

**THE CHINESE GOVERNMENT STRATEGIES IN DEVELOPING
GLOBAL COMPETITIVENESS OF NEW ENERGY VEHICLE
INDUSTRY (2021-2025)
UNDERGRADUATE THESIS**



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FACULTY OF SOCIAL AND CULTURAL SCIENCES
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2026

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Proposed to the Department of International Relations
Faculty of Social and Cultural Sciences
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As a partial fulfillment of requirement to earn
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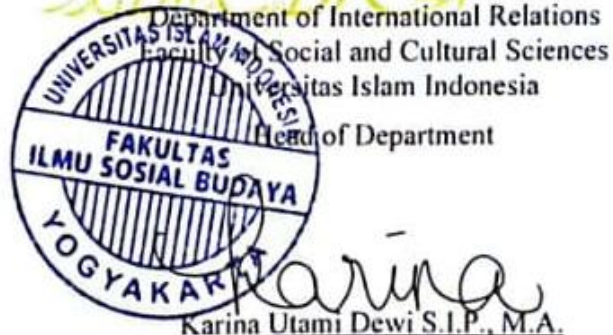
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AUTHORIZATION PAGE

The Chinese Government Strategies in Developing Global Competitiveness of New Energy Vehicle Industry (2021-2025)

Defended in front of Board of Examiners
in the Department of International Relations
Faculty of Social and Cultural Sciences
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As a partial fulfillment of requirement to earn
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LIST OF ABBREVIATIONS

ADAS	Advanced Driver Assistance System
BAIC	Beijing Automotive Industry Corporation
BEV	Battery Electric Vehicle
BYD	Build Your Dreams
CAFC	Corporate Average Fuel Consumption
CASA	China Advanced Semiconductor Industry Innovation Alliance
CATL	Contemporary Amperex Technology Co., Limited
CCTV	China Central Television
CREC	China Railway Engineering Corporation
DRC	Democratic Republic of Congo
EU	European Union
EVB	Electric Vehicle Battery
NEVCI	New Energy Vehicle Charging Infrastructure
FDI	Foreign Direct Investment
FYP	Five-Year Plan
GDP	Gross Domestic Product
ICE	Internal Combustion Engine
IEA	International Energy Agency
IP	Intellectual Property
MIC	Made in China 2025
MoU	Memorandum of Understanding
NEV	New Energy Vehicle (BEV & PHEV)
OEM	Original Equipment Manufacturer
PHEV	Plug-in Hybrid Electric Vehicle
PhD	Doctor of Philosophy
R&D	Research and Development
SOE	State-Owned Enterprise
STEM	Science, Technology, Engineering, and Mathematics
USD	United States Dollar

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ABSTRACT

The global market is dominated by Chinese New Energy Vehicle products and brands which including Battery Electric Vehicle and Plug-in Hybrid Electric Vehicle. The NEV expansion has expanded significantly in recent years. In order to supporting domestic NEV production, the government has various strategies through a variety of program initiatives. Using the Diamond Model of Nations' Competitiveness Advantage, this paper explores four determinants to explain the Chinese government's successful NEV competitiveness strategy in the global markets from 2021-2025. Through STEM education and infrastructure which provide a factor condition in basic and advance factors. While, the demand condition allows for a shift in NEV culture, subsidy programs, and increased FDI outbound investment. In terms of related and supporting industries, China effectively manages the upstream, midstream, and downstream supply chains. Finally, in terms of business, strategy, and structure, the Chinese government implements policies to assist the growth of NEVs while focusing on regulating the policy industry rather than supporting or improving it. As a result, the study's findings suggest that the Chinese government has recently made less effort to maintain its competitive advantage as some enterprises have been eliminated.

Keywords: Chinese Government Strategies, Competitiveness of Advantage, New Energy Vehicle, Porter's Diamond Models,

