, CPCA, Automobility analysis

Figure 8 China PV Sales by Brand Origin

A main reason for local OEM's early success in the EV race is their ability to deliver good content at an affordable price. A clear pattern for the market leaders is their ability to deliver well-equipped electric vehicles at very attractive prices. Some of the top 10 best-selling NEV models sell below CNY 75,000 (about $10,000). It is obvious that foreign brands could not match such pricing (e.g., between CNY 50,000 – 300,000 CNY per car). **The traditional mindset of legacy carmakers** means that they carry over their legacy ICE platforms and business models, and do not define themselves as technology companies. **This carry-over bias limits their ability to capture the secular shift in Chinese consumer preference toward affordable EV technology.**

No.	Group	YTD Sales	YoY
1	BYD	633,777	317.6%
2	SGM – Wuling	208,043	18.0%
3	Tesla	197,575	50.8%
4	Chery	108,363	222.7%
5	GAC (Aion)	102,852	120.2%
6	Geely	102,118	364.7%
7	XPeng	68,982	124.4%
8	Chang'an	65,989	125.9%
9	NETA	63,107	199.0%
10	Great Wall	61,668	17.4%

No.	Model	YTD Sales	YoY
1	Hongguang Mini EV	188,653	19.4%
2	BYD Song	159,068	856.3%
3	BYD Qin	146,490	267.4%
4	Tesla Model Y	133,666	189.4%
5	BYD Han	96,950	85.7%
6	Tesla Model 3	63,909	-24.7%
7	Li ONE	60,403	100.3%
8	BYD Dolphin	58,263	-
9	BYD Yuan Plus	54,664	-
10	BYD Tang	54,538	362.1%

Source: CPCA, Automobility analysis

Figure 9 China NEV year-to-date TOP10 Selling OEM and Models (2022 H1)

Supply Chain Disruptions in China

Several factors have contributed to recent disruptions in the automotive industry's supply chain. Since 2019, the automotive value chain has been disrupted by a trade war with US, the COVID-19 pandemic, a shortage of semiconductors, the Russia-Ukraine war, and COVID-related lockdowns. This has contributed additional headwinds for carmakers and suppliers already challenged by recent market trends.

The secular shift of buying preference toward electric vehicles is a clear trend, which also requires a rethinking of the sales and service requirements for such a mix of vehicles. As this is a long-term shift, carmakers and suppliers must adjust to this new reality.

Recently, the Ukraine war is causing disruption of the supply of key raw materials such as Neon, Palladium and Nickel, which are critical in electronic component and gasoline engine production. Supply chain shortages on semiconductors and more recently batteries have resulted in a significant loss of production capacity across the industry, and have added inflationary pressures to the market. In response to this, **carmakers and suppliers are seeking to more closely align and vertically integrate supply chains into their business.** This runs counter to the previous outsourcing and low-cost country sourcing policies that the industry has been practiced over the course of several decades.

Chinese manufacturers are also subject to supply chain risks, and many are **seeking partnerships to diversify their global footprint** in markets less susceptible to tariff and trade risks or other disruptive events. As a result, many Chinese carmakers and suppliers are focused on extending their footprint internationally. For instance, CATL is looking to extend their production footprint to attractive EV growth markets, including the European Union. Likewise, Great Wall recently opened a European headquarters and established a subsidiary for battery production. NIO also opened their first distribution center in Northern Europe and is expected to open up a factory in Poland.

These were just a few examples of automotive industry players that may seek partnerships to accelerate their international expansion and thereby **protect themselves from risks resulting from over-reliance on a production and supply footprint that is solely concentrated in China.**

The issue of supply-side risk is expected to continue as be a headwind for the global automotive industry. While significant growth and cost benefits have been generated from scaling operations in China, recent events have exposed the risks associated with an over-reliance

on the market. As China's market growth has moderated and as consumer preferences have shifted toward electrification, it seems an appropriate time for global automotive industry players to pause and reflect on the future supply chain strategy.

As it is an appropriate time to revisit the global production footprint, it is also **an opportunity for European companies to seize opportunities emerging from these developments** which create new opportunities for global suppliers who can help alleviate the bottlenecks and accelerate the movement of the supply footprint beyond overly concentrated, and thereby risky markets. We believe **global suppliers can benefit by forming alliances with Chinese suppliers as they seek to expand their supply footprint to the international markets. In return, they may gain a reciprocal benefit in terms of access to the China market.**

2.1.2 New Energy Vehicle Development Policies in China

Comparison among the Three Largest World Markets for EV

The EV commitment has become a global consensus as major economies like China, the European Union and the United States are committed to phasing out ICEs and replacing with zero-emission vehicles including Battery Electric Vehicle (BEV), Plug-in hybrid electric vehicle (PHEV) and Fuel Cell Electric Vehicle (FCEV). China, the European Union, and the United States all have made clear objectives and statements regarding every aspect of NEV development, including formulating objectives and investment plans linked to NEV penetration mandates, NEV infrastructure investments, fuel economy targets, and consumer incentives (both financial and non-financial) (see Figure 10).

	China	United States	Europe
NEV penetration mandates	• NEV credit 5.4% in 2020, 13.4% in 2021, 15% in 2022 (expected), 18% in 2023. 20% in 2025	• 50% NEV sales share by 2030	• EU agreed to ban the sales of ICE in new cars and trucks by 2035 to strive for a 100% Co2 emission reduction
NEV infrastructure investments	• Until May 2022, about 3.6 million charging facilities being operated in China, with 1.4 million of them being public charging station	• 30% rebate in tax credit form on EV charging station or alternative fuel refueling properties plus installation costs (up to $1k for household property and up to $30k for business property). Extended through 2021	• EU targets 1m public chargers by 2025 • EV charger grants in Germany (up to 30% on purchase, installation) • By 2030, a total amount of up to $284b to be invested in installing public and private EV infrastructure
Fuel economy targets	• 4L/100 km by 2025 • Targets maintained in 2022 updates	• 49 mpg in a few years by 2026MY • Fuel economy targets for cars and light trucks each increase 8%, 8%, and 10% for 2024MY, 2025MY and 2026MY	• Carbon Emission: 95 g/km by 2021 (20% cut from 2018), 59 g/km by 2030 (37.5% cut from 2021
Consumer financial incentives	• $2.5k-3.5k per car • Extend NEV subsidies, lowering rates by 10% in 2020, 20% in 2021, 30% in 2022 • Exemption for NEVs from 10% purchase tax until 2022	• $7.5k federal tax credit (first 200k vehicles) • Only Tesla & GM & Toyota have hit cap (credit cut to $3.75k) • State incentives vary	• Purchase incentives in 20 countries ranging from €2-12k per car • Grant tax reductions or exemptions
Additional consumer incentives	• Local NEV subsidies limited (exc. buses) • More NEV license available (no quotas)	• NEV could use HOV lanes in single occupancy condition and enjoy toll reductions in California by applying Clean Air Vehicle (CAV) Decal	• Free access in the metropolitan areas

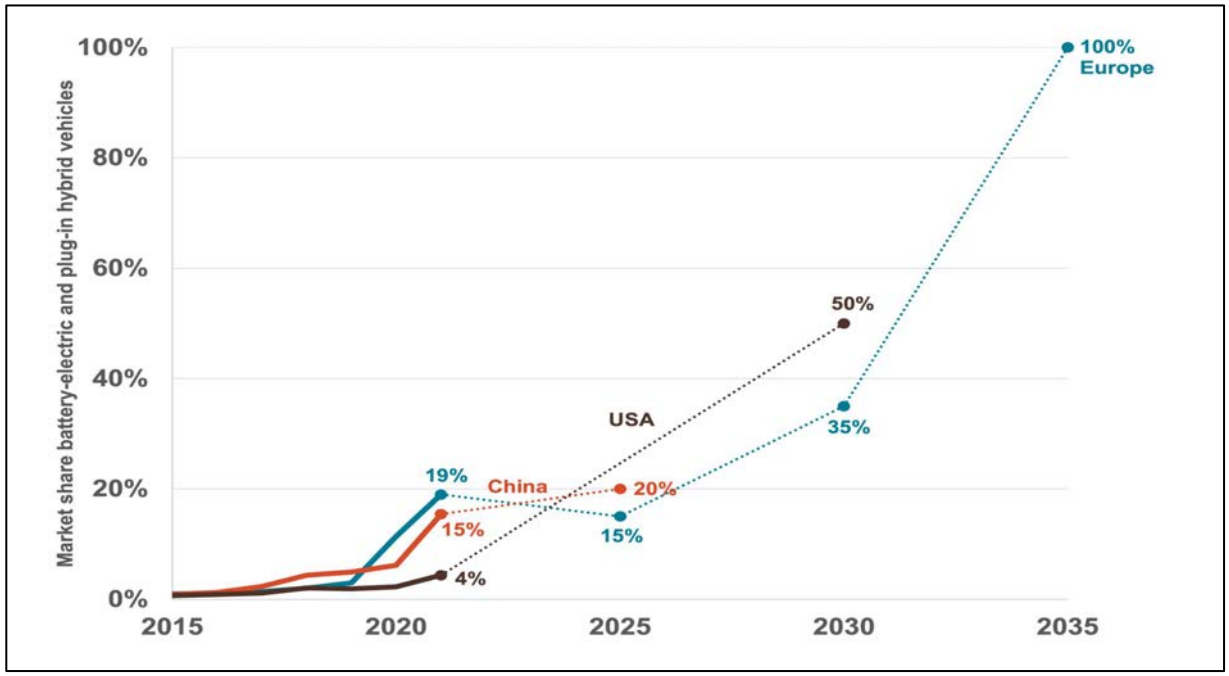
Source: Alix Partners, Automobility analysis

Figure 10 Objectives and targets regarding of NEV development

In China, the NEV penetration rate in terms of new car sales was 5.4% in 2020, 13.4% in 2021, and now it has reached 21.6% in the first half year of 2022, exceeding the initial target of 20% for 2025. China's target of reaching 20% by 2025 will be achieved several years ahead

of schedule. The US has targeted reaching 50% electric vehicle share of annual sales by 2030 and Europe has also made an aggressive target to eliminate CO_2 emissions and ban the sale of new ICE-powered cars by 2035.

In addition, massive NEV infrastructure investment plans are being implemented across China, the United States and Europe. There are 3.6 million charging facilities already in operation in China, in which 1.4 million of them are public charging stations. China is working on further NEV infrastructure deployment at both the central government level and city level. Similar targets are being established by the US and the European Union.



China aims to reach 4L fuel consumption per 100KM by 2025, that is equivalent to about 59 mpg (Miles Per Gallon). While the US aims to reach 49 mpg, that is equivalent to about 4.8L fuel consumption per 100KM. Europe aims directly based on the carbon emission objective, which is 95 g/KM by 2021, and 59 g/KM by 2030. In addition, both financial and non-financial incentives are being offered to consumers, including direct subsidies, lower taxes, or tax credits which differ across countries and regions.

Source: Icct.org, MarkLines

Figure 11 Development of the share of battery-electric and plug-in hybrid vehicle models among all new vehicle registrations in China, Europe, and the United States

Overall, all three regions are well positioned to drive the energy transition (see Figure 11). As the global race towards electrification continues, we expect the competition to intensify. China is leading the NEV race thus far having achieved the highest market share globally. The exponential growth in China was mainly driven by national strategies, as well as the concrete government policies, including pilot programs, consumer incentives, and favorable regulations. The market share of electric vehicles in Europe has also increased rapidly in the past two years, which was mainly driven by the second round of European CO2 targets. In the coming months, the 2025 and 2030 targets are expected to be further tightened so that they are more in line with current market trends and long-term trajectories. The United States has fallen far behind Europe and China in the electrification race which necessitates an aggressive push to close the gap in sales with China.

Guidelines and Technology Roadmap from China's Government Policies

Looking at the long-term strategic direction, decarbonization of transportation is in line with China's carbon-neutral vision. The current EV momentum is supported by clear guidelines and technology roadmap from the China central government. The NEV sales target of 20% by 2025 will easily be surpassed. China also aims to pass the CO_2 emissions peak before 2030 and to achieve carbon neutrality before 2060.

Continued market trends, tax incentives and investments in infrastructure will create the momentum needed to sustain the development of the NEV market. This will encourage further breakthroughs in propulsion technology innovations related to power battery and management, and green hydrogen and hydrogen storage and transport for both private and public vehicles.

The Society of Automotive Engineers of China (SAE) has further elaborated the roadmap for achieving targets set by the New Energy Vehicle Industry Development Plan 2021-2035. The NEV Technology Roadmap 2.0 sets goals and objectives for both passenger and commercial vehicles (see Figure 12).

We believe this is a critical point that differentiates China: **a massive ability to scale automotive solutions combined with a unique ability to leverage public and private partnerships (PPP) to drive the commercialization of high-tech innovation in line with policy objectives.**

		2025	2030	2035
NEV1	Total NEV sales target (% of total vehicle sales)	▪ 20%	▪ 40%	▪ >50%
	BEV+PHEV sales target (% of total vehicle sales)	▪ 15% - 25% (>90% BEV)	▪ 30% - 40% (>93% BEV)	▪ 50% - 60% (>95% BEV)
	FCEV parc target (units)	▪ 100,000	▪ -	▪ 1 mn
Charging Infras-tructure	Slow-charging piles (units)	▪ >13 mn	▪ >70 mn	▪ >150 mn
	Public fast-charging piles (units)	▪ 800,000	▪ 1.28 mn	▪ 1.46 mn
PV	Avg. fuel consumption (per vehicle)	▪ 4.6L/100km	▪ 3.2L/100km	▪ 2L/100km
CV	Lower avg. fuel consumption per car (% from 2019)	▪ Truck: >8% ▪ Bus: >10%	▪ Truck: >10% ▪ Bus: >15%	▪ Truck: >15% ▪ Bus: >20%
Energy-saving Vehicle[2]	Sales target (% of ICE sales)	▪ >50%	▪ >75%	▪ 100%
ICV	Sales target (% of total vehicle sales)	▪ PA/CA (L2/L3): >50% ▪ HA (L4): enter market	▪ PA/CA (L2/L3): 70% ▪ HA (L4): >20%	▪ HA/FA (L4/L5): widely in operation
	C-V2X penetration rate (%)	▪ 50%	▪ 100%	▪ -

Note: 1 - incl. BEV, PHEV, FCEV, etc. ; 1 - incl. HEV, 48V

Source: SAE, Desktop research, Automobility analysis

Figure 12 SAE Technology Roadmap 2.0 for NEV

Development Plan for Hydrogen and FCEV in China

Though China already accounts for more than half of the global BEV market, it is eager to accelerate the commercialization of Fuel Cell Electric Vehicle (FCEV) for specific use cases. The China government prioritized hydrogen and FCEV development in the 13th Five-Year Plan for Economic and Social Development of The People's Republic of China. In 2015, Hydrogen energy development was included for the first time as part of the "Made in China 2025" initiative.

Starting in 2016, the 13th five-year plan period confirmed and expanded commitment to hydrogen and FCEV with "hydrogen energy and fuel cell technology innovation" as a key priority. In 2019, hydrogen energy was written into the government work report for the first time, pointing out the need to promote the construction of charging and hydrogen generation, storage and distribution facilities.

In 2020, a series of hydrogen energy related policies were issued to promote the development of the industry ("notice on developing fuel cell vehicle demonstration application" was released, including a "City Clusters" program to demonstrate and boost FCEV development), aiming to reach 50,000 FCEV car parc and 100,000 – 200,000 tons annual hydrogen production capacity by 2025.

In the 14th five-year plan period, the importance of hydrogen energy was fully recognized. China's national hydrogen strategy was issued in March 2022, named as Hydrogen Energy Industry Development Plan (2021-2035). In this plan, the energy attributes of hydrogen have been clarified. Hydrogen is one of the key strategic emerging industries, with the objective to develop a green and low-carbon industrial system to achieve industrial transformation and upgrade (see the overall targets below).

Targets for Hydrogen and FCEV Development in China

- Up to 200,000 metric tons of green hydrogen shall be produced annually by 2025
- 50,000 hydrogen fuel-cell vehicles shall be in use by 2025
- A complete technology innovation system for hydrogen that enables the production and supply of green hydrogen shall be established by 2030
- A diversified application ecosystem of hydrogen shall be promoted by 2035, including fields such as transport, energy storage, heavy industry, aviation and buildings
- Improved standards for hydrogen quality and safety shall be established

The regulatory barriers for H_2 transportation storage and distribution were removed, advancing the development of a Renewable Hydrogen Solution (RHS) network in China. China will also promote hydrogen to decarbonize various industry sectors, among which transportation positions as the leading H_2 application, reconfirming that China wants hydrogen FCEV to play a significant role in vehicle electrification. In terms of the industry development, China will prioritize technologies where it already has a leadership position or have a chance to jump start and win in the future, and to create a sustainable industry by adopting a market-driven approach starting with small-scale experiments.

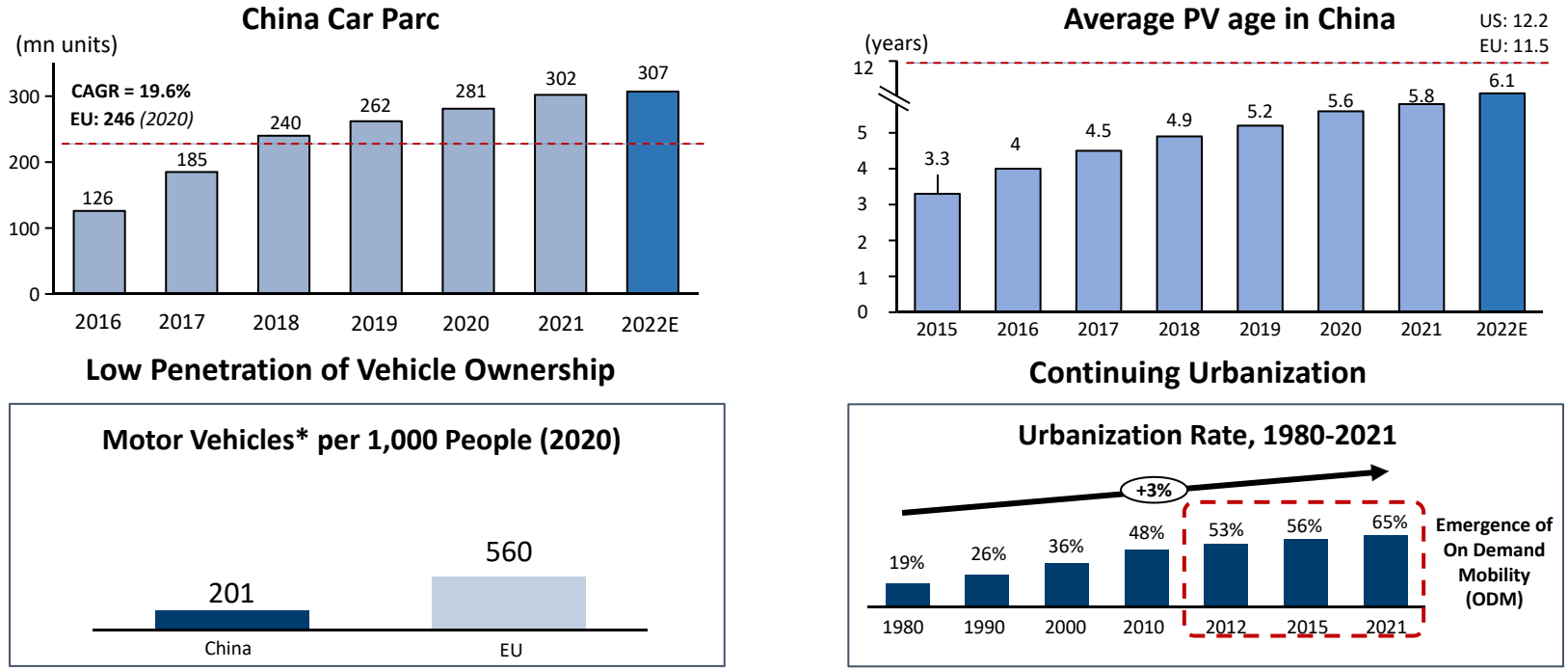
Despite its late start, the FCEV market is developing rapidly in China. By end of 2021, China ranks fourth worldwide in the number of FCEVs on road. The market is predominantly commercial vehicles, including trucks and buses. A clear shift to heavy transportation applications happened since initiating the "City Cluster" development policy. In addition, FCEV will compliment battery electric technology in specific use cases, including heavy-duty transportation and commercial fleets.

2.2 China Aftermarket Deep Dive

2.2.1 China Aftermarket At-A-Glance

The Vast Difference in Aftermarket between China and Western Countries

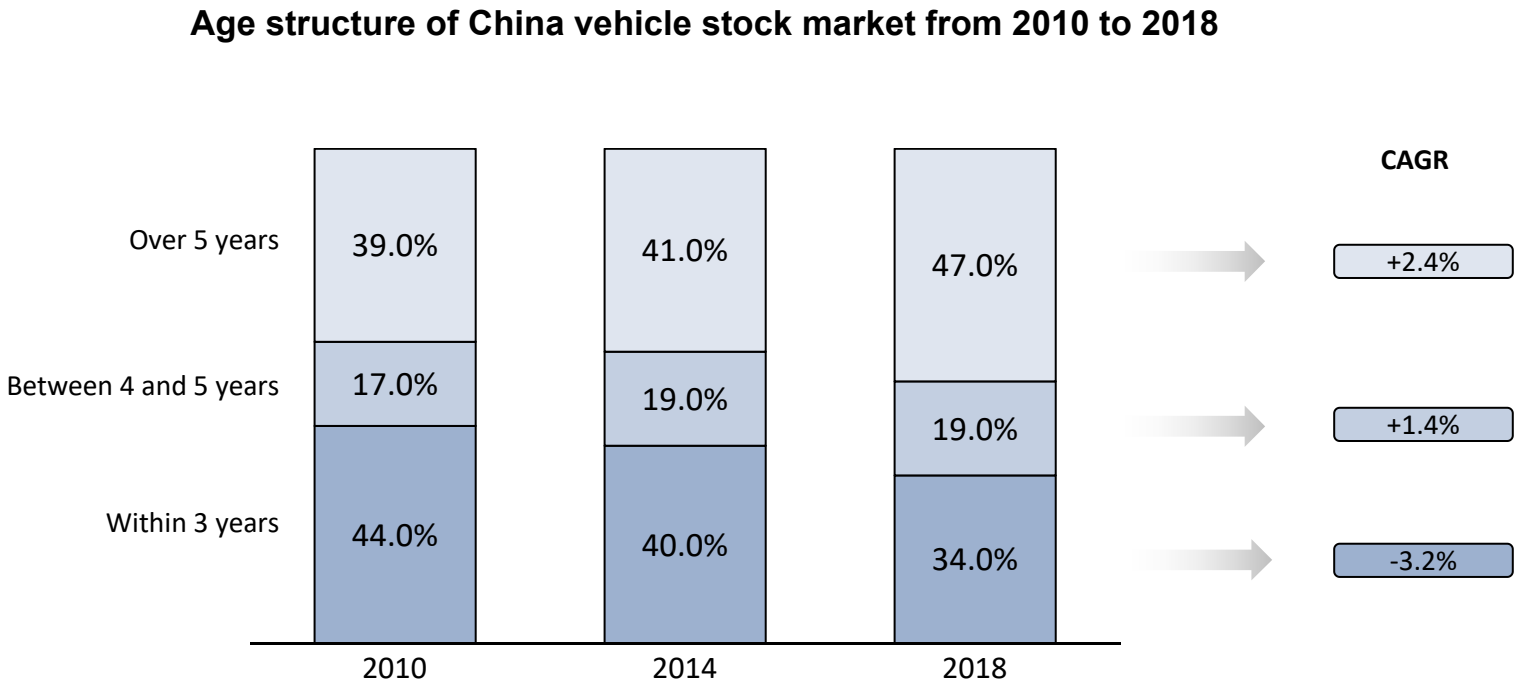
As the world's largest new car sales car market since 2009, China's car population has expanded tremendously, increasing from 126 million units in 2016 to 302 million units in 2021 (see Figure 13). Although sales have moderated since the peak year of 2017, China's car population continues to expand as new car buyers enter the market. Even so, China's overall car penetration (measured in cars per 1000 people) in 2020 was 64.1% lower than that of Europe (China 201 vs. Europe 560).



Source: Desktop research, Automobility analysis

Figure 13 China Car Parc and Average PV age in China

While the number of cars has exploded in recent years, China remains a relatively young car market compared with mature markets such as Europe, the US, and Japan. There is a significant difference in the average age of passenger vehicles between China, Europe, and the US. Average passenger vehicle age in China is expected to reach 6.1 years by the end of 2022, while the US and Europe stand at 12.2 years and 11.5 years, respectively. In addition, the number of cars aged over 5 years is expanding faster than the rate that they are being replaced with new cars (see Figure 14). The trend of an aging car population is a strong tailwind for growth of aftermarket services, as such cars will contribute to higher demand for car repair and maintenance and these vehicles would increasingly be outside of their warranty period.

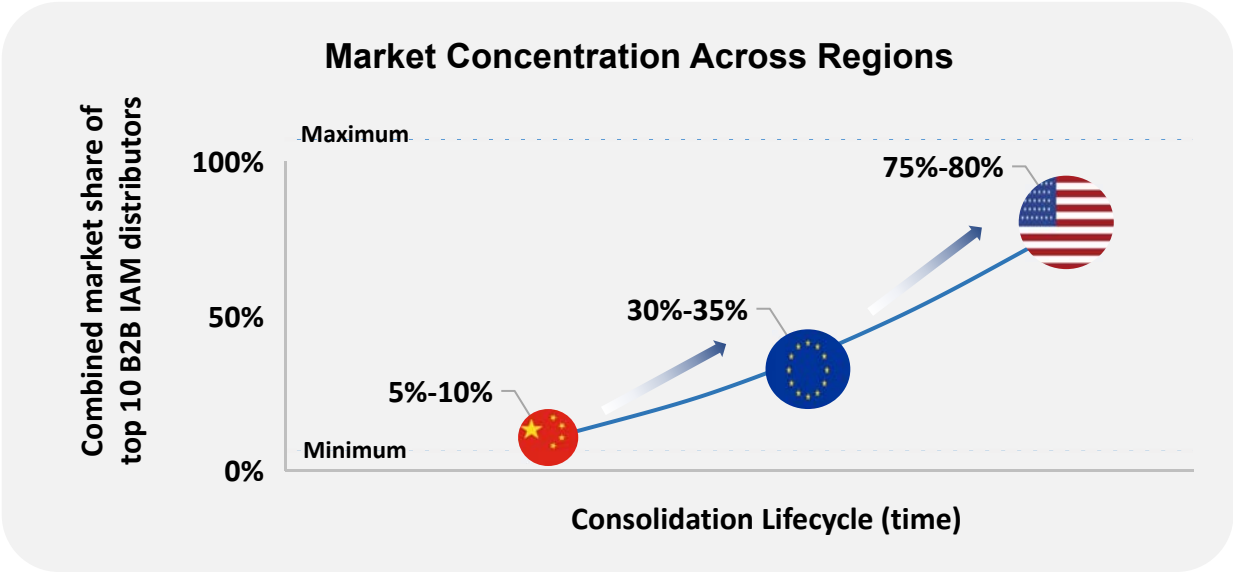


Source: Deloitte, Desktop research, Automobility analysis

Figure 14 China Car Age Structure from 2010 to 2018

Aftermarket channels vary across different regions, mainly resulting from different levels of market concentration. Suppliers in China usually face fierce competition from both local and global players as there are over 20,000 parts suppliers in the market who need wider Stock Keeping Unit (SKU) coverage to remain competitive. Distributors in China face a similar situation as the distribution structure is highly fragmented into multiple tiers of distributors with embedded transfer pricing (see Figure 15). Many of these players are being disrupted by emerging new business models that leverage digital technologies to eliminate inefficiencies.

As the world's largest and most commercially aggressive digital economy, China has stronger e-commerce channels than Europe and the USA. As a result, emerging business models such as online-to-offline platform (O2O) and distributor-to-workshop (B2B) are being deployed into the automotive aftermarket. The O2O model is led by online e-commerce giants such as Alibaba and Tencent, while the B2B model is mainly operated by digitally-enabled distributors seeking to create efficiencies through supply chain integration. This situation differs from Western markets, where Amazon is the main digital disruptor but focuses mainly on B2C model as more consumers in the mature markets prefer Do-It-Yourself (DIY).



Source: Desktop research, Automobility analysis

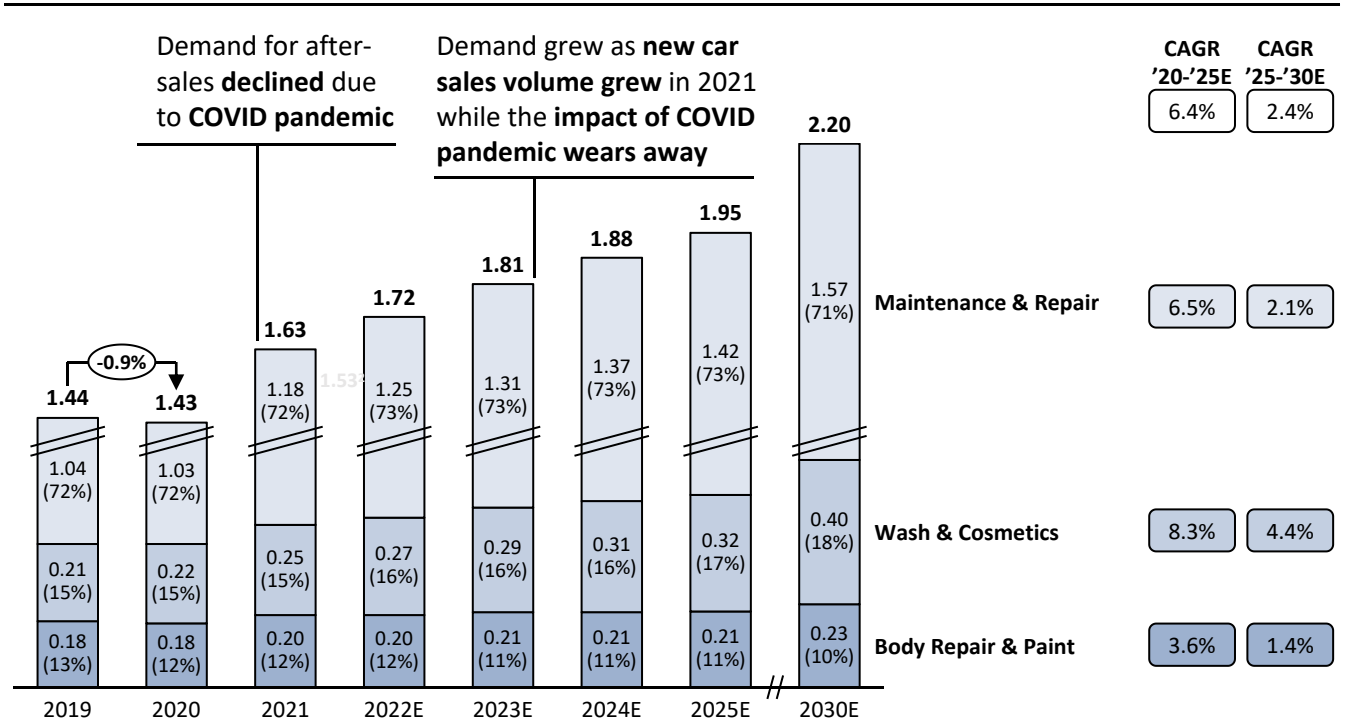
Figure 15 Market Concentration Across Regions

Over 600,000 offline aftermarkets stores are in operation in China, with a large proportion of mom-and-pop shops. Such a fragmented landscape is leading to poor quality of work, competitive pricing and hinders the generation of economies of scale in a large pool of demand. Only a minority of existing workshops have advanced technologies and professional staff. The mature markets, however, are dominated by branded chain workshops with specialized and trained personnel.

China's Aftermarket Market Size and Outlook

Due to growing and aging car parc, the automotive aftermarket is expected to explode in size over the next decade with the total market size reaching 1.96 trillion RMB in 2025 and 2.2 trillion RMB in 2030. The dominant segment will be maintenance and repair which accounts for more than 70% of the whole market value, reaching 1.42 trillion RMB in 2025 (see Figure 16). This sector benefits from increasing car ownership, as well an increasing number of cars that soon will drop out of warranty for repair and maintenance services.

China's Auto Aftermarket Market Size[1]
(RMB trillions, 2019 – 2030E)



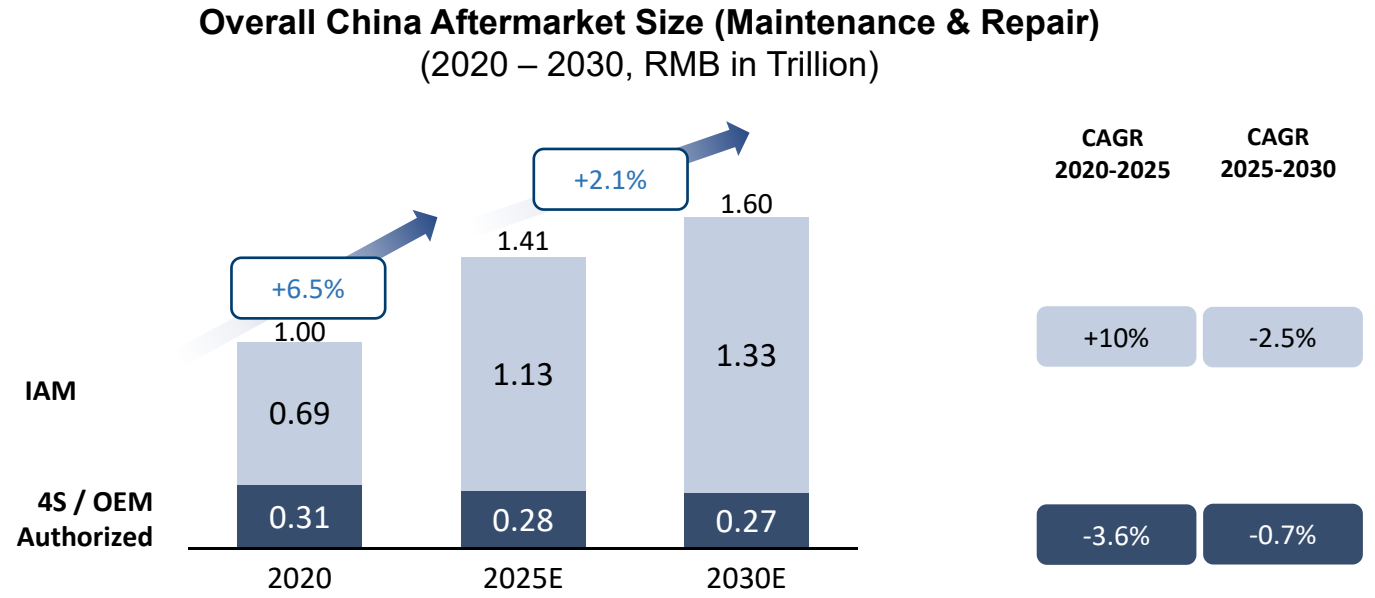
1) Channels including OEM licensed network, independent aftermarket. Value includes parts and labour.
2) Market share in 2020 if there is no impact of COVID pandemic.

Source: Roland Berger, expert interviews, IHS.

Figure 16 China's Automotive Aftermarket Market Size (2019 – 2030E, RMB trillions)

Wash and cosmetics take second place with regard to market size, and show the highest CAGR of 8.3% between 2020 and 2025. This segment is estimated to have solid growth prospects due to upgraded consumption, evolving car culture, and increasing number of car owners who prioritize appearance. Body repair and paint is expected to show slow and steady growth as car ownership increases.

Breaking down the maintenance and repair segment, the independent aftermarket (IAM) is expected to enjoy fast growth through 2030 at the expense of the OEM authorized channel. The IAM market value will reach 1.13 trillion RMB in 2025, representing a growth rate of 6.5% from 2020. The OEM authorized channel, or the 4S[2] channel, is facing fierce competition due to the slower growth of new cars and lower loyalty of customers. In addition, emerging online platforms are creating a more digitalized and efficient IAM. The 4S market value is likely to reduce to 0.28 trillion RMB in 2025 from 0.31 trillion RMB in 2020 (see Figure 17).



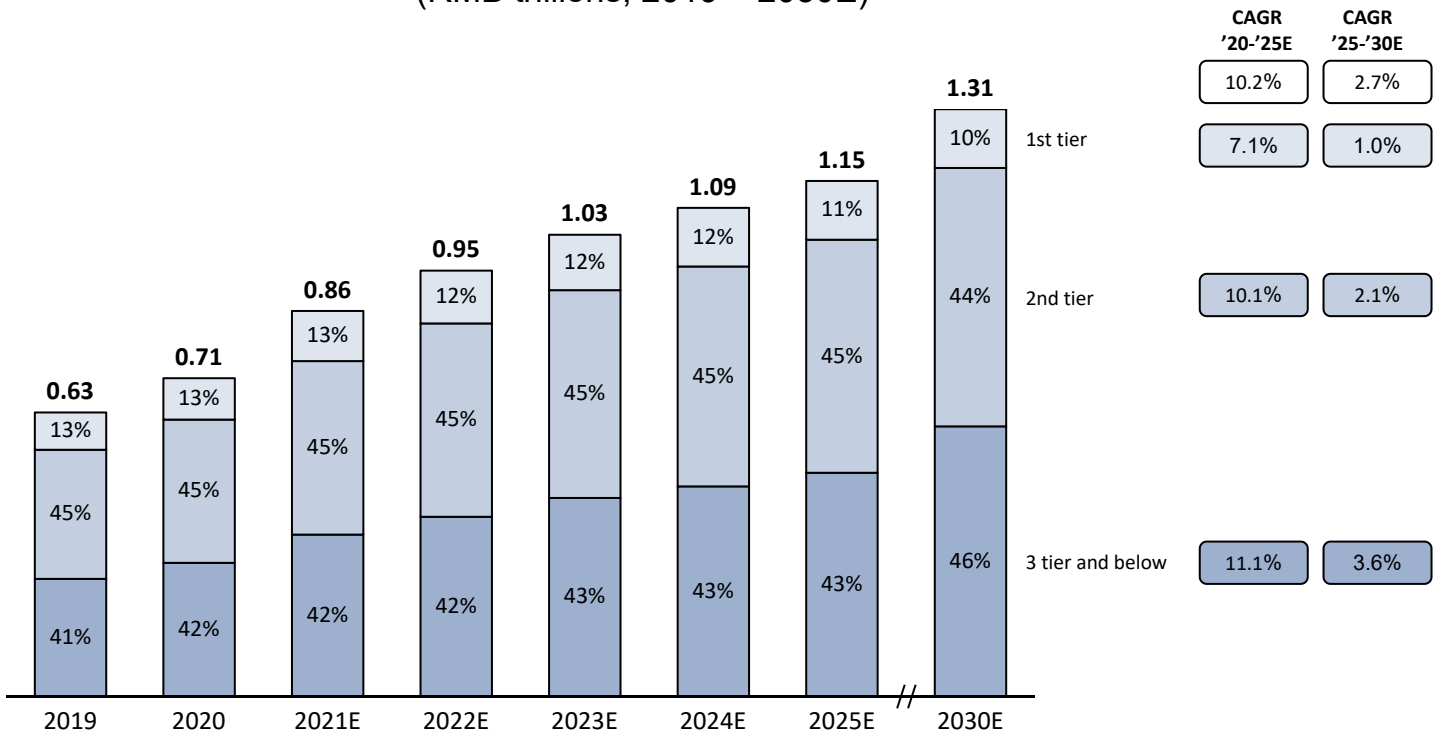
Notes: Market size is combined on parts value and service value
Source: Roland Eerger,Automobility Analysis

Figure 17 China Aftermarket Size in Maintenance & Repair (2020 – 2030, trillion RMB)

[2] 4S: sales, spare part supply, service, and surveys (customer feedback)

An increasing population of older cars coupled with increasing car ownership penetration will make the independent aftermarket (IAM) the dominant channel for the auto aftermarket. This IAM channel differs among cities in China (see Figure 18). Higher-tiered cities make up the bulk of the IAM market share. Existing retail channels are concentrated in the 1st and 2nd tier cities due to the rapid increase of car ownership in these cities in recent years. As car penetration expands to lower-tier cities, these cities will experience a higher growth rate in car penetration and aging cars compared to high tier cities, fueling the growth of IAM in lower-tier regions of China.

