GOVERNMENT'S IMPLICATIONS ON THE DEVELOPMENT OF THE ELECTRICAL VEHICLE IN CHINA

G'aniyev Zafarbek Ikrom o'g'li
JIDU, XIM fakulteti, Tashqi iqtisodiy faoliyat yo'nalishi magistranti
+998910192520
ganiyevzafarbek75@gmail.com

Ishmuradov Bahodir Sunnatovich
JIDU, Xalqaro moliya va Investitsiyalar kafedrasi o`qituvchisi
+998909863538
ishmuradov@uwed.uz

Abstract

This study evaluates the scale, composition, and evolution of Chinese government support for the new energy vehicle (NEV) industry between 2009 and 2023. Drawing on multiple official and industry sources, we estimate that cumulative state support totals approximately **$230.9 billion**, with annual funding rising from an average of **$6.74 billion during 2009–2017** to sharply higher levels after 2018. Five major categories of support are examined: national buyer rebates, sales tax exemptions, infrastructure investment, research and development funding, and government procurement. Buyer rebates and sales tax exemptions account for the majority of assistance, although the former was significantly reduced in 2022 and phased out entirely in 2023. The analysis also highlights important data challenges, particularly inconsistencies in EV sales statistics and discrepancies between State Tax Administration (STA) figures and independent estimates of sales tax exemptions. Due to the lack of long-term, transparent data, this study relies on a consistent estimation methodology aligned with government policy guidelines. Overall, the findings underscore both the substantial role of state intervention in the

rapid expansion of China's NEV sector and the need for greater transparency in official reporting to enable more accurate and long-term assessments.

Key words: China, New Electrical Vehicles, Government Support, Subsidies and Tax incentives, Electrical vehicle industry.

Аннотация

В данном исследовании оцениваются масштабы, структура и динамика государственной поддержки Китая в сфере производства транспортных средств на новых источниках энергии (NEV) в период с 2009 по 2023 год. На основе множества официальных и отраслевых источников мы оцениваем совокупный объем государственной поддержки примерно в 230,9 млрд долларов, при этом ежегодное финансирование увеличилось с среднего уровня в 6,74 млрд долларов в 2009–2017 годах до значительно более высоких значений после 2018 года. Рассматриваются пять основных категорий поддержки: национальные субсидии покупателям, освобождение от налога с продаж, инвестиции в инфраструктуру, финансирование исследований и разработок, а также государственные закупки. Субсидии покупателям и налоговые льготы составляют основную часть поддержки, хотя первые были существенно сокращены в 2022 году и полностью отменены в 2023 году. Анализ также подчеркивает важные проблемы, связанные с данными, в частности несоответствия в статистике продаж электромобилей и расхождения между данными Государственного налогового управления (STA) и независимыми оценками налоговых льгот. Из-за отсутствия долгосрочных и прозрачных данных в исследовании используется единая методология оценивания, согласованная с правительственными руководящими принципами. В целом результаты подчеркивают значительную роль государственного вмешательства в стремительное развитие сектора NEV в

Китае, а также необходимость повышения прозрачности официальной отчетности для более точных и долгосрочных оценок.

Ключевые слова: Китай, транспортные средства на новых источниках энергии, государственная поддержка, субсидии и налоговые льготы, индустрия электромобилей.