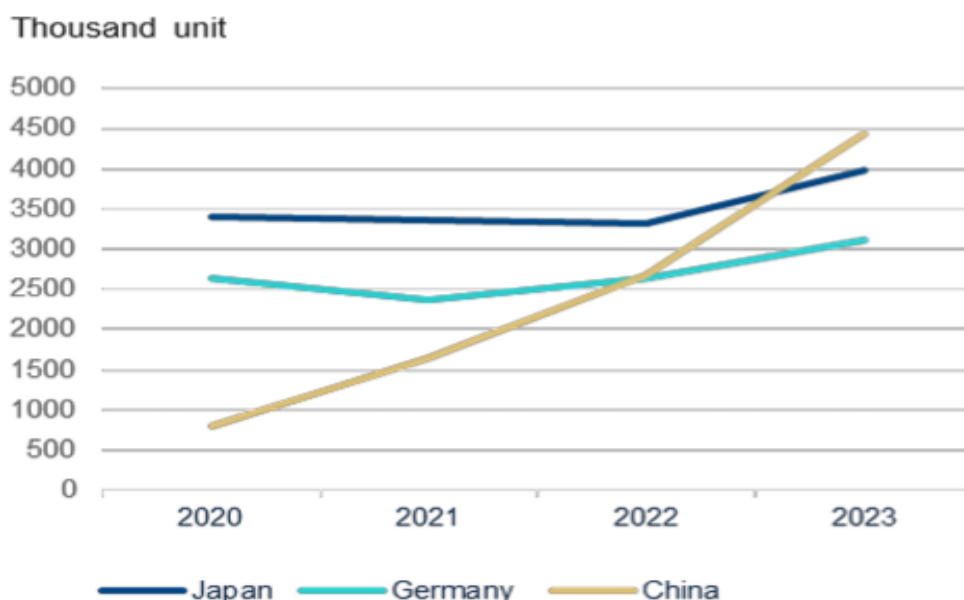
CHAPTER I

INTRODUCTION

1.1 Background

The advancement of technology in industry contributes to the realization of development and innovation. Chinese technologies in the New Energy Vehicle (NEV) sector, such as batteries, motors, and electronic controls, are among the successful case study outcomes; however, China is envious of the advancements made by the US, Japan, and Germany in the automotive sector (Tian, Wang, and Zhu 2024, 6). In fact, since 2020, Beijing has been demonstrating the ability to increase its competitiveness in the automobile sector and after 2022 it surpassed both Japan and Germany as the largest automobile exporter globally as shown in the Figure 1.1 (Huang and Xia 2024, 1).

Figure 1. 1 China Auto Export Over Japan and Germany (2020-2023)

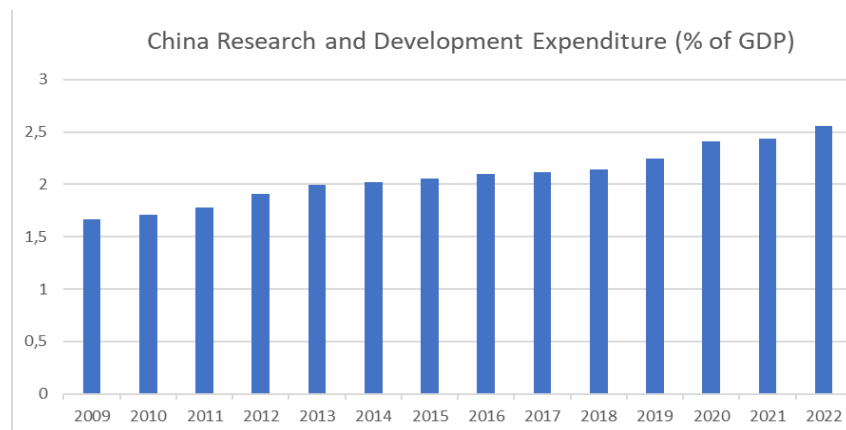


Source: Huang and Xia (2024)

Specifically in the NEV industry, in 2006, the Ministry of Science and Technology of China supported the development of new energy vehicles through 863 policy programs, which

boosted national consumer electronics and successfully supported BYD company growth (Graham, Belton, and Xia 2021, 73). Additionally, to illustrate the industrial policy shift from labor intensive industry to high-technology industry, Figure 1.2 explain the Chinese government in 2008 revised its macroeconomic and investing extensively in science and technology sector to paving the way for the development of NEV industry.

Figure 1. 2 China’s Research and Development Expenditure 2009-2022



Source: World Bank Data (2025)