China's IAM Market Size in Different Tiered Cities
(RMB trillions, 2019 – 2030E)

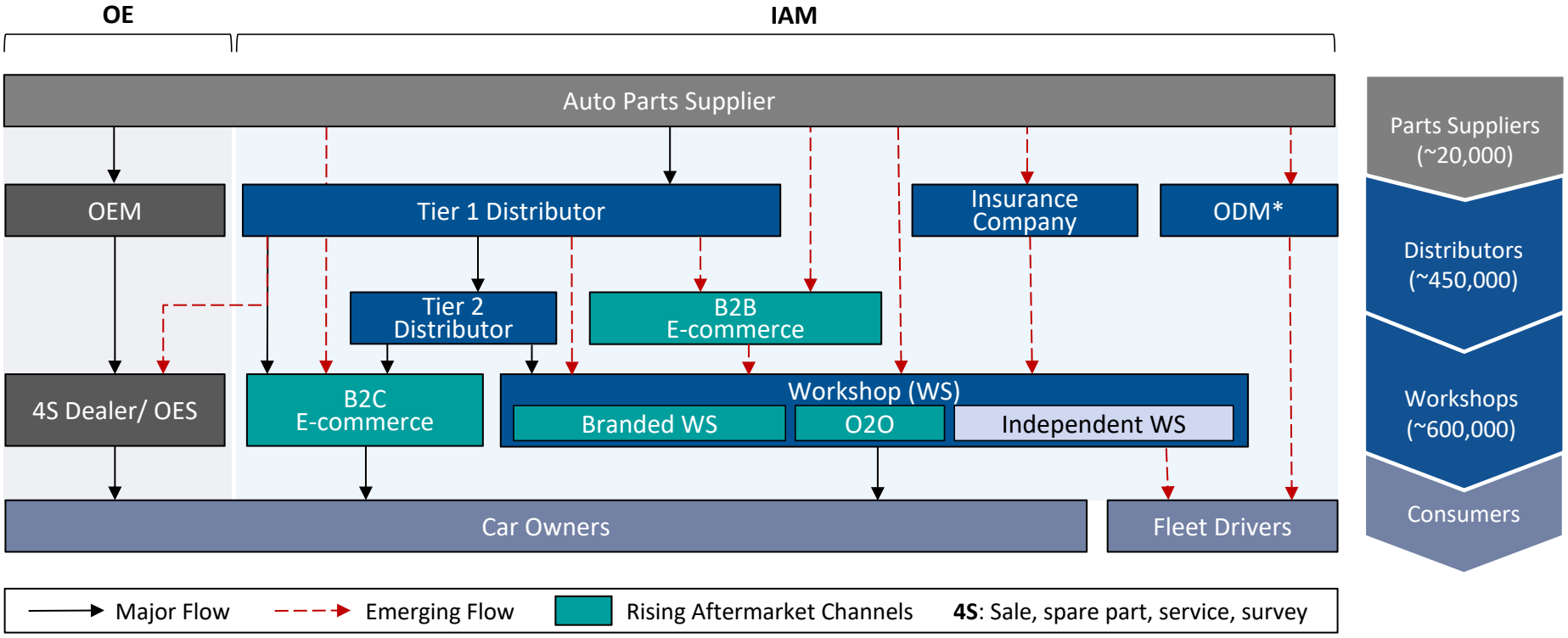


Source: Roland Berger, Automobility Analysis

Figure 18 China's IAM Market Size in Different Tiered Cities

2.2.2 Aftermarket Competitive Landscape

China's automotive aftermarket has grown for over a decade, without showing signs of consolidation. Instead, it remains fragmented and disorganized. In addition, the advent of mobile internet and digital technology allows new business opportunities to emerge in the independent aftermarket, such as B2C and B2B e-commerce, branded workshops, and O2O platforms (see Figure 19).



*Note: On-demand Mobility (ODM) platforms direct fleet drivers to partnered workshops for vehicle services

Source: Desktop research, Automobility analysis

Figure 19 China's Aftermarket Structure

Car dealers and 4S shops are facing challenges with decreasing number of outlets

Since the 4S store model was introduced in China at the end of the 20th century, China's OEM authorized dealer system has shifted from single stores to corporate operations. The top 4S stores have captured great value in the aftermarket (see Figure 20). However, the number of authorized 4S dealers nationwide declined in 2020 for the first time in history, dropping to 26,000 outlets in total as of now. One key factor is the increasing number of emerging New Energy Vehicle (NEV) automakers adopting direct B2C sales models to offer customer-centric services over the entire ownership cycle. This emerging model differentiates itself from the traditional dealership model and is disrupting the market with solutions that address the drawbacks of the 4S dealership model (such as the lack of transparent pricing and poor service quality). However, the new model is still far from mature, requires large capital investment and a complex operational structure that might not be feasible for all NEV manufacturers. Despite this, the service and profit structure of 4S stores will be significantly challenged due to an aging car parc and growing IAM.

Logo	Name	Number of outlets	Revenue 2021 (Billion RMB)	Authorized brands (not exhaustive)
	Zhongsheng Group	745	175	
	China Grand Auto	386	158	
	Lei Shing Hong	156	99	
	Yongda Auto	237	86	
	Hengxin Auto	220	80	
	Yuantong	N/A	51	
	Dah Chong Hong Holdings	165	49	
	Jiangsu Wanbang	77	46	
	Shanghai Auto Industry Sales Co.	55	45	
	SinoMach Auto	30	44	

Source: Desktop research, Wolk After Sales Experts GmbH, Automobility analysis

Figure 20 Car Dealer and 4S Shops Ranking by Revenue

Branded workshops match the demand for standard services

There are several types of branded workshops operated by different groups of players, including car manufacturers (OEMs), dealer groups, independent brands, and suppliers (see Figure 21). Understanding the declining trend of 4S channel, OEMs started to extend to the independent aftermarket by leveraging their own brand reputation to establish offline chain stores for maintenance and repair. While having years of experience in spare parts supply, OEMs are relatively new to the aftermarket service sector and are still in the exploratory stage.

OEMs

*Quick repair chain **Autoyong** (2021,1500)*

*Aftermarket service provider **Chexiangjia** (2021, 400)*

Dealer Groups

*Quick repair chain **Harmony Repair** (2019, 80)*

*Car service provider **G&O Home** (2018, 100)*

Independent Brands

*Luxury car service provider **Harson Service** (2022, 265)*

*Aftermarket service provider **Suremoov** (2022, 1200)*

Suppliers

*Aftermarket service provider **Bosch Car Service** (2019, 1700)*

*One-stop car service provider **Tyreplus** (2021, 1500)*

Source: Desktop research, Automobility analysis

Figure 21 Different Types of Branded Workshops

The sub-brands of parts suppliers and dealer groups are expanding in recent years with strong technical capability and wide category coverage. For example, Bosch built presence in the aftermarket by establishing Bosch Car Service and expanded its business from quick fixes to core parts, including engine and brakes. The dealer group sub-brands could also leverage their technical capabilities to offer the same level of repair service but at a lower price than 4S shops.

Independent workshops are the strongest in "traffic generation" than any other type of player. Empowered by digital technologies, these workshops usually leverage their own APPs with O2O services to bring online traffic offline, then generate profits on offline orders from recurring customers. However, they have lower technical capabilities than other types of branded workshop, limiting them to only focus on quick fix business.

Thanks to government policies regulating the maintenance and repair industry to promote anti-monopoly, standardization, and market transparency, branded workshops are expected to enjoy faster growth than 4S shops and independent workshops.

O2O platforms are growing at the expense of individual workshops

Along with the fast pace of digitalization in China, e-commerce companies are pushing forward into a broad range of markets including the automotive aftermarket. Today, more than 50,000 outlets have online exposure, of which Tuhu is leading the market with 300 directly-owned outlets, 3,000 franchised outlets and 33,000 partnered workshops. O2O platforms are furthermore cooperating with franchised or authorized workshops to increase market presence and scale. They also offer standardized processes from online order placement to offline maintenance and repair. On the other hand, individual workshops with limited technical capabilities are expected to be integrated into standardized or to be phased out in the upcoming wave of digitalization and market consolidation. In the near term, the channel structure of workshops will begin to change significantly (see Figure 22).

Workshop Type	Access to Customers	Brand Awareness	Pricing Competitiveness	Technical Knowhow		Future Outlook
Car Dealer / 4S	★★★★★	★★★★★	★	★★★★★	20%	Dealer group will likely to lose customers as cars are aging and customers prefer IAM with competitive price
Branded Workshop *(OEM, Supplier, Independent, Dealer group)*	★★★	★★★	★★★	★★★	20~30%	Branded workshop will achieve higher brand recognition with ensured product/service quality
O2O Platform	★★★	★★★★	★★★★	★★	50%	O2O platforms may enjoy a promising future with competitive price and standard services
Individual	☆	☆	★★★★★	★	50%	Individual workshops will join chain stores or be phased out with limited technical knowhow and professional staff

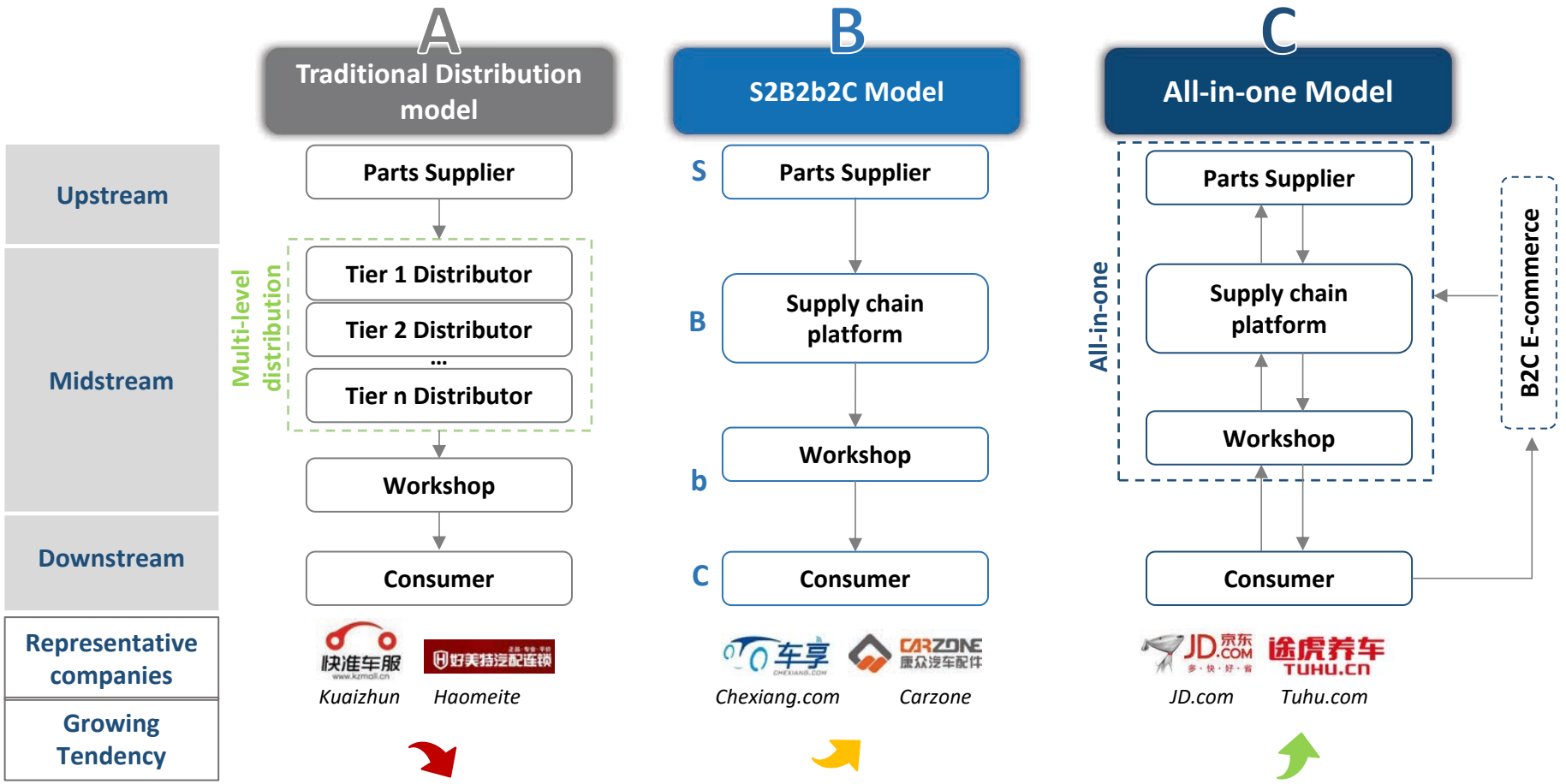
Source: Desktop research, Wolk After Sales Experts GmbH, Automobility analysis

Figure 22 Comparison among Workshops

Emerging business models are disrupting the traditional distribution value chain

There are more than 450,000 distributors in the market of which more than 90% are individually owned. The top 10 distributors account for less than 5% market share indicating a highly decentralized market. The upstream, midstream, and downstream have clear business boundaries where virtually no systematic interaction in the distribution value chain can be found. There are also multiple layers of

distributors that cause inefficiency in the traditional distribution model. Therefore, the S2B2b2C model and all-in-one model was created to integrate the value chain and disrupt the existing market (see Figure 23).



Source: Desktop research, Automobility analysis

Figure 23 Comparison of traditional model, S2B2b2C model and all-in-one model

In the B model (S2B2b2C model), the midstream, which is operated by a supply chain platform, is playing a key role to connect both upstream parts suppliers and downstream service providers. This model emerges to enhance the overall efficiency by reducing the intermediate circulation costs. In this case, the manufacturers might be able to save multi-level distribution costs while the services networks could reduce costs in parts purchasing. However, the data of each part of the value chain is not shared in this model, thus the traditional S2B (parts suppliers to supply chain platforms), B2b (supply chain platforms to workshops), and b2c (workshops to consumers) are still operating independently from each other.

Evolving from the B model, the C model (all-in-one model) reflects an overall market trend towards vertical integration. It integrates auto parts manufacturers (upstream), supply chain and e-commerce platforms (midstream), and auto service networks (downstream) to provide services to end customers directly. Tuhu has become a leading online platform for auto maintenance products and services in China by adopting this business model. Not only the upstream, midstream, and downstream are connected to each, the data is also shared among each part of the value chain, resulting in higher supply chain efficiency and a synergic relationship between production and sales. As vertical integration is accelerating, the C model has already begun to take shape and improve industry concentration.

Auto Parts Suppliers Entering Aftermarket in China with Different Business Models

Foreign auto parts suppliers take different operation approaches in China (see Figure 24). Most of the auto parts suppliers are manufacturers who fully or partially own (through partnership) the key business activities in China, including parts production, online or offline sales, supply chain and distribution, as well as aftersales and customer service. A summary of different business models that currently exist in China is shown below.

Key Business Models	Description of Business Model	Level of Ownership	Production of Parts	Sales (online/ offline)	Supply Chain/ Distribution	Aftersales (customer service)
			Key Business Activities (Upstream → Downstream)			
Full trading company setup	A dedicated legal entity for aftermarket including sales, customer service, product management, and warehouse for product to form internal or external production	High	●	●	●	●
Exclusively with 1 distributor/agent	A marketing firm which sales are handled by a single distributor that is responsible for the whole national market	Medium	●	●	○	○
Partnering with established supplier	Company selling products as complementary to a partner supplier with strong channel and shared customer	Low	●	○	⊗	⊗
Trading + Retail	Trading company expanding to retail with strong brand awareness to end customers	High	●	●	●	●
Trading + Remanufacturing	Trading company expanding to remanufacturing to enter the green aftermarket field	High	●	●	●	●
Licensing	License brand to local partner and collect license fee	Very low	○	⊗	⊗	⊗
Emerging business models						
E-commerce platform	Selling mostly under online platform directly to car owner with or without workshop connection for installation	Medium	●	●	○	●
Cross-border online platform	Sell products directly through cross-border online platform like Alibaba or Amazon mainly for DIY(Do It Yourself) purpose	low	●	●	○	○

● Fully self-owned ○ Partially owned or through partnership ⊗ None involvement

Source: Desktop research, Automobility analysis

Figure 24 Different Business Models of Parts Suppliers in China

a. Full trading company set up

One of the most common business models is to form a dedicated legal trading entity for the aftermarket with a comprehensive departmental structure, including sales, customer service, product management, human resources, procurement, etc. Companies operating in this model usually build warehouses and inventory for products made in China or from other areas in the world. The products are either manufactured on their own or by their local suppliers to meet the customer needs from the local market. Then the products are sent to the distributors who sell both online and offline to reach wide coverage. Companies like Valeo took this approach when it entered the aftermarket in China in 2005 with less than 50 people in the very beginning (more than 10,000 employees for OE business). Valeo extended its product portfolio from wipers and thermal to a wider product range to gain a higher market share. Following this full trading model, the company will have full control over the whole business and fast growth within a relatively short period of time. However, high set up costs and investments are necessary.

b. Exclusively with 1 distributor/agent

The company following this model sets up a legal entity to control the marketing and to ensure that distributors will not resell products back to Europe or cause any brand damage. Product management and sales are handling by one single distributor for the entire national market, allowing the company to enter China's aftermarket with relatively low cost and easy operation. The potential risk of this model is relying too much on distribution partners to control the channels, making it difficult for the company to switch to a full trading company setup. For instance, Liquid Moly, a German company specializing in oils, lubricants, and additives, followed this business model but struggled to make a transition to a full setup trading company.

c. Partnering with an established supplier

Another business operation model with a relatively low entry cost is to sell products to an established supplier who has strong marketing channels and common customers. For example, an Italian brake pad manufacturer who is trying to sell in China could partner with an Italian chassis company as with a complementary product portfolio. TMD Corporate, a leader in braking systems, partnered with Hella, who has existing sales channels among OEM distributors, to drive the business development. TMD received secured net profit with minimum set up cost. As the market matured, TMD Corporate decided to switch to a full trading setup in 2019 to drive growth. This model will lead to success when a company has identified a potentially synergetic partnership.

d. Trading + Retail

Companies like Michelin started as trading companies specializing in tires and subsequently extended to retail business to further increase the market penetration with their products. In 2005, Tire Plus was founded as part of Michelin's retail business with five workshops directly owned by Michelin and 1,500 partnered stores. A few years later, Michelin licensed Tire Plus to scale up and the total number of Tire Plus stores in China has reached 1,500 in 2021. Beyond OE business, Michelin sells tires to distributors who sell products to the workshops, which include Tire Plus. Recently, Michelin has partnered with JD.com to enhance online sales while bringing offline business to Tire Plus by integrating online and offline channels. Michelin has established a successful brand in the last century that allowed it to extend to the retail business much more easily than any other brand. However, operations of franchised workshops require a lot of effort and full dedication to stay competitive in the aftermarket.

e. Trading + Remanufacturing

With the development of green aftermarket, a new business model for the remanufacturing of auto parts emerged, led by a traditional trading company. ZF was a pioneer in implementing remanufacturing business in China. As a leading company in chassis and braking, ZF sets up a team for remanufacturing of gearboxes and transmissions. The team collects the products from workshops or distributors via reverse logistics and resells them to the market after remanufacturing. Given that remanufacturing is still a mostly untapped market in China, companies pursuing this model will be able to enjoy first-mover advantages.

f. Licensing

The business model incurring minimal cost and requires least up-front investment is licensing as it requires the lowest ownership of business activities. Due to the complex business environment in China, some foreign parts suppliers choose to license their brands to local partners who are strong in manufacturing while weak in branding. They collect license fees only and leave operations and sales to the local partners.

g. E-commerce platform

E-commerce platforms have become a popular marketplace for aftermarket auto parts in the last decade. Several players are creating their own e-commerce platform like Qihoo 360, while others sell products through 3rd party platforms such as JD.com and Tmall. DIY (Do-it-

Yourself) product categories are particularly suitable to be sold online as they are typically directly sold to end customers without distributors or workshops. Qihoo 360 is one of the larger self-owned online platforms for IAM product offerings. As a market leader in providing internet and mobile security products in China (measured by user base), Qihoo 360 also offers consumer products for the independent aftermarket including digital video recorder (DVR), phone holders, safety seaters, etc. The e-commerce platform business model works for brands that target consumer categories with competitive prices while looking for a low-cost and quick start in the China market.

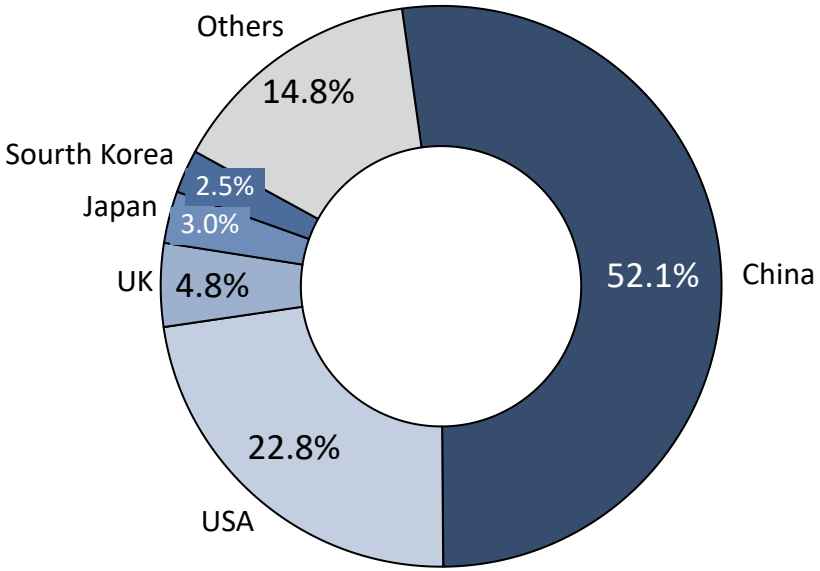
h. Cross-border online platform

Cross-border online platforms work similarly to e-commerce, but suppliers target the global market instead of the local market. Foreign suppliers manufacture products in the local market and sell them to overseas markets by setting up online stores on Amazon or Alibaba. However, the auto parts sold overseas through e-commerce are usually limited to DIY categories.

2.2.3 Consumer Preferences in Aftermarket

There is a significant difference in buying habits between Chinese consumers and the rest of the world. In general, Chinese consumers prefer online shopping, where China takes more than half of the global e-commerce market share at 52.1% (see Figure 25), which indicates a trust and comfort with online shopping. China also has the world's largest number of online shoppers with a population of 824.5 million, representing 38.5% of the global total.

The online shopping craze became even more prevalent during the COVID-19 pandemic, as more Chinese learned how to shop online, especially the elderly population who did not grow up with the internet or the app economy. Thus, online shopping has become a mainstream channel for Chinese consumers and it has been deeply integrated into the purchasing habits of Chinese consumers.

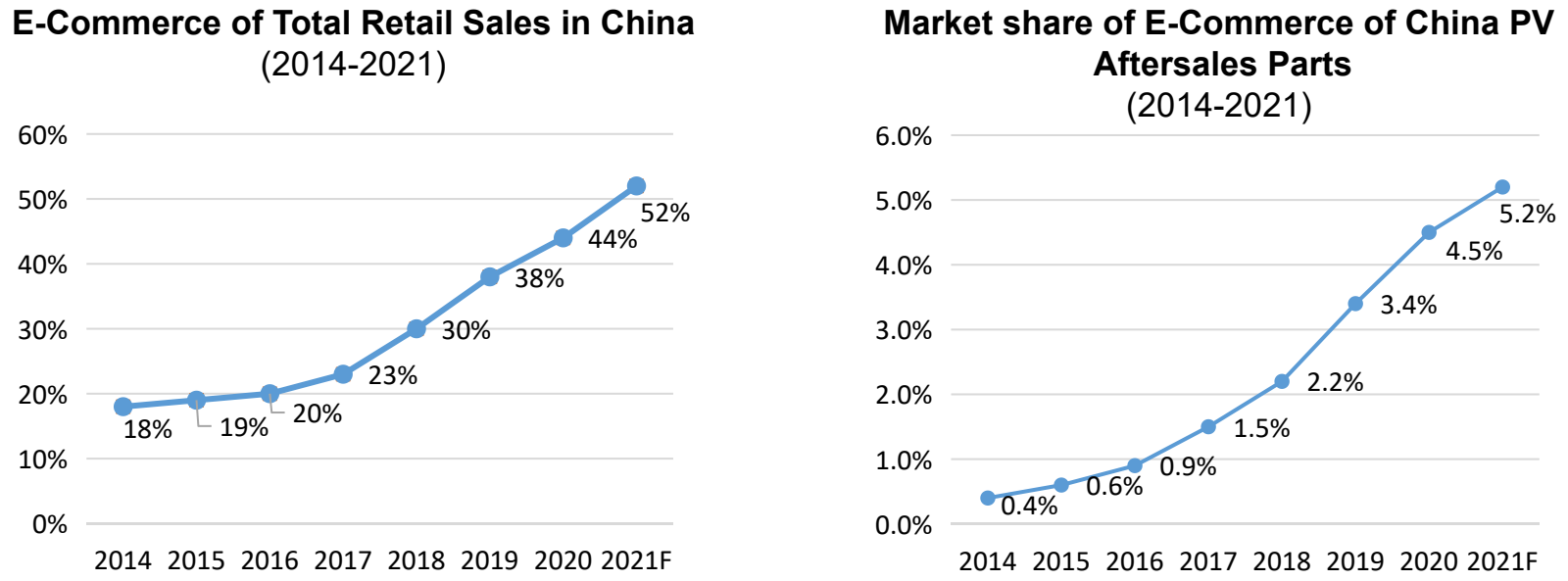


Source: eMarkter, Automobility analysis

Figure 25 Global E-Commerce Market Share in 2021

Customers in North America and Europe, even though they have access to online shopping (e.g., Amazon) and online payment (e.g., Paypal), still prefer to shop offline, a deeply rooted consumer behavior. US and European car enthusiasts generally like to shop for auto parts offline and many even like to tinker with their car in the garage. This is analogous to Western consumers enjoying to shopping at "Home Depot" and "Lowe's" (both are home improvement superstores). This "DIY culture" is not commonly found among Chinese consumers, who generally do not fix their vehicles or perform simple home improvements by themselves.

E-commerce penetration (e-commerce of total retail sales) in China grew to 52% in 2021, while online sales grew from 0.4% to 5.2% from 2014 to 2021 in the aftermarket parts market. This indicates that while being a growing segment, online aftermarket auto parts sales remain niche as most auto parts sold online require Do-It-Yourself (DIY) installation.



Source: eMarketer, Dec.2020; Automobility analysis

Figure 26 E-Commerce Growth in China (2014-2021) & Market share of E-Commerce of China PV Aftersales Parts (2014-2021)

However, online and offline integration has become a major trend in the automotive aftermarket. Consumers are increasingly purchasing parts online to send them to the offline for installation via an online-to-offline model (O2O). This business model is becoming a preferred choice among consumers as it aims to solve two longstanding issues in the aftersales market: untransparent pricing and counterfeit products. This trend will contribute to a significant growth in penetration rate of e-commerce in China's aftersales market.

We have found that the top three maintenance categories sold online are "tire", "engine oil" and "accumulator" which have the highest online penetration rates with 10%, 7-8%, and 5%, respectively. These categories usually have higher brand awareness that allow consumers to make online purchase more easily. All three categories are consumable and wearable products with high degree of standardization and high frequency of maintenance, resulting in higher frequency of purchase.

As Chinese consumers' online shopping habits continue to grow, and as the O2O business model matures, the online penetration of aftermarket parts will grow in the future. The market potential will be realized with other categories catching up in the penetration rate.

Chinese consumers are furthermore shifting their preference from single product purchases towards holistic service experiences. Convenience, affordability and reliability are becoming important decision factors for consumers. In this context, one-stop comprehensive services are becoming the preferred choice for Chinese consumers rather than segmented services. Chinese consumers typically lack experience with cars and thus prefer to establish a trusting relationship with a store or brand that can handle a wide variety of requests.

2.2.4 The Impact of Electrification and Autonomous Driving

Technological advancements of battery electric vehicles (BEVs) and autonomous vehicles (AVs) impact not only to the vehicle manufacturing sector but also the automotive aftermarket at multiple levels: including parts manufacturers, distribution, and workshops.

Vehicle electrification leads to significant simplification of vehicle design with fewer required stock keeping units (SKUs) and more electronic components. The aftermarket is negatively impacted across a range of components including accessories, chassis (brakes), electrical/electronic (E/E) starter batteries, E/E starters and alternators, fluids, and traditional powertrain (ICE parts). In contrast, demand for other chassis components, powertrain (EV parts), thermal parts, and tires will increase.

Currently, GM has 550 engine and transmission combinations. When they reach their all-electric future, they will have 19 skateboard variations. Tesla's Model S requires only half of the components and systems compared with a traditional ICE (see Figure 27) This complexity reduction in vehicle design leads to a lesser demand for staff for product design and development, as well as supply chain management.

Components & Systems	Tesla Model S [vs. ICE]	Comment
Brakes	↓	50% less
Engine and gear box oil	↓	No need
Engine components	↓	No need
Filter (beside cabin)	↓	No need
Belts	↓	No need
Ignition	↓	No need
Battery	↗	Rarely, replace some sub-optimal cells
Tyre	↗	Slightly accelerated tyre wear
Cabin air filter	→	-
Windscreen, wiper, washer fluid	→	-
Tire rotation	→	-
Brake fluid test	→	-
Air conditioning	→	-
Winter care	→	-
Wear and tears	→	-

Source: Desktop research, Automobility analysis

Figure 27 Components Difference Between Tesla Model S and Traditional ICE

Autonomous driving is likely to make vehicles less customizable and to reduce collision frequency, resulting in lower demand for appearance accessories but higher demand for E/E (advanced driver-assistance system, or ADAS, components). Software and computation are more critical than hardware. Software updates are provided "over the air" through car connectivity facilitated by 5G. Based on the data collected from the current sensors and cameras installed, each car is expected to generate 25GB of data per day from the vehicle itself and the surrounding environment.

IAM for AV will require significant investment in diagnostic and calibration equipment, training, and in-car data access. The complexity of autonomous driving systems will create a skillset gap between autonomous vehicle and traditional human-driven vehicle, particularly in software and data security.

The development of autonomous vehicle will also bring impact to workshops. More service technicians need to be trained for electrical services in addition to mechanical services. Moving to AV aftersales service requires an exponential increase in technician skills, as technicians need to inspect in-car network connectivity. These new networks and E/E architectures will evolve and introduce entirely new technologies and new approaches. It still takes time for the aftermarket to make this transition as the insurance and warranty for AV are not clearly identified, and the replacement rate of AV-related products is hard to be measured as of now.

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2.3 Opportunities and Conclusion

We are facing a secular and generational shift in consumer preferences in the automotive and mobility sector. The rise of connected, electric and autonomous cars bring progressive but significant impact to the automotive aftermarket. The trends have quickly ignited the enthusiasm of market players and investors, leading to the emergence of game-changing innovations. Anticipating the shift towards next-generation automotive technology, aftermarket players should seize potential opportunities to pivot to electrification and intelligent connectivity to remain relevant in the new game.

It must be noted that **electrification is a secular and generational shift and while it is happening rapidly in China, the car parc will still be dominated by traditional combustion-powered vehicle for a very long time.**

In the transition period, aftermarket players must:

1. Collaborate with Chinese aftermarket players seeking to build capabilities to compete in both the traditional and new game,
2. Lay the groundwork for pivoting the existing portfolio from the traditional game to the new game by investing in the technologies that substitute those that are displaced,
3. Form global alliances with Chinese aftermarket players to create a way to play in China and a right-to-win in the international markets.

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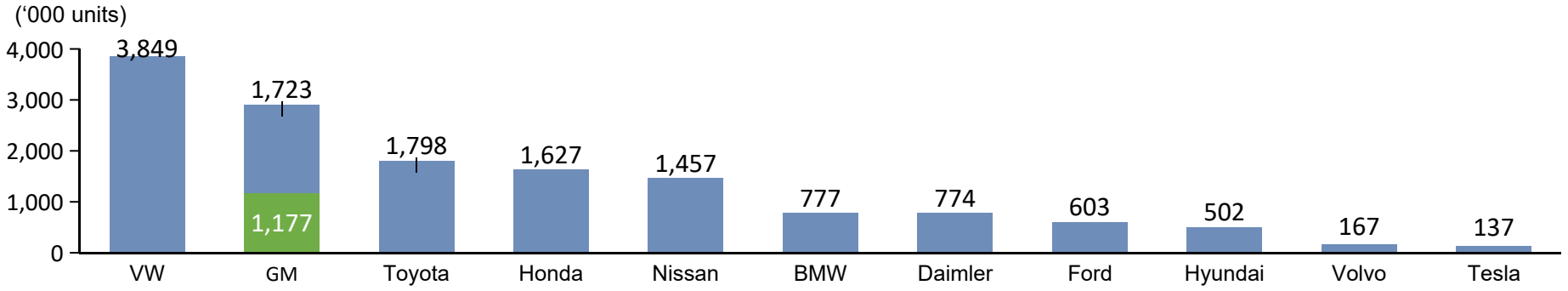
Glossary

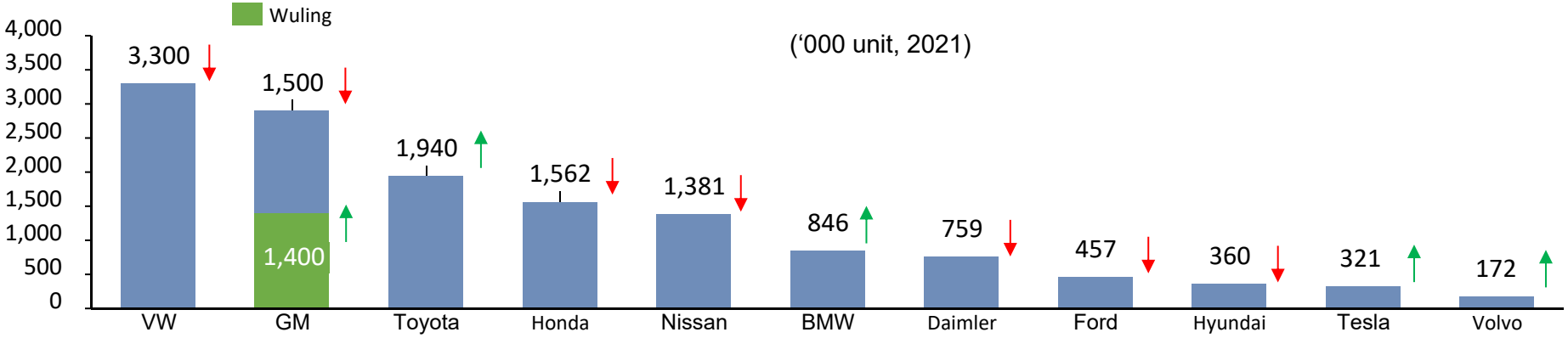
Acronym	Definition
WTO	World Trade Organization
OEM	Original Equipment Manufacturer
OES	Original Equipment Supplier
ODM	On-Demand Mobility
NEV	New Energy Vehicle [includes BEV, PHEV and Fuel Cell Electric Vehicle]
PV	Passenger Vehicle
CV	Commercial Vehicle
ICE	Internal Combustion Engine
ICV	Intelligent Connected Vehicle
ADAS	Advanced Driver Assistance System
EV	Electric Vehicle
BEV	Battery Electric Vehicle
PHEV	Plug-in hybrid electric vehicle
FCEV	Fuel Cell Electric Vehicle
4S shop	Automobile sales shop that covers sales, spare part supply, service, and survey (customer feedback)
O2O platform	Online-to-offline draws potential customers from online channels to make purchases in physical stores
IAM	Independent aftermarket
S2B2b2C	S(Supplier) to B (distributor) to b(workshop) to C(Customer)
V2X	Vehicle to Everything
PPP	Public and Private Partnerships
SKU	Stock Keeping Unit

Notices

Top Global OEMs Car Sales in China (2020 vs. 2021)

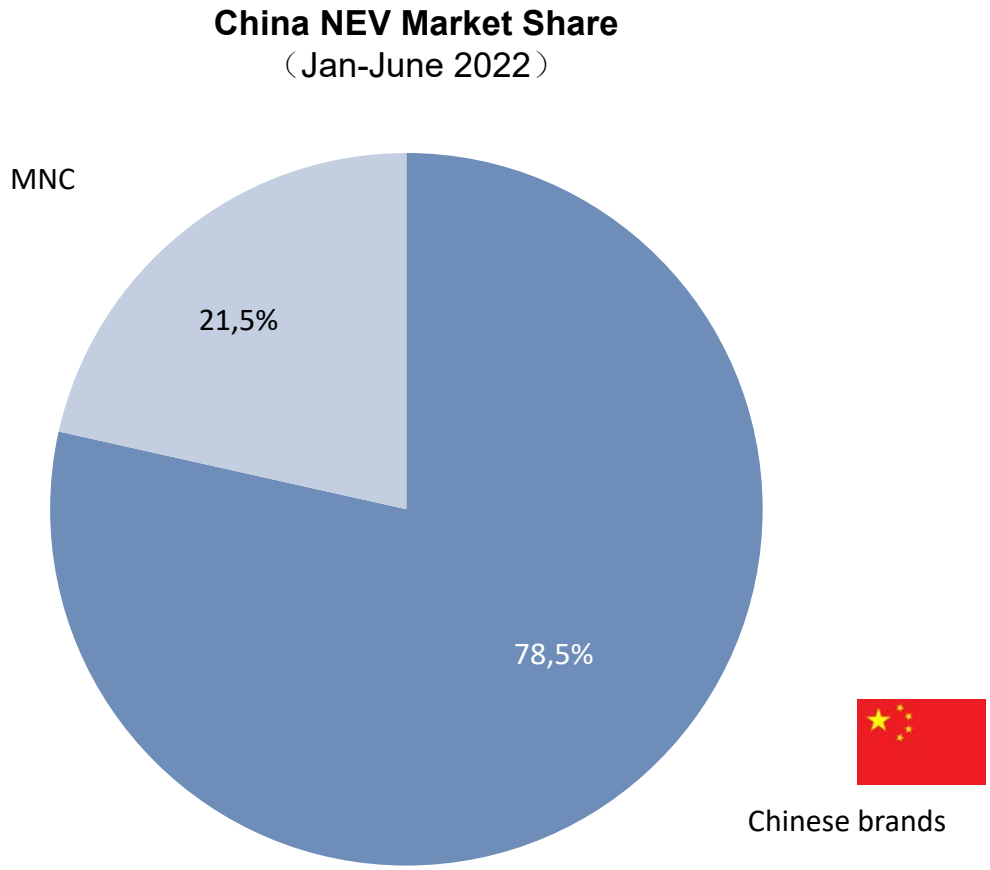
('000 unit, 2020)