Annotatsiya

Ushbu tadqiqot 2009–2023-yillar davomida Xitoy hukumatining yangi energiya vositalari (NEV) sanoatini qo‘llab-quvvatlash bo‘yicha ko‘lamini, tarkibini va rivojlanish dinamikasini baholaydi. Rasmiy adabiyot va intrernet bo‘yicha bir qator manbalarga tayangan holda, umumiy davlat yordamining hajmi taxminan **230,9 milliard dollarni** tashkil etdi. Yillik moliyaviy ko‘mak 2009–2017-yillarda o‘rtacha **6,74 milliard dollar** bo‘lgan bo‘lsa, 2018-yildan keyin keskin oshgan. Tadqiqot besh asosiy qo‘llab-quvvatlash turini qamrab oladi: milliy darajadagi xaridorlar uchun chegirmalar, savdo solig‘idan ozod qilish, infratuzilma (asosan quvvatlash stansiyalari)ga investitsiyalar, elektro-avtomobil ishlab chiqaruvchilari uchun ilmiy-tadqiqot dasturlari va hukumat xaridlari. Xaridorlar uchun subsidiyalar hamda savdo solig‘idan ozod qilish umumiy yordamning katta qismini tashkil etadi; biroq xaridorlar subsidiyasi 2022-yilda sezilarli darajada qisqartirilgan va 2023-yildan boshlab butunlay bekor qilingan. Tahlil shuningdek, muhim ma’lumotlar bilan bog‘liq qiyinchiliklarni ta’kidlaydi — xususan, yilma-yil EV savdosi bo‘yicha statistikadagi nomuvofiqliklar hamda Davlat soliq boshqarmasi (STA) tomonidan keltirilgan savdo solig‘i bo‘yicha imtiyozlar ma’lumotlari bilan mustaqil hisob-kitoblar o‘rtasidagi tafovutlar bor. STA tomonidan so‘nggi yillar uchun izchil, ochiq ma’lumotlar taqdim etilmagani sababli, ushbu tadqiqot hukumat siyosati qoidalariga mos keluvchi yagona, izchil hisoblash metodologiyasidan foydalanadi. Umuman olganda, natijalar Xitoyning NEV sektorining tez sur’atlarda kengayishida davlat

aralashuvining ulkan rolini ko‘rsatadi hamda uzoq muddatli va aniq baholashlar imkonini beruvchi yanada shaffof rasmiy hisobotlar zarurligini ta’kidlaydi.

Kalit so’zlar: Xitoy, Yangi Elektr Transport vositalari, hukumat qo’llab quvvatlashi, Subsidiya va soliq imtiyozlari, Elektr sanoati

Introduction

Sustainable development-it is having maximum profit from the resources, yet making them accessible for future generations. People have been making the use of raw materials to run the economy, to produce outputs but thinking rationally, this resources need to serve not only to present needs but also needs of future generations as well. In this regard, making Electrical Vehicles (EVs) is one of the most successful implementation of sustainable global goals with automobile industry, which alleviates CO2 emission released to the atmosphere from engine motor ones. As EVs are more technologically equipped than traditional cars and be more economically friendly, their sell is increasing. China is one of the world’s most EVs producer countries and has been offering variety of car models for different cohorts, meaning cars are affordable for the middle income people and rich people. In 2024, China cracked a record of selling 2 million EVs. It is profound to learn (1) how China has been increasing its sales and (2) why many people bother to buy Chinese automobiles. (3)What kind of customs regimes are applied for those EV producers in China? (4) How those manufacturers connect to supply chains and (5) are there government supports in importing critical raw materials in order they use? (6) Are there any government involvements in supporting native car producers like imposing huge tariff rates so that their price would increase, or using any non tariff barriers to led this?

Chpater1. Customs and trade policy

Trade is a tool that enhances economy. Customs systems are set of laws that monitor the flow of goods across a country. The role of customs is to collect tax and duties, protect domestic markets, and ensure compliance with trade laws and security. Governments analyze which goods to set duties or exempt duties from, what kind of goods should not be imported to the country or set quotas, embargos and the customs' function is to apply to those norms and defend inner market. As a support, governments provide subsidies for companies to boost their activity, or the other way around, to protect by imposing high tariffs. Customs is a monitoring body in borders. In China EV production has been increasing yearly and millions of cars are being sold overseas. Most of the cars are exported through the sea in China as it is the cheapest mode of transportation. Shanghai seaport is the busiest seaport shipping cars not only in China but around the world as well. In 2024, overall flow of cars imported and exported reached roughly 3.63 million vehicles, with 15% increase from the previous year. China media group informed that Shanghai port has 15 roll on roll off routes, reaching 289 ports in 131 countries and regions. For the first three quarters of 2025, Shanghai port exported 2.05 million vehicles. In China there are 34 main ports and 2000 minor ports.

