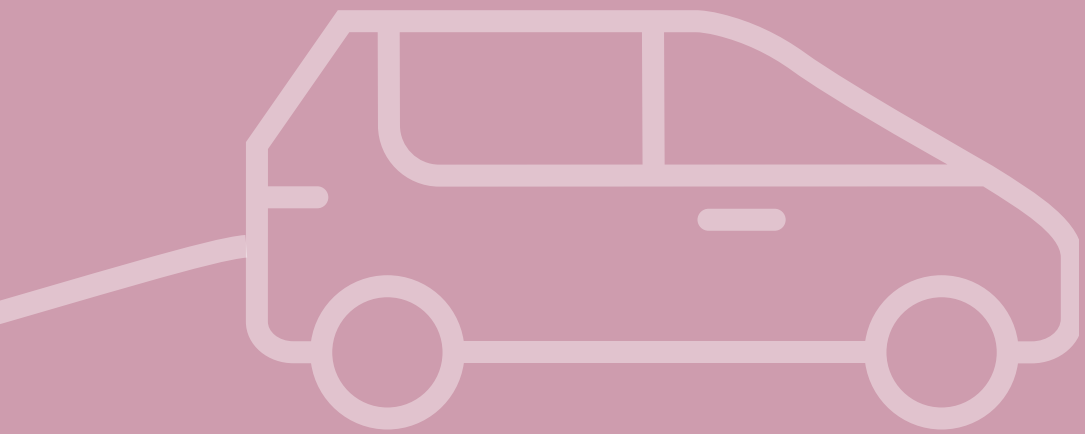
POLICY BRIEF

Boy Luethje
April 2026

The producers of China's new energy vehicles (NEV) and their positioning for international markets



Friedrich Ebert Stiftung

Imprint

Publisher
Friedrich-Ebert-Stiftung e.V.
Godesberger Allee 149
53175 Bonn
Germany
info@fes.de

Publishing department
Division for International Cooperation /
Department for Asia and the Pacific

Responsibility for content and editing
Dr Niels Hegewisch

Contact
Meike Adam
meike.adam@fes.de

Design/Layout
Rohtext, Bonn

April 2026

ISBN 978-3-98628-844-0

Further publications of the Friedrich-Ebert-Stiftung can be found here:
↗ www.fes.de/publikationen

Friedrich Ebert Stiftung

Boy Luethje
April 2026

The producers of China's new energy vehicles (NEV) and their positioning for international markets

Contents

Introduction

The automotive industry in China is undergoing a rapid transformation and globalisation. The production of new energy vehicles (NEV) has grown exponentially in recent years. China is now a global leader in the transition to 'green' and 'digital' cars. New models of production and innovation are emerging that pose a major challenge to the combustion engine industry's productive system forged in the traditions of Fordism and Toyotism. The Chinese lead-firms of the emerging NEV industry – producers of cars, batteries and new software platforms – are not only successful in China, but are also rapidly establishing a presence in traditional industry centres in Europe and North America, as well as in developing countries in Southeast Asia and Latin America.

However, transformation and globalisation are happening under conditions of increasing instability. The rapid transformation has caused a crisis in the traditional car industry, resulting in overcapacity and increasing job cuts in other industrialised countries, as well as in China. Global carmakers and their joint ventures are rapidly losing market share and their once enormous profits in China. Chinese car makers in turn are facing a protectionist backlash in North America and in Europe.

Against this background, this paper will attempt a fact-based analysis of the current transformation and the main characteristics of the Chinese NEV industry and its key players. It aims to provide a differentiated picture of the economic conditions of the NEV 'revolution' and Chinese firms' globalisation strategies, related to the changes in the industry's productive system. It will also highlight the implications for industrial and labour policies in Europe. The policy brief will tackle these questions in four steps.

Section 1 will provide a basic analysis of the current transition and map the field of Chinese NEV players. In a more strategic perspective, we will analyse the different groups of Chinese NEV producers and the competition between large state-owned car makers and their joint ventures with foreign carmakers, on one hand, and the 'new forces' of independent car makers, NEV start-ups and producers of key components, on the other.

Section 2 will attempt to obtain a deeper understanding of the changes in industry structure and production networks and trace the transition from the vertically integrated supply pyramids of the traditional car makers towards a model of network-based mass production similar to the IT industry.

Section 3 will analyse the risks of this transformation with regard to economic and social stability, looking at the impact of the current price wars on the productive structure of the industry, the shifting balance between 'old' and 'new' centres of carmaking and the rapid proliferation of low-wage employment standards in the production of NEV and their core components.

In Section 4, we will analyse the global positioning of major Chinese players in the NEV sector and address key strategic questions of its rapid internationalisation related to the production model, supply chains and labour practices.

The Conclusions will spell out some key lessons for Europe and the need for an integrated sectoral policy of transformation, including technologies, production and work in Europe. We will highlight the challenges for trade unions when it comes to organising the emerging battery sector.

1. Overview and structure of China's transforming auto industry

The current transformation of the Chinese automotive industry must be seen against the backdrop of long-term overcapacity and underlying overaccumulation of capital in the sector, prevalent since its recovery after the 2008 financial crisis.[1] Between 2011 and 2016, overall car manufacturing in China grew rapidly, with peak annual rates of 13.9% in 2013 and 13.7% in 2016. Car production declined abruptly from 2017, shrinking by 2.8% in 2018 and by as much as 8.2% in 2019.

The Covid-19 pandemic became the catalyst for accelerated change. In 2020 – the first year of the pandemic, with the greatest impact on the economy – car production remained relatively stable (–1.9%). It crashed during the first three months of 2020 under the nationwide lockdown (–79.1% year-on-year in February 2020), but recovered rapidly, with monthly production volumes growing by 10–15% year-on-year after May 2020.[2]

The data reflect the Chinese government's nationally coordinated emergency measures and the subsequent recovery of the economy in the second half of 2020. However, the pandemic-related plant closures often disguised longer-term capacity reductions and lay-offs resulting from pre-existing overcapacity. Capacity utilisation rates thus remained low in the wake of the pandemic and employment in the car industry fell substantially. Some companies used the lockdowns to convert production to NEV, usually accompanied by substantial workforce reductions.

In the wake of the pandemic, there was a major shakeout among Sino-foreign joint ventures, leading to the exit of major international carmakers. Stellantis (owner of Peugeot, Fiat and Jeep) withdrew from China altogether, and the operations of Mitsubishi, Ford and Mazda were massively curtailed. The stronger multinational carmakers such as VW, GM and Toyota suffered massive losses in revenues and profits and withdrew several traditional models from the market. In 2020, global brands still provided 62% of light vehicle shipments industrywide, according to the Chinese Association of Automobile Manufacturers (CAAM). But in less than five years the balance shifted substantially. In 2024, 65% of the market was captured by Chinese brands. BYD became the best-selling brand in the domestic market in China.[3]

At the same time, sales and production volumes of NEVs soared, despite shrinking buyer subsidies. The shipment of electric vehicles rose from 1.32 million in 2019 to 12.84 million in 2024, while the share of electric vehicles in total new car shipments climbed from 4.7% to 40.9% (↗ Figure 1).