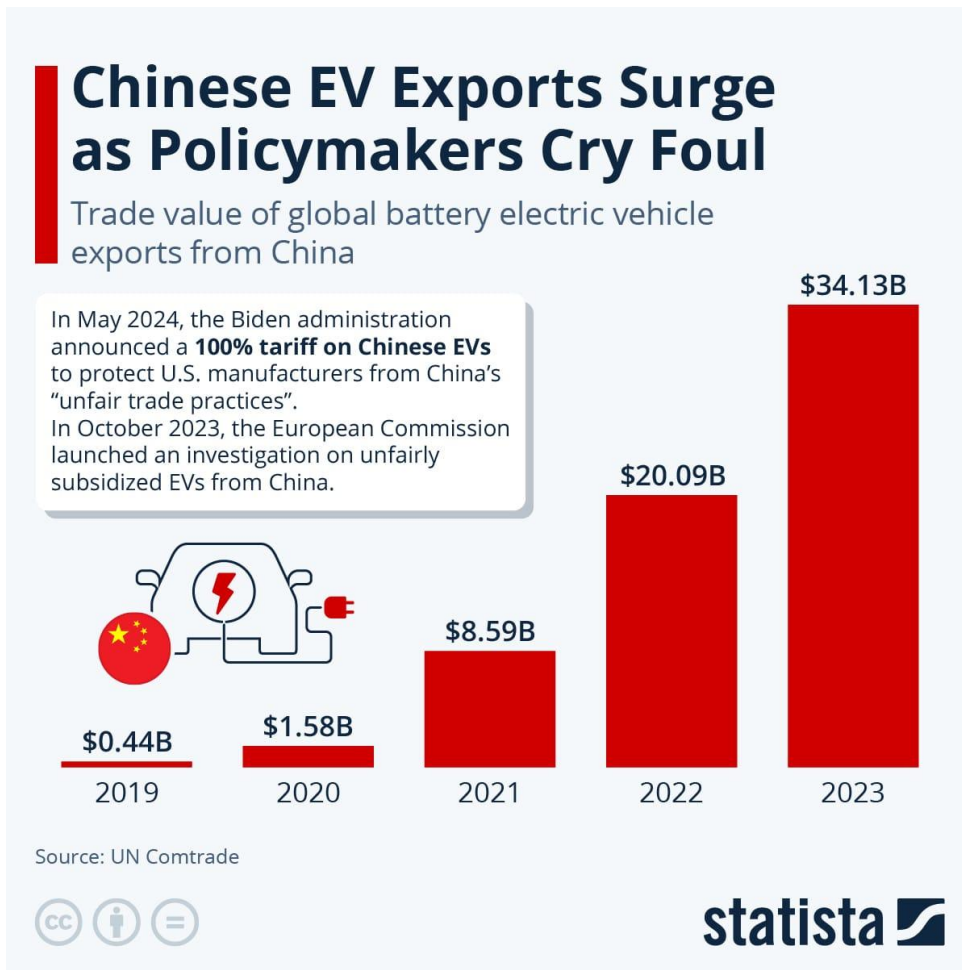
The Chinese government's intervention with the aim of supporting domestic industry through policy incentives has created a favorable environment for NEV growth, providing significant support for corporate innovation and market expansion. It has also promoted consumer acceptance of NEV and increased market demand for businesses along with the industry's rapid expansion (Dokht 2024, 830). Consequently, manufacturers are focusing on China as one of the next major growth regions in the automotive sector, where, at the same time, battery technology is advancing and NEV adoption is increasing (Mazzocco 2023). In the reputable case, Sichuan Tengzhong of China acquired General Motors of Hummer brand in October 2009 within 80% of stake and 20% held by Chinese entrepreneur Suolang Duoiji (Vlasic 2009), resulted in gaining a toehold in the North American market. Following the Beijing Automobile Works’ (BAIC) purchase the production equipment and intellectual property of Saab (Yao and Luo 2010). These remarks that Chinese industry of automobile

technology advanced compared to the European's. Additionally, China supports NEV manufacturers and lowers the cost of NEVs for consumers through government subsidies (Mazzocco 2023).

Later, in 2015, the Chinese government established "Made in China 2025". This 10-year plan aims to develop production networks in important areas by promoting Chinese brands, expanding the service industry, and enhancing manufacturing efficiency by 2025. China intends to be the dominant global player, and the NEV industry is one of ten high-tech industry sectors that the central government expects to develop. Even local automakers targeted China will be included in the top ten models by 2020 and top NEV-makers by 2025 (Yeung 2018). In order to connect with China Southern Power, the Chinese government constructed a high-speed intercity fast charging network for Beijing, Hong Kong, and Macau two years later. This network is referred to as the "national network" (Lai et al. 2021). Even though government subsidies ended in 2022, the Chinese government is still working to ensure the success of the NEV industry by taking small, steady efforts.

Global efforts to meet the Sustainable Development Goals has impacts on the growth of environmentally friendly sectors, like NEV development. NEV exist to provide an alternative solution to using fossil fuel and they can reduce air pollution, giving long-term environmental benefits which the government is willing to support this by investing in NEV expansion and zero-emissions technologies (Razmjoo et al. 2022, 7-8).

Figure 1. 3 China's BEV Export 2019-2023



Source: Statista and Richter (2024)

Figure 1.3 demonstrates the successful development of Battery Electric Vehicle in China since the China's made BEV export experienced annual increase from 2019 to 2023 with the growth in 2021 was exponential. Considering the massive export of its BEV and global trend of NEV industry, Chinese government then shows similar commitment to increase the development of NEV industry which include BEV and Plug-in Hybrid Electric Vehicle (PHEV). It was reported that in 2024, China's PHEV export rose 210% only in the first half of 2024 compared to its BEV export (Lo 2025).