In recent years, the international customs has gradually put smart development on the top agenda and has applied innovative technologies into customs to enhance efficiency. Digitalization and infrastructure help accelerate trade procedures and flow. In this regard, Chinese ports are fixed with certain infrastructure tools like rolling on and off, and digitalized customs procedure that accelerates registration processes. On June 24th 2002, Chinese President Xi Jingpin announced "Smart Customs, Smart Borders, and Smart Connectivity" 3 S initiative at High-level Dialogue on Global Development. The WCO (World Customs Organization) put forward smart technologies and innovation at the forefront of three Focus areas in its Strategic Plan 2022-2025. That's why the "Smart" Customs approved by China is appreciated by the customs community.

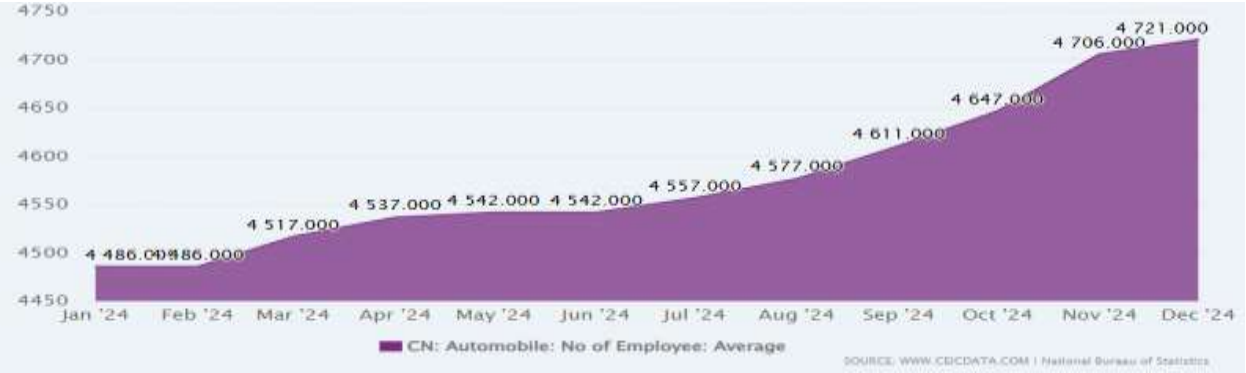
1.2 The concept of 3S

The base of the "3S" concept is to Smart mechanism, which is the application of the high tech and equipment and innovative thinking. Smart Customs ensures technological innovation, optimization of the means of control in order to modernize customs management system and capabilities. Smart Customs pursues smart infrastructure, smart customs control and internal management. Smart Borders encourages all customs and border agencies to share information and strengthen operation and risk control to achieve coordinated border management. Smart Connectivity sustains interconnectedness of systems and standards and cooperation of stakeholders among global supply chain to make sure trade facilitation. Those "3 S" initiatives play a vital role in strengthening connectivity, improving the resilience of supply chains and promoting rapid economic growth. China customs administration looks forward to coordinate with much countries 'customs administration under this initiative. The international customs community actively explores the application of 5G communication tools, AI and other technologies in customs clearance, risk management. With joint efforts, the customs community adopts all way round connection and scientific methods to improve regulatory system. Firstly, cooperation includes promoting digitalization of government services so that the enterprises take send and receive customs control information online. Second, for risk reconstruction, AI, big data and cloud computing automatically collect identify and compare risk information in order to accelerate the automatic quick release of low risk profile of shipment and promote smart early-cautioning systems for high risk profiles. Third, is to upgrade customs control. In order to achieve remote monitoring of loading, unloading and online monitoring cutting-edge technologies such as 5G and AR are used.