1 Lüthje, B., and Tian, M. (2015): China's automotive industry: Structural impediments to socio-economic rebalancing, in: *International Journal of Automotive Technology and Management*, 15(3), 244–267.

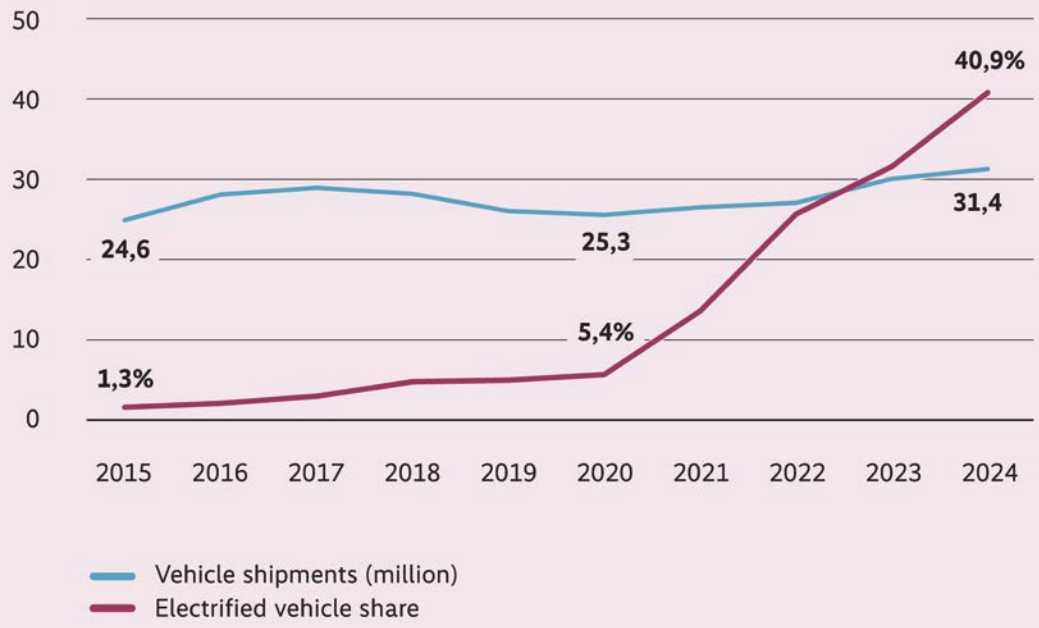
2 MIIT (Ministry of Industry and Information Technology) (2021): *Zhongguo Qiche Chanye Fazhan Nianbao* (China Automotive Industry Development Annual Report). 74 pp. Beijing: MIIT, pp. 12–13.

3 China, once a backwater, rides EV to upend global auto industry, in: *Automotive News China*, 17 April 2025; available at: https://www.autonews.com/china/an-100-china-ev-rise-0417 (accessed 6 January 2026).

Figure 1

EV-market growth China 2015–2025

Electrified vehicles made up just over 1% of China's domestic and overseas car shipments in 2015, gradually increasing to 5.4% by 2020. Last year they made up 41% of car shipments.



Source: *China Association of Automobile ManufacturersAutomotive News, April 17, 2025*

In the wake of this transformation, NEV exports soared, and in 2022 China's automobile exports reached 3.11 million units. From January to June 2023, China's vehicle exports increased by 75.7% year-on-year to 2.14 million units, surpassing Japan and ranking first in the world for the first time. China is now a net exporter of cars, and Chinese NEV and battery makers have commenced widespread internationalisation, a reversal of the domestically-oriented growth model of the Chinese car industry in recent decades.[4]

The NEV sector is dominated by private, smaller state-owned and foreign companies; the traditional joint ventures of global carmakers with large state-owned Chinese car companies play only a secondary role in the new field.

BYD is the undisputed market leader, both in China and globally. In the first quarter of 2025, the company commanded 15.45% of global sales and 38.5% in China, with steady gains in market share in recent years. They are also market leaders in plug-in hybrid vehicles.

Tesla is now number two, with a global market share of 12.6% in early 2025. Whereas sales and market share in China have been decreasing recently (also as a consequence of Elon Musk's involvement in US politics), Tesla maintains strong competitiveness, relying mainly on its familiar Y and S models.

Geely recently ascended to third rank, at

4 China set to overtake Japan as world's biggest car exporter, in: *Financial Times*, 12 September 2023; available at: https://www.ft.com/content/cdcb0d7e-3ec2-42bc-bfcc-9489290aa9ae (accessed 6 January 2026).

6.9%, with a strong year-on-year increase due to the rapid expansion of sales of its Galaxy series.

Wuling, in its joint venture with Shanghai Automotive and General Motors, ranks fourth, with a market share of 6.39% for its best-selling Hongguang MINIEV, a two-seat small car at a very low price, but also a strong performance in the high-end segment of PIV, due to its established competencies as China's leading producer of mini-vans.

Other important brands include **Changan Automobile**, a subsidiary of car and truck maker Changan, owned by the central government (market share 3.4%); **NIO**, a start-up specialising in high-end pure EVs (market share 2.2%); and **Xiaopeng**, a similar start-up based in South China with strong competencies in autonomous driving (ADAS), and a partner of Volkswagen. All in all, there are about 85 EV brands in China at present, among them other prominent names with high ambitions such as **Xiaomi** (one of the leading smart phone and electronics makers in China), Guangzhou Automotive with its popular **AION** brand, **Leapmotor** (now in partnership with Stellantis), and the new partner firms of **Huawei**, such as **Seres** with its AITO brand.[5]

Development is highly dynamic with a rapid concentration of market share among the major producers, such as BYD and Geely. It can be expected that many of the smaller car brands will not survive. On the other hand, the rapid change in production models and industry architecture (see Section 2) may open up unexpected growth opportunities for new players, for example Huawei's alliances with a number of private start-ups, as well as state-owned car makers (Changan and Shanghai Automotive), or foreign car brands such as Audi.[6] It should also be noted that China's truck market is expected to be 50% electric by 2028, according to estimates from battery market leader CATL.[7]

The changing field of industrial actors reflects two major changes in the political economy of the car industry in China. The **first** is the shifting focus of government industrial policy from the large state-owned car groups to private producers of NEV and their key components, especially batteries, digital driving systems and software platforms. From the 1990s, the Chinese government pursued the transfer of advanced car and car manufacturing technology through joint ventures between state-owned car makers and global brands. This policy was successful in terms of building an advanced automotive industry in China, but it failed in its goal of developing viable indigenous car brands. The state-owned car makers enjoyed stable revenues and profits from producing and selling foreign-branded cars in China, but did not invest much in new technologies and production networks. The small, but rapidly growing NEV sector therefore seized the opportunity to build indigenous innovation based on China's growing strength in the new energy and electronics sectors, supported by massive public investment in new energy technologies and infrastructure.[8]

The **second** major change is the declining role of global car makers both in terms of market share and innovation. For many years, China has been their major source of revenue and profit, which stabilised the traditional growth model of mass producing high-quality combustion-engine cars. Sino-foreign joint ventures therefore have been late-comers in NEV and hardly played a role in the reshaping of innovation and production networks. Now, they have to adapt to this process at a relatively advanced stage. Major European and Japanese car makers are now promoting a new series of cooperations and partnerships with key Chinese companies along the NEV chain, described as 'in China

5 Baton Passes to China: New Era for Auto Industry, in: *Autoupdates China*, 15 April 2025. WeChat Special Program/

6 Yang Jian (2025): China, once a backwater, rides EVs to upend global auto industry, in: *Automotive News China*, 17 April.