The Chinese government's stance encouraging global automakers to form joint ventures with local partners displays substantial progress in new energy vehicle production. For example, in the case of a cooperation between China's Geely Auto and Malaysia's Proton, the

collaboration increased Proton's brand reputation, resulting in doubling sales and market share over five years (Wei 2024). Southeast Asia is also the primary destination for Chinese NEVs in China's worldwide NEV expansion, owing to the region's increasing demand for NEV. CATL, a Chinese battery producer, has factories in numerous countries, including Germany, Spain, Hungary, and Indonesia. This project represents China's ambition of making high-quality technology accessible to the rest of the world while also achieving long-term objectives (Bhattacharya et al. 2025). Chinese automakers are recognized in international markets while competing domestically through partnership in Europe, Asia-Pacific, South America, and beyond. The reasons include that Chinese NEVs are successful in providing great performance, new features, and competitive pricing compared to their competitors (Wei 2025).

The cost-effectiveness of China's NEV products distinguishes them from those of other countries with advanced technology. China's enterprises concentrate on improving their efforts to be competitive in the international market in terms of product quality, technological innovation, and brand development (Dokht 2024, 829). With 60% of cars registered as NEVs, China is currently the largest market for NEVs. The country also produces cars domestically, and an increasing number of them are exported, with Europe being one of the countries where China is expanding its manufacturing presence (Mazzocco 2023). Currently, the EU has approved tariffs on BEV from China by following an in-depth investigation that revealed significant governmental backing for China's NEV industry. This has arisen because the EU countries perceive China as a threat to the European automotive industry due to the China's dominance in NEV sector globally. This decision highlights the EU's suspicion of China's non-market operations, which it believes could harm Europe's green technology and automotive industries in the future. Furthermore, unlike US taxes, EU taxes on imports would not make China's NEV sales completely unprofitable, so focus is instead on creating equal opportunities

and maintaining domestic companies' competitiveness in the face of Chinese government subsidies (Featherston 2024).

As a new pillar of economic growth and a tool to boost public trust, the Chinese government is addressing the issues posed by EU's tariffs by recognizing the NEV internationally (Wang 2024). Various regulations and standards, such as free license plate acquisition and car purchase subsidies, are in place to encourage the development of NEVs in China. Furthermore, the goal of the emission and energy efficiency standards for NEVs is to encourage technological innovation and improvement. According to Tian, Wang, and Zhu (2024), the Chinese government took these steps to address the difficulties posed by European tariffs and to establish China as a major participant in the global NEV market. Consequently, this study will analyze how China has successfully maintained their NEV presence in the global market and how the Chinese government has implemented strategies to develop the competitiveness through Porter's Diamond Model.

1.2 Research Question

How does the Chinese Government Implement Strategies to Raise The Competitiveness of New Energy Vehicle Industries?

1.3 Research Objectives

The objective of this research is :

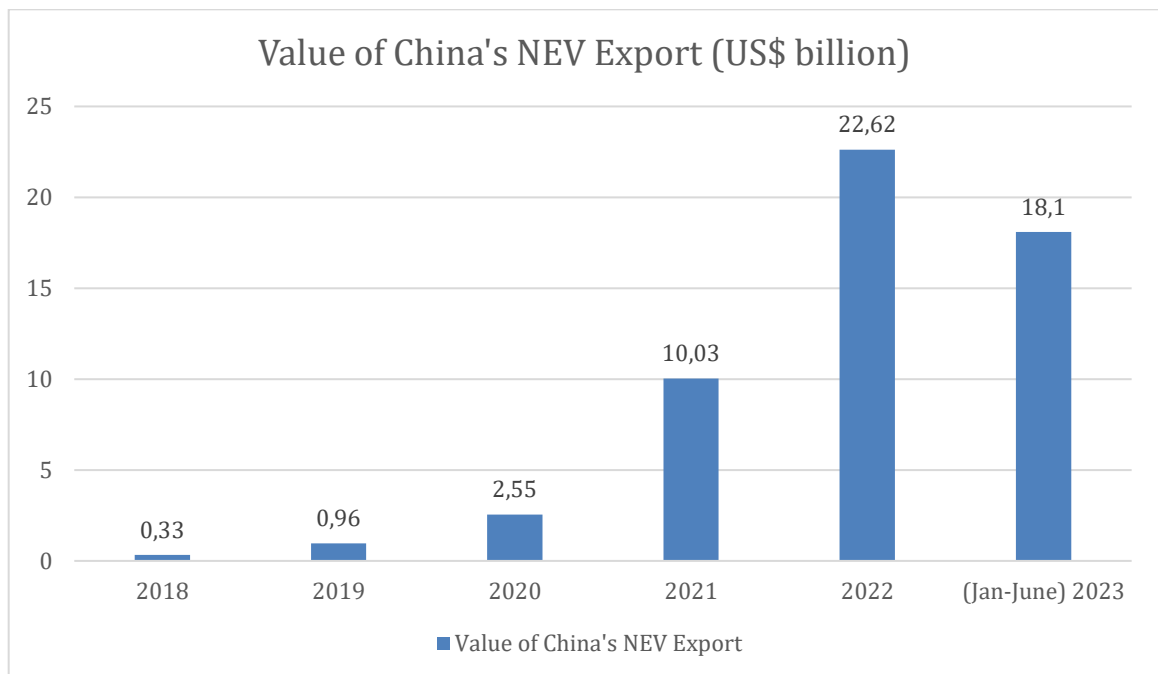
1. To examine Chinese government strategies in raising the competitiveness of New Energy Vehicle in domestic and global market.
2. To analyze determinant of factor condition by Porter's Diamond Model in the context of China's New Energy Vehicle industry.
3. To analyze determinant of factor condition by Porter's Diamond Model in the context of China's New Energy Vehicle industry.