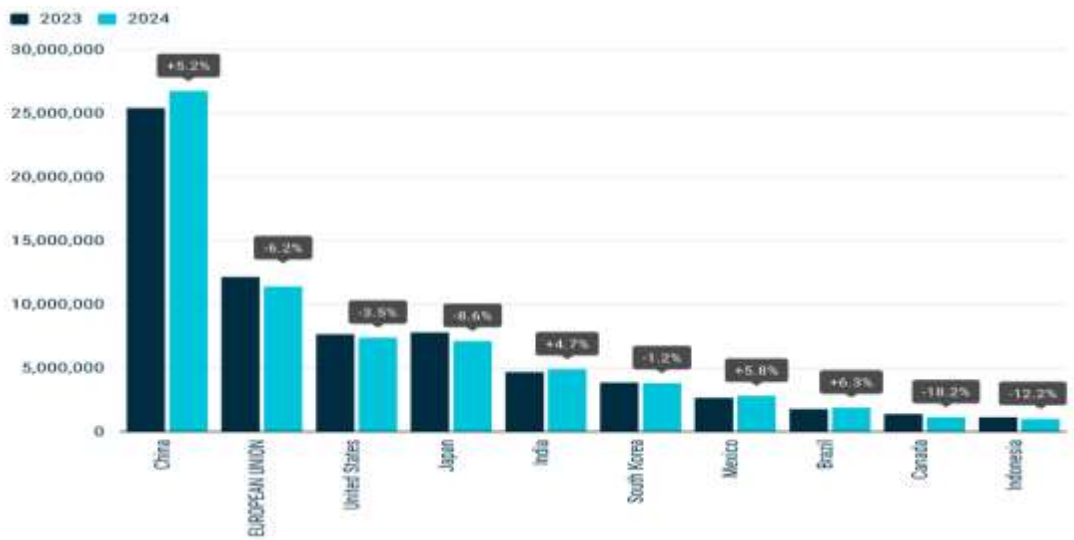
Auto industry is crucial to the economy, because it acts as a major driver of the economy, creating many jobs both directly and indirectly and affects many other

fields via its vast supply chain. Also it fosters technological innovation, contributes to the government revenue through taxes and trade and supplies public with transport. In Europe, giant car manufacturing continent, auto industry makes up of 7 percent of overall GDP accumulated in the EU, while the share of it is higher in emerging markets like China and India. Auto industry is one of the boosting industries in China. In 2024 Dec more 4.7 million people were employed in the field[1]. (Graph1)

Graph 1. Number of people employed in Auto industry.



Graph 2. Top 10 global car producers



Source: S&P Global Mobility

[1] https://www.ceicdata.com/en/china/automobile/no-of-employee-automobile-manufacturing

https://www.acea.auto/files/Economic_and_Market_Report-Full_year-2024.pdf

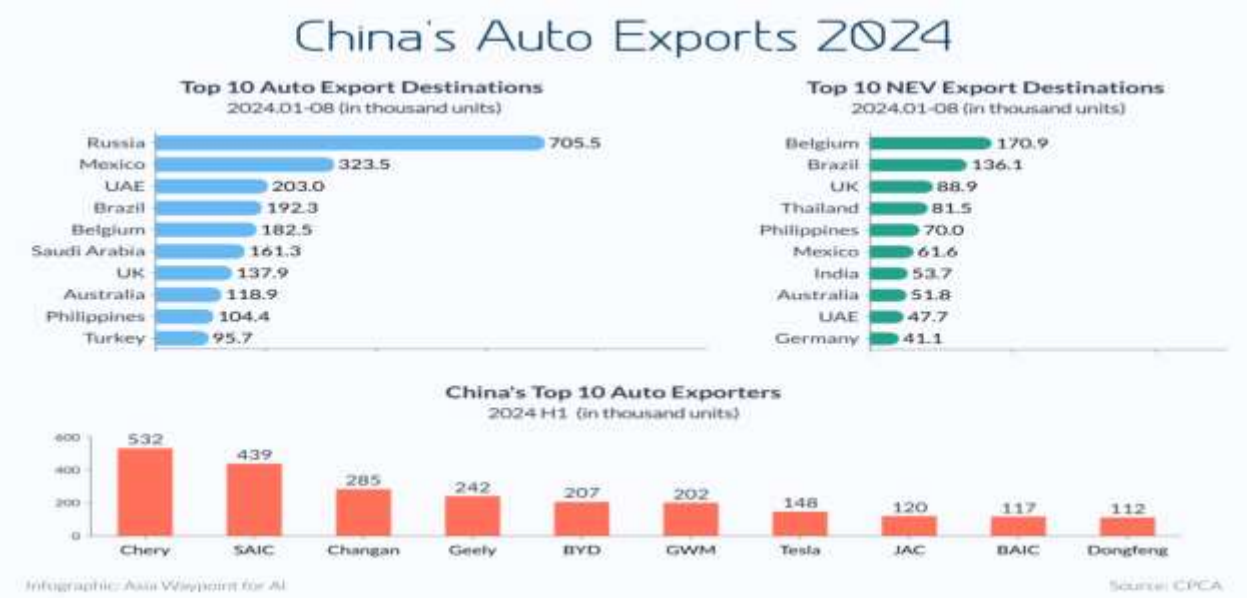
Above the graph compares the growth of car manufacture in 2023-2024. The biggest car manufacturer is China with more than 25 m cars in 2023 and it increased by 5.2 % in the following year, while the EU, second most huge market, experienced a decline by 6.2% from around its 13 m rate. The biggest change was experienced the last two countries namely Canada and Indonesia, with former dropping by 18.2 and the latter by 12.2 accordingly. This graph reveals how China is a relatively big opponent in automotive industry than other countries.