7 CATL founder Robin Zeng expects China truck market to be 50% electric by 2028, in: *Financial Times*, 20 May 2025; available at: https://www.ft.com/content/87372b46-ee9c-4747-ae2d-3f729b92b008 (accessed 6 January 2026).

8 Lüthje, Boy, and Wei Zhao (2024): Between Covid and Geopolitics: Emerging Production Networks in the New Energy Vehicle Industry in China, in: Krzywdzinski, M./Lechowski, G./Humphrey, J./Pardi, T. (eds): *Global Shifts in the Automotive Sector. Markets, Firms and Technologies in the Age of Geopolitical Disruption*. Cham, Switzerland: Palgrave MacMillan, pp. 202–227.

for China', a strategy to stem market losses and stay in the race.[9]

The decline of joint ventures is reflected in massive overcapacity in the Chinese automotive industry. Recent data from a major supplier to several Chinese automakers shows a steady decrease in their capacity utilisation, plummeting from about 62% in 2017 to approximately 48% in 2023. This downturn highlights a concerning trend, with only 20 carmakers maintaining a utilisation rate above 60%, while 19 operate between 30% and 50%, while a significant number, 36 companies, function below 30%, according to supplier data. Such insights have been confirmed by many car industry executives in China.[10]

Many of the idled factories are relatively new. They have been built only since 2010 during the massive investment boom in the wake of the global financial and economic crisis, especially in China's central and western regions. Most are owned by joint ventures of Chinese SOE and foreign car makers. The factories were built to make traditional combustion-engine cars and only few have been converted to NEV.[11]

9 Western carmakers fight back with local know how at Auto Shanghai, in: *AutoUpdate China*, 28 April 2025. WeChat Official Program.

10 Overcapacity looming in China's auto supply chain, in: *Automotive News China*, 5 May 2024; available at: https://www.autonews.com/china/supply-chain-overcapacity/0524

11 Ibid.

2. Changing networks of production and innovation

The 'green' and 'digital revolution' in cars and mobility entails a major reversal of historical industry structures. It is driven by the rapid growth of new industry segments such as batteries and digital driving systems, and the massive re-composition of production networks and capital. This process is increasingly undermining the auto industry's structure of mass production, shaped under Fordism since the 1920s and renewed along the lines of the Toyota model during the 1990s. China is at the forefront of this transition and major Chinese players are in key positions to reshape industry structures.

Today's development is somewhat similar to that of the electronics industry in the 1990s during the 'PC' and 'internet revolutions], which were led by new chipmakers and software firms such as Intel and Microsoft. At that time, a vertically disintegrated industry structure emerged and the major components of IT hardware and software were created and manufactured by specialised, highly concentrated industry segments of their own rather than traditional integrated electronics firms, such as IBM or Siemens.[12]

Figure 2

Towards the horizontal car industry

(vertically disintegrated Model, ILR Ppt)

Product	Manufacturer
Car design and assembly	VW, Toyota, Tesla, BYD etc.
Battery	CATL, BYD, Panasonic, SK
Powertrain and driving system	Bosch, Continental, Denso
Software (platform)	Huawei, Foxconn, Xiaopeng, OEM?
Semiconductors	Infineon, STM, TI, Renesas, Nvidia?
Contract assembly	Foxconn, Magna, Seres

↗ Figure 2 depicts the transition of the industry from the traditional structure of mass production centred on brand-name carmakers ('original equipment manufacturers' or OEM) and their hierarchical supplier pyramids to an industry model composed of horizontal, relatively independent layers of key components. The emerging industry structure in the automotive industry can be described as follows:

→ *Car assembly and design* remain a core function of the production system. However, the assembly-based production know-how of global brand-name carmakers (OEMs) is no longer the key to controlling market cycles, supplier pyramids and innovation chains. The traditional OEMs are increasingly coming under challenge from specialised EV makers, such as Tesla or BYD, whose core competencies are in batteries and information technology rather than in car design and assembly.

→ *Batteries and the minerals* required to produce them have become a strategic core component of electric vehicles, similar to microchips in IT products. The major producers, such as Panasonic, SK and China's CATL, control the knowledge necessary for technology and manufacturing and have established themselves as relatively independent global players. They have an intimate know-how of mass manufacturing of battery cells at their core, accompanied by connections to far-flung minerals and processing supply chains.

→ *Powertrain and drive systems* are a standard core function of car making. Electrification and digitalisation radically altered the know-how base of these components. It now consists of the integration of highly complex information from sensors, radar, maps and software systems with advanced mechanical knowledge, especially in cars' steering units. Carmakers are involved with large internet firms such as Baidu and Ali Baba, as well as global tier-one suppliers, such as Bosch and Continental. A unified structure of this key industry segment has not yet emerged, but it will be one of the key fields of modularisation in the near future.

→ *Car software* today is integrated into complex platforms, rather than being connected to specific devices, such as injection, braking and car entertainment systems. Major EV makers such as Tesla have been leading this development, establishing new product platforms that also function as a strategic interface to trace customer data. Traditional car makers are making enormous efforts to set up or acquire software firms, such as Cariad or Horizon Robotics in the case of VW. At the same time, large electronics and telecoms firms, such as Foxconn and Huawei, are developing new platforms based on their competencies in IT, cloud computing and mobile communications, which may become branded systems in the future ('Huawei inside').

→ A similar integration process is occurring in *automotive semiconductors*. The traditional architecture of car chips was based on electronic control units (ECU) for specific application devices. This grew in complexity over the years, technology development followed the pattern 'add a feature, add a box'. The increasing digitalisation of the entire system in today's electric and digital cars favours integration of electronics into complex microprocessors or 'systems-on-chips', familiar from computers and smartphones.[13] The traditional providers of specialised car chips, such as Infineon, STM and Renesas, are being challenged by designers of super-high integration devices (Qualcomm and Nvidia in particular), and their contract manufacturers such as TSMC. Some very large car suppliers, such as Bosch, may also play a role in this field in the future.

13 Ziegler, A. and Heidling, E. (2023): *The chip crisis in the automotive industry – Challenges, measures, action areas*. Institut für Sozialwissenschaftliche Forschung, ISF; available at: https://doi.org/10.36194/HyValue_Chip_Crisis_2023 (accessed 6 January 2026).