4. To analyze determinant of factor condition by Porter’s Diamond Model in the context of China’s New Energy Vehicle industry.
5. To analyze determinant of factor condition by Porter’s Diamond Model in the context of China’s New Energy Vehicle industry.

1.4 Research Scope

The study adopts 2021 as the starting point because China’s new-energy vehicle (NEV) industry began to witness a substantial expansion in exports during this period as shown in the Chart 1.1. The end -point of 2025 is retained as Chinese NEV exports continued to rise; notably, exports reached approximately 222,000 units in 2025, about double the previous year (Jingjing 2025).

Chart 1. 1 Total Value of China’s NEV Export in US\$



Source: (Mazzocco and Sebastian 2023)

Additionally, by promoting the NEV subsidy plan, the Chinese government has enhanced supportive policies and actions to create a favorable development environment, which is a

further driver of this research, which proposes novel approaches to scrutinizing China's New Energy Vehicle Industry in the global competitiveness of advantages.

1.5 Literature Review

The study used references from three journal articles to compare and find unique research ideas, as well as to bolster its own findings. The first was Yeung's "Made in China 2025" : The Growth of China's New Energy Vehicle Sector (2018) which examines the case study of China as a state supporting the establishment of a domestic production network in NEVs from battery manufacturing up until the NEV manufacturing. It provides a prima facie case illustrating how the government's proactive policy is capable of taking the important role of boosting domestic production networks. The study found that a proactive state could shift the development trajectories of an industry starting from establishing domestic production networks to the evolution of a Global Production Network with concern for the importance of interfirm competition for regional development. As for its implementation, China has already created a good opportunity for improving its lead firm to reach the targeted NEV output without the power influence of global lead firms made possible by the financial aid provided by the local government to support the competitive advantages of Chinese firms (Yeung 2018, 16-17).

Graham, Belton and Xia's (2021) research on "How China beat the US in Electric Vehicle Manufacturing" begins by posing the question of which Chinese government policies were crucial in advancing China's industrial aspirations and how the US responded in order to counter China's ambitions and preserve advantageous trade relations. The study concludes that although China's industrial policies have not yet had a major impact on the US plug-in NEV market, the country's increasing technological capabilities, market power, and market dominance suggest that China will eventually pose a threat to US manufacturers' ability to

compete both domestically and internationally. This has arisen as a result of the US trade policy's constraints and lawmakers' continued weakening of Plug-in Electric Vehicle production and supply chain support measures. Because of the difficulties China has presented to US and international trade policies, the research concludes that US policymakers should encourage the expansion of its Plug-in Electric Vehicle in order to compete with China in the global market (Graham, Belton, and Xia 2021).

The research on The Rise of The Electric Vehicle in China and its impact in The European Union from Bencievelliet.al (2024) found that China growth in NEV has both threats and opportunities for the EU, such as helping the transition from the fuel-vehicles to the NEV in order to achieve the environmental goals as China's NEV are supported by significant subsidies from its government. Another point made here is that the EU currently imposes tariffs on Chinese BEV to restore the ground-level of the playing field and fair competition between NEV producers. In time, the EU car manufacturers will be exposed to foreign competition as well as increased production and employment. Lastly, the study found that the trade barriers can increase risk consequences for future trade dispute and retaliation measures which will have disadvantages for those parties involved (Bencievelliet al. 2024).