Chinese car importers 'figure in 2024. (Graph 3)

Current export figures are taken from the perspective of electric and hybrid cars (referred as new energy vehicles), high tariffs in the USA and the EU had only negligible impact on the rise of the sell. From January 2024 to August 14 millions of Chinese NEVs were exported[2]. Despite the recent seatbacks from the US and EU side the number of cars shipped overseas continues to grow. The most successful brand Chery is a leading Chinese exporter. In the first half of the 2024, the company managed to increase its export by 35 percent to 530000 cars overtaking state owned SIAC, which had long been the champion of export. Greely, BYD, Tesla are another giant exporters with 242 000, 207,000 and 202,000 cars to be sold accordingly. Tesla is non-Chinese company among the top ten car exporters. China currently possesses over half of the world's electric vehicle fleet. In 2023, Chinese EV exports were seven times higher than in 2019 and increased by 70% compared to the previous year, representing almost 60% of all EVs purchased globally.

Graph.3 Top export destinations and companies

[2] https://www.all-about-industries.com/the-top-import-countries-for-chinese-cars-a-01000ac2714892132c84b0663ba1ff87/



Source CPCA

Russia is the biggest export destination of China. In 2024, 705 thousand cars were sold to Russia. Mexico and the UAE are other major markets with 323 thousand and 203 thousand cars. As for NEV exports Belgium stand out with 171 thousand cars, Brazil 136 thousand and the UK with 88.9 thousand cars.

Customs barriers in target markets

The export of China is imposing thread to the automobile sectors in some countries. EV sales are much lower than cars produced in the EU and yet are more efficient. For this reason demand is high. China is cracking the demand s of the Europe with their low and high variety of cars and the auto industry is facing challenges. France came up with additional requirements concerning environmental safety regulations on EV cars. A single Chinese car has to comply hundreds of requirements imposed by the EU side. This makes it hard for the market penetration of Chinese cars. China is making cars not only competitive in innovation but by price than its counterparts. This cost competitiveness has been a subject of debate, often attributed to the government policy. However, this low cost is the reason of that

rooted in efficient supply chains control, technological innovation and government policy.

In the US the government imposed 100% tariffs on Chinese plug in vehicles Sheldon, T. L., & Dua, R. (2025). China's green industrial policies have also prompted concerns regarding economic and national security. Specifically, the country is consolidating control over the entire EV supply chain, spanning mineral extraction, battery production, and vehicle manufacturing and sales. In the European Union, threats to supply chain resilience—such as shortages or limited availability of critical materials, particularly those essential for the EU's green transition—are viewed as economic security risks. Likewise, the United States has cited national security reasons for imposing tariffs and other restrictions on Chinese electric vehicles, as well as related minerals and batteries.

Efficiency of production and technological integration.

Basic driver behind Chinese low cost is their focus on production efficiency, particularly for electric cars. Some automakers like BYD and Nio have adopted innovative strategies which allow them to reduce complexity of their vehicles, cutting costs significantly. Chinese manufacturers also benefits from in house production meaning that they owe supply chain centers. By doing so, companies like BYD can exercise greater control over quality and costs, achieving economics of scale faster than their international competitors. Moreover, Chinese companies are deeply integrated into global battery supply chain, a critical component for EV. BYD makes its own batteries, lowering costs associated import or outsourcing battery production.