→ Finally, the vertical decoupling of traditional technological core know-how in car design and manufacturing from the strategic components of digital and green cars creates space for *contract manufacturing* of electric vehicles, which in the traditional automotive industry has remained limited. The increasing modularisation of vehicles enables assembly without intimate knowledge of the components and their design, similar to IT manufacturing. At the same time, the management of complex procurement and supply chains for electronic components is becoming a key task of manufacturing, driven by shorter market cycles and compressed profit margins. Electronics contract manufacturers, such as Foxconn, are advancing as new players in car assembly, including the development of entire platforms for cars and software.

From this perspective, we can explain the key characteristics of Chinese NEV producers and their differences from European competitors. The leading Chinese NEV and component makers have their origins in the electronics industry and its traditions of vertically disintegrated mass production. The present generation of start-up 'new forces' originated as software companies for advanced drive systems. At the same time, telecommunications firms, such as Huawei and Xiaomi, are becoming important players. In their wake, the production models of the electronics industry are becoming more and more dominant in car manufacturing, including neo-Taylorist models of mass production with large workforces of relatively low-paid production workers.

The emerging industrial ecosystems are serving and shaping a car market that is becoming fundamentally different from the established patterns in traditional industrial countries in Europe, North America and East Asia. Comprehensive digitalisation of vehicles, the availability of advanced digital features at low cost along with extremely shortened market cycles have become key characteristics. Chinese companies have considerable competitive advantages in certain technologies and market segments, such as BYD in fast charging and digital driving or NIO in battery-swap systems. Such networks create and assemble the specific know-how for NEV production without the heritage from traditional car making, There are also new alliances of platform leaders with specialised manufacturers, for example Huawei with Chongqing-based Seres.

Electronics contract manufacturers are playing an increasing role in global restructuring. Foxconn has developed major alliances with Japanese car makers Mitsubishi and Nissan. In the case of Nissan, Foxconn has emerged as a potential investor to rescue the transnational auto maker. The company also has a cooperation agreement with German first-tier supplier ZF and tried to take over the troubled company's entire power train business in mid 2025.[14] At the same time, Foxconn shares its platforms in cooperation with major car makers such as Geely and Stellantis. 'Foxconn's electric vehicle strategy focuses on common platform elements to customise vehicles while sharing underlying architecture. The approach mirrors its electronics manufacturing model, where reference designs reduce development time by up to 80%.'[15]

14 EV boom masks economic pain for China's major auto hubs, in: *Automotive News China*, 9 April 2025; available at: https://www.autonews.com/china/an-china-ev-boom-upends-auto-hubs/www.autonewschina

15 Foxconn sees growth driven by AI, EVs, in: *Digitimes*, 29 May 2025; available at: https://www.digitimes.com/news/a20250529PD225/foxconn-growth-taiwan-technology-electronics.html, accessed January 6, 2026.

3. Risks to economic and social stability

Despite its innovative dynamics the emerging industry model harbours massive risks and imbalances, and the Chinese state has only limited capabilities to mitigate them. On one hand, rapid expansion is often unstable and tends to create overcapacity in highly innovative industry segments. On the other hand, the rapid growth of low-cost flexible mass production faces considerable challenges in terms of social and environmental sustainability, especially labour standards.

The current 'price war' in the Chinese NEV sector is indicative of this situation. The government is warning manufacturers of price dumping and financial pressure on suppliers, also under the impact of international concerns. But it has no efficient means to control the situation because regulatory measures such as price controls could stifle competition and might impede China's global competitive advantages.[16] In light of the explosive development of the EV sector, electric vehicles are no longer listed as a strategic priority in the new Five-Year Plan 2026–2030. Under present conditions, no major impact on future growth of the sector should be expected.

Behind this are major changes in the industrial base of car making. The economic positions of major car industry centres are shifting. According to Chinese government data compiled by Bloomberg, the three centres of traditional car manufacturing in China, Changchun (with FAW-VW), Shanghai (SAIC with Volkswagen and General Motors) and Guangzhou (GAC and Toyota, Honda and Nissan), have lost substantial production volumes during and after the pandemic. On the other hand, major locations of NEV production have soared. Shenzhen became the top location of car manufacturing in China with almost 3 million units per year in 2024, driven by the enormous growth of BYD. It was followed by Chongqing, which is rapidly transforming its car production from traditional state-owned car makers and joint ventures (Changan with Ford and Suzuki) to contract manufacturing, led by a new generation of private companies, such as Seres, a manufacturing partner of Huawei (↗ Figure 3).[17]

Given the size of the car industry and its supply chains, the decline of traditional car production has a major impact on GDP growth, even in large and diversified industrial centres, such as Shanghai or Guangzhou (↗ Figure 4). Guangzhou was hit particularly hard. On one hand, its car sector is highly dependent on the top three car makers from Japan, which have been slow making the transition to NEV and have underperformed in the Chinese market in recent years. On the other hand, the growth of new industry segments was hampered by the failure of major investments in potential new NEV makers, in particular real estate developer Evergrande with a giant industrial project in Guangzhou's Nansha district.

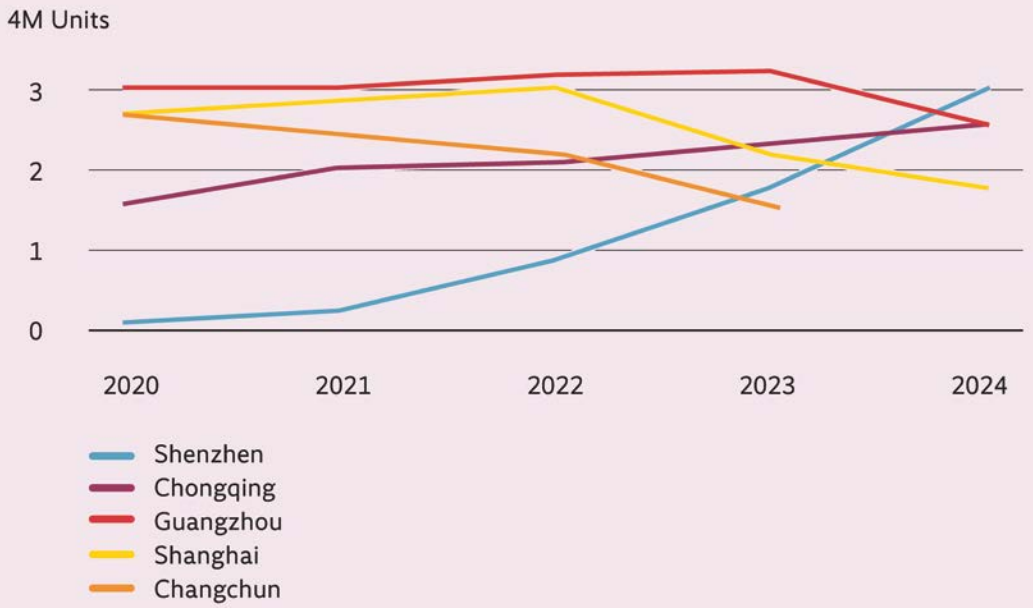
16 Market regulator to reign in autoindustry price wars, in: *Automotive News China*, 11 June 2025; available at: general-motors/market trends/regulator-reign-in-price-wars/0611/ LINK UNVOLLSTÄNDIG

17 EV boom masks economic pain for China's major auto hubs, in: *Automotive News China*, 9 April 2025; available at: https://www.autonews.com/china/an-china-ev-boom-upends-auto-hubs/ (accessed 6 January 2026).