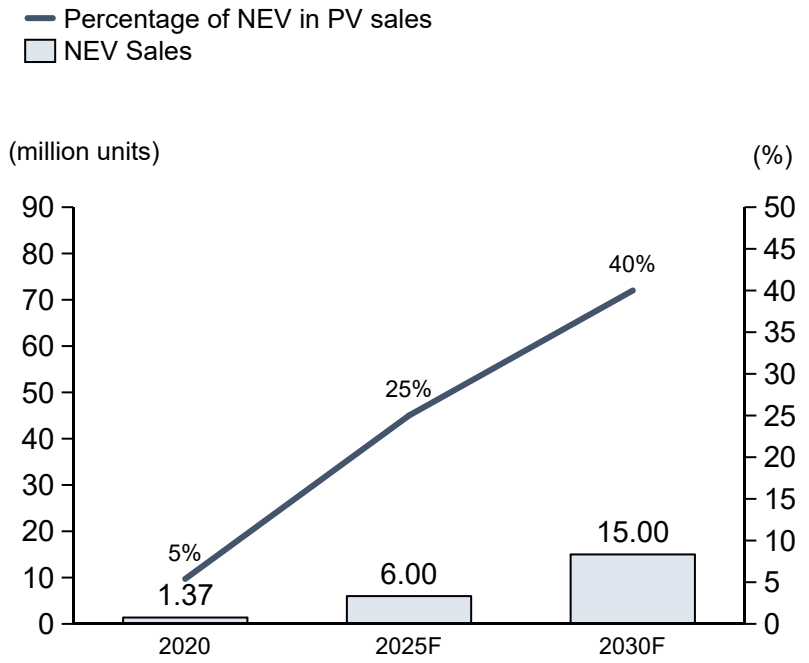
Notes: * Indicates sales through November.
GM sales volume includes Wuling and Baojun brands manufactured by SGMW (44% owned by GM)

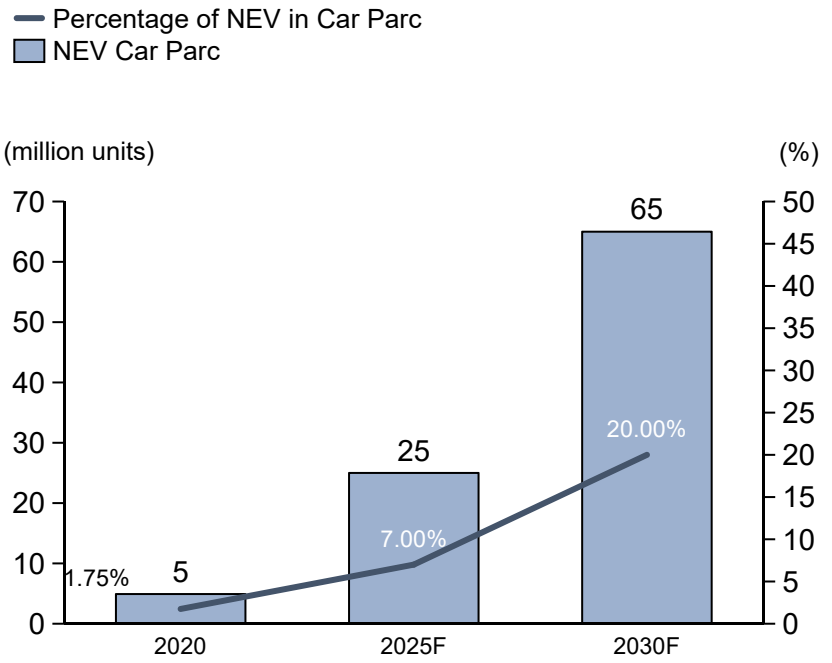
Source: CPCA, company announcements, Automobility analysis



Source: Desktop research, medium.com, Automobility analysis

NEV Penetration in China
(NEV Sales VS. NEV Car Parc)





Source: CAAM, Desktop research, Automobility analysis

China NEV TOP10 Selling OEM and Models
(6/2022)

No.	Group	06/2022 Sales	YoY
1	BYD	132,553	228.8%
2	Tesla	77,938	177.0%
3	SGM – Wuling	43,491	39.0%
4	Geely	26,514	343.6%
5	GAC (Aion)	24,109	131.8%
6	Chery	22,500	211.0%
7	XPeng	15,295	133.0%
8	Chang'an	14,499	128.0%
9	NETA	13,133	155.6%
10	Li Auto	13,024	68.9%

No.	Model	06/2022 Sales	YoY
1	Tesla Model Y	52,150	348.7%
2	Hongguang Mini EV	39,798	36.6%
3	BYD Song	31,787	327.9%
4	BYD Qin	26,383	70.1%
5	Tesla Model 3	25,788	56.1%
6	BYD Han	25,209	201.1%
7	BYD Yuan Plus	16,553	-
8	Li ONE	13,024	68.9%
9	GAC Aion Y	11,801	369.8%
10	BYD Dolphin	10,282	-

Local players are winning the early electrification race, delivering a solid value proposition for Chinese consumers seeking affordable technology

Source: CPCA, Automobility analysis.

China NEV TOP10 Selling Models
(6/2022)

Price under CNY 100,000
Price between CNY 100,000 – CNY 300,000
Price over CNY 300,000

No.	Top 10 Sellers in June
1	Tesla Model Y
2	Hongguang Mini EV
3	BYD Song
4	BYD Qin
5	Tesla Model 3
6	BYD Han
7	BYD Yuan Plus
8	Li ONE
9	GAC Aion Y
10	BYD Dolphin

Tesla Model Y
SUV
CNY 320,000 – 420,000

Wuling Hongguang Mini EV
Sedan
CNY 28,800 – 38,800

BYD Song
SUV
CNY 135,000 – 215,000

BYD Qin
Sedan
CNY 106,000 – 200,000

BYD Han
Sedan
CNY 210,000 – 288,000

Tesla Model 3
Sedan
CNY 290,000 – 370,000

BYD Yuan Plus
SUV
CNY 138,000 – 166,000

Li ONE
SUV
CNY 350,000

GAC Aion Y
SUV
CNY 140,000 – 180,000

BYD Dolphin
Sedan
CNY 94,000 – 122,000

Source: CPCA, Desktop research, Automobility analysis

BEV Models by Volkswagen

Group	Model	June Sales	Total Sales	Ranking (June, NEV)
FAW VW	ID.4 CROZZ	6,243	11,732	No.13
	ID.6 CROZZ	2,802		
	Magotan GTE	2,687		
	Tayron GTE			
SAIC VW	ID.4 X	4,163	10,483	No.15
	ID.3	2,801		
	ID.6 X	1,626		
	Passat PHEV	1,893		
	Tiguan PHEV			

Volkswagen NEV Sales
(6/2022)

ID.4 CROZZ
SUV
CNY 182,000 – 287,000

ID.6 CROZZ
SUV
CNY 246,000 – 337,000

ID.3
SUV
CNY 168,000 – 182,000

ID.4 X
SUV
CNY 210,000 – 280,000

ID.6 X
SUV
CNY 248,000 – 340,000

Source: Desktop research, Automobility analysis

Key Challenges to Automotive Industry Value Chain

Coping with supply chain disruptions

- (2019) Supply chain disruptions resulting from tariff & trade issues
- (2020) COVID-19 pandemic
- (2021) Chip shortage
- (2022) Ukraine War
- (2022) COVID Lockdowns

Becoming a smart EV/ICV company

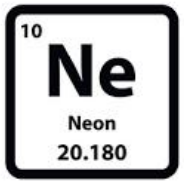
- Secular shift in retail consumer buying preference toward electric vehicles
- Generational shift of buyer preference in favor of smart connectivity

Future of automotive retail

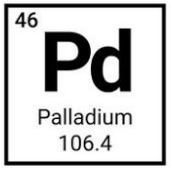
- Franchised dealerships and 4S shops
- Online vs. offline
- Smart device brands and the new retail format

Source: Automobility analysis

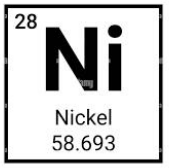
Raw Material Shortages Caused by Ukraine War



- Ukraine is the largest global supplier of neon with a **market share of 30%**
- The gas is needed for semiconductor production
- Price per cubic meter **shot up ninefold** after Russia's invasion of Ukraine to $2,500
- **China is the second largest neon supplier globally** and expected to step into the market void



- Russia supplies **38% of global Palladium**
- Palladium is **required for catalytic converters** in gas engines
- **Prices have risen sharply** since 2015 and reached a temporary high of $2,900 per ton in June 2021
- Russian supply **cannot be easily bridged** as market has been in a deficit for years

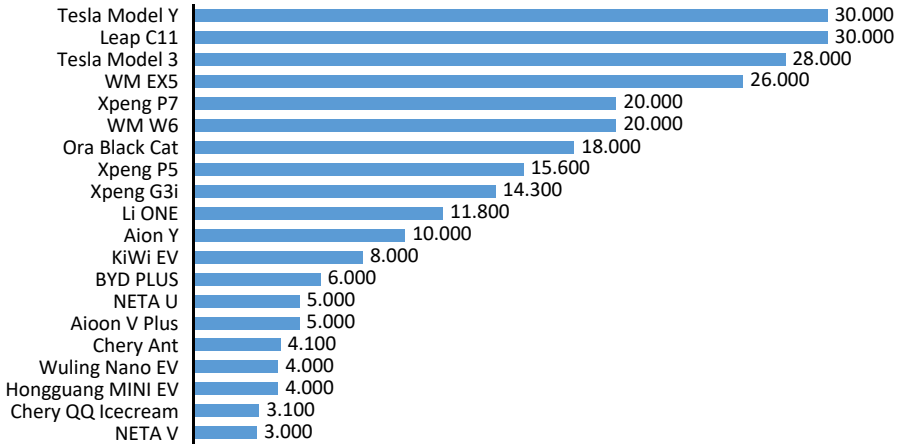


- Russia supplies **17% of global high-purity Nickel**
- Nickel is required for **alloys in the production of lithium-ion batteries**
- After Russia's invasion of Ukraine, **price per ton shot up from $20,000 to more than $100,000** and is expected to stabilize at $34,000
- OEMs are scrambling to **establish business with other Nickel producing countries** such as Indonesia and the Philippines

Source: Desktop research, DW, Automobility analysis

Surging Material Costs

March price increase (RMB)

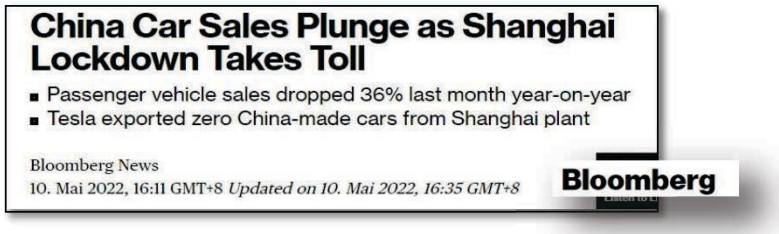


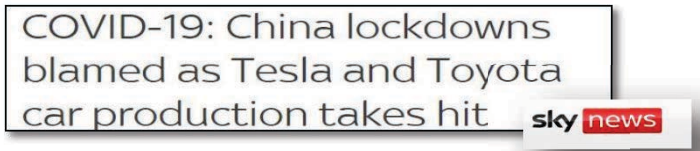
NEV companies have raised their retail prices to cover for price inflation along their supply chains

- Suppliers did not expect the **speed of NEV growth in China** and are scrambling to catch up
- **While demand outweighs supply**, **prices** for raw materials and key components **will continue to rise**
- **Prices will normalize** once production of supplies is ramped up, **which could take several years**
- **Vertically integrated** companies such as Tesla and BYD are **less vulnerable**
- **GM and Ford** recently singed new deals to secure raw materials supply
- **Mid-level and entry-level brands will struggle to pass the extra costs to consumers**, forcing them to take lower margins or to halt certain products

Source: Desktop research, Automobility analysis

Lockdown Impact on Domestic and Global Auto Industry





China is expected to stick to its "dynamic zero-COVID policy"

- The **most severe impact** has been on the **supply-side**, which involves the ability to move parts, manufacture components and assemble vehicles
- Operations at the **Shanghai port** have been heavily hindered by a shortage of drivers, leading to virtually **no shipments in and out** of the world's largest port
- **Toyota's** global production target has fallen by 50,000 to 700,000 in April
- Despite restarting its Shanghai operations on 19 April, **Tesla** has again halted several production lines due to a **lack of parts**
- Halted production of Chinese components is also severely impacting **overseas auto manufacturers**, such as Tata Motors in India
- **Supply chains** are **expected to move** to other Asian, North American and European sites, but **relocations will take time** to implement

Source: Desktop research, Automobility analysis

Chinese Manufacturers Looking for Partners in Europe

CATL

Germany

- Partnered with Quantron AG as CATL's CTP battery distributer for Europe
- Partnered with HOPPECKE for serving CATL batteries in Europe
- German subsidiary CATT obtained approval to produce 8GWh per year for its plant, planned to extend to 14GWh

Spain

- Partnered with QEV Technologies for serving CATL batteries in Europe

Poland

- CATL to supply European bus manufacturer Solaris with lithium batteries with Cell to Pack (CTP) technology.

Great Wall Motors

- European HQ opened in 2021 in Munich, covering R&D, sales and management.
- Svolt, a subsidiary of GWM, selected Saarland to build two battery plants with a €2bn investment.

NIO

- Nio has a foothold in the Norwegian region and the company is set to begin sales in Sweden by the end of 2022
- It is also expected to build a factory in Poland, according to media report

Source: Desktop research, Automobility analysis

Guideline and Roadmap from Central Government on EV Development

Achieve Carbon-neutral by 2060

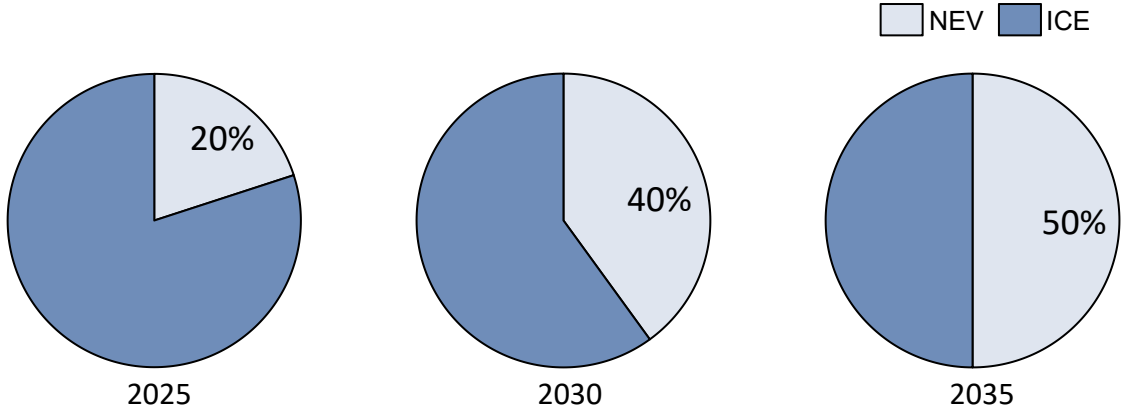
- China aims to have CO2 emissions peak before 2030 and achieve carbon neutrality before 2060 with a clearly-stated four stages objective

NEV[1] to Reach 20% New Car Sales by 2025

- Nov. 2, 2020, the State Council issued China's New Energy Vehicle Industry Development Plan (2021-2035)

China's Targets for NEV Penetration (2025-2035)

1. *According to "China's New Energy Vehicle Industry Development Plan (2021-2035)" &*
2. *"China Energy-saving and New Energy Vehicle Technology Roadmap 2.0"*



Note: 1) NEV includes BEVs, PHEVS (incl. EREVs) and FCEVs

Source: NDRC, MIIT (Ministry of Industry and Information Technology), Automobility analysis

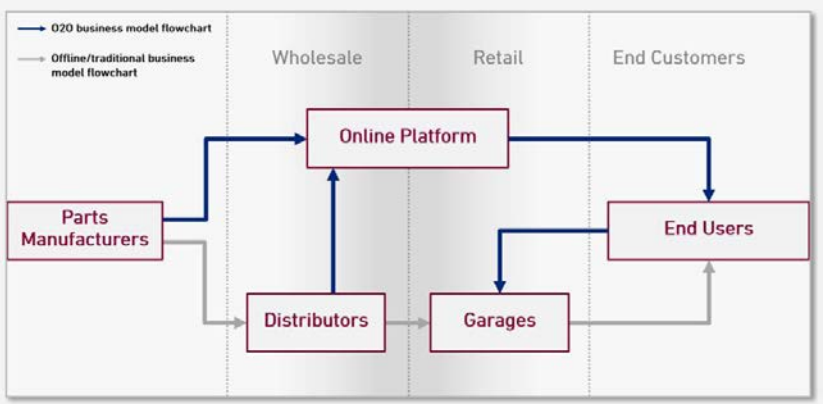
- Nov. 2, 2020, the State Council officially issued China's **New Energy Vehicle[1] Industry Development Plan (2021-2035)**

Penetration	○ **By 2025**, NEV to account for **20%** of new vehicle sales **by 2025** ○ **By 2035**, BEV to be the mainstream in new car sold, FCEVs to be commercialized; **all public services vehicles[1]** should be NEV ○ Starting from 2021, NEVs should account for **no less than 80%** of the new or replacement **public services vehicles** in National Ecological Civilization Pilot Zones and Key Pollution Control Regions[2] ○ **Highly automated ICVs to be commercialized** in restricted zones and special scenarios **by 2025**, and to be put into **scale application by 2035**
Fuel Economy	○ Avg. electricity consumption of new BEV fleets to reach **12kWh/100 km by 2025**
Technology Breakthrough	○ Achieve breakthrough in power battery and management systems, drive motor and electronics, connected and smart technologies, ○ Green hydrogen and hydrogen storage & transportation tech
Infrastructure Construction	○ **Subsidize** public charging facilities, and **build supply ahead of demand** ○ Encourage **battery swapping** applications, and smart charging, high-voltage charging and wireless charging technologies ○ Promote the construction of **hydrogen refueling infrastructure;** encourage combined stations (e.g., gasoline, electricity, H2)

Note: 1) public services includes public transportation, taxi, logistics and delivery etc. 2) NECPZ incl. Fujian, Jiangxi, Guizhou and Hainan – 4 provinces. KPCR incl. Jing-jin-ji, Yangtze River Delta, Pearl River Delta, Chengdu-Chongqing, Shandong city cluster, Liaoning Province etc. - 13 regions in total

Source: NDRC, MIIT (Ministry of Industry and Information Technology), Automobility analysis

Online Platforms Built by E-commerce Companies Overview



Logo	Name	Number of outlets
	Tuhu Yangche	3,369 direct outlets 33,223 franchisees
	JD Jingchehui	1,400+
	Tmall Station	1,500+
	Yangche51	1,000+
	Xiaoju Autocare (Didi)	300

Source: Desktop research, Wolk After Sales Experts GmbH, Automobility analysis

Individual Workshops Overview

Individual Workshops

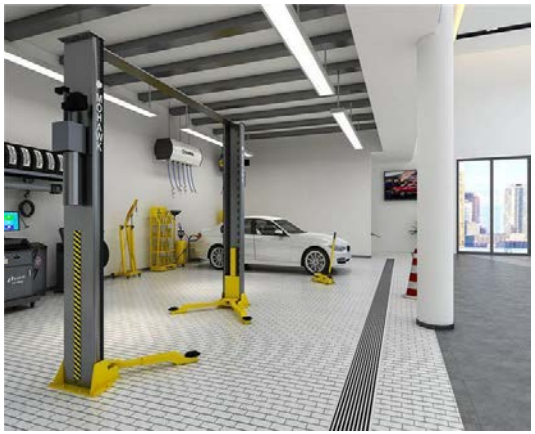
440,000 Quickfix striving for more customers

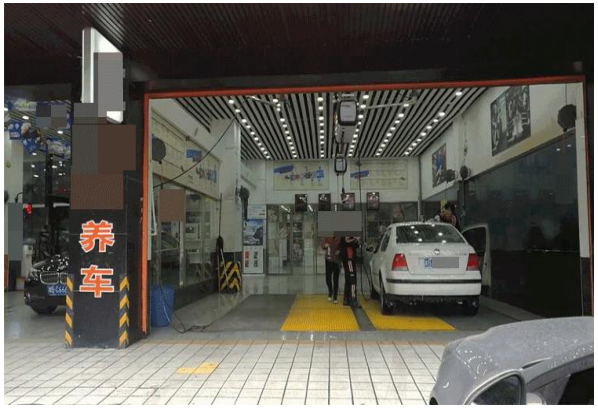
+

*Only **35,000** with robust repair capabilities*

Future Outlook

The number of individual workshop will definitely decrease because of high cost, environmental protection pressure and a lack of professional staff compared with other workshop concepts.





Source: Desktop research, Wolk After Sales Experts GmbH, Automobility analysis

Traditional Distribution Model

Traditional Distributors

Tier 1 Distributor

By Service

By Make

Workshop Quickfix

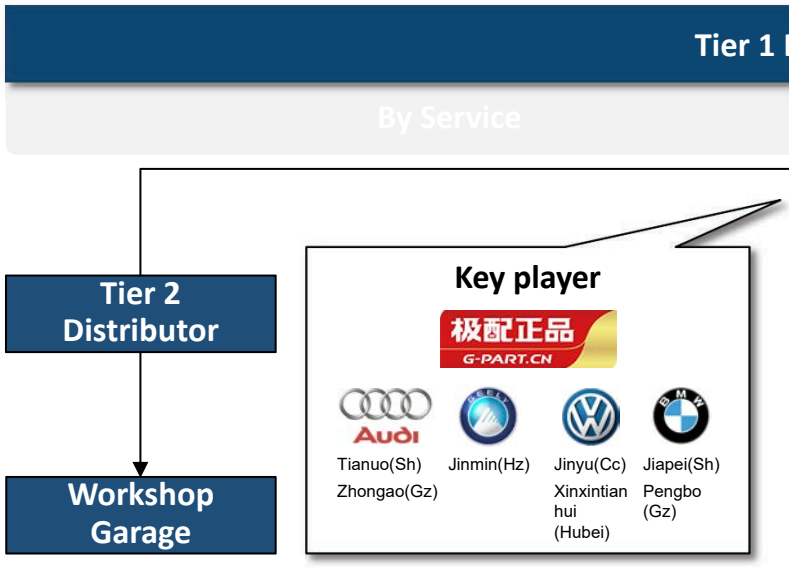
Key player

- Focus of main Investment from VC
- **Forced to improve IT/Supply china/branding due competition from Ecommerce O2O**

Mainly Consumer and Wearable

- **Specialized on fast mover** categories
- **Covering all OEM for those categories** to become 1 stop solution for workshop Quickfix
- Need network of part shop to **manage the last miles delivery around 5 KM**
- Offer balance of global brand premium but also mid and entry level often local
- **Develop private label to improve profitability**
- Comprise of 15% of all traditional distributors in China
- Steadily expand to repair as extension due to car population aging

Traditional Distributors



- Less attractive for VC due to high inventory
- **Limited investment on supply chain and IT and** so slow/hard to evolve to online B2b
- Non competitive on wearable/Consumable

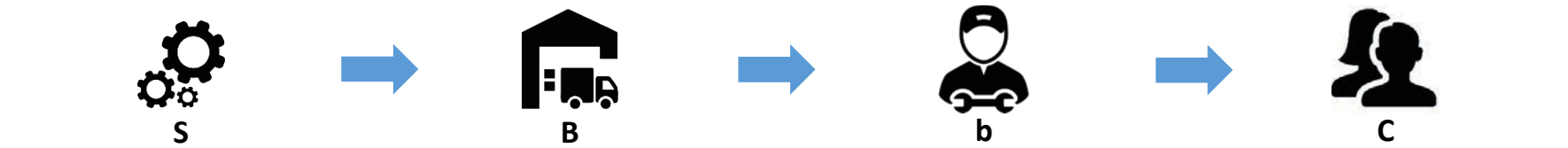
Mainly Repair and Accident

- **Specialized on limited number of OEM**: like GM or Audi/BMW or VW
- Will **provide the full/deeper product portfolio** for those OEM and all Car model
- **Very heavy on inventory** with slow movers
- Target OE IAM brand to compete with OES
- Relying on volume and relationship with supplier to get lower cost
- **Comprise 85% of all traditional distributors** in China with most are small tier 2 distributor handling some inventory, workshop training and last miles delivery to Garage and Quick trying to repair

Source: Desktop research, Automobility analysis

Online Aggregators Enabling S2B2C to Provide Optimized Omnichannel Experience

S2B2C: supplier to business to customer



Parts Suppliers	Distributors	Workshops	Consumers
○ More that **10,000 suppliers**, with around 9800 local players supplying global market and local market	○ Estimated **~500,000 players**, privately owned ○ Main players around **5M USD size** with 10 to 20 shops	○ Estimated **~525,000** independently workshops ○ **No specialized workshops**, all generalists ○ Still **limited workshop chain**; traditional franchising model faces great challenge	○ **DIY market** almost non-existent ○ **Very limited** brand awareness and **trust to IAM brands**

Supply Aggregation

Demand Aggregation

Source: Desktop research, Automobility analysis

Key Features of Aftersales Categories and Online Penetration

Category	Tyre	Engine Oil	Accumulator	Air filter	Brake Pad	Spark Plug	Wiper
Replacement Frequency (annually)	~1 – 1.5 unit	~2.4 times	~0.4 times	~0.6 times	~0.2 times	~0.3 times	~0.5 times
Standardization	◑	◑	◕	◔	◔	◔	◔
Brand Recognition	●	◕	◕	○	○	○	○
Circulation efficiency *	◑	◔	◔	○	○	○	○
Online penetration	10%	7~8%	5%	<2%	<1%	<1%	<2%

* Circulation efficiency refers to the level of distribution, numbers of channels and complexity of distribution system

Source: Deloitte; Automobility analysis

Comments

- The high online penetration rate for the top three products is mainly due to the high brand awareness and high degree of standardization with relatively small number of optional SKUs, as well as high frequency of maintenance as consumable products
- The market potential will be realized with other categories catch up in penetration rate

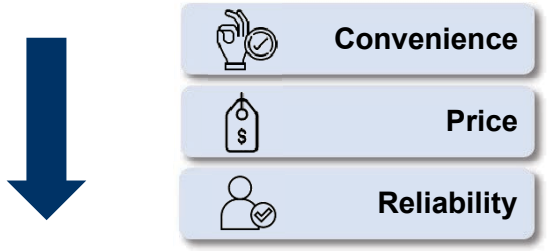
Source: Deloitte; Automobility analysis

Consumer Preferences of Workshops

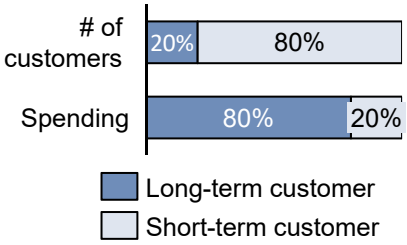
A Service Workshop in Shanghai

- A typical chained service workshop has **10 to 12 technicians and 4 working stations**: 1 for car wash, 1 for polish, 2 for repair
- Service **radius** is from 5km to 10km
- Monthly **revenue** is around **RMB 300k** for well performing stores with longer history (8~10 years), good reputation, and **RMB 50~200k** for normal stores with short history (2~3 years)
- **Bottleneck for workshop boss is HR and skills:** keep the good technician and skill up to manage more complex repair

Key Selection Criteria for Workshops



Consumer behavior



- Serves a total of **6,000 to 9,000 customers p.a.**
- Average spending is **300-400 RMB**
- **30~40** customers spend more than **10,000 RMB p.a.**

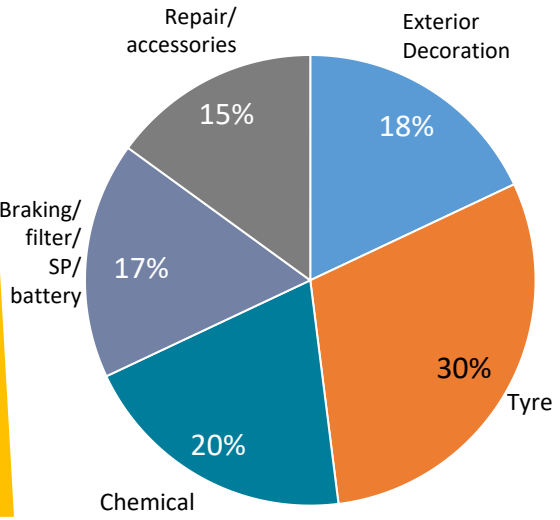
Implications

- Hence, **distributors are needed in a bid to penetrate** and serve local workshops
- Need work with distributor **to build training program** to help workshop address exhaust needs -> Garage rather than Quick fix
- Selecting workshops that align with Faurecia's premium branding will be challenging

Auto Detailing Service by Frequency & Consumer Interaction

Frequency	Auto Detailing	Price	Gross Margin	Car owners Acknowledge	Level of trust*
High	Car Wash	Low	Low	High	1
	Polish/ coating	Middle	High	High	1
Medium	Lubricant	Middle	Middle	Middle	2
	Tyre	High	Low	Middle	3
	Coolant	Low	Middle	Middle	2
Low	Air Filter	Low	High	Low	4
	Sparkplug	Middle	High	Middle	4
	Brake	Middle	Middle	Middle	4
	Exhaust	High	High	Low	5

Revenue Breakdown by Category



Implications

- Service related to exhaust is limited and does not justify direct approach to workshop
- Majority of workshop might not be qualified for providing complex service on exhaust
- Important to approach workshop with distributor or supplier selling other technical product with high demand

***Note:** (1) Exterior Decoration (2) Chemical (3) Tyer (4) Braking/Filter/SP (5) Others (repair, accessories)

Source: Desktop research, Automobility analysis

Comparison between Traditional ICE Chassis and BEV Chassis

Traditional ICE Chassis

Future BEV Chassis

Comments
○ BEVs are simpler and require **fewer auto parts** (24 ECUs per vehicle) than traditional ICEs (125+ per vehicle) ○ Currently, GM has **550 engine and transmission combinations**. When they reach their all-electric future, they will have **19 skateboard variations**. This complexity reduction means **fewer people** are needed to design, develop, manage supply chains, and put them together

Source: Desktop research, Automobility analysis

Resources and Reference

1		**Automotive Aftermarket Supplier Association(AASA)** The Automotive Aftermarket Suppliers Association (AASA) exclusively represents the North American Aftermarket supplier industry. AASA is recognized as one of the nation's strongest and most prominent trade organizations with more than 100 years of experience, AASA's sole mission is to help members, the aftermarket suppliers, to be more profitable, innovative and competitive on a global scale.
2		***China Passenger Car Association (CPCA)*** Established in 1994 and located in Shanghai, China Passenger Car Association is a well-known platform for information exchange and market research for China's automobile industry in China. CPCA covers most of the car manufacturers in China across passenger vehicles, commercial vehicles (mainly mini bus, light-duty, and pickup truck) and new energy vehicles.
3		***China Association of Automobile Manufacturers (CAAM)*** China Association of Automobile Manufacturers (CAAM) is a social organization founded in Beijing in the May of 1987, with the approval of the Ministry of Civil Affairs of the People's Republic of China.Having the qualifications of a legal social organization, CAAMis a self-discipline and non-profit social organization formed based on the principle of equality and voluntariness, which consisting of enterprises and institutions as well as organizations engaged in production and management of automobiles (motorcycles), auto parts and vehicle-related industries founded within the boundaries of the People's Republic of China.
4		***China Automotive Technology and Research Center (CATARC)*** China Automotive Technology and Research Center (CATARC) is a science research institute established in 1985 to meet China's need of managing the automotive industry and now belongs to SASAC (State-owned Assets Supervision and Administration Commission of the State Council).
5		***The American Chamber of Commerce in Shanghai (AmCham)*** The American Chamber of Commerce in Shanghai, known as the "Voice of American Business" in China, is the largest and fastest growing American Chamber in the Asia Pacific region. Founded in 1915, AmCham Shanghai was the third American Chamber established outside the United States. As a non-profit, non-partisan business organization, AmCham Shanghai is committed to the principles of free trade, open markets, private enterprise and the unrestricted flow of information.
6		***China Automobile Dealers Association (CADA)*** China Automobile Dealers Association is the only national-level legal organization in the automobile industry registered with the Ministry of Civil Affairs. It is composed of automobile (including used car) sales enterprises, sales departments of automobile manufacturers, automobile multinational companies in China, automobile auction companies, used car appraisal and evaluation, brokerage companies, auto parts, motorcycles and accessories sales companies, car tangible Markets, car clubs, car decoration and beauty and supplies sales and service companies, car rental companies. Headquartered in Beijing, CADA was officially approved by the Ministry of Civil Affairs in 1990.

Chapter 3: Geography of Economic Relations in the Automotive Sector Italy-China

China-Italy Chamber of Commerce

Energy and Environmental Protection Working Group (EEPWG)

Summary

The automotive industry is one of the pillars of the Chinese economy and expanded rapidly in the past years, offering significant investment opportunities. Thanks to the increasing demand from the emerging middle class and the numerous subsidies and incentives from the government for the promotion of new energy vehicles, China became the world's largest market for motor vehicles, with over 26.3 million units sold in 2021 (+3.8% vs 2020). China is also the largest manufacturer of motor vehicles, with numerous domestic carmakers and joint ventures with foreign groups scattered in economic districts all around China.

The report aims to provide a geographical overview of the Chinese automotive industry, highlighting the relevant industrial clusters and economic zones scattered across the country established to develop the industry, as well as an understanding of the direct investments from Sistema Italia in the industry and the trends in the Chinese market with a focus on the major imports of Italian-made automotive products, including assembled motor vehicles, components and spare parts.

Geography of economic relations in the automotive sector Italy-China

China is the world's largest manufacturer of motor vehicles, with over 26.08 million cars produced in 2021, an increase of 3.4% compared to the previous year. Production of passenger cars accounted for 82.1% of the total motor vehicles manufactured in 2021 (up from 79.3% in 2020), while the share of commercial vehicles declined from 20.7% to 17.9%. China introduced several measures to support and promote NEVs, including tax exemptions and subsidies. In 2021, the share of NEVs on the total motor vehicles production increased from 5.4% to 13.6%.

Volkswagen is the leading brand in China, with over 2.16 million vehicles sold in 2021, followed by Toyota and Honda. Geely ranks first among domestic brands by the number of vehicles sold in 2021.In aggregate, Chinese brands account for over 44.7% of the sales in 2021, up from 38.4% in 2020.

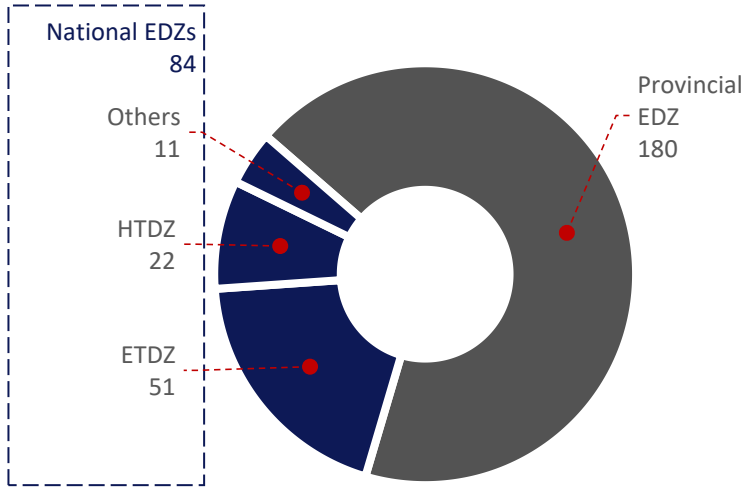
The main players in the automotive industry are scattered across the country, with the biggest agglomeration of automotive companies in the East region of China, especially in the Yangtze River Delta, the Northeast, the heart of China's early heavy industrialization (Shenyang and Changchun), in Guangdong (Guangzhou), and adjacent provinces in Central South China. Central and provincial authorities established Economic Development Zones (EDZs) with preferential policies to attract foreign and domestic investments and promote innovation in the automotive industry.

The major players in the Chinese automotive industry are located within dedicated national and provincial economic development zones (EDZs). EDZs are areas with preferential policies designed to attract foreign direct investments, boost domestic growth, and promote innovation. Based on the Catalogue of Economic Development Zones (version 2018), China established 2,543 EDZs, 552 approved at the national level and 1,991 at the provincial level. 10.4% of these EDZ, equal to 264, are partially or fully dedicated to the automotive industry. The ratio increases to 15.2%, when considering only the national level EDZ.

Among the 264 EDZs identified for the automotive industry, 84 are EDZs at national level, as follows:

- 51 are economic and technological development zones (ETDZ);
- 22 are high-tech development zones (HTDZ);
- 11 are national EDZ of other types, including Customs special supervision areas and cross-border economic cooperation zones.

Item	Total (number)	Automotive (number)	Share total (percent)
National EDZs	552	**84**	15.2
Provincial EDZs	1,991	**180**	9.0
Total	**2,543**	**264**	**10.4**



The Eastern part of China, with the Yangtze River Delta, is the economic heart of China. Several car manufacturers established their headquarters and manufacturing plants in the region, which offers economic development zones (both at the national and provincial levels) to boost investments in the automotive industry. Shanghai, the country's financial centre, is the headquarter of SAIC, together with its joint ventures with GM and Volkswagen. The US car manufacturer Tesla operates a large factory in Shanghai Lingang Special Area. NIO, which represents China's new generation car maker, is headquartered in Shanghai. Other car manufacturers, such as Chery, Geely, JAC Motors, Mazda, and Roewe, are established in neighboring Jiangsu, Anhui, and Zhejiang provinces.