Greater focus on innovation.

Chinese policymakers have long emphasized that their goal is for the NEV industry to eventually become self-sustaining. In line with this, they have been

winding down the extensive subsidies and tax incentives that supported the sector for many years. The nationwide consumer subsidy for electric vehicle purchases was terminated at the end of 2022, and purchase tax rebates are scheduled to be gradually eliminated by 2027, though several automotive industry groups in China are urging the government to slow the pace of this phase-out.

According to a Chinese policy adviser[3], who requested anonymity, the decision not to categorize EVs as a strategic emerging industry should not be interpreted as a sign of reduced importance. He stressed that NEVs remain crucial — pointing to their strong export performance, their role in generating profits across the automotive sector, their contribution to the broader industrial supply chain, and China's global leadership in this field.

The role of government support.

While production efficiency and supply chain are vital, government's role is undeniable in upgrading China Auto miracle. The government supports enabling Chinese automakers to keep their costs low. Chinese government has long supported key industries through subsidies, tax rebates and favorable financial policies. However these treatments are not as straightforward as many critics suggest. Nikel Asia revealed a data Chinese automakers benefit more from tax rebates than from direct subsidies. For instance, over a span of five years, BYD obtained 37.1 billion Yuan in tax rebates, nearly four times the amount of direct subsidies it was granted. These rebates are typically tied to export activities, supporting Chinese manufacturers in staying price-competitive in global markets. Exporters often receive reimbursements for VAT paid on raw materials and components, enabling them to lower operational costs without receiving direct cash payments. According to data from the China Association of Automobile Manufacturers, Yang (2010)

[3] https://www.reuters.com/business/autos-transportation/china-signals-it-will-pull-plug-subsidies-evs-with-five-year-plan-exclusion-2025-10-29/

states that China emerged as the world's largest automotive market in 2009. He explains that the Chinese government allocated roughly US$ 15 billion in incentives to boost the industry, promote the development of electric vehicles, create employment opportunities, and curb both urban pollution and reliance on imported oil.

Graph 4. Industrial Policy Spending for China's EV Sector

Type of Support	2009-2017	2018	2019	2020	2021	2022	2023	Total
Rebate	37.8	4.3	3.3	3.5	7.4	9.2	0.0	**65.7**
Sales Tax Exemption	10.8	7.7	6.4	6.6	16.4	30.3	39.6	**117.7**
Infrastructure Subsidies	2.3	0.2	0.2	0.3	0.3	0.6	0.6	**4.5**
Research & Development	2.0	3.6	3.4	3.5	4.3	3.9	4.3	**25.0**
Government Procurement	7.8	1.6	1.4	2.9	1.7	1.8	0.8	**18.0**
Total	**60.7**	**17.4**	**14.8**	**16.8**	**30.1**	**45.8**	**45.3**	**230.9**
Spending as Share of Total Sales	42.4%	22.7%	23.3%	25.4%	18.3%	15.1%	11.4%	**18.8%**
Subsidy per Vehicle (US$)	-	13,860	12,311	12,294	8,538	6,656	4,764	-