Figure 3

Car production in 'old' and 'new' car making locations in China, 2020–2024

Shenzan overtakes Guangzhou in Auto Production



Note: *2024 figure not available for Changchun* ***Source:*** *Government data, media reports*

NEV and battery producers are building up large-scale production systems with high flexibility in supplier relations, as well as employment. A considerable number of large production complexes have been built in emerging industrial centres in central and western China. The cities of Hefei in Anhui province (home to battery maker Gotion, car maker JAC and VW's new China joint venture VW Anhui), Changzhou in Jiangsu province (China's largest battery-making cluster) and Liuzhou in Guangxi province (with Wuling and several battery factories) have become major locations for NEV and component manufacturing. BYD has opened a number of new industrial parks in central and western cities in recent years, among them Changsha, Hefei, Xian, Chengdu and Taiyuan. Its new industrial park in Shanwei, a rural city in Guangdong province near Shenzhen, features an integrated structure of car and battery manufacturing, dormitories and housing facilities, and a seaport for car exports.

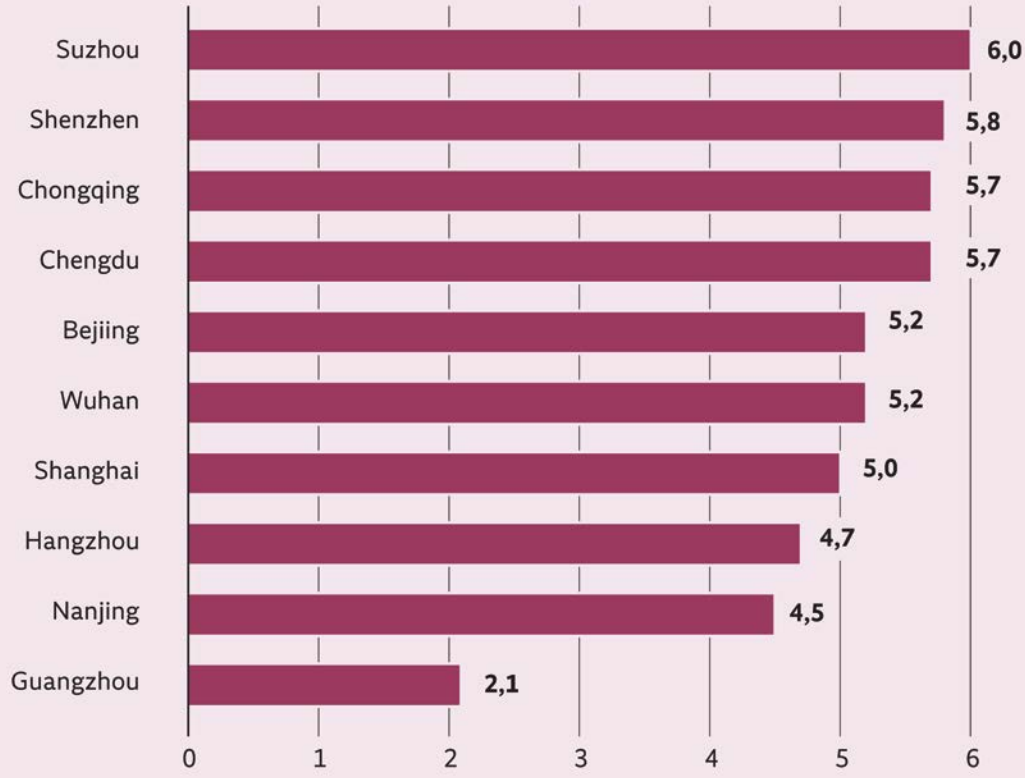
The expansion of low-cost mass production goes along with the proliferation of related production regimes, which can be described as the 'Foxconnisation of car manufacturing'.[18] The wages of production workers are substantially lower than in joint ventures. The rule of thumb for salaries among industry experts at the top joint ventures is about 9 US dollars as a standard hourly wage compared with 4 or 4.50 dollars at independent carmakers such as Geely and

18 Lüthje, B. (2022): Foxconnisation of automobile manufacturing? Production networks and regimes of production in the electric vehicle industry in China, in: C. Teipen, P. Dünhaupt, H. Herr and F. Mehl (eds), *Economic and social upgrading in global value chains*, pp. 311–334; available at: https://doi.org/10.1007/978-3-030-87320-2_12 (accessed 6 January 2026).

Figure 4

GDP growth in major centers of car making in China Growth Rate (%)

Guangzhou's Economic Growth slows. Auto hub's GDP expanded the least in 2024 among China's key cities



Source: *Government data*

BYD. These companies also employ large numbers of technicians and engineers, mostly trained at Chinese vocational colleges and universities. Their salaries are also lower than in first-tier joint ventures, but have risen considerably due to the shortage of such talent in the recent boom.

Such high-performance production regimes have been adapted from Korean, Taiwanese and US models.[19] Working conditions are fairly decent and generally comply with labour laws and regulations. However, the wage system is highly incentive-based with relatively low basic wages, usually less than half the regular monthly income. Production workers, many of them migrants, are forced to work overtime to achieve barely a subsistence income.

Chinese EV producers work at significantly lower levels of automation than the global car makers and their joint ventures. They maintain large workforces concentrated in industrial parks, similar to electronics firms. BYD, for