Conversely, the heavy industries and the first car manufacturers were established in North and Northeast China, with a very high concentration of state-owned enterprises. FAW, the first Chinese state-owned car manufacturer, was established in Changchun, Jilin Province, in 1953, with joint ventures with Toyota in Tianjin. BAIC and its joint ventures with Benz and Hyundai are located in Beijing, while Brilliance and the joint venture with BMW are established in Shenyang, Liaoning Province.

Furthermore, the Pearl River Delta Economic Belt, which consists of the coastal provinces of Guangdong and Guangxi, is a manufacturing centre with a high concentration of companies in the automotive. GAC Group and the joint ventures with Toyota and Honda are located in Guangzhou, the provincial capital. Dongfeng has its headquarters in Wuhan, Hubei Province, along with its joint ventures with Honda, Nissan, and PSA.

Trend and Italian exports of automotive goods to China

China is one of the largest importers worldwide, with over 2,600 billion USD of goods inflow in 2021 (+30% vs 2020). Imports from Italy topped USD 30 billion USD (+36% vs 2020), accounting for 1.1% of total import value. While Chinese imports of automotive goods reached 91 billion USD in 2021 (3.4% of total Chinese imports), automotive goods imported from Italy totaled 1.3 billion USD, accounting for 1.4% (Italy is 13th in the ranking of top suppliers of China).

Germany and Japan accounted together for 54.4% of the total Chinese imports of auto parts due to the joint ventures established with Chinese local car manufacturers. Germany is the first trading partner for Chinese automotive imports, followed by Japan and the US. Almost 65% of the Chinese automotive imports in Y2021 originated from these three countries. Italy ranks 13°, with USD 1,291 million, accounting for 1.4% of China's automotive imports. Italy exported over 964 million USD of motor vehicles and 327 million of auto

components to China, including parts, components, engines, and lighting fixtures. Conversely, Chinese imports of automotive goods from Italy are mainly carried out in six Provinces, which process together 92% of the total value of imports (Shanghai Customs processed 64% of the import of automotive goods from Italy in 2021). China's imports of Italian made goods for the automotive industry increased by 72.4% in Y2021 reaching USD 1,291 million, boosted by the growth of motor vehicles imports (+107.7%). Auto parts include:

- Brakes and servobrakes
- Gearboxes
- Bumpers
- Drive and non-driving axles
- Suspension systems
- Steering wheels and boxes
- Road wheels
- Other parts of bodies for vehicles
- Other parts for vehicles.

Most of the selected investments are located in the eastern coastal provinces (Shanghai, Jiangsu, Zhejiang) and the southern Guangdong province. These regions are the top recipients of foreign direct investments flowing into China. They are the most economically advanced and industrialized centers of the country, with solid development in the automotive industry. Scattered investments are recorded in North and Northeast China and in Chongqing municipality.

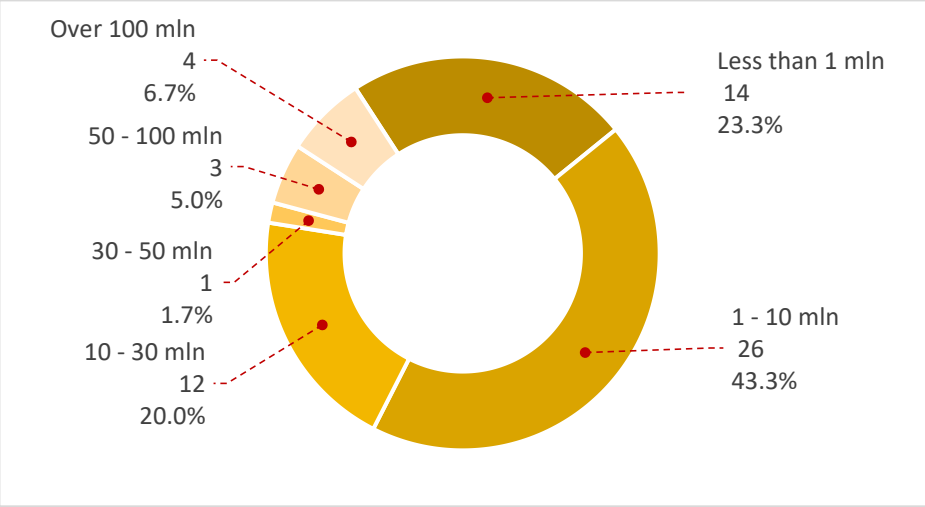
Chinese imports of Italian made motor vehicles reached USD 964 million in Y2021, up by 107.7% compared to Y2020. Passenger cars, referring to motor vehicles for the transport of less than ten persons, accounted for 97.4% of these imports, with a total value of USD 938.8 million (vs USD 446.9 million imported in Y2020). Almost 97% of the passenger cars imported in Y2021 were spark-ignition internal combustion vehicles, and the residual 3.4% consisted of hybrid vehicles.

Conversely, trucks, which refer as motor vehicles for transporting goods, accounted for 2.6% of the total Italian motor vehicles imported by China in Y2021, followed by chassis fitted with engines. There were no imports of motor vehicles for the transport of more than ten persons (i.e., buses) in Y2021. Nevertheless, Chinese imports of auto parts from Italy reached USD 220.4 million in Y2021, up by 15.4% compared to USD 190.9 million in Y2020. Brakes and servo-brakes accounted for 39.8% of the auto parts imported by China, with

USD 87.6 million, up by 15.4% vs 2020. A significant percentage increase was recorded for gearboxes and parts (+86.5% vs Y2020, USD 9.1 million), bumpers and parts (+35.6% vs Y2020, USD 7.4 million), and steering wheels and boxes (+47.2% vs Y2020, USD 5.8 million).

Foreign Investments in Automotive in China

Most of the investments have been performed during the decade Y2000 – Y2010 (29 investments, 48.3% of the total), and Y2011 – Y2020 (25 investments, accounting for 41.7% of the total). Among the 60 selected investments, 27 are production enterprises established in China by Italian group for the local manufacturing of goods and products for the automotive industry, mainly components and spare parts. 16 investments are related to the establishment of import-export and trading enterprises engaged in the trade of components and automotive parts. The remaining 17 investments refer to enterprises operating in the services and other activities, mainly providing design, engineering, and supporting business.



Two-thirds of the selected investments (40) have a registered capital less than USD 10 million. Among them, 14 have a capitalization less than USD 1 million, and 26 between 1 to 10 million. 20% of the investments (12) have a capital between 10 to 30 million, with the remaining 13.3% (8 investments) with a capital over USD 30 million. With regards to the number of employees and workers, in 30% of the selected investments the total headcount is lower than 10, and 23.3% the headcount ranges between 10 to 50. In the remaining 28 investments, the headcount ranges between 51 to 100 in 7 companies, and over 100 in 21 companies.

Registered capitals not expressed in USD were converted in USD according to the following exchange rates:

1 EUR	1.050	USD
1 CNY	0.148	USD
1 HKD	0.127	USD

3.1 Introduction

The automotive industry has been one of the pillars of the Chinese economy and its growth since the Five-year plan in 1986, when the government decided to make the industry a national champion, aimed to create several companies able to accumulate technology and produce a large number of vehicles of good quality.

For foreign automotive brands to enter Chinese market, the central government has implemented some access requirements in licensing and tariffs. Regarding licensing, the government encouraged the establishment of joint ventures between local manufacturers and foreign brands to achieve best practices for producing motor vehicles. From July 1, 2018, import tariffs on automotive products have been reduced, while the gap between those on finished products (15%) and parts (6%) is still significant.

China is the world's largest market for passenger vehicles, boosted by increased demand from the emerging middle class and numerous subsidies and incentives from the government. China is also the most prominent manufacturer by number of cars produced every year, with international brands having a significant market share.

The high demand and the development of the industry, which includes the new energy vehicles, boosted investments from domestic and overseas investors and the growth of automotive companies all around China. The Chinese automotive industry expanded rapidly in the past years and offers significant investment opportunities.

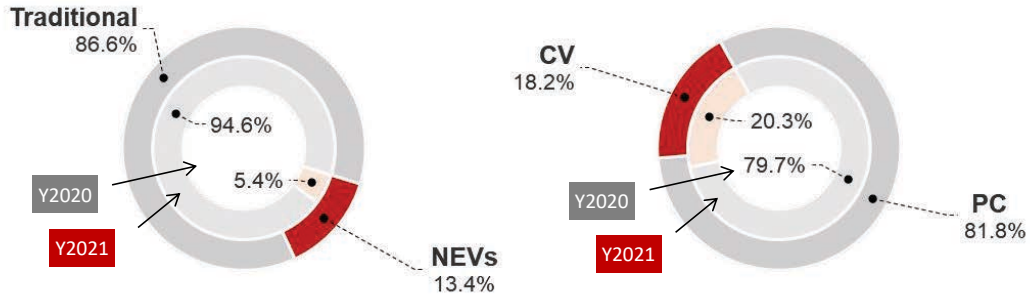
This report aims to provide an overview of the Chinese automotive industry from a geographical point of view by highlighting the different industrial clusters scattered across the country and the dedicated economic zones promoted by central and local authorities to develop the industry. In addition, this report intends to understand the direct investments from Sistema Italia in the Chinese automotive industry and the trends in the Chinese market with a focus on the major imports of Italian-made automotive products, including assembled motor vehicles, components and spare parts.

World Top Market

China is the world's largest market for motor vehicles, with a sales volume of almost **26.27 million vehicles in 2021**, up 3.8% over the previous year, among which 21.48 million passenger cars (81.8% of the total sales) and 4.79 million commercial vehicles (18.2% of the total sales).

The sales of new energy vehicles (NEV) in 2021 raised by 157.5% from 1.37 to 3.52 million vehicles. The share of total vehicle sales increased from 5.4% to 13.4%.

Sales	Y2020 thous. vehicles	Change YoY percent	Y2021 thous. vehicles	Change YoY percent
Passenger cars (PC)	**20,178**	***-6.0*** ▼	**21,482**	***6.5*** ▲
Cars	9,275	*-9.9* ▼	9,934	*7.1* ▲
Multipurpose vehicles (MPV)	1,054	*-23.8* ▼	1,055	*0.1* ▲
Sport utility vehicles (SUV)	9,461	*0.7* ▲	10,101	*6.8* ▲
Crossed passenger cars	388	*-2.9* ▼	391	*0.8* ▲
Commercial vehicles (CV)	**5,133**	***18.7*** ▲	**4,793**	***-6.6*** ▼
Buses	448	*-5.6* ▼	505	*12.6* ▲
Trucks	4,685	*21.7* ▲	4,288	*-8.5* ▼
Total sales of motor vehicles	**25,311**	***-1.9*** ▼	**26,275**	***3.8*** ▲
Among which:				
New energy vehicles	**1,367**	***10.9*** ▲	**3,521**	***157.5*** ▲
NEV – Passenger cars	1,246	*14.6* ▲	3,334	*167.5* ▲
NEV – Commercial vehicles	121	*-17.2* ▼	186	*54.0* ▲



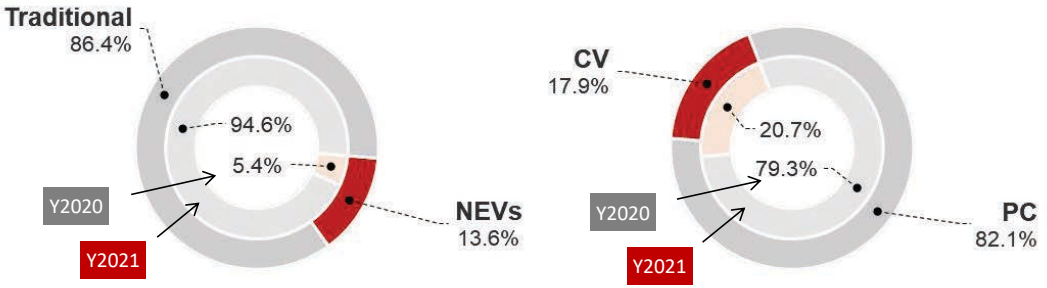
World Top Manufacturer

China is the world's largest manufacturer of motor vehicles, with over **26.08 million cars** produced in 2021, an increase of 3.4% compared to the previous year.

The production of passenger cars accounted for 82.1% of the total motor vehicles manufactured in 2021 (up from 79.3% in 2020), while the share of commercial vehicles declined from 20.7% to 17.9%.China introduced several measures to support and promote NEVs, including tax exemptions and subsidies.

In 2021, the share of NEVs on the total motor vehicles production increased from 5.4% to 13.6%

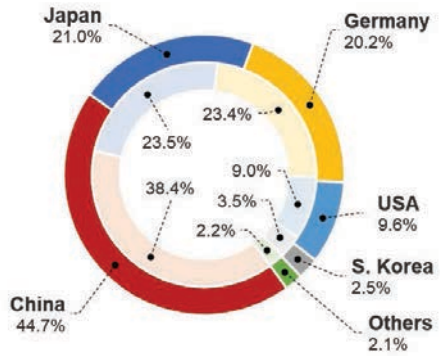
Production	Y2020 thous. vehicles	Change YoY percent	Y2021 thous. vehicles	Change YoY percent
Passenger cars (PC)	**19,994**	***-6.5*** ▼	**21,408**	***7.1*** ▲
Cars	9,189	*-10.0* ▼	9,908	*7.8* ▲
Multipurpose vehicles (MPV)	1,011	*-26.8* ▼	1,073	*6.1* ▲
Sport utility vehicles (SUV)	9,398	*0.1* ▲	10,030	*6.7* ▲
Crossed passenger cars	395	*-1.7* ▼	397	*0.6* ▲
Commercial vehicles (CV)	**5,231**	***20.0*** ▲	**4,674**	***-10.7*** ▼
Buses	453	*-4.2* ▼	508	*12.2* ▲
Trucks	4,778	*22.9* ▲	4,166	*-12.8* ▼
Total production of motor vehicles	**25,225**	***-2.0*** ▼	**26,082**	***3.4*** ▲
Among which:				
New energy vehicles	**1,366**	***7.5*** ▲	**3,545**	***159.5*** ▲
NEV – Passenger cars	1,247	*11.3* ▲	3,359	*169.5* ▲
NEV – Commercial vehicles	120	*-20.8* ▼	186	*55.4* ▲



China Car Sales by Brand

Volkswagen is the leading brand in China, with over 2.16 million vehicles sold in 2021, followed by Toyota and Honda. Geely is the first domestic brand by the number of vehicles sold in 2021.In aggregate, Chinese brands account for over 44.7% of the sales in 2021, up from 38.4% in 2020.

Share (%)



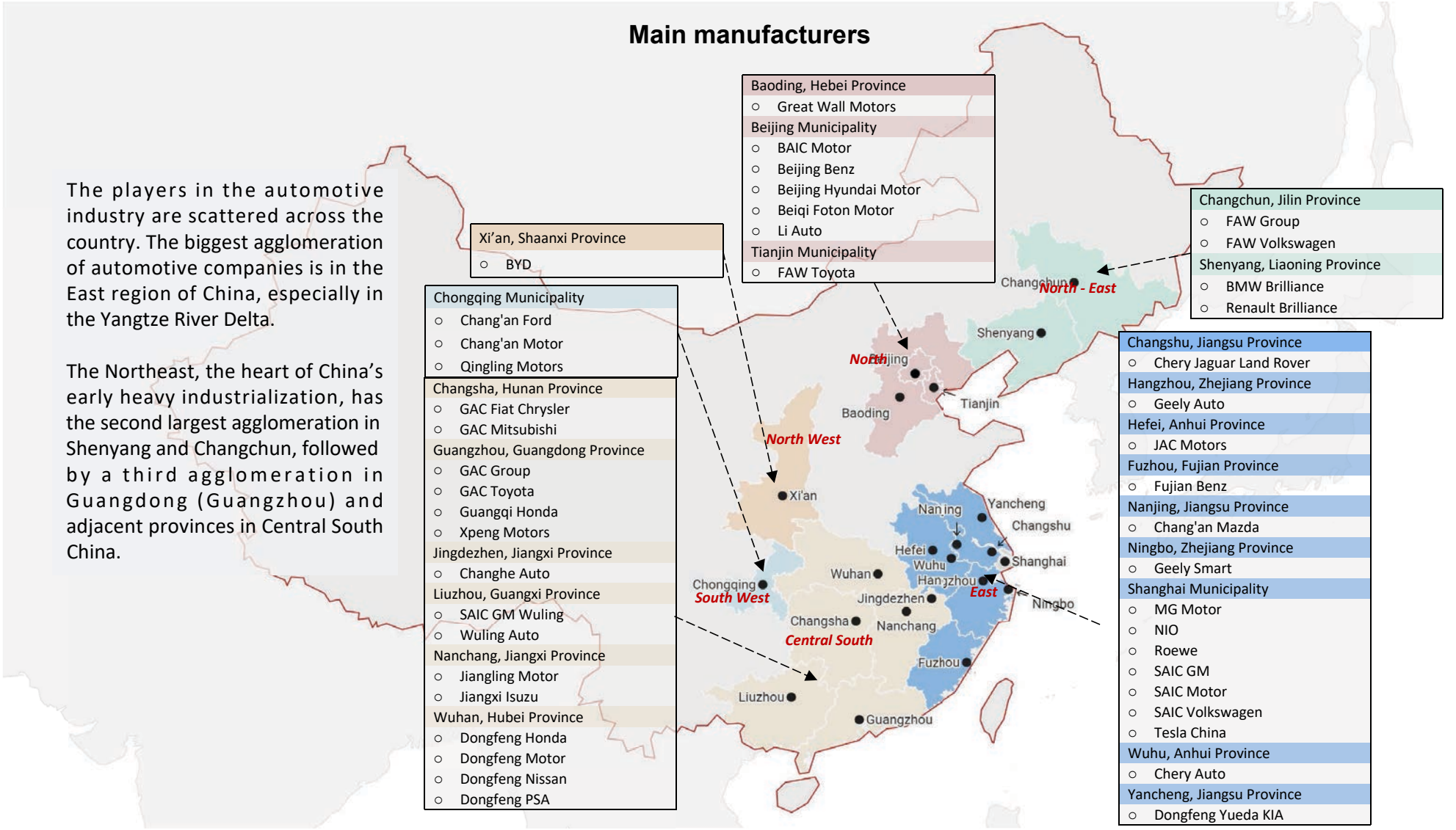
Country of origin	Brand	Sales Y2020 thous. vehicles	Share total percent	Sales 2021 thous. vehicles	Share total percent
Germany	Volkswagen	2,620	*13.2*	2,169	*10.3*
Japan	Toyota	1,533	*7.7*	1,643	*7.8*
Japan	Honda	1,636	*8.3*	1,518	*7.2*
China	Geely Auto	1,123	*5.7*	1,074	*5.1*
China	Wuling Motors	669	*3.4*	1,040	*4.9*
Japan	Nissan	1,104	*5.6*	968	*4.6*
China	Chang'an	793	*4.0*	935	*4.4*
U.S.	Buick	921	*4.7*	829	*3.9*
China	Haval	750	*3.8*	779	*3.7*
China	BYD	404	*2.0*	725	*3.4*
Germany	BMW	609	*3.1*	674	*3.2*
China	Chery	449	*2.3*	647	*3.1*
Germany	Audi	638	*3.2*	631	*3.0*
Germany	Benz	619	*3.1*	598	*2.8*
China	MG	243	*1.2*	400	*1.9*
China	Roewe	436	*2.2*	376	*1.8*
South Korea	Hyundai	434	*2.2*	365	*1.7*
U.S.	Tesla	0	*0.0*	327	*1.6*
China	GAC Trumpchi	301	*1.5*	324	*1.5*
China	Hongchi	196	*1.0*	300	*1.4*
U.S.	Ford	255	*1.3*	274	*1.3*
U.S.	Chevrolet	309	*1.6*	269	*1.3*

3.2 Geography of China automotive market

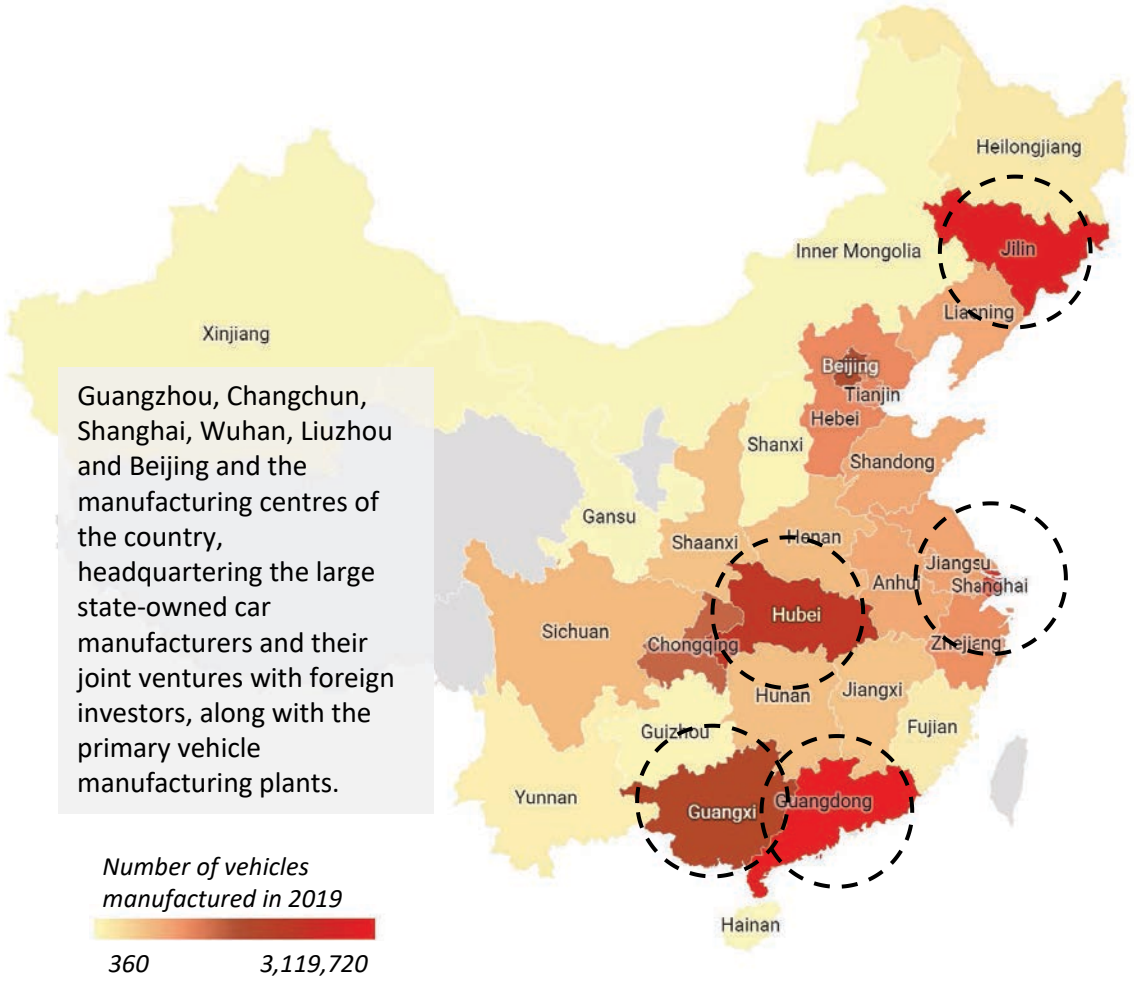
The players in the automotive industry are scattered across the country. The biggest agglomeration of automotive companies is in the East region of China, especially in the Yangtze River Delta.

The Northeast, the heart of China's early heavy industrialization, has the second largest agglomeration in Shenyang and Changchun, followed by a third agglomeration in Guangdong (Guangzhou) and adjacent provinces in Central South China.

Main manufacturers



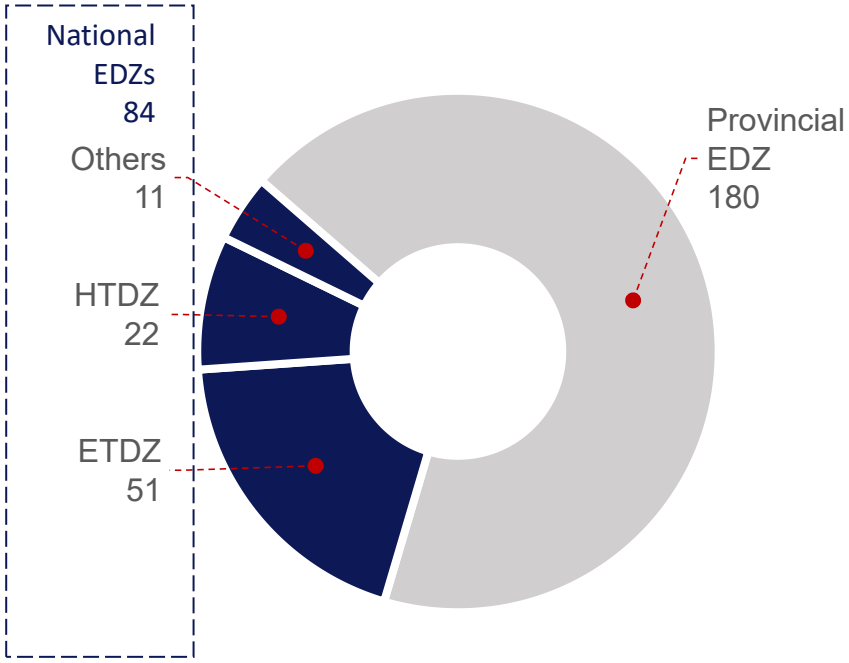
Production by region



Province	Production Y2019 (thous. vehicles)	Share total (percent)
Guangdong	**3,119.7**	**12.1**
Jilin	**2,891.2**	**11.3**
Shanghai	**2,749.0**	**10.7**
Hubei	**2,239.6**	**8.7**
Guangxi	**1,830.3**	**7.1**
Beijing	1,640.2	6.4
Chongqing	1,374.7	5.4
Hebei	1,050.8	4.1
Tianjin	1,041.5	4.1
Zhejiang	991.9	3.9
Jiangsu	838.2	3.3
Liaoning	791.6	3.1
Shandong	777.0	3.0
Anhui	776.2	3.0
Sichuan	642.3	2.5
Henan	618.6	2.4
Hunan	579.1	2.3
Shaanxi	547.0	2.1
Jiangxi	535.6	2.1
Heilongjiang	188.9	0.7
Fujian	161.6	0.6
Yunnan	113.7	0.4
Shanxi	65.8	0.3
Guizhou	56.9	0.2
Inner Mongolia	29.0	0.1
Xinjiang	25.3	0.1
Gansu	0.7	0.0
Hainan	0.4	0.0

Economic areas for automotive industry

EDZs dedicated to automotive industry



84 EDZs at national level (on a total of 552) are dedicated to the automotive industry

Item	Total (number)	Automotive (number)	Share total (percent)
National EDZs	552	**84**	15.2
Provincial EDZs	1,991	**180**	9.0
Total	**2,543**	**264**	**10.4**

The major players in the Chinese automotive industry are located within dedicated national and provincial economic development zones (EDZs). EDZs are areas with preferential policies created to attract foreign direct investments, boost domestic growth, and promote innovation.

Based on the Catalogue of Economic Development Zones (version 2018), China established 2,543 EDZs, 552 approved at the national level and 1,991 at the provincial level.

A 10.4% of these EDZ, equal to 264, are dedicated, partly or wholly, to the automotive industry. The ratio increases to 15.2%, considering only the national level EDZ.

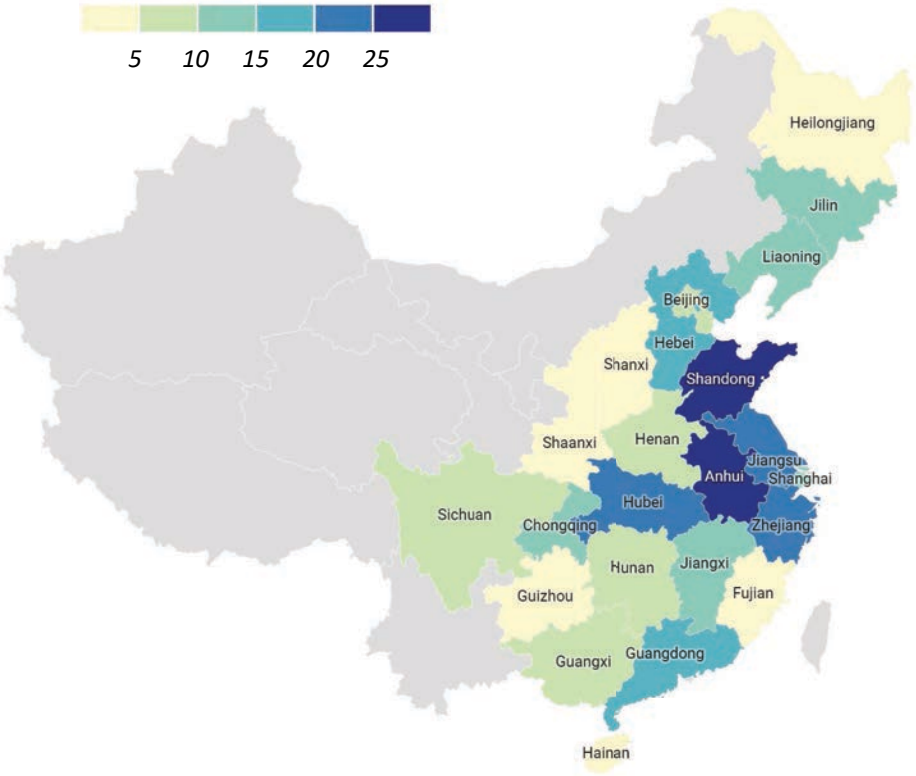
Among the 264 EDZs identified for the automotive industry, **84 are EDZs at national level,** as follows:

- 51 are economic and technological development zones (ETDZ);
- 22 are high-tech development zones (HTDZ); and
- 11 are national EDZ of other types, including Customs special supervision areas and cross-border economic cooperation zones.

Economic areas for automotive industry

EDZs dedicated to Automotive industry, by province

Number of total EDZs for Automotive



Region	National level EDZ (number)	National level Share (percentage)	Provincial level EDZ (number)	Provincial level Share (percentage)	Total EDZ (number)	Total Share (percentage)
Northeast	10	*11.9*	16	*8.9*	26	*9.8*
North	7	*8.3*	26	*14.4*	33	*12.5*
Northwest	1	*1.2*	2	*1.1*	3	*1.1*
Central South	25	*29.8*	46	*25.6*	71	*26.9*
Southwest	2	*2.4*	17	*9.4*	19	*7.2*
East	39	*46.4*	73	*40.6*	112	*42.4*
Total	**84**	***100.0***	**180**	***100.0***	**264**	***100.0***

Most of the EDZs dedicated to the automotive industry is located in the East region of China, in the Yangtze River Delta (Shanghai, western Anhui, northern Zhejiang, and southern Jiangsu) and Shandong province, followed by the Central South of the country (Guangdong, Hubei, and Guangxi) and the Northeast China (Jilin and Liaoning).

East China

The Eastern part of China, with the **Yangtze River Delta**, is the economic heart of China.

Several car manufacturers established their headquarters and manufacturing plants in the region, which offers economic development zones (both at the national and provincial levels) to boost investments in the automotive industry.

	National EDZ	Provincial EDZ	Total EDZ
East	**39**	**73**	**112**
○ Shandong	9	18	27
○ Anhui	8	17	25
○ Jiangsu	10	14	24
○ Zhejiang	8	13	21
○ Shanghai	3	9	12
○ Fujian	1	2	3

Shanghai, the country's financial centre, is the headquarter of SAIC, together with its joint ventures with GM and Volkswagen. The US car manufacturer Tesla operates a large factory in Shanghai Lingang Special Area.

NIO, which represents China's new generation car maker, is headquartered in Shanghai.

Other car manufacturers, such as Chery, Geely, JAC Motors, Mazda, and Roewe, are established in neighbouring **Jiangsu**, **Anhui**, and **Zhejiang** provinces.

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East China: Automotive Economic areas

- **East China**: Anhui, Fujian, Jiangsu (national EDZs)

Code	Item	Province	Approval (year)	Area (ha)	List of leading industries
G341023	Wuhu Economic and Technological Development Zone	Anhui	1993	1,000	Automotive and parts, electronic appliances, building materials
G341125	Ma'anshan Economic and Technological Development Zone	Anhui	2010	1,144	Automotive and parts, food, machinery and equipment
G341127	Anqing Economic and Technological Development Zone	Anhui	2010	1,240	Chemical medicine, auto parts, equipment manufacturing
G341129	Chuzhou Economic and Technological Development Zone	Anhui	2011	1,089	Smart home appliances, automotive, food
G341132	Xuancheng Economic and Technological Development Zone	Anhui	2014	725	Auto parts, equipment manufacturing, medicine
G342020	Hefei High-tech Industrial Development Zone	Anhui	1991	1,850	Home appliances and accessories, automotive
G342091	Bengbu High-tech Industrial Development Zone	Anhui	2010	674	Auto parts, equipment manufacturing, electronic information
G343065	Wuhu Comprehensive Bonded Zone	Anhui	2015	217	Electronic appliances, auto parts
G351025	Fuqing Rongqiao Economic and Technological Development Zone	Fujian	1992	1,000	Electronic information, automotive and parts, optics
G321085	Jiangning (Nanjing) Economic and Technological Development Zone	Jiangsu	2010	3,847	Automotive, electrical machinery equipment, electronics
G321092	Xiangcheng (Suzhou) Economic and Tech. Development Zone	Jiangsu	2014	213	Electronic information, equipment manufacturing, automotive
G321094	Changshu Economic and Technological Development Zone	Jiangsu	2010	780	Electronic equipment, equipment manufacturing, automotive
G321098	Rugao Economic and Technological Development Zone	Jiangsu	2013	467	Shipbuilding engineering, new energy vehicles, equipment manufacturing
G321101	Yancheng Economic and Technological Development Zone	Jiangsu	2010	872	Automotive, photovoltaic, textile
G321102	Yangzhou Economic and Technological Development Zone	Jiangsu	2009	1,110	Electronic devices, photovoltaics, automotive
G322071	Xuzhou High-tech Industrial Development Zone	Jiangsu	2012	700	General equipment, electronic equipment, automotive
G322077	Huai'an High-tech Industrial Development Zone	Jiangsu	2017	234	New energy vehicles and parts, equipment manufacturing
G323051	Yancheng Comprehensive Bonded Zone	Jiangsu	2012	228	Auto parts, optoelectronics, electronics
G323054	Taizhou Comprehensive Bonded Zone	Jiangsu	2015	176	Equipment manufacturing, electronic information, auto parts

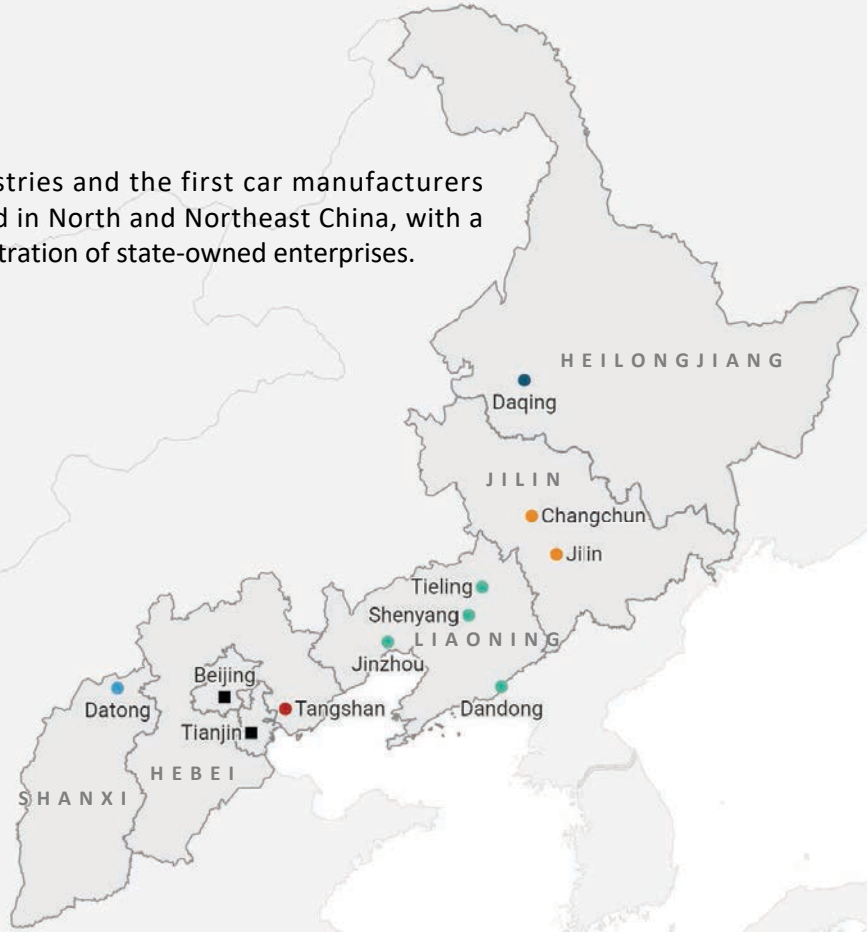
East China: Automotive Economic areas

- **East China**: Shandong, Shanghai, Zhejiang (national EDZs)

Code	Item	Province	Approval (year)	Area (ha)	List of leading industries
G371028	Qingdao Economic and Technological Development Zone	Shandong	1984	1,752	Home appliances, petrochemicals, automotive
G371029	Yantai Economic and Technological Development Zone	Shandong	1984	1,000	Electronic information, machinery, automotive, food
G371155	Weihai Lingang Economic and Technological Development Zone	Shandong	2013	500	New materials, auto parts, equipment manufacturing
G371156	Rizhao Economic and Technological Development Zone	Shandong	2010	850	Automotive and parts, grain, oil and food, packaging
G371159	Liaocheng Economic and Technological Development Zone	Shandong	2013	1,200	New energy, new energy vehicles, biopharmaceuticals
G371160	Binzhou Economic and Technological Development Zone	Shandong	2013	900	Auto parts, new materials, textiles and home textiles
G372107	Yantai High-tech Industrial Development Zone	Shandong	2010	1,465	Information technology, auto parts, pharmaceuticals
G372109	Tai'an High-tech Industrial Development Zone	Shandong	2012	1,376	Transmission and transformation equipment, automotive and parts
G372110	Jinan Laiwu High-tech Industrial Development Zone	Shandong	2015	653	Automotive and parts, electronic information, new materials
G311082	Shanghai Jinqiao Economic and Technological Development Zone	Shanghai	2001	2,738	New energy vehicles, robots
G313025	Shanghai Jiading Export Processing Zone	Shanghai	2005	300	Manufacturing, logistics, automotive and parts
G313027	Shanghai Jinqiao Export Processing Zone	Shanghai	2001	280	New energy vehicles, industrial Internet, robots
G331020	Ningbo Economic and Technological Development Zone	Zhejiang	1984	2,960	Chemical, automotive, metal smelting and processing
G331111	Ningbo Hangzhou Bay Economic Technological Development Zone	Zhejiang	2014	1,000	Automotive and parts, new materials, electrical
G331112	Jiaxing Economic and Technological Development Zone	Zhejiang	2010	1,100	Equipment manufacturing, auto parts, food
G331116	Huzhou Changxing Economic and Tech. Development Zone	Zhejiang	2010	1,900	New energy vehicles and parts, equipment manufacturing
G331119	Hangzhou Bay Shangyu Economic Technological Development Zone	Zhejiang	2013	1,000	Chemicals, new materials, automotive and parts
G331120	Jinhua Economic and Technological Development Zone	Zhejiang	2010	886	Automotive, heat, transportation equipment
G332083	Hangzhou Xiaoshan Linjiang High-tech Industrial Develop. Zone	Zhejiang	2015	355	Equipment manufacturing, automotive, new energy, new materials
G333055	Zhejiang Hangzhou Export Processing Zone	Zhejiang	2000	292	Electronic information, auto parts, cross-border e-commerce

North & Northeast China

The heavy industries and the first car manufacturers were established in North and Northeast China, with a very high concentration of state-owned enterprises.