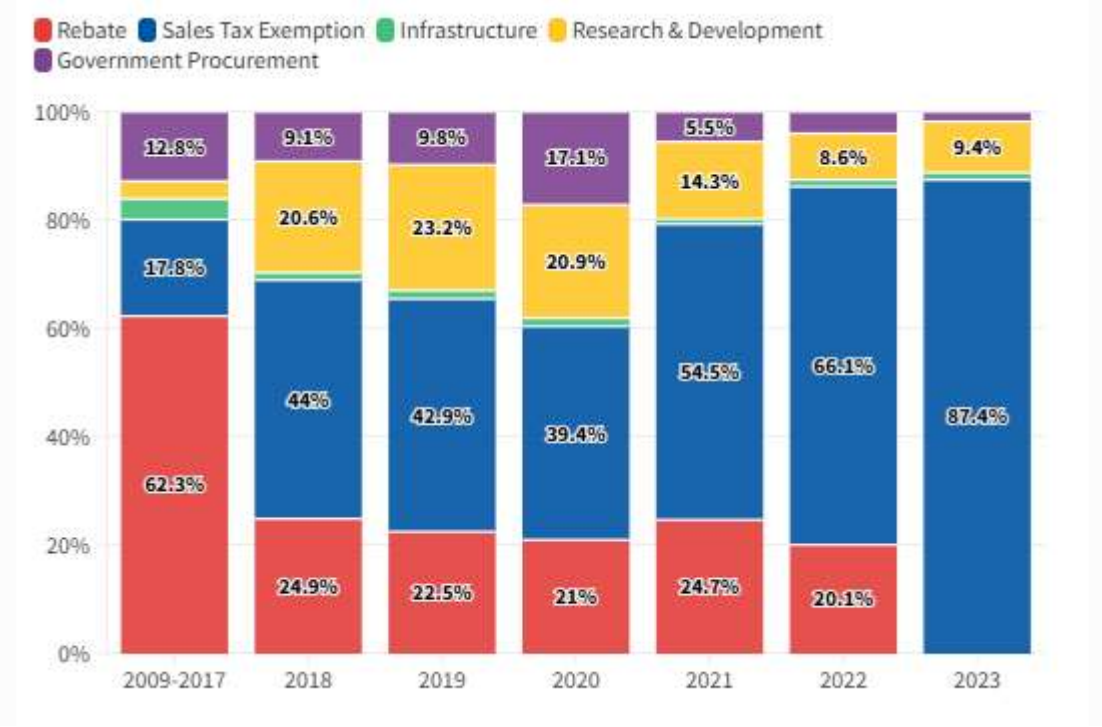
Source: Trust chair in Chinese Business and Economies.

Rebate calculations rely on the published incentive rates for eligible vehicles and assume that 25% of EV sales did not qualify. For years before 2023, it is assumed that local governments contributed support equal to 15% of the central government's subsidy level. The sales tax deduction is estimated using the 10% exemption applied to qualifying NEVs. Infrastructure subsidy estimates draw on funding figures from the Ministry of Science and Technology. R&D-related estimates are based on government-funded research data, assuming that 90% of automotive R&D spending was directed toward NEVs. For government procurement, it is assumed that half of all vehicle purchases were NEVs. Average vehicle prices are taken to be RMB 1.2 million for commercial vehicles and RMB 250,000 for passenger cars. Annual currency conversions use OECD exchange rate data.

Between 2009 and 2023, total Chinese government support for the sector is estimated at $230.9 billion. In the initial years (2009–2017), when the industry was still emerging, annual support averaged about $6.74 billion. Funding then increased significantly—nearly tripling during 2018–2020—and has surged again since 2021.

These estimates combine five main categories of assistance: nationally approved consumer rebates, exemption from the 10% vehicle purchase tax, government-backed infrastructure investments (mainly charging stations), R&D programs for EV manufacturers, and government procurement of EVs. Among these, consumer rebates and the purchase tax exemption made up the bulk of total support (Graph 5). However, due to the high fiscal cost and the government's intent to streamline the number of producers, the central authorities scaled back the consumer rebate in 2022 and abolished it entirely from 2023 onward.

Graph 5. Composition of Chinese Industrial Policy Support



Source: Trust chair in Chinese Business and Economies.

Much of the available data poses difficulties for researchers, and two issues are particularly significant. The first concerns annual EV sales figures, which are essential for several parts of the analysis. For consistency, we use data from the China Association of Automobile Manufacturers (CAAM) rather than the China Passenger Car Association (CPCA), as CAAM provides continuous, comparable data for both passenger and commercial vehicles.

A second issue relates to the sales tax exemption. The State Tax Administration (STA) reported that the exemption amounted to RMB 87.9 billion ($13.0 billion) in 2022 and RMB 121.8 billion ($17.2 billion) in 2023, which is considerably lower than our own estimates of $30.3 billion and $39.6 billion for those years.