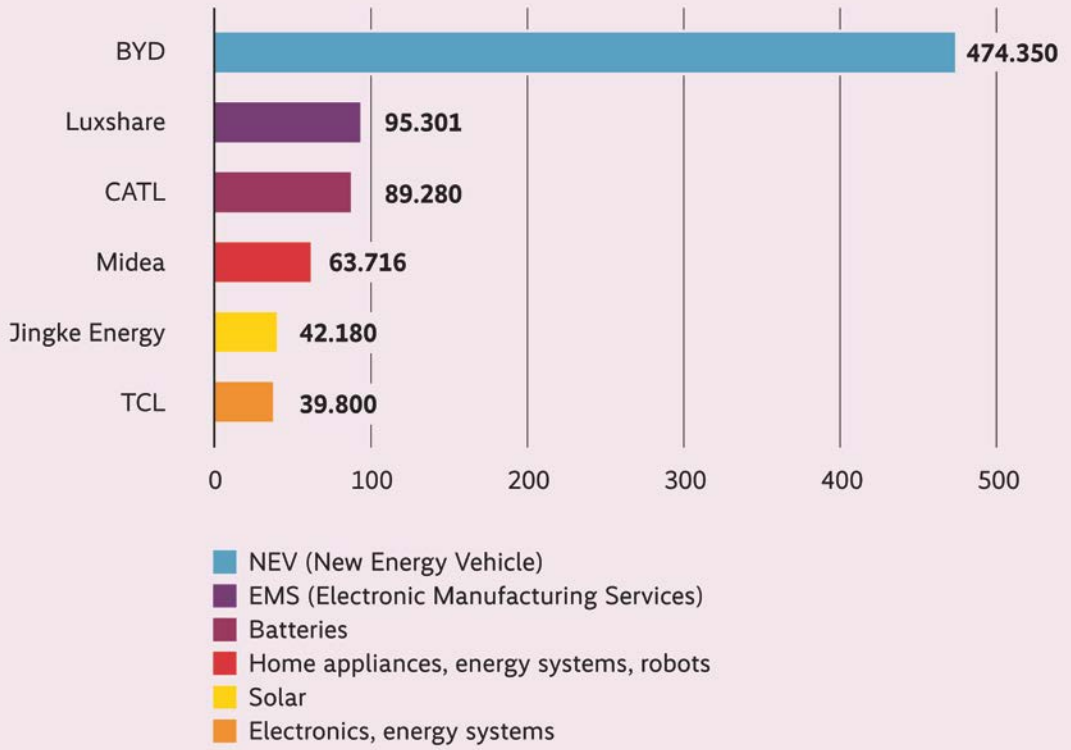
19 Lüthje, B., Luo, S and Zhang, H. (2013): *Beyond the Iron Rice Bowl. Regimes of Production and Industrial Relations in China*. Frankfurt/New York: Campus

example, had its car manufacturing concentrated in two complexes near Shenzhen, one with 20,000–30,000 workers and the other with over 70,000 in 2018 (2018 field interviews). The EV boom of recent years has led to mass hiring of production workers. The company has set up large new industrial parks in central and western China and expanded its overall workforce by 474,000 to nearly 900,000 from 2019 to 2023.

Besides the 'old' and 'new' carmakers, electronics contract manufacturers such as Foxconn are playing a major role in EV supply chains. These companies are, however, notorious for their poor working conditions and low wages, even by Chinese standards. Their factories, many with 100,000 or more workers, feature flexible mass production closely associated with the unique characteristics of China's internal labour migration system. It is based on large-scale employment of rural migrant workers in coastal provinces or big-city inland locations. Basic wages are usually at the local legal minimum and migrant workers have to work a lot of overtime, often beyond legal limits. Such work is extremely segmented and deskilled, designed to accommodate mass recruitment and lay-offs as market conditions dictate. Workers are housed mainly in dormitories, some with harsh living conditions.[20]

Figure 5

New industries drive employment, added employment 2019–2023



Source: *Nikkei Asia, May 22, 2024, Data from Wind Database*

20 Im Reich der 14-Tage-Woche. Zahlen Chinas Arbeiter den Preis fuer den E-Auto Boom?, in: *Frankfurter Allgemeine Zeitung*, 11 June 2025; available at: https://www.faz.net/aktuell/wirtschaft/byd-arbeiter-haben-80-stunden-woche-zahlen-sie-den-preis-fuer-chinas-e-auto-boom-110527993.html (accessed 6 January 2026).

4. Internationalisation of China's emerging industry model?

The internationalisation of Chinese car and battery makers is part of a global restructuring of the industry and its architecture, in which Chinese and established multinational car makers are involved and mutually intertwined. Development here can thus not be described solely in terms of the growth of Chinese players' overseas market shares and production volumes. Rather it is a process of restructuring in which new forms of industrial cooperation and competition are emerging. In this perspective, the internationalisation of the Chinese NEV sector is different from previous periods of Chinese investment in Europe, which focused on acquisitions of European companies and production facilities with advanced production know-how (as in the case of German robot maker Kuka in 2016)[21] or portfolio investments.

The current globalisation of Chinese car production focusing on NEV and batteries is driven by the following elements:

1. (Internationalisation of car assembly by FDI: Chinese NEV makers are setting up or acquiring factories in Southeast Asia, Latin America and Europe for local production and in order to ease the pressure from tariffs. The first steps were taken in the early 2020s into Southeast Asia, Thailand, Malaysia and Indonesia in particular.[22] The goal is to enter local markets and establish early leadership in NEV, especially against the dominant position of Japanese car makers in these countries. A similar strategy has been followed in Latin America in recent years, with a focus on Mexico and Brazil. In both countries, Chinese NEV makers are in leading positions. Mexico is also a potential base for low-cost exports to the United States. In Europe, Chinese NEV firms are attempting for the first time to enter mature car markets. Major Chinese brands have established relations with car dealerships and announced the establishment of production facilities in Europe. BYD has announced an investment of up to USD 4 billion for a new factory in Hungary with a planned capacity of 500,000 cars per year and 10,000 jobs.[23] The company had previously considered taking over idle car plants in France and Germany, such as Ford's former factory in Saarlouis.

2. Global production of core components, batteries in particular: Chinese battery makers are setting up or acquiring factories in Europe for local production. This is closely connected to the internationalisation of Chinese producers of battery machinery who provide the core equipment for most battery factories in Europe, including those under European ownership, such as AGC or Northvolt (taken over by Lyten of Canada after bankruptcy in 2024).

21 Mercator Institute for China Studies (2016): *Made in China 2025. The making of a high-tech superpower and its consequences for industrial countries*. MERICS Papers on China, No. 2, Berlin; available at: https://merics.org/sites/default/files/2020-04/Made%20in%20China%202025.pdf (accessed 6 January 2026).

22 China's made-in-Europe EVs pose new threat to region's carmakers, in: *Automotive News China*, 25 July 2024; available at: https://www.autonews.com/Europe/new-threat-to-EU-carmakers/0625/

23 BYD to invest $4bn for new factory in Hungary, in: *Automotive News China*, 17 February 2025; available at: https://www.autonews.com/byd/invest-4bn-factory-hungary/0217/

3. Cooperative ventures in Europe and other markets between Chinese NEV and LIB players with European multinationals. Stellantis bought a 20 per cent stake in Leapmotor in a landmark deal in 2024, under which the Chinese start-up would sell imported low-cost NEVs at Fiat and Peugeot dealerships in Europe and produce other models at a Stellantis facility in Poland.[24] Volkswagen has a 25 per cent capital stake in Chinese battery maker Gotion, and both companies are developing a number of cooperation projects in China and Germany.