	National EDZ	Provincial EDZ	Total EDZ
Northeast	**10**	**16**	**26**
○ Jilin	4	9	13
○ Liaoning	5	7	12
○ Heilongjiang	1	0	1
North	**7**	**26**	**33**
○ Hebei	1	18	19
○ Tianjin	4	4	8
○ Beijing	1	4	5
○ Shanxi	1	0	1

FAW, the first Chinese state-owned car manufacturer, was established in **Changchun**, **Jilin** Province, in 1953, with joint ventures with Toyota in **Tianjin**.

BAIC and its joint ventures with Benz and Hyundai are located in **Beijing**, while Brilliance and the joint venture with BMW are established in **Shenyang**, **Liaoning** Province.

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North and Northeast China: Automotive Economic areas

- **North China:** Beijing, Hebei, Shanxi, Tianjin (national EDZs)

Code	Item	Province	Approval (year)	Area (ha)	List of leading industries
G111001	Beijing Economic and Technological Development Zone	Beijing	1994	3,980	Automotive, electronic information, equipment manufacturing
G132054	Tangshan High-tech Industrial Development Zone	Hebei	2010	450	Equipment manufacturing, auto parts, new materials
G141060	Datong Economic and Technological Development Zone	Shanxi	2010	820	Medicine, automotive, construction
G121050	Dongli Economic and Technological Development Zone	Tianjin	2014	722	Automotive, new energy, new materials
G121002	Tianjin Economic and Technological Development Zone	Tianjin	1984	3,797	Automotive, medicine, equipment manufacturing
G121051	Xiqing Economic and Technological Development Zone	Tianjin	2010	1,688	Electronic information, automotive, machinery
G122002	Tianjin Binhai High-tech Industrial Development Zone	Tianjin	1991	5,524	New energy vehicles, IT, energy saving and environmental protection

- **Northeast China:** Heilongjiang, Jilin, Liaoning (national EDZs)

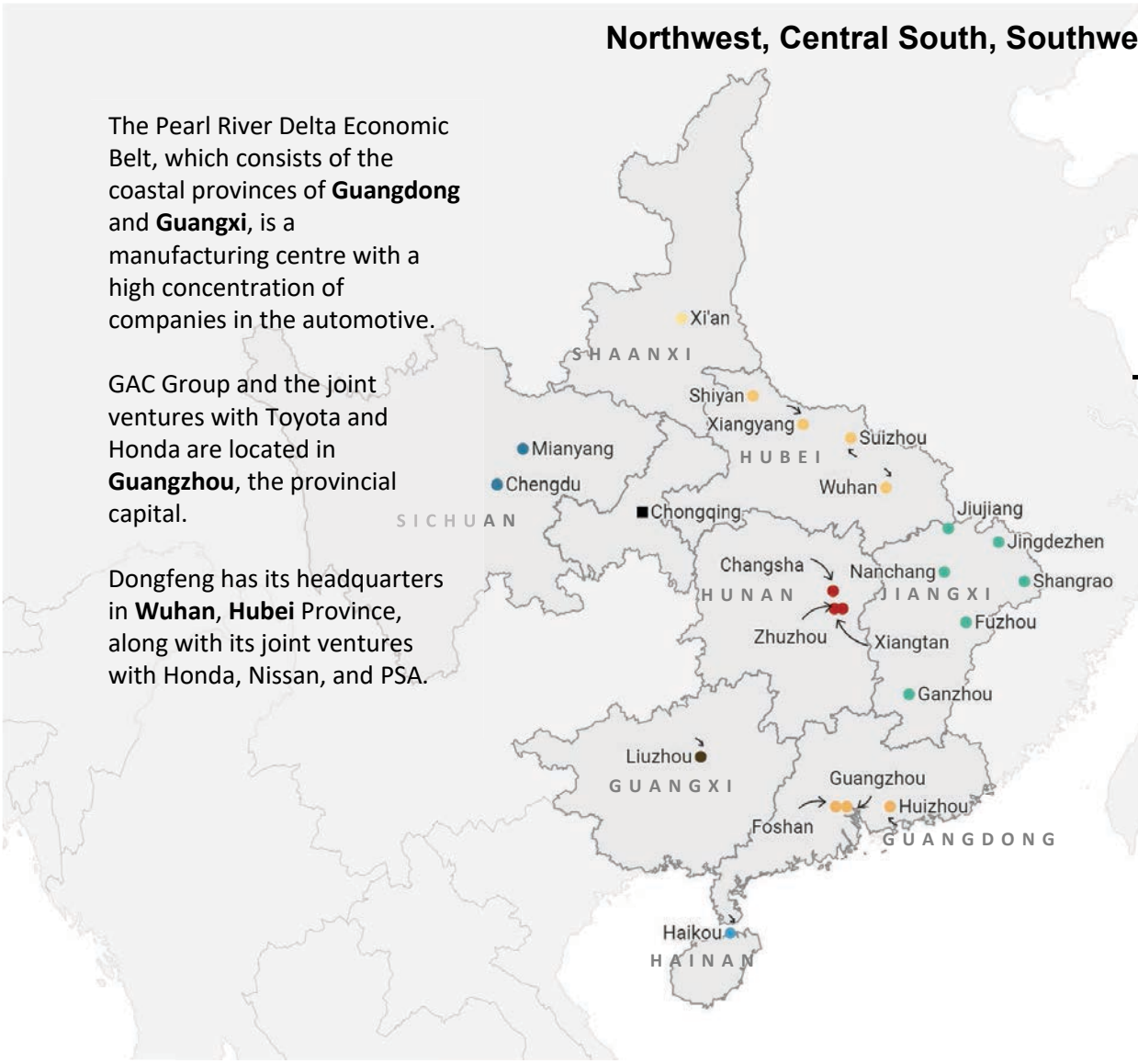
Code	Item	Province	Approval (year)	Area (ha)	List of leading industries
G232013	Daqing High-tech Industrial Development Zone	Heilongjiang	1992	1,430	Petrochemical, automotive, equipment manufacturing
G221009	Changchun Economic and Technological Development Zone	Jilin	1993	1,000	Automotive and agricultural products processing
G221071	Changchun Automotive Economic Technological Development Zone	Jilin	2010	599	Automotive
G222010	Changchun High-tech Industrial Development Zone	Jilin	1991	1,911	Automotive, equipment manufacturing, biomedicine
G222011	Jilin High-tech Industrial Development Zone	Jilin	1992	436	Chemicals, automotive and parts, electronics
G211070	Tieling Economic and Technological Development Zone	Liaoning	2013	120	automotive, valve, rubber and plastic
G212061	Jinzhou High-tech Industrial Development Zone	Liaoning	2015	372	Auto parts, fine chemicals, food
G215003	Dandong Border Economic Cooperation Zone	Liaoning	1992	630	Automotive and parts, instruments and meters
G216034	Sino-German (Shenyang) High-end Equip. Manufacturing Indus. Park	Liaoning	2015	3,553	Intelligent manufacturing, equipment manufacturing, automotive
G216022	Shenyang Strait Science and Technology Industrial Park	Liaoning	1995	500	Computer and software, automotive and parts, environmental protection

Northwest, Central South, Southwest China

The Pearl River Delta Economic Belt, which consists of the coastal provinces of **Guangdong** and **Guangxi**, is a manufacturing centre with a high concentration of companies in the automotive.

GAC Group and the joint ventures with Toyota and Honda are located in **Guangzhou**, the provincial capital.

Dongfeng has its headquarters in **Wuhan**, **Hubei** Province, along with its joint ventures with Honda, Nissan, and PSA.



	National EDZ	Provincial EDZ	Total EDZ
Northwest	**1**	**2**	**3**
○ Shaanxi	1	2	3
Central South	**25**	**46**	**71**
○ Hubei	7	15	22
○ Guangdong	5	10	15
○ Jiangxi	6	4	10
○ Hunan	3	6	9
○ Henan	2	7	9
○ Guangxi	1	4	5
○ Hainan	1	0	1
Southwest	**2**	**17**	**19**
○ Chongqing	0	12	12
○ Sichuan	2	4	6
○ Guizhou	0	1	1

Northwest, Central South, Southwest China: Automotive Economic areas

- **Central South China:** Guangdong, Guangxi, Hubei, Hunan (national EDZs)

Code	Item	Province	Approval (year)	Area (ha)	List of leading industries
G441034	Guangzhou Economic and Technological Development Zone	Guangdong	1984	3,858	Electronic and communication equipment, chemical industry, automotive
G441183	Zengcheng Economic and Technological Development Zone	Guangdong	2010	500	Automotive and parts, electronic information, equipment manufacturing
G441037	Huizhou Daya Bay Economic and Technological Development Zone	Guangdong	1993	2,360	Petrochemical, electronics, automotive
G442038	Foshan High-tech Industrial Development Zone	Guangdong	1992	1,000	Equipment manufacturing, smart home appliances, auto parts
G443100	Guangzhou Export Processing Zone	Guangdong	2000	95	Automotive, logistics
G452136	Liuzhou High-tech Industrial Development Zone	Guangxi	2010	110	Automotive, equipment manufacturing, new materials
G462043	Haikou High-tech Industrial Development Zone	Hainan	1991	277	Medicine, automotive and parts, food
G421170	Wuhan Airport Economic and Technological Development Zone	Hubei	2010	1,900	Automotive, agricultural and sideline food
G421032	Wuhan Economic and Technological Development Zone	Hubei	1993	1,000	Automotive, electronic appliances, food
G421172	Shiyan Economic and Technological Development Zone	Hubei	2012	2,003	Automotive
G421173	Xiangyang Economic and Technological Development Zone	Hubei	2010	1,470	Automotive, equipment manufacturing, electronic information
G422032	Xiangyang High-tech Industrial Development Zone	Hubei	1992	750	Automotive, equipment manufacturing, new energy, new materials
G422123	Suizhou High-tech Industrial Development Zone	Hubei	2015	413	Automotive and parts, agricultural products, electronic information
G423092	Hubei Wuhan Export Processing Zone	Hubei	2000	130	Electronic appliances, auto parts, biomedicine
G431033	Changsha Economic and Technological Development Zone	Hunan	2000	1,200	Construction machinery, automotive and parts, electronic information
G431179	Xiangtan Economic and Technological Development Zone	Hunan	2011	1,246	Automotive and parts, equipment manufacturing, electronic information
G432034	Zhuzhou High-tech Industrial Development Zone	Hunan	1992	858	Rail transit equipment, Automotive, biomedicine

Northwest, Central South, Southwest China: Automotive Economic areas

- **Central South China:** Jiangxi (national EDZs)

Code	Item	Province	Approval (year)	Area (ha)	List of leading industries
G361027	Nanchang Economic and Technological Development Zone	Jiangxi	2000	980	Electronic information, automotive and parts, medicine
G361141	Nanchang Xiaolan Economic and Technological Development Zone	Jiangxi	2012	1,800	Automotive and parts, food and beverage, biomedicine
G361143	Jiujiang Economic and Technological Development Zone	Jiangxi	2010	2,267	New energy, electronic appliances, automotive and parts
G361144	Ganzhou Economic and Technological Development Zone	Jiangxi	2010	748	New materials, new energy vehicles, electronic information
G361149	Shangrao Economic and Technological Development Zone	Jiangxi	2010	1,481	Photovoltaics, optics, automotive
G362104	Fuzhou High-tech Industrial Development Zone	Jiangxi	2015	1,333	Automotive and parts, biopharmaceuticals, electronic information

- **Southwest China:** Sichuan (national EDZs)

Code	Item	Province	Approval (year)	Area (ha)	List of leading industries
G511040	Chengdu Economic and Technological Development Zone	Sichuan	2000	994	Automotive, construction machinery, food and beverage
G512046	Mianyang High-tech Industrial Development Zone	Sichuan	1992	580	Electronic information, automotive and parts, new materials

- **Northwest China:** Shaanxi (national EDZs)

Code	Item	Province	Approval (year)	Area (ha)	List of leading industries
G611044	Xi'an Economic and Technological Development Zone	Shaanxi	2000	988	Automotive, special general equipment, new materials

3.3 Italian Business Network in China Automotive Market

Sistema Italia: CICC and the Italian business network

The Italian business network of CICC includes over **800** investments, among which **60** in the automotive industry.

This report would like to give an overview of the Italian business network in the automotive industry in China, based on the analysis of the information collected and organized by the CICC, and to provide a mapping of the entities representing Sistema Italia in China as of 31 December 2021.

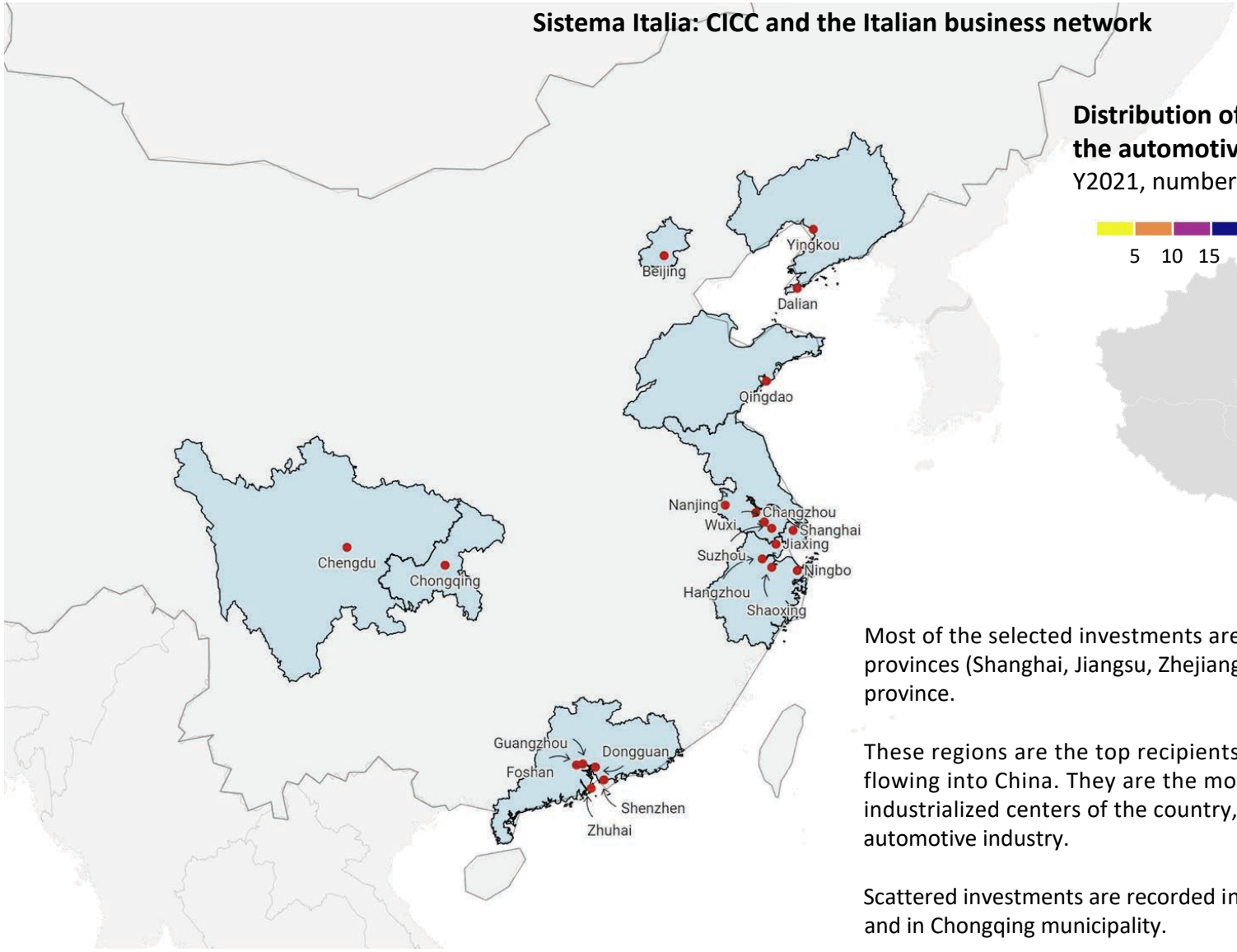
Starting from over 800 investments by Italian groups, companies, and individuals, we identified 60 companies established within the territory of China and with operations in the local growing automotive industry.

The mapping aims to provide an understanding of the geographical collocation of the selected investments, the kind of activities and business performed, and the size of the investment.

This report, however, is not intended to cover all the Italian investments in China with operations in the automotive industry but is limited to those recorded in the CICC's database.

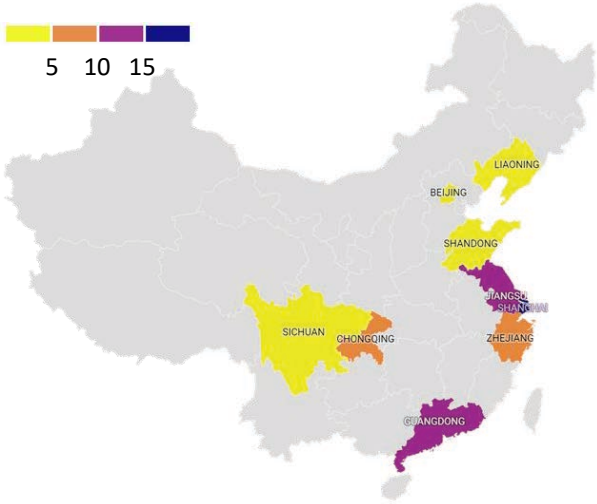
The CICC (**China – Italy Chamber of Commerce**) is the only business organization recognized by the Italian Government and the People's Republic of China that aims to boost Italian business's internationalization and promote the "**Made in Italy**" in China.
With seven offices across the country, CICC represents the interest of the Italian business community in China and welcomes to its network Chinese companies as "Friends of CICC", boosting connectivity among the Sino-Italian business community, made of over 800 members operating across several industries and sectors. .

Sistema Italia: CICC and the Italian business network



Distribution of the investments in the automotive industry

Y2021, number of investments



Most of the selected investments are located in the eastern coastal provinces (Shanghai, Jiangsu, Zhejiang) and the southern Guangdong province.

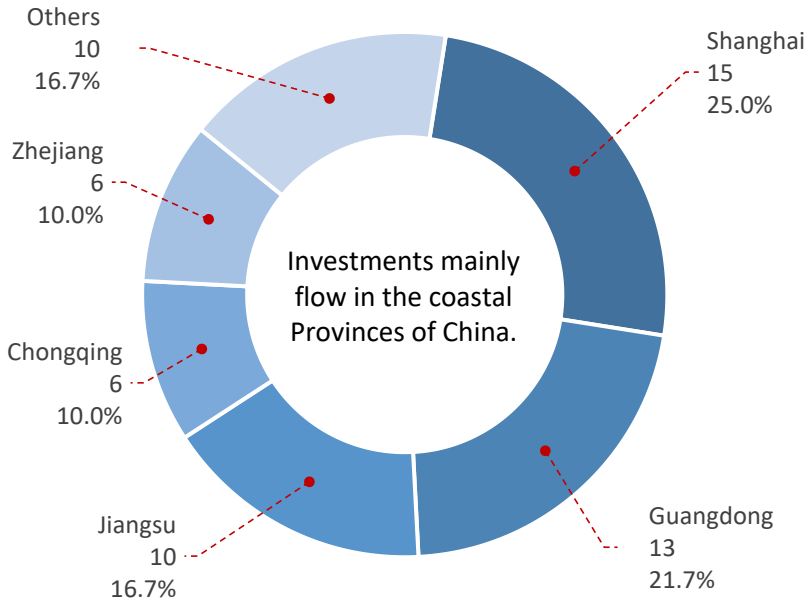
These regions are the top recipients of foreign direct investments flowing into China. They are the most economically advanced and industrialized centers of the country, with solid development in the automotive industry.

Scattered investments are recorded in the North and Northeast China and in Chongqing municipality.

Distribution of the investments by province and prefecture

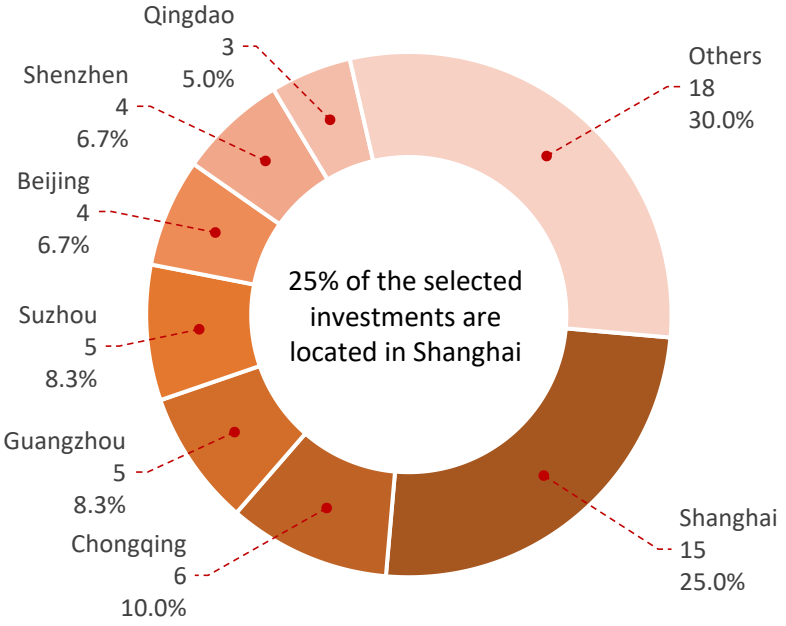
Distribution of the investments by province

N = 60, *number of investments and percentage of total*



Distribution of the investments by prefecture

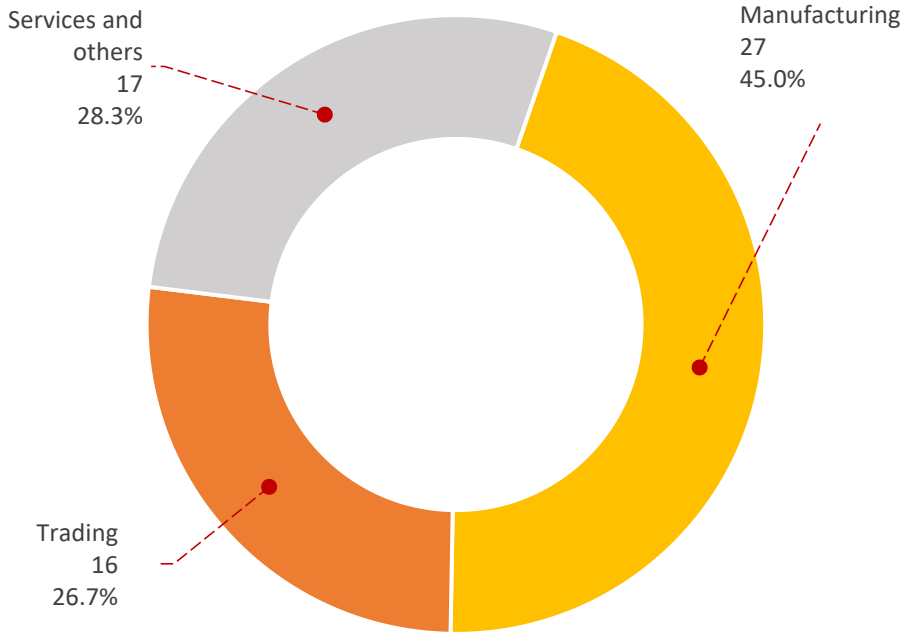
N = 60, *number of investments and percentage of total*



Distribution of the investments by activity and by year of establishment

Distribution of the investments by activity

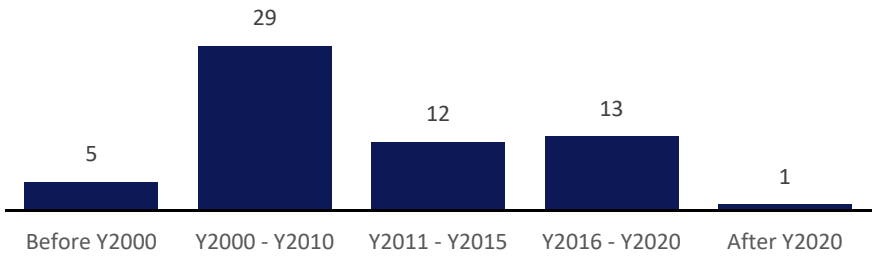
N = 60, *number of investments and percentage of total*



Distribution of the investments by year of establishment

N = 60, *number of investments and percentage of total*

Most of the investments have been performed during the decade Y2000 - Y2010 (29 investments, 48.3% of the total), and Y2011 – Y2020 (25 investments, accounting for 41.7% of the total)



Among the 60 selected investments, 27 are production enterprises established in China by Italian group for the local manufacturing of goods and products for the automotive industry, mainly components and spare parts.

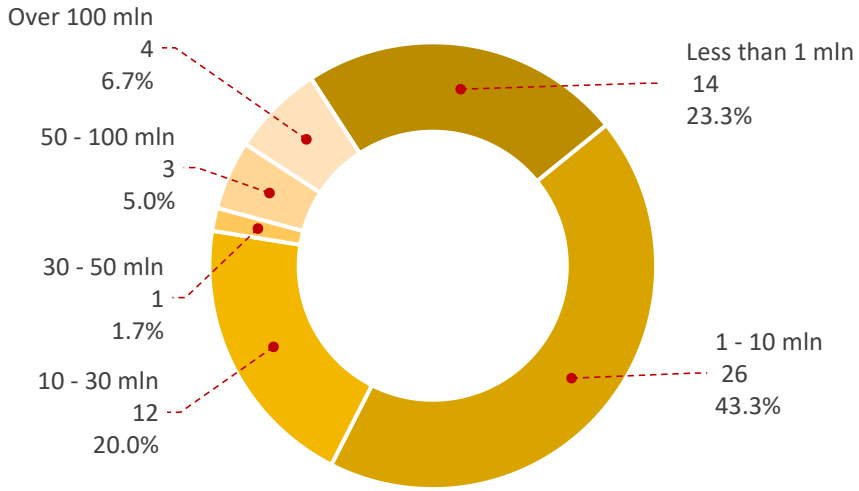
16 investments are related to the establishment of import-export and trading enterprises engaged in the trade of components and automotive parts.

The remaining 17 investments refer to enterprises operating in the services and other activities, mainly providing design, engineering, and supporting business.

Distribution of the investments by registered capital and by headcount

Distribution of the investments by registered capital

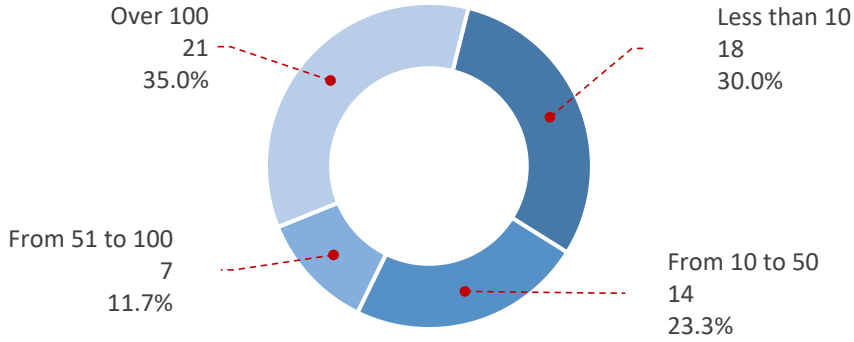
N = 60, *number of investments and percentage of total, registered capital in USD*



Registered capitals not expressed in USD were converted in USD according to the following exchange rates:	1 EUR	1.050 USD
	1 CNY	0.148 USD
	1 HKD	0.127 USD

Distribution of the investments by headcount

N = 60, *number of investments and percentage of total*



Two-thirds of the selected investments (40) have a registered capital less than USD 10 million. Among them, 14 have a capitalization less than USD 1 million, and 26 between 1 to 10 million.

20% of the investments (12) have a capital between 10 to 30 million, with the remaining 13.3% (8 investments) with a capital over USD 30 million.

With regards to the number of employees and workers, in 30% of the selected investments the total headcount is lower than 10, and 23.3% the headcount ranges between 10 to 50.

In the remaining 28 investments, the headcount ranges between 51 to 100 in 7 companies, and over 100 in 21 companies.

3.4 China Imports of Italian Automotive Products

China imports of goods: Trend

China is one of the largest importers worldwide. In 2021, the value of Chinese imports increased by 30.1%, after the decline in Y2019 (-2.7%), and Y2020 (-1.1%), setting a record-high amount of USD 2,687.5 billion.

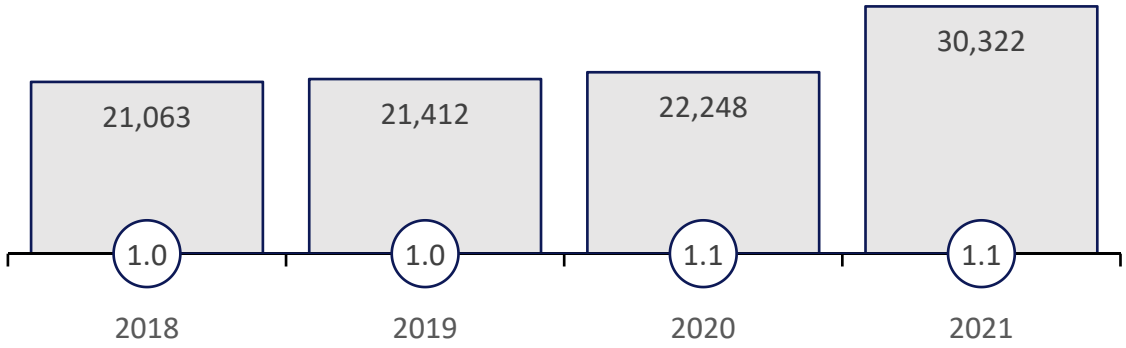
China mainly imported goods such as electrical machinery and equipment (HS Chapter 85), machinery and mechanical appliances (HS Chapter 84), and resources， including mineral fuels and oils (HS Chapter 27), and ores, slag and ashes (HS Chapter 26).

Chinese Imports from Italy topped USD 30.3 billion in 2021, growing by 36.3% compared to 2020.

Item	Unit	Y2018	Y2019	Y2020	Y2021
China Total Imports	USD mln	2,135,637	2,077,097	2,055,612	2,687,529
Increase YoY	Percent	15.8	-2.7	-1.1	30.1
China Imports from Italy	USD mln	21,063	21,412	22,248	30,322
Increase YoY	Percent	2.8	1.7	3.9	36.3
Share on Total Imports	Percent	1.0	1.0	1.1	1.1

China imports from Italy

Amount in USD mln and share of total China imports in percent



China imports of goods: by Chapter

China mainly imports integrated circuits (included in HS Chapter 85), crude petroleum (HS chapter 27), iron ore (HS chapter 26), machinery and mechanical appliances (HS chapter 84), LCDs and medical instruments (HS chapter 90), cars and motor vehicles (HS chapter 87)

HS Ch.	Item	Imports Y2020 (USD mln)	Share Y2020 (percent)	Imports Y2021 (USD mln)	Share Y2021 (percent)	Increase YoY (percent)
85	Electrical machinery and equipment, sound recorders, reproducers, television image, and parts thereof	548,743	*26.7*	668,846	*24.9*	21.9
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	267,556	*13.0*	403,915	*15.0*	51.0
26	Ores, slag and ash	180,016	*8.8*	274,653	*10.2*	52.6
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof	191,964	*9.3*	231,206	*8.6*	20.4
90	Optical, photo, cinematographic, measuring, checking, precision, medical or surgical instruments ….	99,097	*4.8*	109,179	*4.1*	10.2
87	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	73,974	*3.6*	86,395	*3.2*	16.8
39	Plastics and articles thereof	71,041	*3.5*	82,814	*3.1*	16.6
71	Natural or cultured pearls, precious or semi-precious stones, precious metals, metals clad with precious…	31,750	*1.5*	77,417	*2.9*	143.8
74	Copper and articles thereof	48,549	*2.4*	66,097	*2.5*	36.1
29	Organic chemicals	45,558	*2.2*	60,250	*2.2*	32.2
	Others	497,364	*24.2*	626,757	*23.3*	26.0
	China total imports	**2,055,612**	***100.0***	**2,687,529**	***100.0***	**30.7**

China Automotive Imports

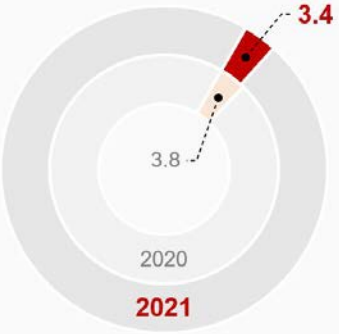
Item	Unit	Y2020	Y2021
China **Total Imports**	USD mln	2,055,612	2,687,529
China Total Automotive Imports	USD mln	78,708	91,017
Share of Total Imports	*Percent*	*3.8*	*3.4*
China **Imports from Italy**	USD mln	22,248	30,322
China Automotive Imports from Italy	USD mln	749	1,291
Share of Imports from Italy	*Percent*	*3.4*	*4.3*
Share of Total Automotive Imports	*Percent*	*1.0*	*1.4*

China Automotive Imports refer to the import of goods and products classified by the General Administration of Customs of China as motor vehicles, chassis fitted with engines, and parts, accessories, and components of vehicles (the complete list of goods and their HS classification is available in the **appendix**).

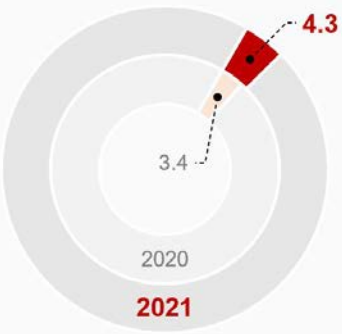
Imports of goods for the automotive industry totaled USD 91.02 billion in 2021, up by 15.6% over the previous year and accounting for **3.4% of Chinese imports** (vs 3.8% in 2020).

In the same period, China imported USD 1.29 billion of goods from Italy for the automotive industry, increasing 72.4% compared to 2020. Imports of Italian - sourced automotive products accounted for **4.3% of the total Chinese imports from Italy** (up from 3.4% recorded in 2020) and for 1.4% of the total automotive imports of the country in 2021.

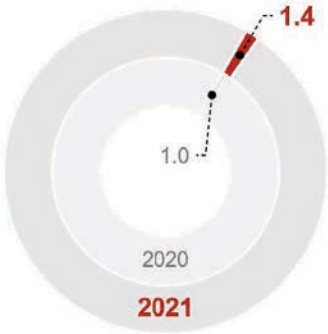
China total automotive imports
Share of Automotive imports on China total imports, in percent



Automotive imports from Italy
Share of Automotive imports on China's import from Italy, in percent



China total automotive imports
Italy share of China total automotive imports, in percent



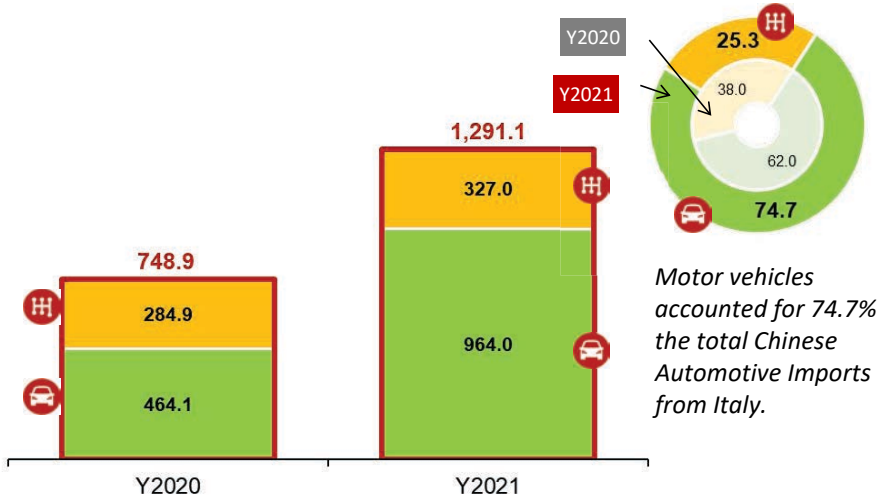
China's Automotive Imports from Italy reached USD 1,291 million in Y2021, accounting for 4.3% of the total Chinese imports from Italy and 1.4% of China's Automotive Imports in the same year.

China Automotive Imports: Total Imports VS Imports from Italy

Item	China Total Automotive Imports			China Automotive Imports from Italy		
	Imports 2020 (USD mln)	Imports 2021 (USD mln)	Increase YoY (percent)	Imports 2020 (USD mln)	Imports 2021 (USD mln)	Increase YoY (percent)
Motor vehicles	46,701.8	53,908.9	15.4 ▲	464.1	964.0	107.7 ▲
Components and spare parts	32,006.6	37,107.9	15.9 ▲	284.9	327.0	14.8 ▲
Automotive imports	**78,708.5**	**91,016.8**	**15.6 ▲**	**748.9**	**1,291.1**	**72.4 ▲**

China total automotive imports
Amount in USD mln and share of total in percent

China Automotive imports from ITaly
Amount in USD mln and share of total in percent



Motor vehicles accounted for 74.7% of the total Chinese Automotive Imports from Italy.