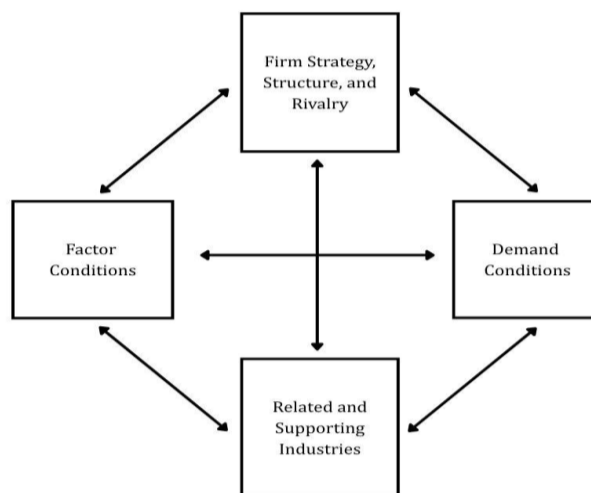
As a result, the gap between prior studies and this research plan is that there is still a lack of focus on the domestic level: how China's NEV market still competitive in the global market. Furthermore, the application of a different approach to analyzing Chinese government strategy to the competitiveness of the China NEV market utilizing Porter's Diamond Models theory is not evident in existing literature. Within this new methodology, this research could provide a novel perspective by focusing on Chinese government strategy to maintain its NEV in global market.

1.6 Research Framework

In 1990, Michael E. Porter released *The Competitiveness Advantage of Nations*, a theoretical framework that explains how a country's competitiveness is based on the ability of its local companies to innovate and improve. The Chinese NEV industry has created an innovation to help its nation to take advantages from rivals such as the US, Japan, and Germany. Porter believes that a highly nationalized process, with differences in national values, culture, economic structures, institutions, and history can lead to the productivity of nation. Those elements create and maintain competitive advantage which contribute to the successful path. every nation has its own strategies for competing with others, but nations can't or won't be competitive in all the majority industries. As a result, the nation can successfully compete in particular industries due to the most innovative, dynamic, and demanding home environment. In this case, the Chinese government has seized the opportunity to achieve in the new segment of NEV industry, by fulfill the determinants of the national competitive advantage, such as the active policy to support the favorable environment, China's NEV industry is successfully developing globally.

Diagram 1. 1 Porter's Diamond Theory (1990)

Determinants of National Competitive Advantage



Source: Porter (1998)

In the Diamond of National Advantages, Porter identifies four determinants to explain the reason of nation's firm capable to maintain constant innovation, pursue improvements and seek sophisticated sources of competitive advantage. The determinants are:

1. **Factor Conditions.** There are two types of factor condition in competitive advantage that are inherited by a nation: Basic and Advance factor conditions. According to Porter, basic factor conditions are those naturally possessed or easily developed by a country such as low-skilled labor, natural resources, location, and capital, while advanced factor require sustained investment, institutional support, and innovation including R&D ecosystem, infrastructure development, and high-skilled labor. To upgrade the competitiveness of its NEV industry, China's government has been emphasizing the advanced factor conditions covering critical infrastructure development and policies to increase high-skilled labor while the basic factor condition is centered on the China's position as one of the countries holds significant reserve of graphite.

2. **Demand Condition.** There are three categorizes of the demand conditions: 1. The nature of buyer needs, 2. The size and pattern of growth in home demand, and 3. Mechanism that the nation choose to transmitted into global market. Thus, with the influence of the Chinese government in the creation of favorable conditions in the NEV industry through the incentive tax and promotion regulation.

3. **Related and Supporting Industries.** The presence of the supplier industry to boost the NEV competitiveness are important for the process of innovation and internationalization. In the China's NEV industry, the industry from the downstream to the upstream are consider as these determinants. Which including the raw material industry, battery, and refining industry.

4. **Firm Strategy, Structure, and Rivalry.** The formation and the character of domestic competition, are greatly influenced by national context and conditions. Such as the

Chinese government's proactive policies that permit the growth of the NEV industry, including BYD and CATL in competition for the NEV industry and also Geely, XPeng, NIO and Tesla which support the local industry competition.

1.7 Provisional Argument

The analysis shows Chinese government's strategies to develop the competitiveness of its NEV industry, as identified by Porter's Diamond theory. In Factor Condition, the Chinese government has increased STEM education to fulfill the demand of high-skilled labor. In the Demand Condition, the Chinese government gave incentives for local NEVs, as well as subsidies to carmakers who provide lower prices for NEVs. In terms of supporting industries, China has focused on downstream to upstream supply chain industries. In Firm Strategy, Structure, and Rivalry, China focus on the regulation of manage the firms, structure and rivalry domestically. Within these determinants, China sustain its competitive advantage especially in the NEV industry helped by the government efforts through the variant policy support for NEV industry.

1.8 Research Method

1.8.1 Type of the Research

Qualitative research is an approach to data collection and analysis that typically prioritizes language above quantitative measures (Bryman 2012, 36). According to Creswell & Creswell (2018), the research approach aims to investigate and comprehend the significance that individuals or groups attribute to a social or human issue.