↗ Figure 6 shows the major investment projects of Chinese car and battery makers in Europe. The number is relatively small, but most projects are substantial. The largest are from battery maker CATL in Hungary (a projected USD 8 billion) and Spain (a projected USD 4 billion). The biggest project in car assembly is BYD's planned factory in Szeged, Hungary (a projected USD 4 billion), along with its existing bus factory in Komárom, Hungary, and a facility for producing 150,000 NEV in Turkey (which has a customs union with the EU) beginning in 2026.[25] Other Chinese NEV firms are mainly pursuing partnerships with European automakers, such as Chery with Ebro in Spain and Leapmotor with Stellantis in Poland. Similar arrangements are under consideration with regard to recently idled Volkswagen plants in Germany, for which XPeng and Chery have appeared as potential buyers at some point.[26] Battery makers are pursuing mainly stand-alone projects in central and eastern Europe (Hungary, Poland, Slovakia) or de-industrialised regions in western Europe (Douai in northern France, Erfurt in eastern Germany). Most of these factories are supposed to serve major European car makers as key customers, such as BMW with CATL in Hungary, Stellantis with CATL in Spain or Renault with AESC Envision in France. Volkswagen Power Co. directly involves its Chinese partner Gotion in the operation of its key factory in Salzgitter; most of the manufacturing know how is transferred from China and VW employees are trained in Gotion facilities in China (2025 field interview data).

The foreign investment in Europe is related to tariffs, set at up to 45 per cent on NEVs from China for various companies by the EU Commission in 2024.[27] After one year, it turned out that the tariffs had not halted the growth of Chinese car makers in Europe. As the tariffs were applied only to battery driven electric vehicles, Chinese car makers shifted to selling plug-in hybrid vehicles (PHEV) or conventional cars in Europe.

Within one year from October 2024, Chinese brands increased their overall sales by 93 per cent. EVs made up 34 per cent of Chinese sales from January through October 2025, down from 43 per cent in the same period in 2024.[28]

24 New cooperative ventures challenge Europe's car market, in: *Automotive News China*, 6 March 2025; available at: https://www.autonews.com/Europe/new-ventures-challenge-car-market-0306/

25 Chinese FDI taking shape in Europe, in: *Financial Times*, 7 April 2024; available at: https://www.ft.com/content/cdcb0d7e-3ev5-42bc-9489290aa9ae

26 XPeng and Chery eyeing VW factories in Germany, in: *Automotive News China*, 29 April 2025; available at: https://www.autonews.com/manufacturing/automakers/XPeng-Chery-vw-factory-0429/

27 EU steps up protections against Chinese car imports, in: *Financial Times*, 25 May 2025; available at: https://www.ft.com/content/cdcb0d8f-3ec2-45cb-bfcc-9489290aa9ae,

28 EU tariffs on Chinese EVs to protect European automakers may have had the opposite effect, in: *Automotive News China*, 9 December 2025; available at: https://www.autonews.com/manufacturing/automakers/ane-china-europe-tariffs-1209/ (accessed 6 January 2026).

Figure 6

Major Chinese investment projects in battery and NEV production in Europe

Existing or decision confirmed, as of 06/2025

Type of investment	Batteries	NEV assembly
Chinese direct investment	**CATL** – Arnstadt/Erfurt, Germany – Debrecen, Hungary **BYD** – Komárom, Hungary **CALB** – Sines, Portugal **Envision AESC** – Douai, France **Sunwoda** – Nyiregihaza, Hungary **Gotion** – Göttingen, Germany – Bratislava, Slowakia	**BYD** – Szeged, Hungary – Komárom, Hungary – Bursa, Turkey **Chery** – Spain – Bursa, Turkey
European-Chinese cooperations	**VW PowerCo/Gotion** – Salzgitter, Germany **CATL/Stellantis** – Zaragoza, Spain	**Geely/Volvo** – Gent, Belgium **Leapmotor/Stellantis** – Tychy, Poland **Chery/Ebro** – Barcelona, Spain

Source: *Automotive News, China, Autoupdates China, own research. Copyright: Institut fuer Sozialforschung, Frankfurt/M*

In the course of negotiations, the EU has also proposed floor prices and requirements for technology transfer. Floor prices seem relatively difficult to determine and impractical because they would have to be set for individual products. A proposal of a general price floor of 35,000 euros for Chinese cars met resistance from the Chinese and European producers involved because some Chinese low-cost cars cost under 20,000 euros. It would de facto remove Chinese low-cost cars from European markets.[29] Requirements for technology transfer are typically a strategy used by developing countries, including China under the joint venture model in the car industry. In practice, such requirements have often represented an obstacle to industrial cooperation within joint ventures and along supply chains. They have also been a disincentive for China's large automakers to create indigenous local brands (see above).

Under the continuing political insecurity, the key question concerns how Chinese companies may adapt to the fundamentally different environment of innovation, production and work, and how and to what extent they may export their home-grown practices to foreign locations? In light of the above analysis, two major problems of localisation occur. One is the transfer of production models and networks to the European context; the other is the models of flexible, low-cost production and their adaptation to European labour standards.

As already explained, Chinese NEV makers' production models are highly focused and depend on large and very flexible networks of suppliers. Chinese managers and experts are concerned that Chinese standards of speed and flexibility cannot be achieved in Europe, and that factory projects will be delayed by bureaucratic rules on land use, the environment and work. Supply chains are of particular concern because they can be transferred from China only to a limited extent, and new relationships have to be developed with European suppliers. Cooperation with European OEMs may ease this problem, but Chinese NEV makers do not command much bargaining power vis-à-vis European suppliers and most car assembly projects are too small to warrant full-scale transfer of supplier networks from China. Chinese NEV factories in Europe will therefore remain highly vulnerable to protectionist limitations on the import of car parts, which are part of the scenario of current trade conflicts (2025 field interviews).

At the same time, the organisation of production in relevant Chinese companies is centralised and hierarchical, geared to strictly controlling the manufacturing process, as well as intellectual property. Particularly in battery production, rigid centralisation prevails, also because of the complexity of production and very high requirements with regard to maintaining stability and quality of manufacturing. Chinese players therefore tend to transfer production technologies and processes entirely from China and to 'copy exactly'. Most equipment is imported from China and European facilities are developed and managed by Chinese specialists and service firms. This strategy may support operational speed in setting up new facilities, but can be costly in the long run because large numbers of Chinese specialists cannot be employed indefinitely in European plants. To date, Chinese battery makers have not developed viable localisation strategies. Joint learning processes have been initiated only in projects involving direct cooperation, which are also an essential condition for the transfer of advanced manufacturing know-how from China to Europe (2025 interview data). The strategies of NEV makers are similar, but car production is more diversified. Only the very large ones (such as BYD) can follow a copy-exactly approach; the smaller ones need more specialised arrangements.

Such centralised strategies become particularly problematic with regard to work and labour standards. Chinese practices of human

29 Floor prices threaten to squeeze out Chinese low-price EV, in: *Financial Times*, 11 June 2025; available at: https://www.ft.com/content/cdcb09bb-3ec2-42bc-fucc-9489290aa9ae,

resource management cannot be transferred easily to foreign locations, especially to countries with high labour standards and established systems of union representation and collective bargaining. Chinese managers are often aware of such problems, and see the potential for adapting 'high-road' practices from Europe, especially with regard to vocational and workplace training. However, the organisational and institutional framework for labour–management cooperation within companies is weak,[30] and industrial policies in the respective locations in Europe usually do not address workforce issues and labour standards when competing for investment from Chinese companies. Chinese NEV players therefore tend to concentrate their investment on EU countries with weak labour laws and trade unions, such as Hungary.