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China Automotive Imports: Imports by Category

Item	Imports Y2020 (USD mln)	Share Y2020 (percent)	Imports Y2021 (USD mln)	Share Y2021 (percent)	Increase YoY (percent)
Components and spare parts	**32,007**	***40.7***	**37,108**	***40.8***	**15.9** ▲
Bodies for motor vehicles	20	*0.0*	39	*0.0*	98.8 ▲
Glass and mirrors	423	*0.5*	518	*0.6*	22.4 ▲
Lighting	1,999	*2.5*	2,301	*2.5*	15.1 ▲
Locks	154	*0.2*	201	*0.2*	30.9 ▲
Mountings and fittings	41	*0.1*	47	*0.1*	12.6 ▲
Other automotive parts	1,188	*1.5*	1,702	*1.9*	43.3 ▲
Auto parts	25,778	*32.8*	30,281	*33.3*	17.5 ▲
Piston engines	1,780	*2.3*	1,269	*1.4*	-28.7 ▼
Tyres and parts	623	*0.8*	750	*0.8*	20.3 ▲
Motor vehicles	**46,702**	***59.3***	**53,909**	***59.2***	**15.4** ▲
Buses	23	*0.0*	24	*0.0*	1.9 ▲
Chassis fitted with engines	67	*0.1*	21	*0.0*	-69.5 ▼
Passenger cars	44,917	*57.1*	52,846	*58.1*	17.7 ▲
Road and other tractors	298	*0.4*	374	*0.4*	25.7 ▲
Special purpose motor vehicles	172	*0.2*	137	*0.1*	-20.7 ▼
Trucks	1,224	*1.6*	509	*0.6*	-58.4 ▼
Total China Automotive Imports	**78,708**	***100.0***	**91,017**	***100.0***	**15.6** ▲

China's imports of goods for the automotive industry increased by 15.6% in Y2021

Auto parts include
- Brakes and servobrakes
- Gearboxes
- Bumpers
- Drive and non-driving axles
- Suspension systems
- Steering wheels and boxes
- Road wheels
- Other parts of bodies for vehicles
- Other parts for vehicles

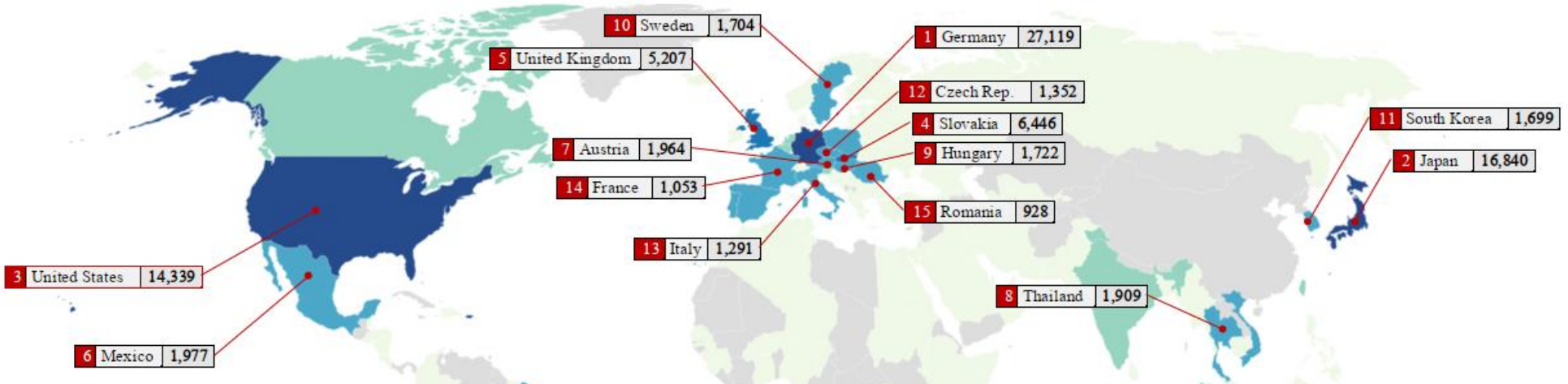
ITA
ITALIAN TRADE AGENCY

China Automotive Imports: Imports by Trading Partner

Rank	Trading Partner	Imports Y2020 (USD mln)	Share Y2020 (percent)	Imports Y2021 (USD mln)	Share Y2021 (percent)	Increase YoY (percent)
1	Germany	23,327	*29.6*	27,119	*29.8*	16.3 ▲
2	Japan	18,021	*22.9*	16,840	*18.5*	-6.6 ▼
3	United States	11,367	*14.4*	14,339	*15.8*	26.1 ▲
4	Slovakia	5,682	*7.2*	6,446	*7.1*	13.4 ▲
5	United Kingdom	3,867	*4.9*	5,207	*5.7*	34.7 ▲
6	Mexico	1,838	*2.3*	1,977	*2.2*	7.6 ▲
7	Austria	1,235	*1.6*	1,964	*2.2*	59.0 ▲
8	Thailand	1,779	*2.3*	1,909	*2.1*	7.3 ▲
9	Hungary	941	*1.2*	1,722	*1.9*	82.9 ▲
10	Sweden	1,585	*2.0*	1,704	*1.9*	7.5 ▲
11	South Korea	1,397	*1.8*	1,699	*1.9*	21.6 ▲
12	Czech Republic	1,066	*1.4*	1,352	*1.5*	26.8 ▲
13	**Italy**	**749**	***1.0***	**1,291**	***1.4***	**72.4** ▲
14	France	608	*0.8*	1,053	*1.2*	73.2 ▲
15	Romania	611	*0.8*	928	*1.0*	52.0 ▲
	RoW	4,635	*5.9*	5,468	*6.0*	18.0 ▲
	Total China Automotive Imports	**78,708**	***100.0***	**91,017**	***100.0***	**15.6** ▲

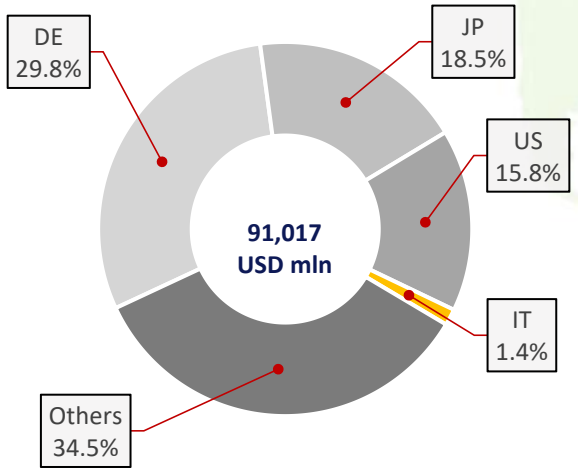
Germany is the first trading partner for Chinese automotive imports, followed by Japan and the US. Almost 65% of the Chinese automotive imports in Y2021 originated from these three countries.

Italy ranks 13°, with USD 1,291 million, accounting for 1.4% of China's automotive imports.



China Automotive imports by trading partner

Share of total in percent



China Automotive Imports: Imports by Trading Partner

Imports in USD, Y2021

China Imports of Auto Parts: by Trading Partner

No.	Trading partner	Imports 2020 (USD mln)	Share Y2020 (percent)	Imports 2021 (USD mln)	Share Y2021 (percent)	Change YoY (percent)
1	Germany	8,382	*32.5*	9,639	*31.8*	15.0 ▲
2	Japan	6,144	*23.8*	6,855	*22.6*	11.6 ▲
3	United States	2,171	*8.4*	2,524	*8.3*	16.3 ▲
4	South Korea	1,297	*5.0*	1,480	*4.9*	14.1 ▲
5	Mexico	1,260	*4.9*	1,336	*4.4*	6.1 ▲
6	France	515	*2.0*	926	*3.1*	79.6 ▲
7	Czech Republic	662	*2.6*	789	*2.6*	19.2 ▲
8	Portugal	586	*2.3*	729	*2.4*	24.3 ▲
9	Romania	369	*1.4*	652	*2.2*	76.7 ▲
10	Hungary	492	*1.9*	637	*2.1*	29.3 ▲
11	Poland	490	*1.9*	621	*2.1*	26.9 ▲
12	Vietnam	306	*1.2*	441	*1.5*	44.2 ▲
13	Thailand	465	*1.8*	394	*1.3*	-15.2 ▼
14	Austria	312	*1.2*	353	*1.2*	13.1 ▲
15	Spain	285	*1.1*	343	*1.1*	20.4 ▲
16	Taiwan, Prov. of China	189	*0.7*	308	*1.0*	63.1 ▲
17	Slovakia	152	*0.6*	235	*0.8*	55.3 ▲
18	**Italy**	**191**	***0.7***	**220**	***0.7***	**15.4** ▲
19	Sweden	187	*0.7*	204	*0.7*	9.5 ▲
20	United Kingdom	168	*0.7*	172	*0.6*	2.2 ▲
	Rest of the World	1,156	*4.5*	1,421	*4.7*	22.9 ▲
	Total	**25,778**	***100.0***	**30,281**	***100.0***	**17.5** ▲

Focusing only on **auto parts**, Italy is the 18° supplier of China by imports value 2021, with a share of 0.7%.

Germany is by far the main supplier of auto parts, with Chinese imports from Germany topping USD 9.64 billion in 2021, followed by Japan, with USD 6.85 billion.

Germany and Japan accounted together for 54.4% of the total Chinese imports of auto parts due to the joint ventures established with Chinese local car manufacturers:

- FAW Volkswagen Audi
- SAIC Volkswagen
- Beijing Benz
- Brilliance BMW
- Beijing Mitsubishi
- Chang'an Mazda
- Dongfeng Honda
- Dongfeng Nissan
- FAW Toyota
- Guangqi Toyota
- Guangqi Honda

ITA
ITALIAN TRADE AGENCY

China Automotive Imports from Italy

Item	Imports Y2020 (USD mln)	Share Y2020 (percent)	Imports Y2021 (USD mln)	Share Y2021 (percent)	Increase YoY (percent)
Components and spare parts	**284.9**	**38.0**	**327.0**	**25.3**	**14.8** ▲
Bodies for motor vehicles	0.2	0.0	0.0	0.0	-100.0 ▼
Glass and mirrors	2.3	0.3	2.5	0.2	9.9 ▲
Lighting	22.4	3.0	24.4	1.9	9.3 ▲
Locks	15.8	2.1	20.8	1.6	31.6 ▲
Mountings and fittings	0.4	0.1	1.2	0.1	185.5 ▲
Other automotive parts	7.3	1.0	9.8	0.8	32.8 ▲
Auto parts	190.9	25.5	220.4	17.1	15.4 ▲
Piston engines	12.2	1.6	9.0	0.7	-26.0 ▼
Tyres and parts	33.2	4.4	38.9	3.0	16.9 ▲
Motor vehicles	**464.1**	**62.0**	**964.0**	**74.7**	**107.7** ▲
Chassis fitted with engines	2.2	0.3	0.3	0.0	-86.7 ▼
Passenger cars	446.9	59.7	938.8	72.7	110.1 ▲
Special purpose motor vehicles	0.9	0.1	0.0	0.0	-100.0 ▼
Trucks	14.1	1.9	25.0	1.9	77.4 ▲
Automotive Imports from Italy	**748.9**	**100.0**	**1,291.1**	**100.0**	**72.4** ▲

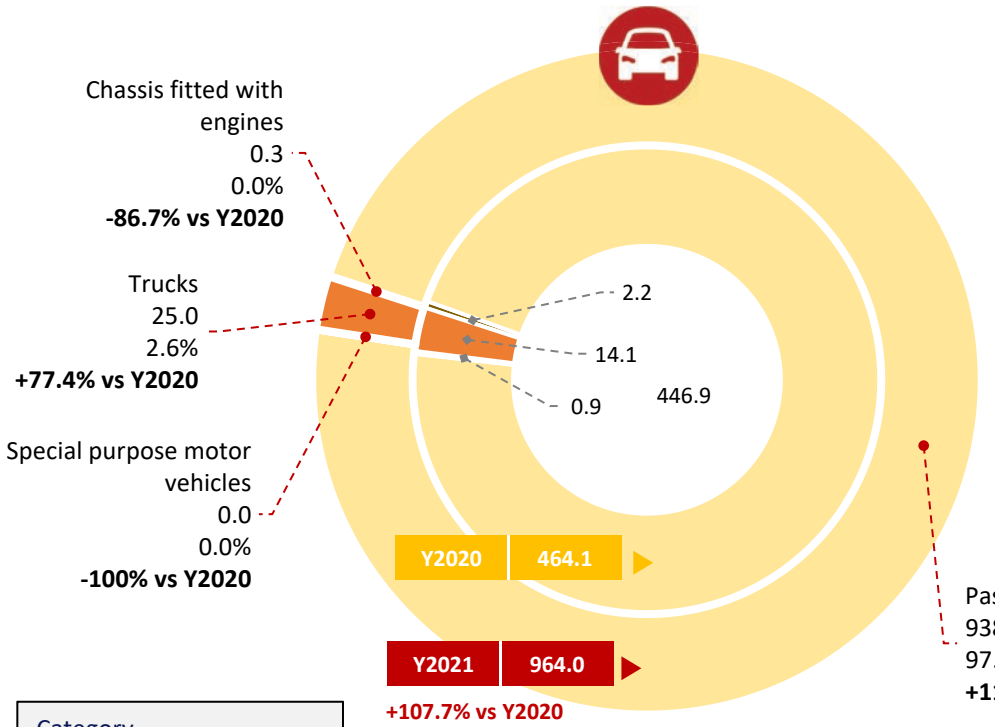
China's imports of Italian made goods for the automotive industry increased by 72.4% in Y2021 reaching USD 1,291 million, boosted by the growth of motor vehicles imports (+107.7%)

Auto parts include
- Brakes and servobrakes
- Gearboxes
- Bumpers
- Drive and non-driving axles
- Suspension systems
- Steering wheels and boxes
- Road wheels
- Other parts of bodies for vehicles
- Other parts for vehicles

China Imports from Italy of Motor Vehicles

Imports of motor vehicles from Italy

Breakdown by category

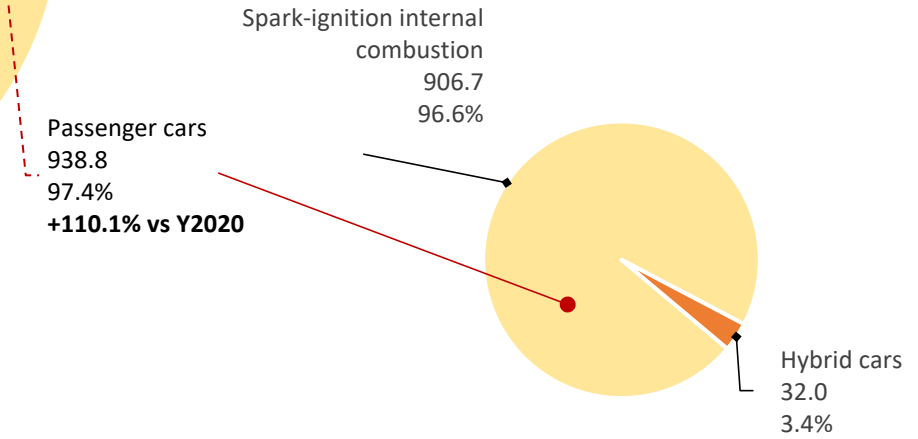


Chinese imports of Italian made motor vehicles reached USD 964 million in Y2021, up by 107.7% compared to Y2020.

Passenger cars, referring to motor vehicles for the transport of less than ten persons, accounted for 97.4% of these imports, with a total value of USD 938.8 million (vs USD 446.9 million imported in Y2020). Almost 97% of the passenger cars imported in Y2021 were spark-ignition internal combustion vehicles, and the residual 3.4% consisted of hybrid vehicles.

Trucks, which refer to motor vehicles for transporting goods, represented 2.6% of the total Italian motor vehicles imported by China in Y2021, followed by chassis fitted with engines.

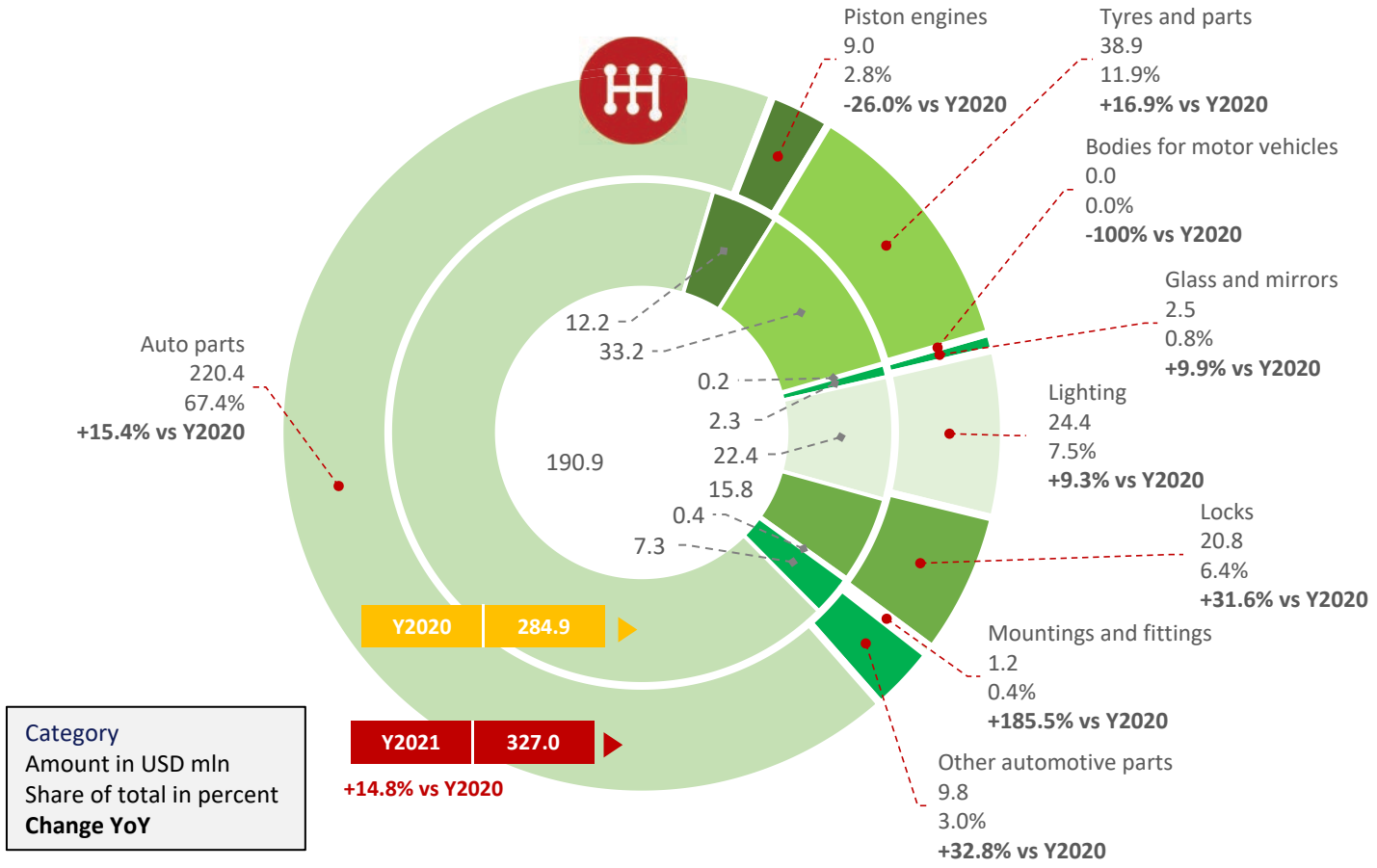
There were no imports of motor vehicles for the transport of more than ten persons (i.e., buses) in Y2021.



China Imports from Italy of Components and Spare Parts

Imports of components and spare parts from Italy

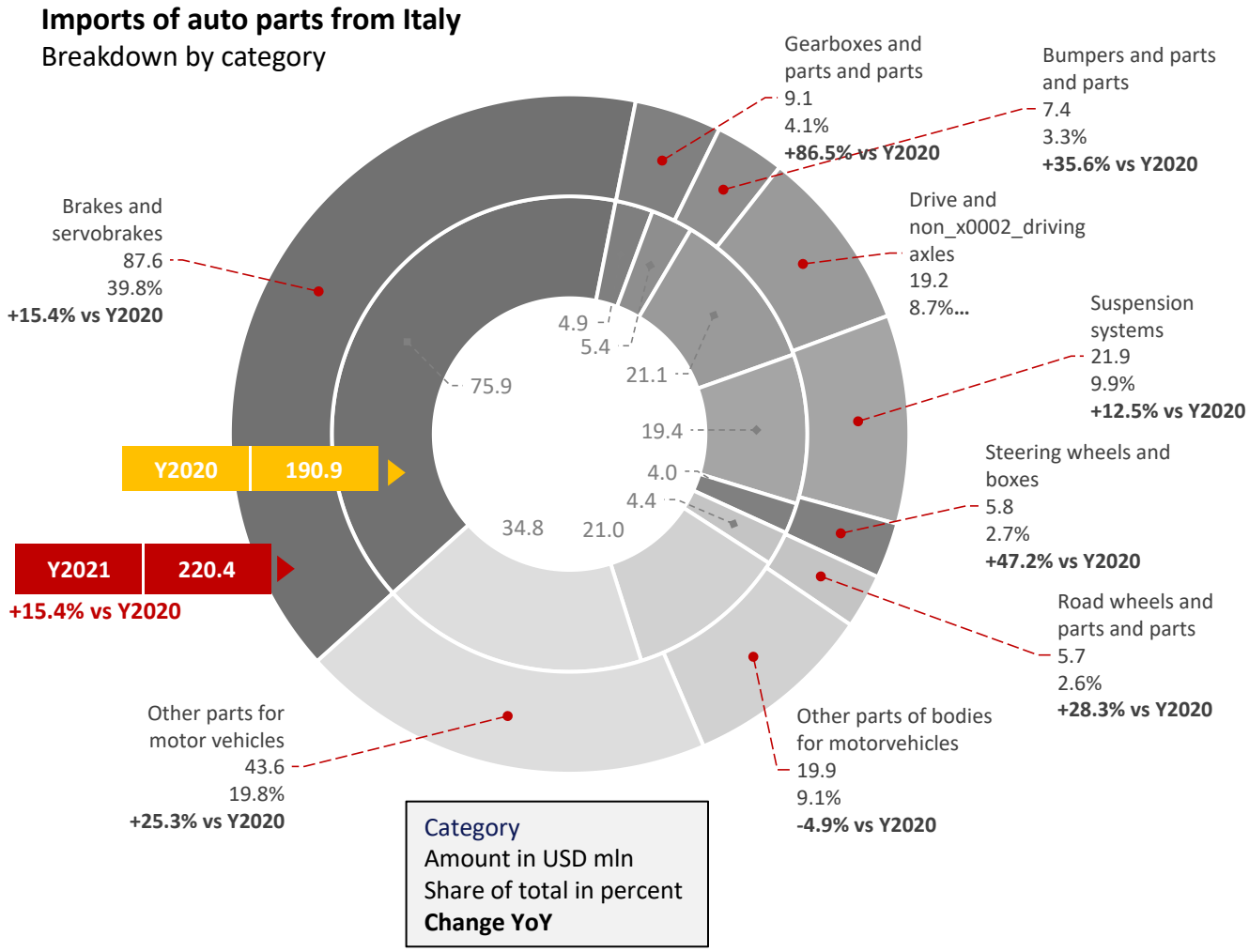
Breakdown by category



Chinese imports of Italian made components and spare parts for vehicles reached USD 327 million in Y2021, growing 14.8% compared to Y2020.

Auto parts, which include brakes, gearboxes, suspension systems, bumpers, and driving axles, account for 67.4% of these imports, for a total import value of USD 220.4 million (vs USD 190.9 million in Y2020), followed by tyres and parts, lighting fixtures, and locks.

China Imports from Italy of Auto Parts



Chinese imports of auto parts from Italy reached USD 220.4 million in Y2021, up by 15.4% compared to USD 190.9 million in Y2020.

Brakes and servo-brakes accounted for 39.8% of the auto parts imported by China, with USD 87.6 million, up by 15.4% vs 2020.

A significant percentage increase was recorded for gearboxes and parts (+86.5% vs Y2020, USD 9.1 million), bumpers and parts (+35.6% vs Y2020, USD 7.4 million), and steering wheels and boxes (+47.2% vs Y2020, USD 5.8 million).

ITA ITALIAN TRADE AGENCY

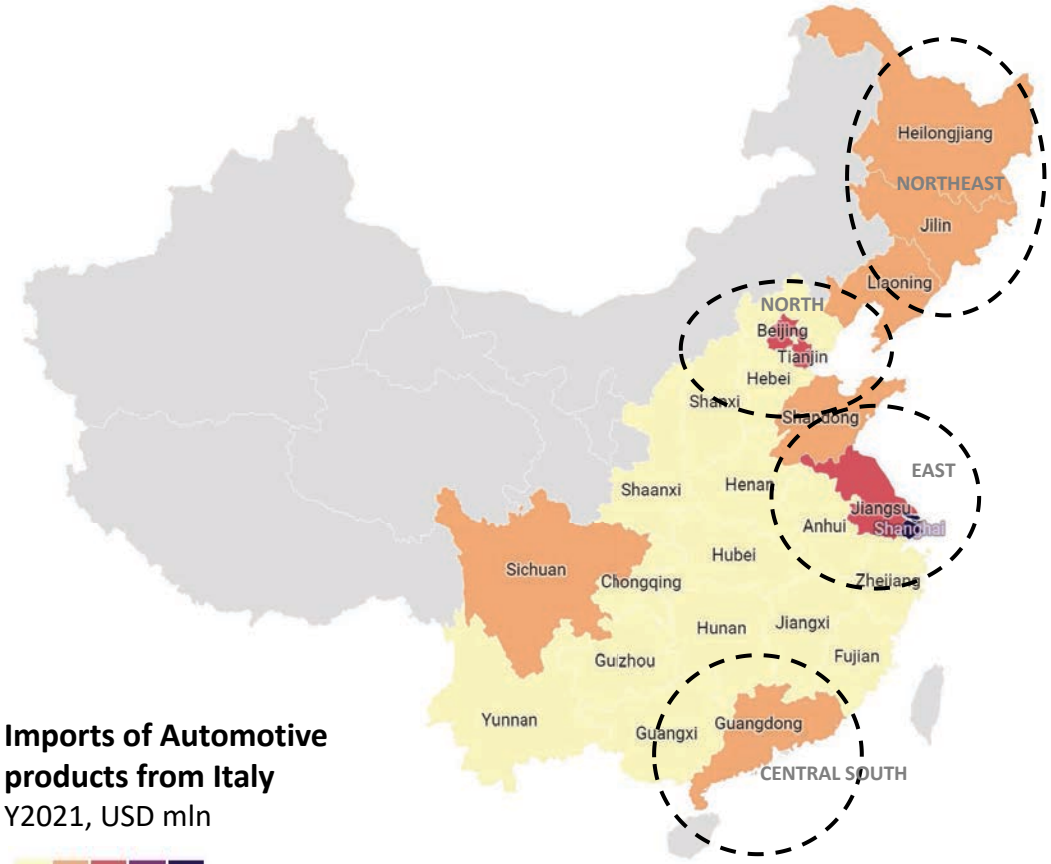
China Automotive Imports from Italy Y2021, by Province

Chinese imports of automotive products from Italy are mainly carried out in six Provinces, which process together 92% of the total value of imports.

In particular, Shanghai received almost 64% of the automotive products from Italy, mostly motor vehicles (three vehicles every four imported in China are delivered through Shanghai Customs), followed by Tianjin (15.2% of total imports from Italy), Beijing (4%), Jiangsu (3.9%), Jilin (2.6%), and Liaoning (2.3%).

Import of	Motor vehicles		Components Spare parts		Total Automotive	
Province	Amount (USD mln)	Share (percent)	Amount (USD mln)	Share (percent)	Amount (USD mln)	Share (percent)
Anhui	0.0	*0.0*	0.1	*0.0*	0.1	*0.0*
Beijing	**4.4**	***0.5***	**47.8**	***14.6***	**52.2**	***4.0***
Chongqing	0.0	*0.0*	6.5	*2.0*	6.5	*0.5*
Fujian	1.8	*0.2*	5.6	*1.7*	7.4	*0.6*
Guangdong	1.9	*0.2*	11.2	*3.4*	13.1	*1.0*
Guangxi	0.0	*0.0*	0.1	*0.0*	0.1	*0.0*
Guizhou	0.0	*0.0*	0.0	*0.0*	0.0	*0.0*
Hebei	0.0	*0.0*	5.5	*1.7*	5.5	*0.4*
Heilongjiang	0.0	*0.0*	18.3	*5.6*	18.3	*1.4*
Henan	0.2	*0.0*	0.6	*0.2*	0.8	*0.1*
Hubei	0.0	*0.0*	5.2	*1.6*	5.2	*0.4*
Hunan	0.0	*0.0*	4.4	*1.4*	4.4	*0.3*
Jiangsu	**16.5**	***1.7***	**34.1**	***10.4***	**50.6**	***3.9***
Jiangxi	0.0	*0.0*	0.1	*0.0*	0.1	*0.0*
Jilin	**0.0**	***0.0***	**32.9**	***10.1***	**32.9**	***2.6***
Liaoning	**0.0**	***0.0***	**29.8**	***9.1***	**29.8**	***2.3***
Shaanxi	2.3	*0.2*	4.0	*1.2*	6.3	*0.5*
Shandong	0.4	*0.0*	16.6	*5.1*	17.0	*1.3*
Shanghai	**748.4**	***77.6***	**77.0**	***23.6***	**825.4**	***63.9***
Shanxi	0.0	*0.0*	0.0	*0.0*	0.0	*0.0*
Sichuan	0.2	*0.0*	11.7	*3.6*	11.9	*0.9*
Tianjin	**187.9**	***19.5***	**8.8**	***2.7***	**196.8**	***15.2***
Yunnan	0.0	*0.0*	0.0	*0.0*	0.0	*0.0*
Zhejiang	0.0	*0.0*	6.5	*2.0*	6.5	*0.5*
Total	**964.0**	***100.0***	**327.0**	***100.0***	**1,291.1**	***100.0***

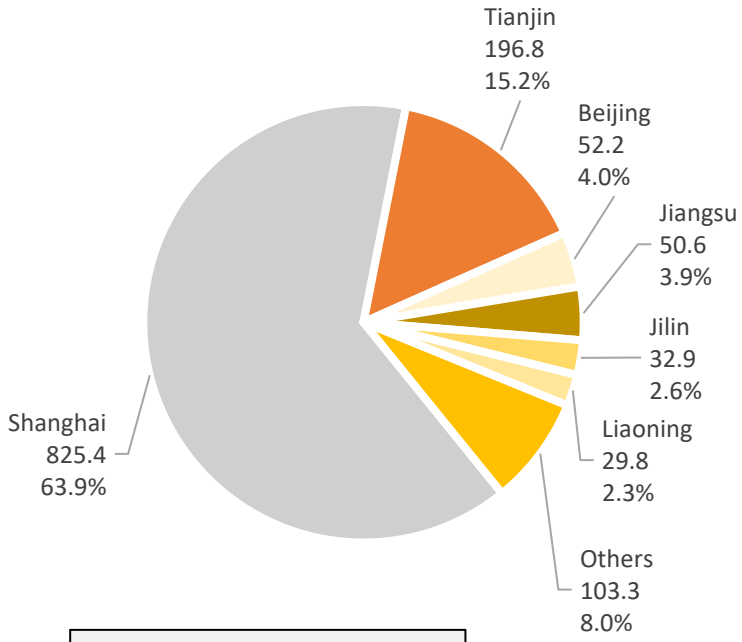
China Automotive Imports from Italy Y2021, by Province



Imports of Automotive products from Italy
Y2021, USD mln

10 50 300 500

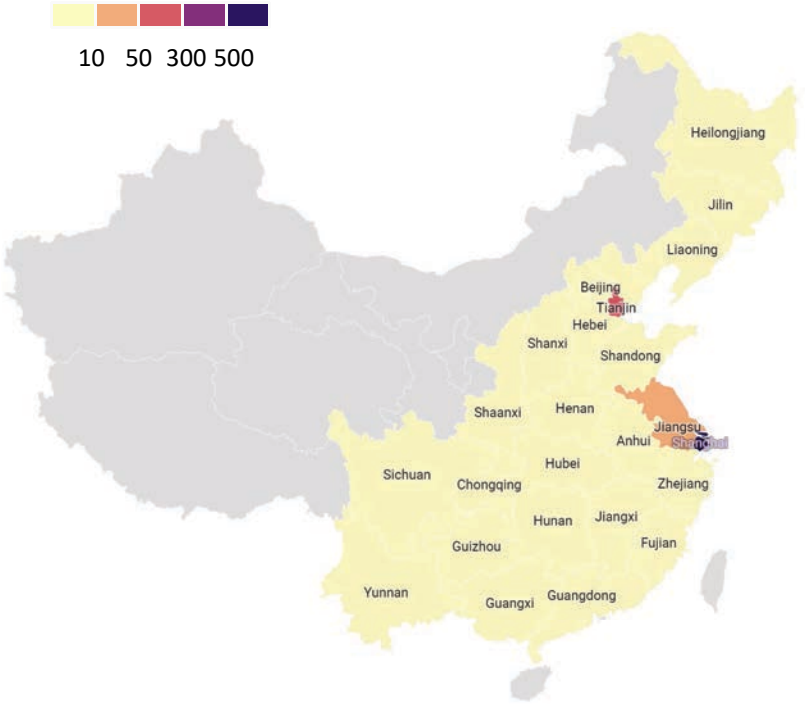
Imports of Automotive products from Italy, by recpient province
Y2021, USD million and percentage of total



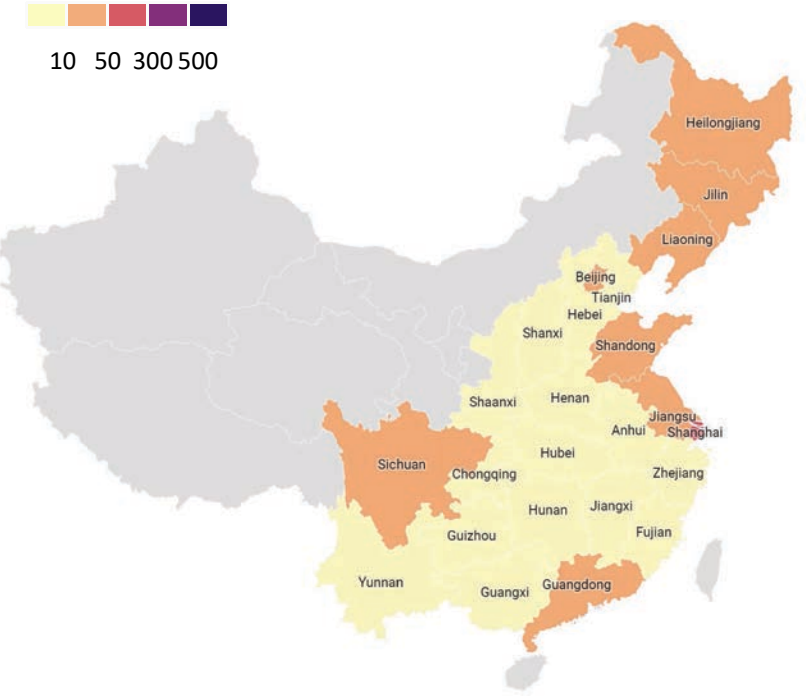
Province
Amount in USD mln
Share of total in percent

China Automotive Imports from Italy Y2021, by Province

Imports of Motor Vehicles from Italy
Y2021, USD mln



Imports of Components and Spare parts from Italy
Y2021, USD mln



ITA ITALIAN TRADE AGENCY

3.5 Case Studies: Chinese Automotive Market for Italian Companies

Company Name	Stellantis	Icona	Brembo	UFI Filters	Radici
World turnover	€152 billion (2021)	€20 million	€2.8 billion (2021)	€500 million	€1.5 billion
International presence	worldwide	Los Angeles, Turin, Dubai, Shanghai, Tokyo	Italy, Germany, Spain, Poland, Czech Rep, Denmark, UK, China, India, USA, Mexico, Brazil.	Italy, Czech, Poland, Brasil, Mexico, India, China, Korea	Italy, Germany, Switzerland, Czech Republic, Hungary, France, Spain, China, India, Mexico, USA, UK, Argentina, Brazil
Year of entry in China	1983 (Jeep brand's entry)	2011	2000	1983	2006
Presence in China	Shanghai,Changsha, Wuhan,Chengdu,Xiangyang	Shanghai	Nanjing, Langfang, Jiaxing, Qingdao, Shanghai	Shanghai, Changchun, Chongqing	Suzhou
Number of employees in the world	Around 300,000	130	12,225	4,000	3,000
Number of Employees in China	Around 1,200 (excluding JV)	85	2,000	2,000	120
R&D centers in the world	worldwide	Italy	Italy, USA, China, Spain, Poland, Denmark, India	3 (Italy / India / China)	7 (for High Performance Polymers Division)
R&D centers in China	Shanghai	Shanghai	Nanjing	Shanghai	Suzhou

Stellantis

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Website: www.stellantis.com

Company Group and world presence

Formed from the combination of former Fiat Chrysler Automobiles N.V. and former Groupe PSA in January 2021, Stellantis is one of the world's leading automakers and a mobility provider. Stellantis is home to 14 iconic brands that cover the full spectrum of market segments from luxury, premium and mainstream passenger vehicles to hard-charging pickup trucks, SUVs and light commercial vehicles. In addition to the Group's rich heritage and broad geographic presence, its greatest strengths lie in its sustainable performance, depth of experience and the wide-ranging talents of employees working around the globe. Stellantis aspires to become the greatest, not the biggest while creating added value for all stakeholders as well as the communities in which it operates.

Stellantis posted record results in 2021 with net revenues of €152 billion, up 14%; net profit of €13.4 billion, nearly tripled year-on-year; adjusted operating income nearly doubled to €18.0 billion, with 11.8% margin and all segments profitable. In 2021, Stellantis achieved combined shipments of more than 6.14 million units worldwide, represents a y-o-y increase of 3%; the combined sales reached 6.58 million units globally, represents a y-o-y increase of 3.9%.

Company's presence in China

Headquartered in Shanghai, Stellantis China has six automotive brands operated in the country: Peugeot, Citroën, DS, Jeep®, Alfa Romeo, Maserati. In addition, Stellantis' operations in China also include R&D, design, auto finance, "EUROREPAR" independent aftermarket business and "MOPAR" auto parts business, etc. Currently, Stellantis majorly operates 2 joint ventures (JVs) in China: Dongfeng Peugeot Citroën Automobile Co., Ltd (DPCA) and GAC-Stellantis. In 2021, DPCA sold more than 100,000 vehicles, more than doubling the annual sales volume of 2020. For the Jeep brand, the iconic Wrangler had record sales in 2021.

Company's products and services

Stellantis N.V. (NYSE / MTA / Euronext Paris: STLA) is one of the world's leading automakers and a mobility provider. Its storied and iconic brands embody the passion of their visionary founders and today's customers in their innovative products and services, including Abarth, Alfa Romeo, Chrysler, Citroën, Dodge, DS Automobiles, Fiat, Jeep®, Lancia, Maserati, Opel, Peugeot, Ram, Vauxhall, Free2move and Leasys. Stellantis is guided by a clear vision: to offer freedom of movement with distinctive, affordable and reliable mobility solutions. Powered by its specific diversity, Stellantis leads the way the world moves – aspiring to become the greatest sustainable mobility tech company, not the biggest, while creating added value for all stakeholders as well as the communities in which it operates.