1.8.2 Subject and Object of the Research

The Chinese government is the research's subject, and the strategy it implemented to increase the competitiveness of the NEV industry is its main object.

1.8.3 Method of Data Collection

Public qualitative documents, such as newspapers, meeting minutes, and official reports, served as a source of information that identified the properly chosen sites for the proposed study (Creswell and Creswell 2018). Virtual documents were also used, which are a sort of document that are available online (Bryman 2012, 554).

1.8.4 Process of the Research

The procedure started with the gathering of information from secondary sources, like news articles, journals, reports, and official websites, and then analyzed the findings to provide answers to research questions that describe the tactics employed by the Chinese government.

1.9 Thesis Outline

CHAPTER I : INTRODUCTION

This consists of the background of the research questions, explanation of the framework, scopes of research, literature review and methods of research.

CHAPTER II : CHINA'S NEW ENERGY VEHICLE DEVELOPMENT IN DOMESTIC AND GLOBAL MARKET

This chapter focuses on the dynamics of global development of China NEV in order to depict the Chinese government's strategies in supporting the NEV industry especially in domestic level. Additionally, it will explain China's NEV expansion globally.

CHAPTER III : THE CHINESE GOVERNMENT'S STRATEGIES FOR NEW ENERGY VEHICLE COMPETITION

This chapter analyzes Chinese government strategies to boost the competitiveness of its NEV products using the National Competitive Advantages framework regarding the determinants.

CHAPTER IV : CONCLUSION AND RECOMMENDATIONS

This chapter consists of conclusions and suggestions of future research.

CHAPTER 2

CHINA'S NEW ENERGY VEHICLE DEVELOPMENT IN DOMESTIC AND GLOBAL MARKET

This chapter focuses on the dynamics of China's NEV growth, including the Chinese government's efforts to promote the development of NEV in domestic industry. Initially, it emphasizes the goals and efforts to expand the NEV industry both locally and globally, resulting in the gain of a competitive advantage. As China became the largest supply chain and now plays a significant role in the NEV industry, European governments imposed tariffs on Chinese NEVs in order to restore the market's standard competitiveness. To gain a comprehensive understanding of the dynamics of China's NEV development, the subpoint of (2.1) will concentrate on the development of China's domestic NEV sector. Furthermore, a subsequent discussion (2.2) will examine the stage of China's NEV penetration in the global market. These sub-points will provide comprehensive knowledge of NEV development in respect to its context and dynamics.

2.1 The Dynamics of New Energy Vehicle Development in China

Scholars continue to discuss why China established the NEV business in light of rising global temperatures and an energy dilemma. It happened before the Chinese government announced its ambitious Made in China 2025 agenda. First, Zhao and Luethje (2024) have claimed that NEV development might be a viable answer to energy shortages and efforts. Second, Masiero et al. (2016) assert that the reason is that NEV is an effective solution to reduce greenhouse gas emissions. During the development of NEV technology, difficulties arose from the high production cost of NEV batteries, which account for over half of the total cost per unit produced. Nonetheless, China's population growth has propelled the country to

become one of the world's largest consumer markets, allowing its economy to flourish with regard to the population's purchasing power. The Chinese government recognized these patterns and, as a result, developed a policy to promote the development of NEV.

Yan and Liao (2025) explain that China has followed a different road from other competitive countries such as Japan and the West. As a consequence of efforts that began in the early 1990s, China has demonstrated success in the NEV market by implementing a national strategy that favors NEV production and domestic buyers. Therefore, the Chinese government has implemented policies that actively support NEV in order to compete with Western manufacturers. The ambitious goal has been set to limit carbon use and, consequently, climate change. China's NEV development began in 2001, with the Ministry of Science and Technology conducting research and development frameworks for new energy vehicles as an optimistic and strong backer for NEV research under the name “Three Verticals and Three Horizontals”.

Furthermore, "The 11th Five-Year Plan" is a vital time to transform the industrialization process in the early stages of a new sector (Yan and Liao 2025, 2). During a critical moment in 2008, the Chinese government responded to the financial crisis by revising its macroeconomic policies to ensure GDP growth while continuing to spend heavily in Science and Technology (Yao and Luo 2010). China launched a pilot program in 2009 named "Thousands of Vehicles, Tens of Cities" and as Masiero et al. (2016) have explained, this program aims to promote the use of new energy vehicles by selecting and financing local cities in order to establish a culture of this mode of transportation throughout the country. The major characteristic of China's advanced vehicle program was aided by state-level subsidies for its BEV, along with a combination of central government and provincial subsidies, which vary by city and BEV design (Graham, Belton, and Xia 2021, 73). The result though is that it helps to increase the fortunes of Chinese firms and make them more competitive in the market.