Recent reports about poor working conditions and questionable visa practices by a Chinese construction company building a BYD factory in Brazil show the risks of employing Chinese suppliers and adopting their labour practices in investment projects abroad.[31] Recently, the European Commission launched an investigation into such issues against BYD in Hungary.[32] According to information from Chinese social media, in Hungary BYD is using the same construction company as in Brazil. Workers say they receive 500 RMB per day and working time is ten hours. It should also be noted that Chinese specialists sent out to work in factory projects abroad are strongly aware of the risk of violations of labour and immigration laws on the part of their Chinese employers (2025 field interviews).

In light of such experiences, manufacturing alliances between European and Chinese players seem to provide a more sustainable framework within which to develop industrial cooperation and to restructure Europe's ailing car industry. As recent discussions around some idled Volkswagen plants in Germany reveal, Chinese investment may also offer alternatives to converting car factories to defence production under Europe's new drive for military rearmament.

30 Bian, Shuwen (2025): *Der abwesende Partner in der Sozialpartnerschaft. Veraenderungen der Mitbestimmungspraxis in Betrieben mit chinesischen Investoren*. Düsseldorf: Hans Boeckler Stiftung. Mitbestimmungsreport No. 84, 04/2025.

31 Brazil sues EV giant BYD over poor working conditions at new plant, in: *Financial Times*, 28 May 2025; available at: https://www.ft.com/content/bbcd-0d8e-4ev3-42bc-brcc-9489290aa9ae,

32 EU to investigate working conditions at Chinese plants in Hungary, in: *Financial Times*, 25 February 2025; available at: https://www.ft.com/content/cdscb-0a8e-3ec2-43bc-bfcc-9577290aa9ae,

5. Conclusions

This report investigates the ascent of the Chinese electric vehicle industry in light of changing industry structures and production models. It views the new constellation of industrial players in the Chinese NEV industry in the perspective of deep structural changes in the automotive sector, which is transitioning away from the Fordist and Toyotist models of vertical integration and global supply chains controlled by global car makers from Western and East Asian countries. The report analyses the economic and social risks of this rapid transformation in China and looks at potential problems of global expansion within the framework of which Chinese car makers are trying to implement their production models and regimes in Europe and other new markets.

With regard to the current political discussion about the 'Chinese threat' in NEV and other parts of the new energy sector, our report shows that the problems of a sustainable and just transition in the automotive sector are global and in many ways similar in China and Europe.

On one hand, it becomes clear that overcapacity in the global automotive industry is a structural problem emanating from the long-term fixation of global car makers and their Chinese partners on producing pricey and ecologically problematic 'premium cars' rather than accelerating the electric and digital transition. Obviously, most of the overcapacity in China's car industry is in traditional cars and not NEV. They were built to supply the rapidly growing Chinese market before the shift to NEV began. Foreign car makers were major beneficiaries of this boom. In fact, the car market boom in China was a major reason why traditional global car makers invested little in electric vehicle technology and maintained their traditional growth model based on mass production of combustion-engine cars. Against this background, protectionist measures against NEV imports and industrial investment by Chinese NEV players would punish the most innovative firms and further impede the adoption of electric cars in Europe.

On the other hand, it is evident that protectionism cannot curb the growing competitive strength of Chinese NEV firms. Recent developments in the battery sector have made this clear. The EU has championed the creation of a new battery industry in Europe with large subsidies, but the relevant new companies in Europe could not compete against the big players from China, Korea and Japan. When the leading European start-up, Northvolt, had to declare bankruptcy, it became clear that most of the new battery factories in Europe were heavily using Chinese equipment and specialists to set up manufacturing operations. Major European players in the battery industrial chain are therefore claiming that 'Europe should abandon efforts to rival China's battery industry' and seek enhanced industrial cooperation with China.[33]

However, the emerging industry model of highly innovative low-cost mass production pioneered by Chinese NEV and battery makers engenders considerable economic and social risks, as this report has shown. These risks need to be addressed by policies of industrial transfor-

33 Europe's mineral producers see lost race against China, in: *Financial Times*, 27 May 2025; available at: https://www.ft.com/content/cdcb0f9e-4ec3-42bc-bfcc-9579290aa9ae,

mation that must provide integrated prospects of economic, social and environmental transition, especially with regard to production practices and decent work. This would mark a major shift in political discussions in Europe.

In light of this analysis, a new set of challenges is emerging for European industrial policies in the EV sector. In the face of China's leadership in restructuring production networks there seems to be no alternative to cooperation. Europe should basically open up to the transfer of Chinese production networks, in both cars and components. Cooperation with Chinese firms should not be restricted to a limited number of large European car makers, but must encompass the whole spectrum of suppliers in the car and new energy sectors, especially small and medium-sized enterprises. In this context, Europe should promote flexible specialisation and diverse industrial clusters in the EV sector, rather than the concentration of mass production among leaders of large-scale industry. At the same time strict standards must be applied with regard to work, health and safety and the environmental impact of new production facilities. However, such an approach challenges present realities in Europe because competition between regions at various levels of development has often created races to the bottom rather than the proliferation of high-quality standards of environmental and social governance.

Decent work in manufacturing is a key issue when it comes to making the new energy vehicle industry sustainable and ensuring a just transition in the automotive sector. Trade unions are key actors in developed industrial countries. They must develop industry-wide perspectives to ensure labour, environmental and safety standards. As development in China shows, NEV production is emerging as a diversified industrial sector with different types of firms and specialisations, as well as a high degree of local clustering. Such an environment provides the conditions for industry-wide organising, collective bargaining and industrial policies. Including the new segments of car production, especially battery manufacturing, in union representation and collective bargaining seems a key issue when it comes to ensuring a 'just transition' in the automotive sector.

In fact, union strategies for the sector must go beyond securing the traditional interests of core carmakers and their employees. Unions must rather define new strategic goals that include workers in the battery industry and along the global supply chains of mining, refining and materials production, as well as the strategically important recycling sector. Industrial unions should promote industrial policies that support diversity within the battery sector, rather than engaging in a global technology race based on the creation of mega factories with large government subsidies.

The policies currently being implemented in Europe and the USA to catch up with battery cell producers from China, Japan and Korea foster such a technology race in the name of 'supply chain security', rather than focusing on diversified industrial development in order to counterbalance an emerging oligopoly of global battery makers in conjunction with large carmakers. Given the central position of China and other emerging economies in production and innovation, 'decoupling' and protection of national or regional markets is not possible and not practical for workers and trade unions.

The Author

Boy Luethje is a research fellow at the Institute for Social Research, Goethe University Frankfurt, Germany, and Prof. emeritus at Sun Yat-sen University and South China University of Technology. He lives in Guangzhou, China.


Friedrich
Ebert
Stiftung