Company's strategy from the entry in the Chinese market

- **DPCA:** founded in May 1992, a 50/50 JV owned by Stellantis and Dongfeng Motor Group, operating Peugeot brand and Citroën brand in China. Currently has 2 car manufacturing plants in Wuhan and Chengdu, respectively; and an engine and transmission manufacturing plant in Xiangyang
- **GAC-Stellantis:** founded in March 2010, a 50/50 JV owned by Stellantis and Guangzhou Automobile Group, operating Jeep brand in China. Currently has a manufacturing plant in Changsha (cars and engines)
- **Auto Finance:** In April 2022, Stellantis announced that it intended to consolidate its auto financial services in China into a Stellantis wholly owned Auto Finance Company (AFC). Stellantis and DPCA stake in DPCAFC, the 15-year-old auto finance joint venture between Stellantis, DPCA and Donfgeng Group, will be sold to Dongfeng, subject to regulatory approval. The new structure of Stellantis' auto finance in China will align with "asset light business model" in China as described in Stellantis "Dare Forward 2030" strategic plan and support the new DPCA business model
- **Independent Aftermarket:** after an initial investment in the independent spare parts distributors of Shanghai JianXin and Shandong United Auto Parts (UAP) in 2018, and then Fujian Longstar in 2019, Stellantis has now taken control of UAP, merging the three entities into one integrated national distributor, and creating the fourth-largest spare parts distributor in terms of sales turnover in the independent aftermarket business in China.

Future development of the company in the Chinese market

As described in Stellantis "Dare Forward 2030" strategy plan, in China, Stellantis plans for asset-light business model to reduce fixed costs and achieve profitable growth, with Net Revenues of €20 billion:

- Peugeot & Citroën: new business model with DFM
- One Jeep Strategy with GAC
- Customer-centric & Innovative Distribution
  - IAM: #4 largest distributor in China with best-in-class profitability and fast expansion plan
  - Top quartile in Overall Customer Satisfaction
  - Distribution digitalization to improve customer journey
- Premium, Electrified & Profitable
  - Grow highly profitable Maserati import business
  - Leverage iconic brands through imports
  - Maintain CAFC/NEV credits self-compliance

Besides, the R&D center and design center in China will contribute to the global R&D and design projects within the group.

Innovation trends in the Chinese market related to electric vehicles and hydrogen

With Stellantis "Dare Forward 2030" strategy plan, Stellantis will be the industry champion in climate change mitigation, becoming carbon net-zero by 2038, with a 50% reduction by 2030. Taking a leadership role in decarbonization, as well as a decisive step forward in the circular economy, is Stellantis' contribution to a sustainable future. The group plans to have more than 75 BEVs and reach global annual BEV sales of five million vehicles by 2030. The group is also expanding hydrogen fuel cell technology to large vans in 2024.

In China, the group aims to achieve 60% of passenger cars sales to be BEV. Currently, the BEV and PHEV lineup in China include Peugeot e2008, Peugeot 508L PHEV, DS 3, Citroën C5 Aircross PHEV, Jeep Wrangler 4xe, Jeep Grand Commander PHEV.

ICONA

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Company Group and world presence

ICONA was founded in Turin in 2010, opened a new design center in Turin on 22 February 2018.In order to better combine the new business model of ICONA with the advantages of Italy as an automotive design and production center, ICONA decided to open a new design center in the core area of Turin after careful consideration. As the world-famous cradle of the automobile industry, many internationally renowned automotive industry design companies, OEMs, universities and research centers are located in Turin. The founders and shareholders of The Group are Turin-based Italian companies Cecomp and Tecnocad and Dr. Teresio Gigi Gaudio. Dr. Gaudio is a top management decision maker with long successful performance experience, holding executive positions at Fiamm, Stile Bertone and Aprilia, and remains executive vice chairman of Coeclerici. Dr. Gaudio said, " We realized the need to build a whole new automotive design business model. Despite a rich pool of local experts, we have no future if still based on the old business model of the Turin car industry. Developing an open, international business model is critical. ICONA customers have a lot of new projects but still lack all the technology necessary to produce quality products. During these seven years, the number of customers in ICONA increased from 6 to 16, and in 2017, turnover reached 18 million euros and profit reached 1.4 million euros. For a young company focused on design, this performance is excellent. The first office abroad was settled within few months in Shanghai with the principle to work close to the clients. And now ICONA is distributed in Turin, Dubai, Shanghai, Tokyo, and Los Angeles have design center and working closely with Italy's parent company Tecnocad-Progetti and Cecomp two industry leaders. ICONA brings the best international team especially Chinese customers around the world, provide modeling design, engineering design, modeling model, exhibition and sample car manufacturing, a full range of automobile development services.

And after ten years, ICONA has grown into the largest automobile design company with the largest market share in China, which is much higher than similar enterprises in terms of project number and customer coverage. ICONA has more than 100 employees, among which 40 designers from 22 different countries guarantee the globalization and diversification of design. ICONA purpose is to help the rise of China's independent brands through high level of service and quality. The business is diversifying in different fields, from product to industry design and more recently in the Smart city vision and technology development and Architecture through his partnership and Joint ventures. At the same time, in recent years, ICONA has entered into industrial design, product design, artificial intelligence, smart city, architectural design and other aspects. In cooperation with Lenovo, Meituan, JD and Yadi and other domestic front-end industries, ICONA designed and developed unmanned truck delivery trucks and food delivery robots. At present, ICONA has become a 360-degree comprehensive design service company, and has reached strategic cooperation with many new energies, new technology and construction industry companies at home and abroad, together to achieve the future low-carbon.

Company's presence in China

ICONA was founded in Turin in 2010 and at the same time also in Shanghai. Currently, the Shanghai branch has more than 100 employees, among which 40 designers from 22 different countries ensure the globalization and diversification of design. It has maintained long-term partnerships with many automobile companies, such as overseas Maserati, Land Rover, Volkswagen Group, etc. It maintains long-term cooperation with domestic Geely Group, SAIC Group, FAW Group and emerging new energy vehicle companies such as Weima. The company provides a series of design services and solutions according to the needs of each enterprise, and provides sample car manufacturing and small batch production services. At the 2021 Shanghai CIIE, the group and its partners presented a series of works covering hyperloop, urban travel, driverless driving, vending, wireless charging, new energy and other fields, to create future low-carbon students with the power of design. And also at the 2021 Shanghai CIIE, ICONA and Hyperloop Transportation Technologies unveiled the passenger class after several months. The new HyperloopTT passenger cabin features the first five-meter-long passenger cabin and is the first "immersive" experience of the public through virtual reality technology. At this CIIE, ICONA and its partners shared their imagination of smart city, smart travel and smart life with the integration of creative design and cutting-edge technology. ICONA brings the best international team especially Chinese customers around the world, provide modeling design, engineering design, modeling model, exhibition and sample car manufacturing, a full range of automobile development services. However, in recent years, ICONA has entered in industrial design, product design, artificial intelligence, smart city, architectural design and other aspects.

In cooperation with Lenovo, Meituan, JD and Yadi and other domestic front-end industries, the company designed and developed unmanned truck delivery trucks and food delivery robots. In the Chinese market, ICONA has cooperated with a number of well-known enterprises, such as Hongqi, Roewe, FAW Toyota, Weima, etc., for product design cooperation with JD, Lenovo, Yadi and other well-known companies. In recent years, it has won several awards for its cutting-edge concepts in automotive design and autonomous driving. Actively cooperate with global cutting-edge enterprises to achieve breakthrough development in the field of mobile travel and smart city. At present, ICONA has become a 360-degree comprehensive design service company, and has reached strategic cooperation with many new energy, new technology and construction industry companies at home and abroad, together to achieve the future low-carbon environmental protection, people-oriented and sustainable development of the smart city. In recent years, it has won several awards for its cutting-edge concepts in automotive design and autonomous driving. Actively cooperate with global cutting-edge enterprises to achieve breakthrough development in the field of mobile travel and smart city. ICONA entered the electric car market in 2010, in 2011 designed the electric cars in Shanghai auto exhibition, also from a single car design company gradually to driverless, intelligent city, new energy, product design, architectural design and other fields of 360 degrees comprehensive design company, efforts to sustainable development and zero carbon emissions as a business guide bring more creative, with the power of design and industry to explore the future low carbon life and wisdom travel.

Company's products and services

After ten years ICONA has grown into the largest automobile design company with the largest market share in China, which is much higher than similar enterprises in terms of project number and customer coverage. ICONA has more than 100 employees, among which 40 designers from 22 different countries guarantee the globalization and diversification of design. ICONA purpose is to help the rise of China's independent brands through high level of service and quality. ICONA has become a 360-degree comprehensive design service company, and has reached strategic cooperation with many new energies, new technology and construction industry companies at home and abroad, together to achieve the future low-carbon environmental protection, people-oriented and sustainable development of the smart city. ICONA has three main purposes. First, internationalization and globalization. At present, China is the most important market, with the market share accounting for more than 80% of the total business. The second is innovation. Third, to cooperate with companies with the latest technology in the world, adhering to the concept of always being an automotive design company. In the future, ICONA will continue to bring more creativity with sustainable development and zero carbon emissions as the business orientation, and explore new ways of low-carbon life and smart travel in the future with the power of design and the industry.

Company's strategy from the entry in the Chinese market

ICONA realized the need to build a whole new car design business model. Developing an open, international business model is critical. ICONA customers have a lot of new projects but still lack all the technology necessary to produce quality products. During these seven years, the number of customers in ICONA increased from 6 to 16, and in 2017, turnover reached 18 million euros and profit reached 1.4 million euros. From the beginning, ICONA wanted to bring the best international team, especially Chinese customers, to all over the world, to provide a full range of automobile development services such as styling design, engineering design, styling model, exhibition and sample car manufacturing. The key to success is working closely with the customer, which means that the product schedule needs to be strictly controlled over the whole process, from project management to renderings design, engineering design, prototype car manufacturing and final production. The team has a wealth of project experience and work enthusiasm, and based on the solid professional experience of the creators, ICONA is able to show customers a new creative perspective.

A traditional concept of car design is that if a design is welcomed by the market, there will be no big changes. In China, the market is changing very quickly, consumers have higher pursuit of excellent design, they are eager to see some fresh design, and as an independent automotive design group, ICONA can provide new design ideas for various brands, and having three design centers in Turin, Shanghai and Los Angeles, can show more diversified design concepts. In China, the pace of car design is very fast, and ICONA is also trying to follow the pace of the Chinese market.

Future development of the company in the Chinese market

In the future, ICONA is gradually shifting from a single automotive design company to a 360-degree comprehensive design company in driverless, smart city, new energy, product design, architectural design and other fields, and ICONA will continue to be at the forefront of innovation, and work closely with the most leading technology companies, and continue to develop industrial design, product design, artificial intelligence, smart city, architectural design and other fields, continuous progress. ICONA will gradually shift focus to driverless, smart city, new energy, product design, architectural design and other fields of 360-degree comprehensive design companies, continue to bring more creativity with sustainable development and zero carbon emissions as the business orientation, and explore new ways of future low-carbon life and smart travel with the power of design and the industry. ICONA vision is to bring innovation and aesthetics to the future and create a green and sustainable clean, positive world.

Innovation trends in the Chinese market related to electric vehicles and hydrogen

After the Shanghai epidemic and the global epidemic, ICONA began to reflect about the redistribution of the new energy vehicle industry. Whether the whole vehicle enterprises or parts enterprises, for the future, the new value chain of the new four modernizations of automobiles has accelerated its formation:

1 In terms of electrification,
2 Intelligent aspects,
3 Network connection,
4 Service.

As for electrification, the traditional three-power value chain lies in electronic control, battery and motor, while the new value chain will migrate to the upstream battery materials and new equipment, the downstream charging infrastructure, battery recycling and operation. The formation of a new electrification value chain is accelerating, which is a new stage and a new feature of automobile electrification.

The only direction of global automobile development is new energy, or electric, which has become the consensus of all countries and enterprises around the world. In the past, many countries have disputed and swayed about this, while China's new energy vehicle industry has been growing and rising to a new level. After recent years of development, the irreversible situation of new energy has been basically formed. Small and medium-sized cities and rural areas will become the new market growth points of new energy vehicles.

In the past decade, the theme of change in the auto industry has been electrification. In the next stage, the theme of change will be intelligence based on electrification. The popularization of electrification should be driven by intelligence. Pure electric vehicles will not become the selling point of the market, and only more intelligent cars are the focus of market competition. On the other hand, only electric vehicles can be more completely embedded in intelligent technology, and the best carrier of intelligent technology is the electric platform. Therefore, on the basis of electrification will accelerate the generation of intelligence, "two" will be formally combined in the car.

About the hydrogen energy market, under the guidance of the goal of "carbon peak and carbon neutral", hydrogen energy is emerging from the rapid development of new energy as a recognized low and zero carbon energy. As a clean energy source, it has the characteristics of high proportion compression, large-scale storage, energy without attenuation and so on. With a wide range of sources and applications, it can effectively reduce the proportion of fossil energy and improve the level of clean development. The development of hydrogen energy is an important carrier for building a "multi-energy complementary" energy supply system and an important boost to realize energy transformation and upgrading. China is the world's largest hydrogen producer, and its rich resources have laid a material foundation for the development of hydrogen energy industry. As a high energy density, clean and efficient energy source, hydrogen energy can play an important role in solving the energy crisis, global warming and environmental pollution. As a national strategic emerging industry in the new energy vehicle industry, the central and local governments have issued a series of support and cultivation policies. The encouraging policies have created conditions for the sustainable development of the new energy industry in the future, and driven the sustainable development of China's new energy vehicle and lithium battery industry. Through the implementation of the policy of supporting the pros and cons, actively promote the healthy development of the new energy industry chain, accelerate the upgrading of process technology and the improvement of safety performance. From the promotion of China, hydrogen energy vehicles still have a lot of room for growth. In recent years, the heat of the hydrogen energy industry is increasing year by year. Previously, the " Outline of the National Innovation-driven Development Strategy and other important documents, clearly mentioned to vigorously develop hydrogen fuel vehicles. By 2030, China will achieve the target of 2 million hydrogen fuel cell vehicles. In addition, the Chinese Society of Automotive Engineering has predicted that by 2030, the output value of China's hydrogen automobile industry is expected to exceed the one trillion yuan mark. Under the background of advocating health and environmental protection, the development of new energy vehicles is one of the current mainstream trends, including hydrogen energy vehicles with good environmental compatibility, high energy conversion efficiency, low noise, long range, short refueling time, no charging and other characteristics, is regarded as a promising clean energy vehicles. In order to build a sustainable development society, the market scale of hydrogen energy vehicles will be further expanded in the future and accelerate the green environmental protection society. For quite a long time in the future, the biggest opportunity to develop the hydrogen energy industry is the strong support of the state. It can be expected that for a long time in the future, especially before the independent development of hydrogen fuel cell vehicles, the hydrogen energy industry will be in the development stage of favorable policies. In the future, it will bring sustainable development and mankind more portability and efficiency with zero carbon emissions, and make them more harmonious with nature in a new way of low-carbon life and smart travel, love life and return to themselves.

BREMBO

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Company Group and world presence

Brembo SpA is the world leader and acknowledged innovator of brake technology for automotive vehicles. Brembo supplies high performance brake systems for the most important manufacturers of cars, commercial vehicles and motorbikes worldwide, as well as clutches and other components for racing. Brembo is also a leader in the racing sector and has won more than 500 championships. Today the company operates in 15 countries on 3 continents, with 29 production and business sites, and a pool of over 12,200 employees, about 10% of whom are engineers and product specialists active in R&D. 2021 turnover was € 2,777.6 million (31.12.2021). Brembo is the owner of the Brembo, AP, AP Racing, Breco, Bybre, J.Juan, Marchesini and SBS Friction brands.

Company's presence in China

Brembo came to China in 2000 and has been in China for more than 20 years and is now employing about 2000 team members in 5 industrial premises and 1 trading company. Brembo sales revenue in China amounts to 3,300 million RMB in 2021. Brembo is specialized in the design, development and production of braking systems and components for the OE market and after-market.

Brembo current industrial premises are headquartered in Nanjing, where Brembo has 2 plants (1 plant for cast iron discs production and the other for aluminum calipers, cast iron calipers and knuckles production) and 1 R&D center, in Langfang where it has 1 plant for casting iron discs' production, in Jiaxing where it has 1 plant for motorbike brakes production and in Qingdao where it controls AFT MKT trading company, serving customers in China and worldwide.

Brembo R&D center in Nanjing is one of the 3 main R&D centers of Brembo worldwide, it performs application development work and product testing for the China market with ambition to also serve customers in Asia Pacific.

Company's products and services

Brembo supplies high performance brake systems for the most important manufacturers of cars, commercial vehicles and motorbikes worldwide, as well as clutches and other components for racing.

In China Brembo mainly produces braking products such as brake discs, cast iron calipers, aluminum calipers, steering knuckles for passenger cars and light commercial vehicles and brake hoses for motorbikes.

Brembo guarantees the utmost safety and product performance thanks to process integration and optimization of the entire production cycle and value chain, from design to manufacturing, from simulations on the bench, to testing on track and road. from casting to machining and assembly.

Company's strategy from the entry in the Chinese market

Brembo announced in 2020 the new mission to become a Solution Provider through smart, more sustainable and digital products and services, integrating its products and services into harmonic, all-round solutions to meet the rapidly evolving needs of the automotive industry.

This new approach follows Brembo's new vision for the future, "Turning Energy into Inspiration", by which the Company plans to increase its competitiveness and ensure its long-term viability.

The goal of the company is to continue to serve the most technological advanced and demanding Customers of the Chinese market in the long-run. The strategy is to select the customers to whom Brembo can provide value, in particular on premium and luxury brands, and be the most valuable provider of solutions for the newcomers as producers of electric vehicles.

The product offer strategy is following the new vision for the future – cited above – and it is reflected into design and innovation partnership with selected customers of the Chinese market for the application of the newly developed braking system Sensify™.

Future development of the company in the Chinese market

The automotive industry is facing unprecedented challenges: electrification, autonomous driving, and digitalization are increasing the pressure on all players. Brembo believes this is the right time to break new ground in the future of the market and support its partners to overcome these challenges.

Brembo is on a mission to anticipate the impact of the mega trends that are shaping the automotive industry and to surprise Brembo partners by offering them solutions that are at the cutting edge of innovation. Brembo is on their side to build together a more sustainable mobility.

Brembo defined a roadmap for this journey which is built on 3 strategic pillars: digital, global, and cool brand. Brembo will further strengthen innovation capabilities on a global scale through the creation of R&D centers of excellence in its main regions. Brembo wants to infuse its solutions with AI and sustainable technologies, to become an aspirational cool brand for the generations to come.

Innovation trends in the Chinese market related to electric vehicles and hydrogen

In 2021, China EV nationwide penetration exceeds 11% and even up to nearly 20% in tier 1 areas, well ahead of the government's 2025 plan and expected to be exceeding 18% in 2022.

On Oct, 26th, 2021, The State Council published the Action Plan for Carbon Dioxide Peaking before 2030, which clearly stated the requirement about penetration ratio of NEVs: by 2030, the share of incremental vehicles fueled by new and clean energy will reach around 40%; the release of Action Plan will accelerate the penetration speed of NEVs and reinforce customer's demand about sustainability. By 2030, BEV sales are forecasted to exceed 14 million (from I.H.S), with an average increase of 20% each year over the following years.

On March 23, 2022, the Chinese government released the long-term plan for hydrogen, covering the period of 2021–2035, which laid out a phased approach to developing a domestic hydrogen industry and mastering technologies and manufacturing capabilities, while pointing to the country's carbon peaking and neutrality commitments as an overarching driver. The government has shown a growing focus to reflect the desire to overcome the current deficit in producing low-carbon forms of hydrogen.

UFI FILTERS

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Company Group and world presence

Universal Filter Italiana, now UFI Filters, was founded in Nogarole Rocca, in Italy, in 1971 as a supplier of filtration systems for the automotive market.

Some 10 years later, the Sofima brand was created to grow the distribution potential in the Italian aftermarket. At the same time, the company began working with the most important Formula 1 teams, becoming a supplier of specific, tailormade solutions guaranteeing top performance and taking the teams to the top of the championships.

In the 1990s, thanks to the vision and growth goals of its owners, UFI Filters began to expand its boundaries into new product development and new world markets. In 1992, UFI Hydraulic Division was established, starting production of filtration solutions for the hydraulic sector. In 1996, being the first European filtration company to enter the Chinese market, UFI opened the first of its now six plants in China.

The late ‘90s was a time of notable growth, with the company winning over car manufacturers with fuel filters that guaranteed the separation of water from diesel.

At the start of the new millennium, UFI Filters became a supplier to the demanding German car manufacturers, providing not only fuel but also oil and air modules, and thus reinforcing its reputation as a global Original Equipment supplier to the world’s leading car manufacturers.

In 2010, UFI entered the world of heat exchangers, specializing in the design, development and production of vacuum-brazed aluminium water-cooled heat exchangers. Today, 6 of the 7 biggest automotive groups in the world work with UFI to develop complete filtration and lubrication systems.

The results obtained by the company can be attributed to the constant investment in research and development (over 5% of turnover), allowing UFI to come up with innovative, exclusive solutions for its customers. Over the years, UFI has registered more than 280 patents.

The UFI Innovation Centers in Italy, India and China are equipped with sophisticated, advanced research and analysis tools for developing new products and filtration materials. UFI Filters now has over 4000 employees at 19 production sites, 3 innovation centers and 57 commercial offices.

Company's presence in China

In 1983 thanks to the Vision of its Chairman Giorgio Girondi UFI Filters entered the Chinese Market with several turn key projects among which the establishment of Bengbu filters. Following such successes UFI Filters in 1996 founded its own first wholly owned and operated facility in Shanghai Qingpu district naming the company Sofima Automotive Filter Shanghai Co Ltd. The company initially had a facility of 5.000 sqm. After 25 years UFI Filters Group can now count on 6 industrial facilities with a 7th under construction for 2023 Start of Operations.

The additional industrial sites are located in
Shanghai - UFI Filters Shanghai Co ltd - 2004
Changchun - Sofima Automotive filter Changchun Co Ltd - 2006
Shanghai - Sofima industrial Automotive filter Shanghai Co Ltd - 2011
Shanghai - MIT - R&D laboratory - 2009
Chongqing - Sofima Automotive Filter Chongqing Co Ltd - 2019
Under Construction - Jiaxing - Ufi Filters Green Technologies Co Ltd (2023 expected)
The UFI Filters Group also count with a regional HQ office located in QingPu district Shanghai.

Company's products and services

UFI Filters is a global leader in filtration technology and thermal management. It serves a wide range of sectors – from automotive, aerospace and marine to specialized industrial and customized hydraulic applications.

- OEM / OES

Car Manufacturers- Thanks to continuous technological innovation and to investments into cutting-edge products, UFI Filters has consolidated its reputation as a leading Original Equipment supplier of filtration systems for the automotive market.

Nowadays 95% of vehicles manufacturers worldwide choose UFI Filters, boasting a list of more than 250 co-branded products with the biggest OEMs. Thus, covering over 60 thousand light vehicle applications in the world.

Heavy Duty Manufacturers - UFI Filters products are chosen as Original Equipment by the leading manufacturers accounting for 50% of the world's production of trucks and industrial vehicles. High levels of efficiency and safety, the complete range and investments in new technological solutions are the strengths that make UFI a premium supplier for OEMs, which produce vehicles used mainly for professional purposes.

- Thermal Management

UFI Filters entered the Thermal Management sector in 2010 and is already a global supplier of solutions for the complete management of the lubrication system in the OEM sector. Thanks to continuous investments in research and innovation UFI Group is specialized in the production of water-cooled and vacuum-brazed aluminum heat exchangers, a system that allows for a more reliable and efficient product, essential in the oil cooling circuit. Correct Thermal Management of a vehicle is fundamental for good performance and longevity of an engine, bringing a fundamental contribution in fuel consumption savings. Thermal management is also fundamental for BEV applications, thus assuring to the company a prominent business in the mobility of the future.

The Group also includes divisions that specifically provide solutions to Hydraulic clients (wind power / Construction industry) High Tech Division for F1 and Racing clients (9/10 F1 clients use Filters and Filtration solutions from UFI on their racing cars) and Aftermarket with its own Sofima and UFI Filters brands.

Company's strategy from the entry in the Chinese market

UFI Filters Group strategy in entering the Chinese Market was a vision of its Chairman Giorgio Girondi in 1983 as a direct result of a visit of a Chinese Government delegation to search for automotive technology to export to China from Europe.

After establishing its own wholly owned and operated factory in Shanghai UFI Filters started to operate the new factory for the then growing Chinese local market and also as a production base for export.

With the development of the business a second and third factories were needed to increase the production capacity and the ability to export the Chinese made products to European countries. The product base was established with UFI Filters Shanghai in the Export processing Zone of Qingpu District in Shanghai.

In order to attend and meet the needs of global and regional customers, who demand consistent commitment and point of contact, and to improve UFI capability to run global and regional projects by coordinating systems of productions in worldwide network, UFI has made the decision to Think Globally and Act Locally. Glocal is a mantra that has always permeated the organization while expanding its geo-footprint in all continents.

China is a striking example of such mantra. 60% of the production is directed to export market and the remaining 40% (growing year-on-year) is directed towards more and more local customers and local factories of international clients.

Future development of the company in the Chinese market

UFI Filters being a principal actor in the filtration of pollutants and elements that could harm the environment has taken a lead in helping OEMs reach the emission targets assigned and is resolutely committed to providing:

- Systems and solutions with a strong reduction thanks to new materials and multifunctional integration within other components.
- Solutions that enable engines and vehicles, to perform in an efficient way minimizing fuel consumption and pollutant emissions into the atmosphere.

The world is directing its attention more and more towards sustainable solutions and systems and UFI Filters clients worldwide and in China are no exception. As a result of these trends the Group has published its first Sustainability report and is preparing solutions and strategies to reduce its carbon footprint in all its industrial sites.

Testimonial to this vision is the new plant of Jiaxing that will see the light in 2023 and that has been named as "UFI Filters Green Technologies" to signify the direction of the future towards more sustainable growth and products.

R&D and innovation will also be an integral part of the future as exemplified by the following question.

Innovation trends in the Chinese market related to electric vehicles and hydrogen

The organization of R&D and Innovation is focused on four products vectors:

1. Liquid Filtration
2. Air & Oil Mist Separation
3. Air Filtration
4. Thermal Management

UFI success in pursuing clean mobility solutions together with its customers is based on the following three key points:

1. INNOVATION: Continuous technological.
2. RESEARCH: Solutions for extreme performances.
3. DEVELOPMENT: Investment in technologically advanced products.

Innovation is UFI DNA and as a result Research & Development (R&D) are a fundamental asset of the Group. Every year UFI Filters reinvests about the 5% of its turnover in R&D with more than 250 employees around the world to provide innovative filtration solutions along with New Thermal Management and New Energy Vehicle-related products.

Over the last five decades, UFI has developed and provided proprietary know-how in filtration and in the design of innovative and complex systems, which are protected by many international patents, patent applications and utility models that provide the Group a distinctive imprint in all its business market and channels.

Electrification has brought new lines ups of products such as full Electric Vehicle technology and Hybrid Vehicles. On the other hand, ICEs will continue to exist for a while longer, where efficiency improvement is pursued by combustion optimization and Thermal Management. These innovations have focused the development of new efficient technologies for the optimization of Thermal Management of engines and batteries.

This new product line and market segment is one in which UFI Filters Group will play a major role in the future having in-depth knowledge and having invested in Thermal Management since some years.

Fuel cells will be a trend of the future and possibly the future of electrification (especially for heavy duty vehicles) and UFI Filters is studying and preparing for this eventuality by adapting its product line-up for this potential future change.

RADICI

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Website: www.radicigroup.com

Company Group and world presence

With a network of production and sales sites located throughout Europe, North America, South America and Asia, RadiciGroup is one of the world's leading producers of a wide range of chemical intermediates, polyamide polymers, high performance engineering polymers and advanced textile solutions used for applications in the following sectors: automotive, electrical & electronics, water management, consumer goods and industrial. With its business areas – Specialty Chemicals, High Performance Polymers and Advanced Textile Solutions , RadiciGroup is part of a larger industrial group that also includes textile machinery (ITEMA), and energy (GEOGREEN) businesses.

Company's presence in China

RadiciGroup High Performance Polymers Division decided to establish its first production unit in China in 2006. Radici Plastics Suzhou started its operations in 2007 in the Suzhou Industrial Park area (SIP) which was chosen for its proximity to Shanghai where many global customers already setup their headquarters. The company has seen a continuous growth in its business, in particular from 2014, and currently has 120 employees and an annual turnover of around 700 million RMB. An investment in a new facility is currently ongoing.

Company's products and services

RadiciGroup High Performance Polymers are used to produce compounds for injection molding, blow molding and extrusion for the automotive, E/E, industrial and consumer goods industries.

Concerning the automotive applications, RadiciGroup engineering polymers are used for the manufacturing of a variety of engine components, exterior and interior parts, representing excellent alternatives for metal replacement in the manufacturing of under-the-bonnet parts, which are subjected to increasingly higher temperatures due to the introduction of new generation engines. The company is more and more active in the NEV providing standard and customized solutions to all the main players in the market.

Company's strategy from the entry in the Chinese market

The decision to enter in the Chinese market was initially made to supply locally customers that had already been served in other regions like Europe and North America. Beside supplying global players in different sectors, Radici Suzhou started to develop business with local customers focusing on specialties and supporting them with standard materials but also with more and more tailor-made solutions, guaranteeing a higher degree of flexibility which has represented an important drive for the company's growth. A clear attention to the market trends and the capacity to anticipate them has allowed Radici Suzhou to become an important player in the engineering plastics business in China.

Future development of the company in the Chinese market

The steady growth of the past years together with the perspectives of a continuous growth in the demand for the High Performance Polymers business in China led the shareholders to invest 35 million EURO in one completely new facility in Suzhou (36.600sqm) which will allow Radici Suzhou to add further production capacity and to enhance flows and performances. Further investments in R&D will be a key development to satisfy the ongoing changes in market demand in terms of solutions and innovation. Radici Suzhou is also working on strengthening its role as hub for the South-East Asia markets where the company is already operating through some local partnership.

Innovation trends in the Chinese market related to electric vehicles and hydrogen

In Radici view "Driving Range" and "Charging Time" are still the most sensitive aspects for the consumers and it is where innovation has to focus. Battery Pack evolution from conventional design to Cell-To-Pack (CTP) and now to Cell-To-Chassis (CTC) is a clear example. Fuel cell vehicles still have to fully demonstrate their attractiveness to the mass market; if on one side advantages like absence of CO2 emissions during operation, longer driving range, lower weight - to mention some advantages - are undoubtingly awesome, on the other hand FCVs' mass-market adoption is limited by three major problems: cost of the vehicle, distribution infrastructure and hydrogen production.

Notices

List of articles and goods included in the category of Motor Vehicles (by HS code)

The analysis of China's automotive imports is based on information and data collected, organized, and provided by the General Administration of Customs of China (GACC). The following tables provide a detailed list of the goods and articles included in the analysis, with their corresponding HS code.

The figures reported in this document are collected from the data export performed on 15 April 2022.

Category	HS code	Item
Passenger cars - Motor vehicles for the transport of less than 10 persons	870321	Motor vehicles, cylinder capacity ≤ 1L, with only spark-ignition internal combustion reciprocating piston engine
	870322	Motor vehicles, 1L < cylinder capacity ≤ 1.5L, with only spark-ignition internal combustion reciprocating piston engine
	870323	Motor vehicles, 1.5L < cylinder capacity ≤ 3L, with only spark-ignition internal combustion reciprocating piston engine
	870324	Motor vehicles, cylinder capacity > 3L, with only spark-ignition internal combustion reciprocating piston engine
	870332	Motor vehicles, 1.5L < cylinder capacity ≤ 2.5L, only with compression-ignition internal combustion piston engine
	870333	Motor vehicles, cylinder capacity > 2.5L, with compression-ignition internal combustion piston engine
	870340	Motor vehicles, with both spark-ignition internal combustion reciprocating piston engine and electric motor for propulsion, incapable of being charged by plugging to external source of electric power
	870360	Motor vehicles; with both spark-ignition internal combustion reciprocating piston engine and electric motor for propulsion, capable of being charged by plugging to external source of electric power
	870370	Other vehicles; with both compression-ignition internal combustion piston engine (diesel or semi-diesel) and electric motor for propulsion, capable of being charged by plugging to external source of electric power
	870380	Other vehicles; with only electric motor for propulsion
	870390	Vehicles; for transport of persons (other than those of heading no. 8702) n.e.c. in heading no. 8703

List of articles and goods included in the category of Motor Vehicles (by HS code)

Category	HS code	Item
Road tractors and drive axless	87012000	Road tractors for semi-trailers
	87019290	Other tractors, engine power ≤ 18kW (excluding tractors of heading No.87.09)
	87019390	Other tractors, 37kW < engine power ≤ 75kW (excluding tractors of heading No.87.09)
	87019490	Other tractors,75kW < engine power ≤130kW (excluding tractors of heading No.87.09)
	87019590	Other tractors, engine power > 130kW (excluding tractors of heading No.87.09)
Motor vehicles for the transport of 10 or more persons	8702	Motor vehicles for the transport of 10 or more persons, including the driver
Motor vehicles for the transport of goods	8704	Motor vehicles for the transport of goods
Special purpose motor vehicles	8705	Special purpose motor vehicles, other than those principally designed for the transport of persons or goods
Chassis fitted with engines	8706	Chassis fitted with engines, for motor vehicles of heading 87.01 to 87.05

List of articles and goods included in the category of Components and Spare parts (by HS code)

Category	HS code	Item
Tyres and parts	401110	New pneumatic tyres of rubber, used on motor cars (including station wagons and racing cars)
	401120	New pneumatic tyres of rubber, used on buses or lorries, of a cross-section width exceeding 30 inch
	401211	Retreaded tyres, used on motor cars(including station wagons and racing cars)
	401212	Retreaded tyres, used on buses or lorries
	40122010	Used pneumatic tyres of rubber , of a kind used on motor cars ,buses or lorries
	40129020	Solid or cushion tyres, of a kind used on automobiles
	401310	Inner tubes of rubber, used on motor cars (including station wagons and racing cars), buses or lorries
Glass and mirrors	70071190	Other safety glass for vehicles (of size and shape suitable for incorporation in vehicles)
	70072190	Laminated safety glass, of other size and shape suitable for incorporation in vehicles
	700910	Rearview mirrors for vehicles , whether or not framed
Locks	830120	Locks; of a kind used for motor vehicles (key, combination or electrically operated), of base metal
Mounting and fittings	830230	Mountings, fittings and similar articles; for motor vehicles, of base metal
Piston engines	840731	Spark-ignition internal combustion reciprocating piston engine of a kind used for the propulsion of vehicles of Chapter 87, of a cylinder capacity not exceeding 50cc
	840732	Spark-ignition internal combustion reciprocating piston engine of a kind used for the propulsion of vehicles of Chapter 87, a cylinder capacity exceeding 50cc but not exceeding 250cc
	840733	Spark-ignition internal combustion reciprocating piston engine of a kind used for the propulsion of vehicles of Chapter 87, of a cylinder capacity exceeding 250cc but not exceeding 1000cc
	840734	Spark-ignition internal combustion reciprocating piston engine of a kind used for the propulsion of vehicles of chapter 87, of a cylinder capacity exceeding 1000cc
	840820	Compression-ignition internal combustion piston engines (diesel or semi-diesel engines), of a kind used for the propulsion of vehicles of chapter 87

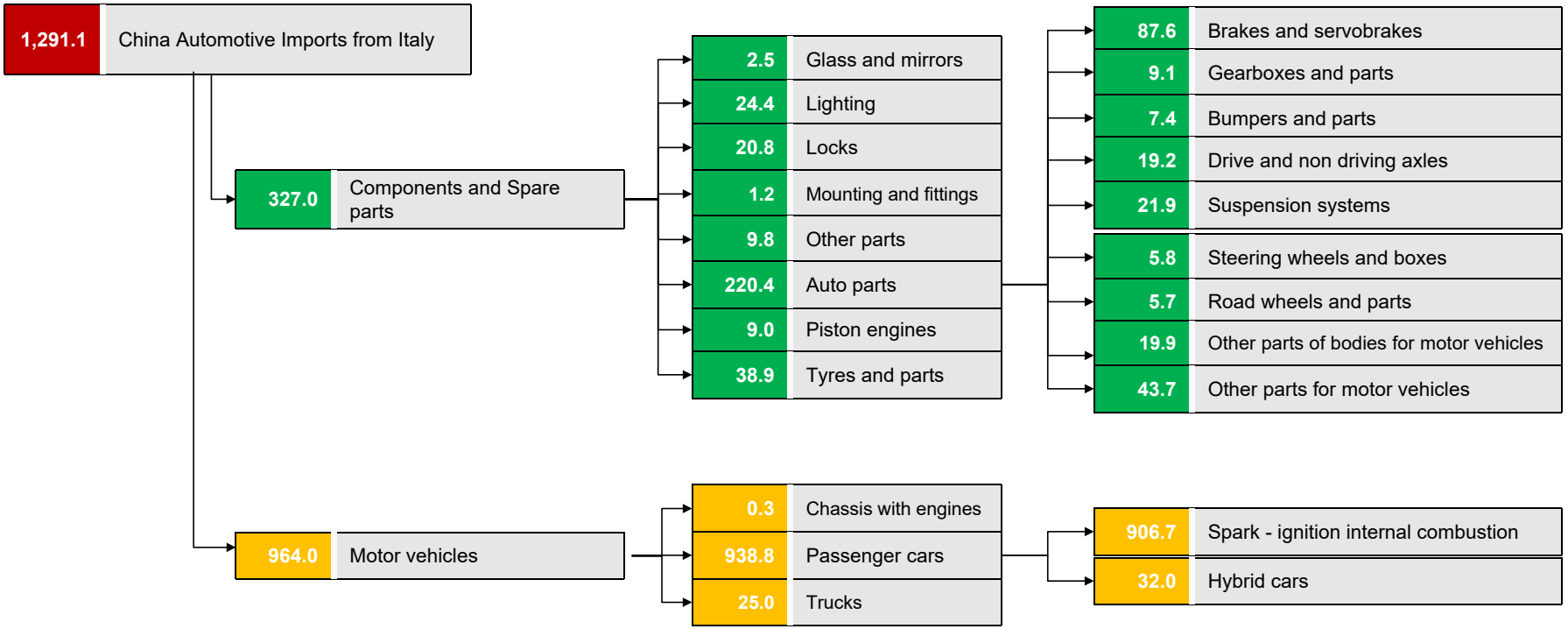
List of articles and goods included in the category of Components and Spare parts (by HS code)

Category	HS code	Item
Lighting	851220	Electrical lighting or visual signaling equipment for motor vehicles (excl. lamps of heading 8539)
	85392130	Tungsten halogen for motor vehicles
	85392930	Other filament lamps, for motor vehicles
Bodies for motor vehicles	870710	Bodies (including cabs) for the motor vehicles of heading no. 8703
	870790	Bodies (including cabs) for the motor vehicles of heading no. 8701, 8702, 8704 or 8705
Auto parts	870810	Bumpers and parts thereof, for the vehicles of heading no. 8701 to 8705
	870821	Safety seat belts
	870829	Parts and accessories, of bodies, other than safety seat belts
	870830	Brakes, servo-brakes and parts thereof
	870840	Gear boxes and parts thereof
	870850	Drive-axles with differential, whether provided with other transmission components, and non-driving axles; parts thereof
	870870	Road wheels and parts and accessories thereof
	870880	Suspension systems and parts thereof (including shock-absorbers)
	870891	Radiators and parts thereof
	870892	Silencers (mufflers) and exhaust pipes; parts thereof
	870893	Clutches and parts thereof
	870894	Steering wheels, steering columns and steering boxes; parts thereof
	870895	Safety airbags with inflater system; parts thereof
	870899	Other vehicles parts and accessories not in heading no. 8708