While the STA's numbers could be viewed as more authoritative, the agency has not released annual data for earlier years or clarified the assumptions behind its calculations. This makes it challenging to determine the precise value of the tax exemption year by year or to identify long-term trends. Because maintaining consistency over time is critical—and because our estimation method reflects official policy design—we continue to rely on our own calculations. However, using the STA figures would significantly reduce the totals for government support: for 2023, the combined five categories would amount to $22.9 billion; just over half of our estimate of $45.3 billion; for 2022, the corresponding totals would be $28.6 billion instead of $45.8 billion. Ultimately, the most effective way to address these discrepancies would be for Chinese authorities to publish more complete, year-by-year data for all components of support going back to 2014.

Striking Quality

If Chinese electric vehicles were truly of poor quality, they would not pose such a significant competitive threat to automakers worldwide. For many years,

China's car manufacturers trailed far behind the industry leaders in Europe, East Asia, and North America. However, they have rapidly closed this gap in the broader automotive sector and have even taken the lead in EV technology. While China's long-standing joint-venture requirements since the mid-1990s did facilitate considerable technology transfer, the situation has evolved. Although formal limits on foreign ownership in auto JVs were lifted in 2022, the American Chamber of Commerce in China notes that foreign companies still struggle in practice to secure majority stakes, buy out their Chinese partners, or establish wholly owned subsidiaries—Tesla being the clear exception. Even so, the most recent innovations have not been driven by JVs but by China's private independent firms such as BYD, Geely, Great Wall, NIO, Li Auto, and XPeng. These firms have built strong in-house engineering and design capabilities, drawing on the expertise of global automotive consultants and foreign collaborations, including Geely's acquisition of Volvo. A major factor behind China's accelerated progress is that the transition from internal combustion engines to electric drive trains has significantly lowered technological barriers to entry, enabling IT-sector start-ups to enter the market successfully. Although many low-tier manufacturers remain, China's leading automakers have advanced dramatically and can no longer be dismissed as imitators or producers of low-end vehicles.

Conclusion.

China's support for the NEV industry has been both extensive and transformative. From 2009 to 2023, government assistance reached an estimated **$230.9 billion**, enabling the sector to grow from a nascent technology segment into the world's largest market for electric vehicles. The analysis shows that government incentives—particularly buyer rebates and sales tax exemptions—were instrumental in driving adoption and production capacity during the industry's formative years. Although subsidies have gradually declined in recent years as the government seeks

to consolidate the industry and foster greater self-reliance, other forms of support, such as infrastructure investment and procurement, continue to sustain growth.

The study also identifies significant challenges related to data reliability. Discrepancies between estimates and the STA's published sales tax exemption figures illustrate the difficulty of producing precise calculations in the absence of comprehensive, long-term data from Chinese authorities. While methodology prioritizes consistency and alignment with official policy rules, the variation in available data remains a concern. To improve transparency and facilitate more accurate assessments of state support, more detailed and continuous reporting from government agencies is essential.

References

1. [Zhang et al., 2011]Y. Zhang, Y. Yu, B. Zou.

Analyzing public awareness and acceptance of alternative fuel vehicles in China: The case of EV.

2. https://www.ceicdata.com/en/china/automobile/no-of-employee-automobile-manufacturing

3. https://www.all-about-industries.com/the-top-import-countries-for-chinese-cars-a-01000ac2714892132c84b0663ba1ff87/

4. https://www.reuters.com/business/autos-transportation/china-signals-it-will-pull-plug-subsidies-evs-with-five-year-plan-exclusion-2025-10-29/

5. Sheldon, T. L., & Dua, R. (2025). A perspective on the evolving plug-in electric vehicle landscape amid trade tariffs and strategic responses. Energy Research & Social Science, 127, 104327.

6. International Energy Agency. (2023). Global EV Outlook 2023. https://www.iea.org/reports/global-ev-outlook-2023

7. European Commission. (2023). European Economic Security Strategy. https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3358

8. Busby, J. et al. (2024). China, Clean Technologies, and National Security. https://warontherocks.com/2024/10/china-clean-technologies-and-national-security/