List of articles and goods included in the category of Components and Spare parts (by HS code)

Category	HS code	Item
Other automotive components	841520	Air conditioning machines of a kind used for persons, in motor vehicles
	851240	Electrical windscreen wipers, defrosters and demisters, for motor vehicles
	85229091	Tone converters or transmission apparatus of a kind used for vehicles
	85269110	Radio navigational aid apparatus For motor vehicles
	852721	Radio-broadcast receivers not capable of operating without an external source of power, of a kind used in motor vehicles; combined with sound recording or reproducing apparatus
	852729	Radio-broadcast receivers not capable of operating without an external source of power, of a kind used in motor vehicles; not combined with sound recording or reproducing apparatus
	85443020	Ignition wiring sets and other wiring sets for motor vehicles
	90292010	Speed indicators for motor vehicles
	94012010	Seats of a kind used for motor vehicles with outer surface of leather or composition leather
	94012090	Other seats of a kind used for motor vehicles

Summary of Chinese Automotive Imports from Italy by category in Y2021



Amount in USD million

Contact Appendix

Selected contacts:

Company/ Group Name.	Chiense Name	Website	Email address	City	Province	AIC Category
ACTIVE	活力国际贸易（上海）有限公司	activeinternational.com	vwang@activeinternational.com	Shanghai	Shanghai	Wholesale
ALFA ROMEO	阿尔法罗密欧（上海）汽车销售有限公司	www.alfaromeo.com.cn	steve.sun@external.fcagroup.com.cn	Shanghai	Shanghai	Wholesale
ASK GROUP	宁波艾思科汽车音响通讯有限公司	www.askgroup.it	hemanwu@askgroup.com.cn	Ningbo	Zhejiang	Manufacturing
AUTONEUM	日特固（广州）防音配件有限公司	www.autoneum.com	caiyin.gao@autoneum.com	Guangzhou	Guangdong	Manufacturing
BAILIAN	上海百联集团股份有限公司	www.bailiangroup.cn	blgf@bl.com	Shanghai	Shanghai	Wholesale
BAOSTEEL	宝钢金属有限公司	www.baosteelmetal.com	niuhuan@baosteel.com	Shanghai	Shanghai	Manufacturing
BREMBO	布雷博（南京）制动系统有限公司	www.brembo.com	jingfang_lv@brembo.cn	Nanjing	Jiangsu	Manufacturing
CARRARO	卡拉罗（中国）传动系统有限公司	www.carraro.com	ying_li@carraro.com	Qingdao	Shandong	Manufacturing
CIMA	西玛（青岛）弹簧有限公司	www.cimaqd.com.cn	seiko.liu@cimaqd.com.cn	Qingdao	Shandong	Manufacturing
COBO	广州蔻博电子系统及元器件有限公司	www.cobogroup.net	alessandro.lamantia@it.cobogroup.net	Guangzhou	Guangdong	Manufacturing

Contact Appendix

Selected contacts:

Company/ Group Name	Chiense Name	Website	Email address	City	Province	AIC Category
COMOTEC	来利眼镜制品（东莞）有限公司	visotticacomotec.com	l.zhong@visotticacomotec.cn	Dongguan	Guangdong	Manufacturing
CROWN	深圳皇冠（中国）电子有限公司	www.miyakoshi-holdings.com	chen-erzhu@miyakoshi-holdings.com	Shenzhen	Guangdong	Manufacturing
DIGIANT	思想咖（北京）电子商务有限公司	www.digiantglobal.com	hello@digiantglobal.com	Beijing	Beijing	Business Services
EDT	意迪特压铸科技（苏州）有限公司	www.edt-china.com	ellen.qian@edt-china.cn	Suzhou	Jiangsu	Manufacturing
FAIST	菲斯达排放控制装置（苏州）有限公司	www.faist.net	federico.bonotto@faistcomp.com	Suzhou	Jiansu	Manufacturing
FERRARI	法拉利汽车国际贸易（上海）有限公司	www.ferrari.com/zh-CN	cathy.han@ferrari.com	Shanghai	Shanghai	Wholesale
ICONA DESIGN	意柯那（上海）工业设计有限公司	www.icona-designgroup.com	info@icona-designgroup.com	Shanghai	Shanghai	Business Services
ITT	埃梯梯精密机械制造（无锡）有限公司	www.itt.com.cn	vicky.chen@itt.com	Wuxi	Jiangsu	Manufacturing
IVECO	依维柯（中国）商用车销售有限公司	www.iveco.com	xiaoli.zhan@cnhind.com	Shanghai	Shanghai	Wholesale

Contact Appendix

Selected contacts:

Company/ Group Name	Chiense Name	Website	Email address	City	Province	AIC Category
LPR AUTO PARTS	力派尔（珠海）汽车配件有限公司	www.lprautoparts.cn	michael.xu@lprautoparts.cn	Zhuhai	Guangdong	Manufacturing
MAGNETI MARELLI	马瑞利汽车电子（广州）有限公司	www.magnetimarelli.com	yingqin.chen@external.marelli.com	Guangzhou	Guangdong	Manufacturing
MASERATI	玛莎拉蒂（中国）汽车贸易有限公司	www.maserati.com/cn/zh	qianyi.yang@maserati.com.cn	Shanghai	Shanghai	Wholesale
MECCANO TECNICA	密凯加（青岛）机械密封件有限公司	www.meccanotecnica.cn.com	zhaosh@mtu-group.com	Qingdao	Shandong	Manufacturing
MOUETTE	常州摩迪模塑科技有限公司	www.mouetteplastic.com	-	Changzhou	Jiangsu	Technical services
MPE	爱默普（苏州）汽车零部件有限公司	www.mpeplastics.com	finance.china@mpeplastics.com	Suzhou	Jiangsu	Manufacturing
NANNINI	深圳市鑫君合进出口有限公司	www.nanninichina.com	-	Shenzhen	Guangdong	Wholesale
PININFARINA	宾尼法利纳产品设计（上海）有限公司	www.pininfarina.cn	finance@pininfarina.cn	Shanghai	Shanghai	Technical services
POLY	保利汽车（重庆）有限公司	polycars.com.cn	zhangyh@polycars.com.cn	Chongqing	Chongqing	Retail

Contact Appendix

Selected contacts:

Company/ Group Name	Chiense Name	Website	Email address	City	Province	AIC Category
ROECHLING	劳士领汽车配件（昆山）有限公司	www.roechling.com	mmao@roechling.com	Kunshan	Jiangsu	Manufacturing
SELCOM	萨康电子（上海）有限公司	www.selcomgroup.com	catherine.shen@selcomgroup.com.cn	Shanghai	Shanghai	Manufacturing
SOFIMA SH	上海索菲玛汽车滤清器有限公司	www.ufifilters.com	y.zhu@cn.ufifilters.com	Shanghai	Shanghai	Manufacturing
SOFIMA CQ	索菲玛汽车滤清器（重庆）有限公司	www.ufi.org	ada.chen@cn.ufifilters.com	Chongqing	Chongqing	Manufacturing
SPAL	斯佩尔汽车科技（常州）有限公司	www.spalautomotive.it	j.zhu@spal-china.com	Changzhou	Jiangsu	Technical services
SPARKLE CHINA	重庆斯帕客国际贸易有限公司	www.sparkle-china.com	-	Chongqing	Chongqing	Wholesale
TOMORNI	今朝计算机技术（深圳）有限公司	www.tomorni.com	thomas@syslive.cn	Shenzhen	Guangdong	Wholesale
UTIL	优蒂利（广州）汽车配件有限公司	www.utilgroup.com	phoenix.liu@utilgroup.com	Guangzhou	Guangdong	Manufacturing

Appendix

1.Sector Exhibitions in China

2.Chinese Main Producers & Brands

Sector Exhibitions in China

Beijing International Automobile Exhibition-Auto China

Location: Beijing
Website: ***www.autochinashow.org***

Beijing International Automobile Exhibition, (Auto China for short), was founded in 1990. It has been held regularly in Beijing every two years and has been held for ten consecutive times. So far, it has gone through 20 years of development. Jinganzhuang Hall of China International Exhibition Center mainly displays domestic and foreign auto parts and related products and sets up a special hall in Jinganzhuang Hall to hold the "New Energy and Intelligent Connected Auto Technology Exhibition Area", which displays new products in the design and manufacturing of new energy and intelligent connected cars at home and abroad.

Auto Shanghai

Location: Shanghai
Website: ***http://sh.autochinashow.org***

Auto Shanghai was founded in 1985. It is the earliest professional international automobile exhibition in China and the largest auto exhibition in Asia. It is held in odd years and has been successfully held for 13 times.

Guangzhou International Automobile Exhibition-Guangzhou Auto Show

Location: Guangzhou
Website: ***www.autoguangzhou.org.cn***

Guangzhou International Automobile Exhibition (Guangzhou Auto Show for short), founded in 2003, is one of the three most influential automobile exhibitions in China and is known as the wind vane of China's automobile market. Guangzhou Auto Show is not only a gathering of auto brands and manufacturers from home and abroad, but also an excellent stage for the region and even China's auto industry to show its vitality and strength. With the vigorous development of China's auto industry, Guangzhou has become one of the most important production and distribution bases of auto parts in China, with an annual output value of more than 300 billion yuan. Toyota, Honda, Nissan, Volkswagen and many other auto parts manufacturers at home and abroad have also taken root in Guangzhou, and thousands of auto parts and post market distribution enterprises are scattered in various core areas of the city.

Changchun Auto Show

Location: Changchun
Website: ***www.auto-changchun.com***

Changchun Auto Show was founded in 1999. After 13 years of polishing for eight consecutive sessions, Changchun Auto Expo has become one of the top automobile exhibitions in China. The biggest feature of Changchun Auto Show is that 100% of the cars are exhibited by automobile manufacturers. 132 enterprises will bring 927 exhibition cars to Changchun Auto Show. The number of cars participating in the show is the largest ever, and many models are exhibited for the first time in Changchun.

Chengdu International Automobile Exhibition

Location: Chengdu
Website: ***www.cd-motorshow.com***

Chengdu International Automobile Exhibition, founded in 1998, is the largest and highest specification annual automobile event in the western region. Chengdu International Automobile Exhibition has kept forging ahead, adhered to innovation and development, and after 24 years of growth and transformation, it has now stood out from many regional automobile exhibitions and ranked among the four A-level automobile exhibitions in China. Auto parts on display include engine, chassis system, brake system, driving system, steering system, body and parts system, exhaust system, tires and auto after-sales related products.

Guangzhou International Exhibition of Automotive Products, Auto Parts & Post-market Services-CIAACE

Location: Guangzhou
Website: ***www.ciaace.cc***

Guangzhou International Exhibition of Automotive Products, Auto Parts & Post-market Services (CIAACE for short), founded in 2005, is a professional exhibition in the automotive aftermarket industry. Held in Beijing in spring and Guangzhou in autumn, CIAACE has long been the preferred platform for upstream enterprises to launch new products, expand business, purchase dealers and seek cooperation, purchase goods at terminal stores, understand trends and learn technology. More than international famous brands, with exhibits covering the whole industry chain of automotive aftermarket, such as automotive electronics, automotive supplies, auto protection equipment, car washing, vulnerable parts, upgrading and refitting, and new energy for automobiles.

Auto Aftermarket Guangzhou-AAG

Location: Guangzhou
Website: ***www.aag.org.cn***

Auto Aftermarket Guangzhou (AAG for short) is a large-scale exhibition of auto parts, supplies and refitting, maintenance, testing and diagnostic equipment in South China. AAG is committed to building an efficient platform for international industrial technical exchanges and comprehensive business cooperation. Exhibits cover stamping, sheet metal processing, casting/forging, surface treatment/heat treatment, cutting/grinding, and resin forming of automotive engine/chassis/gearbox/body parts and semi products, and automotive parts. processing equipment, abrasive tools, plastic molds, automation and testing equipment, mold related accessories, etc.

Shenzhen International Charging Station (Pile)Technology & Equipment Exhibition-CPTE

Location: Shenzhen
Website: ***http://cp.szevexpo.com***

Shenzhen International Charging Station (Pile)Technology & Equipment Exhibition (CPTE for short), founded in 2016, is an annual event with international influence and has been recognized by many well-known enterprises at home and abroad. CPTE has played a positive role in promoting the development of China's new energy automobile industry. SYNCH: Shenzhen Electric Travel Exhibition, Shenzhen Battery Technology Exhibition, Shenzhen Energy Storage Technology and Application Exhibition, China International Charging Pile Operator Conference.

Guangzhou International New Energy Automobile Industry Ecological Chain Exhibition-EVE

Location: Guangzhou
Website: ***www.evexpovip.com***

Guangzhou International New Energy Automobile Industry Ecological Chain Exhibition (EVE for short), founded in 2018, is the only automobile industry ecological chain exhibition in the world. It is committed to promoting the coordinated and efficient development of the entire automobile industry chain, deploying the supply chain around the value chain, configuring the industrial chain around the supply chain, promoting the extension of the industrial chain to the back-end and the value chain to the high-end, and building a new exhibition that includes transportation and logistics, shared travel, user interaction Smart city ecosystem with new elements such as information utilization.

Automotive World China-AWC

Location: Shenzhen
Website: ***www.automotiveworld.cn***

Automotive World China (AWC for short), is a combination of exhibitions and conferences focusing on intelligent and new energy related topics such as autopilot, Internet of Vehicles, smart cockpit, new energy, etc. Relying on the development needs of China's intelligent automobile industry, the exhibition will share the international resources and influence of Automotive World in Japan and will attract more than 500 domestic and foreign brand exhibitors, more than 20000 professional visitors from OEMs, primary supporting suppliers, secondary and tertiary suppliers, and upstream and downstream enterprises of the relevant industrial chain.

Automechanika Shanghai

Location: Shanghai
Website: ***www.autopartsshanghai.com***

Automechanika Shanghai, founded in 1992, has established its important position in the international market as an industry platform in the field of auto parts, maintenance, detection and diagnosis equipment and auto supplies. Focus on auto parts, electronics and systems, auto supplies, modification, repair and maintenance, tire hubs, etc.

China Automobile Parts Fair

Location: all round China
Website: ***www.qipeihui.com***

China Automobile Parts Fair is a traditional grand event in China's auto parts industry. It was founded in 1965 and travels in different cities in China every spring and autumn. Each exhibition can attract more than 2000 exhibitors and more than 80000 visitors from all over the country. It is a domestic auto aftermarket exhibition with a long history and a large scale, which has played a positive role in promoting the development of China's auto aftermarket.

China International New Energy Vehicle Electric Control Exhibition-MC Expo

Location: Shenzhen
Website: ***www.mc-expo.cn***

China International New Energy Vehicle Electric Motor Control Exhibition, (MC expo for short), was held to continue to serve the new energy vehicle industry and promote its sustainable development. Make full use of the "two in one" mode of professional exhibitions and trade fairs, the "three in one" mode of exhibitions, order fairs and seminars, and the "four in one" mode of manufacturers, dealers, supporting suppliers and service providers. The exhibition is a model exhibition in the new energy automobile industry with market orientation, technical professionalism, effectiveness, user groups and activity characteristics, and truly becomes a new energy automobile industry market promotion, display of new products It is an activity platform for exchanging new technologies, releasing new information and exploring new business opportunities.

Auto-C Maintenance & Repair-AMR

Location: Tianjin
Website: ***www.amr-china.cn***

Auto-c maintenance & repair (AMR for short). After nearly 40 years of growth, China International Auto Parts Exhibition has become the preferred business platform and annual grand event in the automotive aftermarket in China and has continuously helped the industry grow and go global over the years. The Beijing Tianjin Hebei region, where the exhibition takes root, will develop rapidly in recent years under the promotion of policies, and the automobile market will be prosperous in both supply and demand. In 2023, AMR exhibition will be held in Tianjin to focus on new opportunities through innovation. Under the theme direction of "new look, new concept, new experience, whole industry, high quality and high specification", AMR exhibition will take a new attitude and continue to exert its profound and positive influence.

CAPAS-Chengdu International Auto Parts and After Sales Service Exhibition

Location: Chengdu
Website: ***www.capas-chengdu.com***

Chengdu International Auto Parts and After Sales Service Exhibition, (CAPAS for short), was founded in 2014, which reflects the huge demand for auto parts and after-sales service in the southwest market of China. As a professional platform, CAPAS has provided a series of customized services for insiders before and during the exhibition, from in-depth analysis lectures in the southwest market to customized exhibition plans, such as visiting manufacturers and local auto parts cities. Exhibitors and visitors should be informed of the latest information of the local emerging automobile market while expanding business opportunities here.

China Auto Parts Expo and National Auto Wearing Parts Procurement Fair

Location: Zhengzhou
Website: ***www.ciaaff.org***

The holding of "China Auto Parts Expo and National Auto Wearing Parts Procurement Fair" will provide a stage for auto parts industry to display high-quality products, innovate products, exchange technology, negotiate trade and promote brands. Zhengzhou, the host city, is an important transportation hub in China. The development of the Central Plains Economic Zone has become a national strategy. The superior business environment has attracted more than 10000 commercial and trade institutions at home and abroad to set up offices and business sites here. Now, it has a large number of multi-functional large-scale commercial and trade facilities and a commodity distribution market radiating throughout the country.

China International Auto Parts Expo-CAPS

Location: Beijing
Website: ***www.ap-show.com***

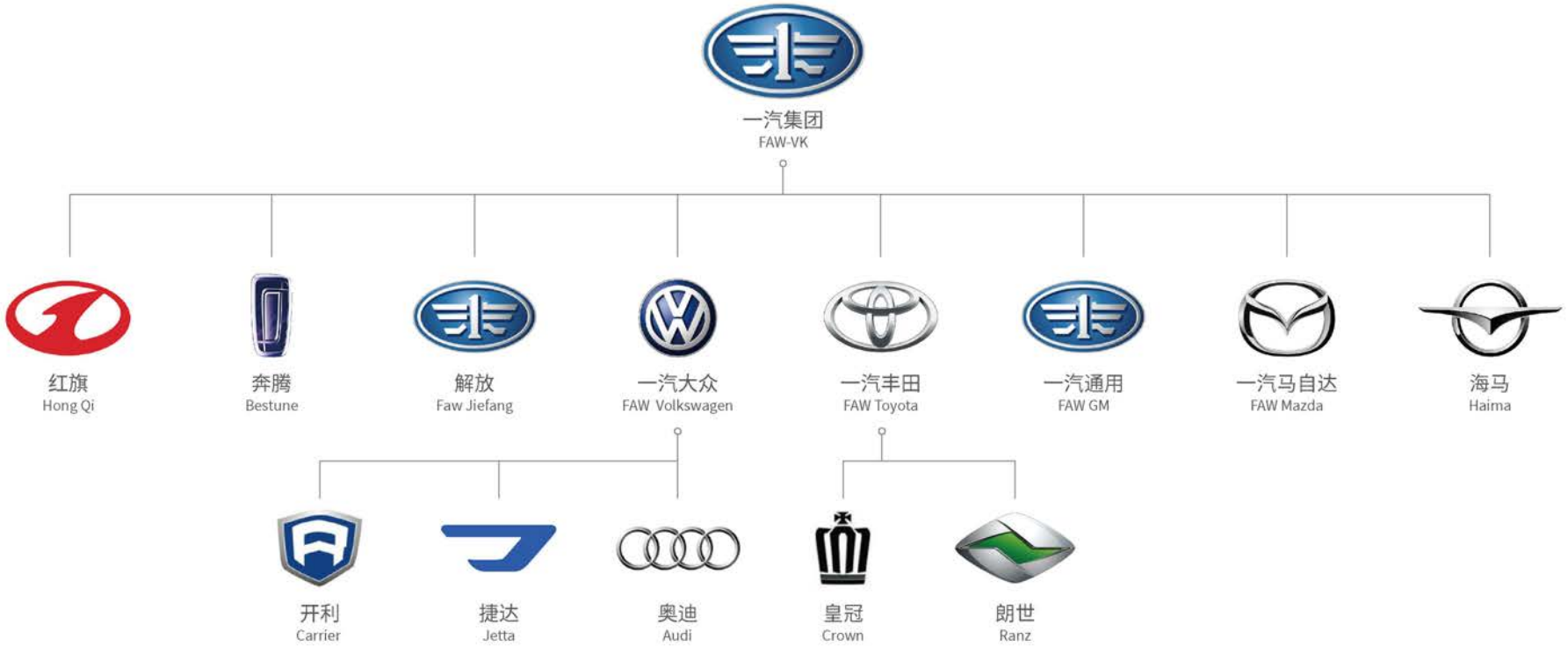
China International Auto Parts Expo (CAPS for short), was founded in 2007, attracting more than 800 exhibitors from 50 countries and regions around the world, and more than 35 of the world's top 500 enterprises. With more than 60000 professional visitors, the exhibition has established long-term cooperation with 21 national embassies and business associations. It enjoys a good reputation in the industry, has a good reputation, and is known as the wind vane of auto parts. During the exhibition, more than 30 academic conferences will be held to build a "one-stop" procurement platform for China's automobile manufacturing industry chain with the theme of "Gathering excellent equipment to create the source of high-quality cars".

China Shanghai International Automotive Interiors and Exteriors Exhibition-CIAIE

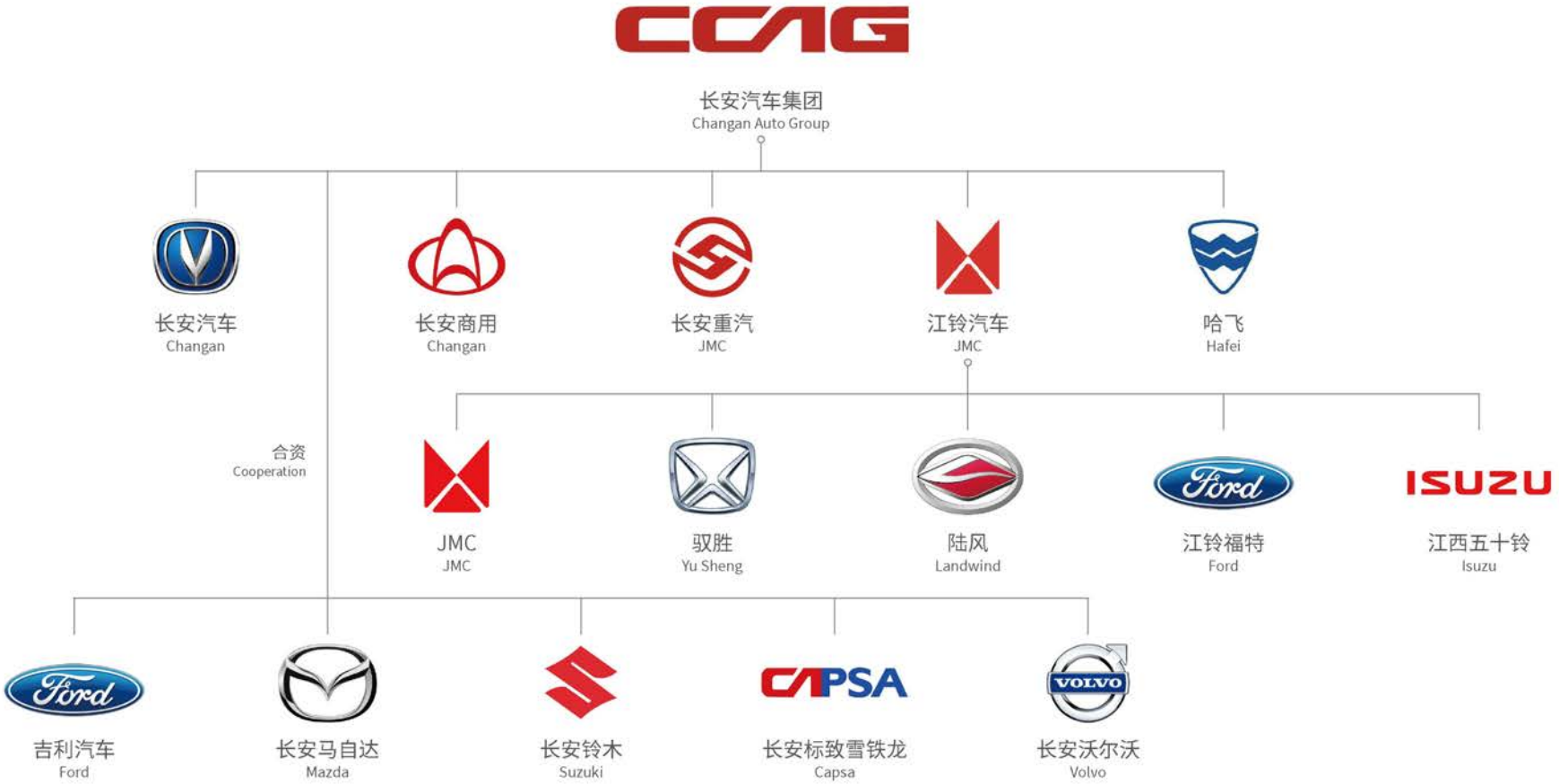
Location: Shanghai
Website: ***www.ciaie.com***

China Shanghai international automotive interiors and exteriors exhibition (CIAIE for short). With the steady development of China's automobile industry, the 12th session has been successfully held. Exhibits include interior and exterior trim assembly, seats, intelligent cockpit, plastic parts, decorative parts, steering wheel, door panel, ceiling, body covering parts, body structure parts, exterior parts, cabin electronics, passive safety, bumper, rearview mirror, lamps and vehicle lighting, as well as new materials, new technologies, new equipment and new processes in the application field. The exhibition fully links the upstream and downstream industrial chains of automotive interior and exterior trim.

Chinese Main Producers & Brands



CHINA FAW GROUP CO., LTD.
Location: Changchun City
Website: www.faw.com



CHINA CHANGAN AUTO GROUP CO.,LTD
Location: Beijing City
Website: www.changan.com.cn

北汽集团
BACI Group

极狐
Arcfox

Beijing
Beijing

北京
Beijing

北京奔驰
Mercedes-Benz

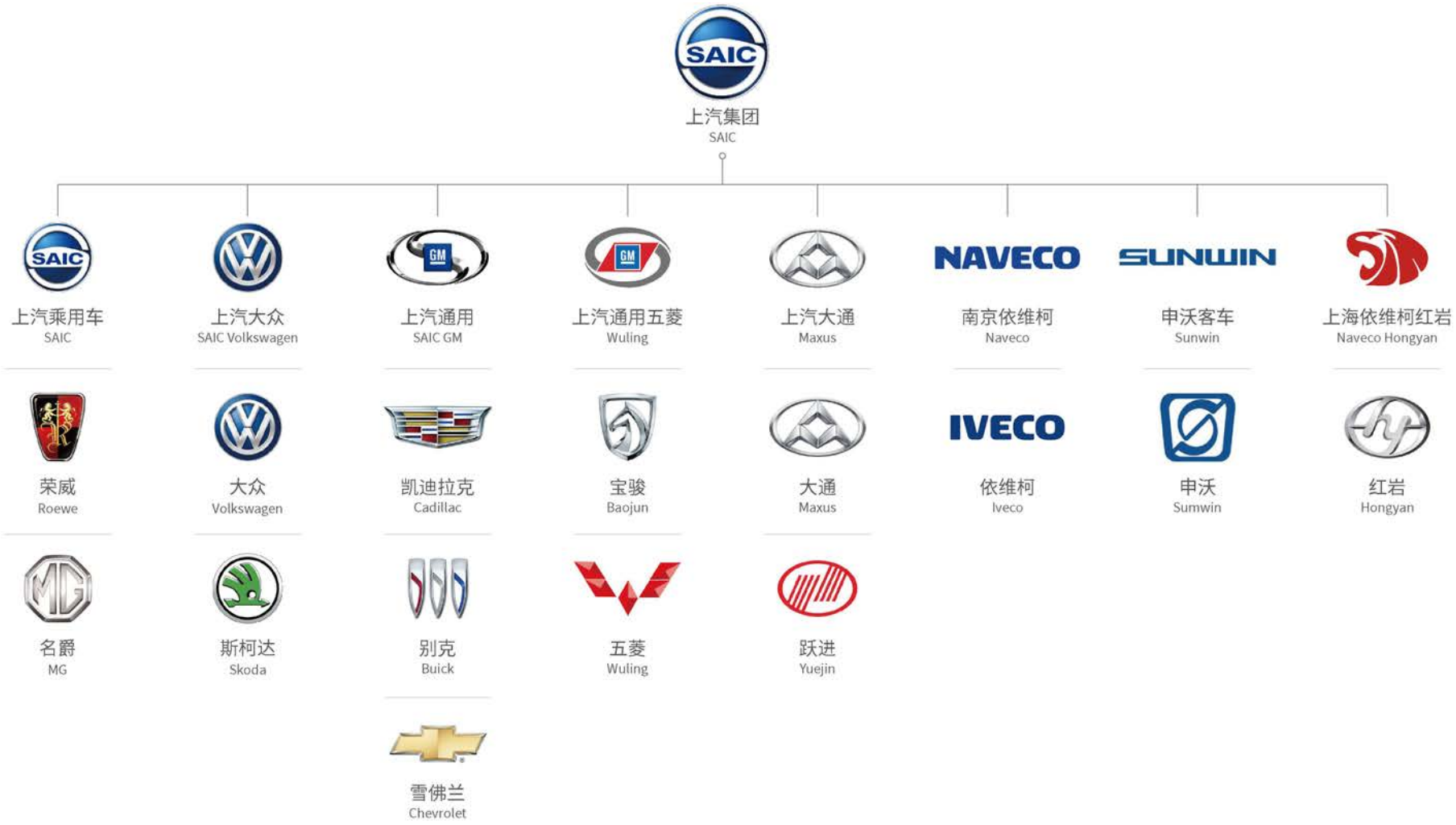
福建奔驰
Mercedes-Benz

北京现代
Hyundai

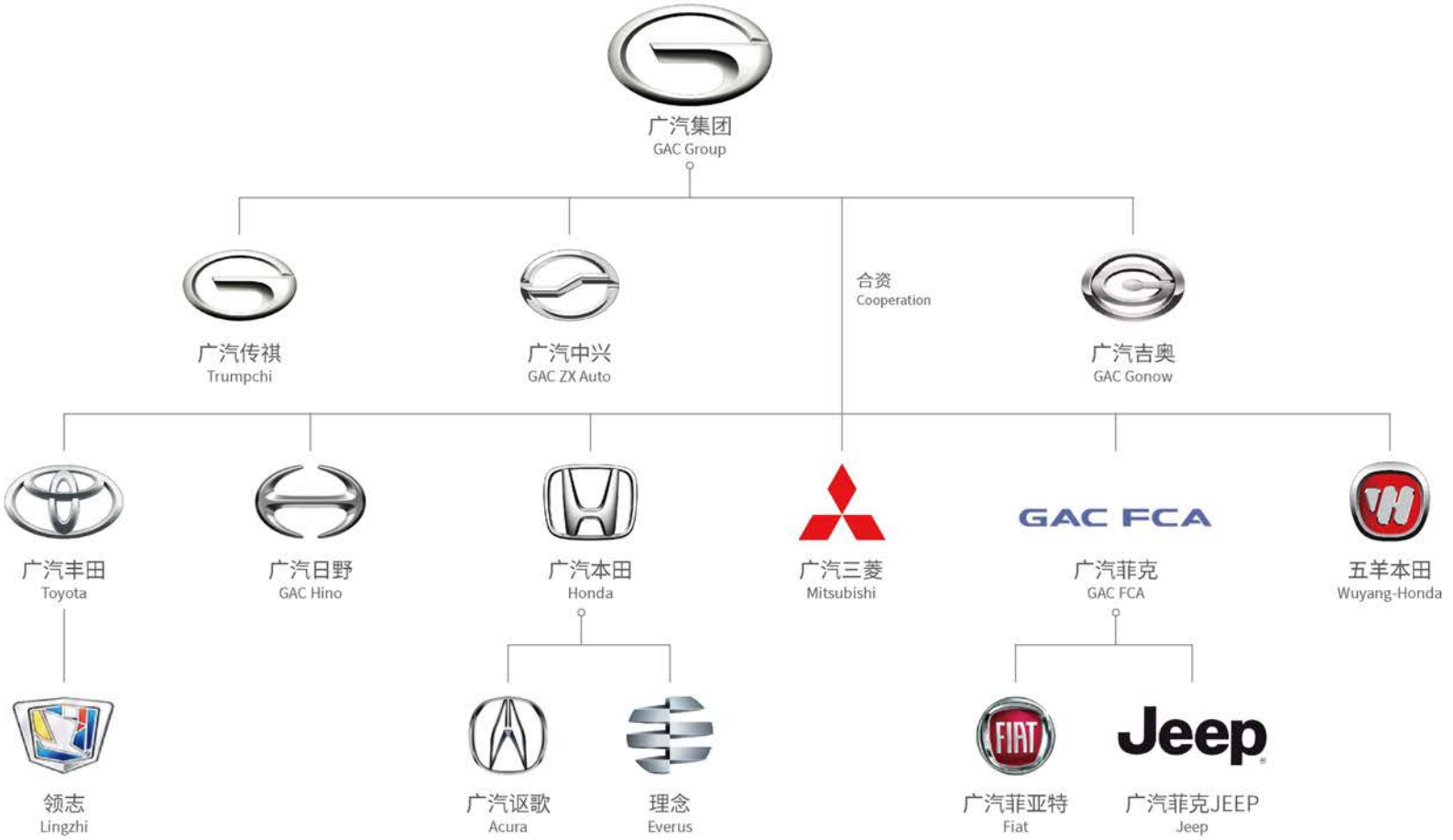
福田汽车
Futon

田河汽车
Changhe

BEIJING AUTOMOTIVE GROUP CO.,LTD
Location: Beijing City
Website: www.baicgroup.com.cn

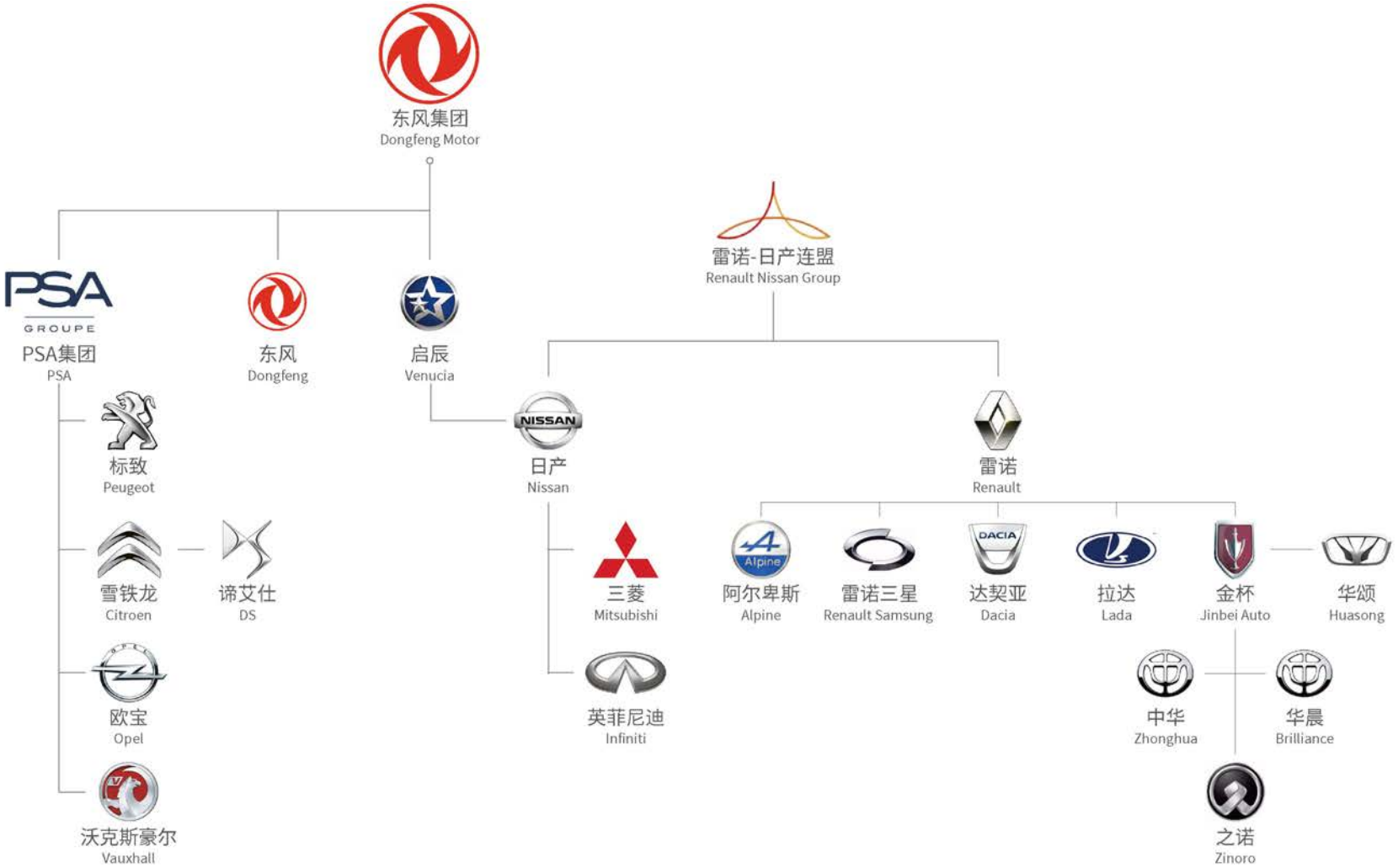


SAIC MOTOR CORPORATION LIMITED
Location: Shanghai City
Website: www.saicmotor.com



GUANGZHOU AUTOMOBILE GROUP CO.,LTD
Location: Guangzhou City
Website: www.gac.com.cn

ZHEJIANG GEELY HOLIDNG GROUP CO.,LTD
Location: Hangzhou City
Website: www. zgh.com



DONGFENG MOTOR CORPORATION
Location: Wuhan City
Website: www.dfmc.com.cn

HERY AUTOMOTIVE GROUP CO.,LTD
Location: Wuhu City
Website: www.chery.cn

Other Chinese Producers of NEV

比亚迪集团
BYD Group

BYD COMPANY LTD
Location: Shenzhen City
Website: www.bydglobal.com

小鹏
Xpeng

GUANGZHOU XIAOPENG AUTOMOTIVE TECHNOLOGY CO., LTD
Location: Guangzhou City
Website: www.heyxpeng.com

理想
Lixiang

LI AUTO
Location: Beijing City
Website: www.lixiang.com

蔚来
NIO

SHANGHAI NIO AUTOMOTIVE CO.,LTD
Location: Shanghai City
Website: www.nio.cn

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