Table 2. 1 The Maximum Subsidy Standard for BEV (in Yuan)

Year	Total Subsidy
2009	60,000
2015	54,000
2017	44,000
2018	54,000
2019	25,000
2020	22,500
2021	18,000
2022	12,600

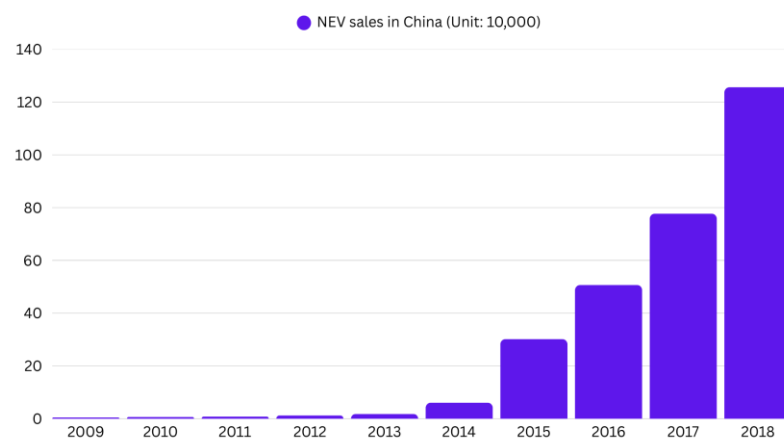
Source: Zhao et al. (2024)

As seen in Table 2.1, Zhao et al. (2024) explain the Chinese government's investment per vehicle has continuously decreased as subsidies were phased out in 2022. Government spending reached 44,000 Yuan in 2017, but then it decreased up until 12,600 Yuan in 2022. Thus, in the same year, China implemented a trade-in subsidy with a larger premium for the purchase of NEVs, resulting in an additional expenditure of approximately USD 2.7 billion. As a result, NEV sales in China increased from 5,294 to 6,887 million units (2009-2002), with yearly registrations of NEV-related businesses increasing from roughly 5,100 units in 2013 to 239,400 units in 2022.

Li, Yang, and Sandu (2018) explained that "The 12th Five-Year Plan" from 2011 to 2015 aimed to choose one of the strategic industries to develop the NEV for the achievement of renewable technology within an integrated ecosystem of new energy technologies. For example, the State Council launched the long-term action plan "Made in China 2025" in 2015

to stimulate the growth of strategic industries, including the improvement of the NEV China market across 2009-2018, as displayed in Graph 2.1. Salaberria and Xia (2023) have also explained the benefits from increased domestic markets globally as part of the government's national strategy. To accelerate NEV adoption, the Chinese government implemented a variety of legislative tools, including subsidies, tax breaks, and incentives. However, at the same time China's government declared the subsidy would be phased out between 2016 and 2020. Efforts were, however, maintained by the establishment of BYD as a battery company that would support the development of Chinese NEV.

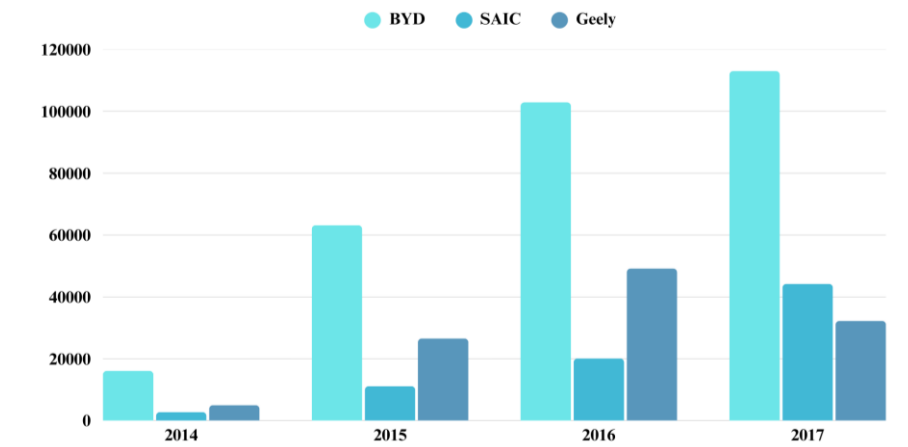
Graph 2. 1 NEV China Market Growth 2009-2018



Source: Xiong and Qin (2020)

As Graham, Belton, and Xia (2021) noted that BYD is a battery manufacturer that was founded in 1995. Later, China successfully raised national consumer electronics, which led to the BYD company entering the auto industry and being considered a privately owned company in 2003. Then in 2015, the IEA ranked BYD as the only Chinese firm in the top ten of list of a leader in the development of battery NEV production, competed with Japan, Germany, and South Korea companies (Masiero et al. 2016, 4).

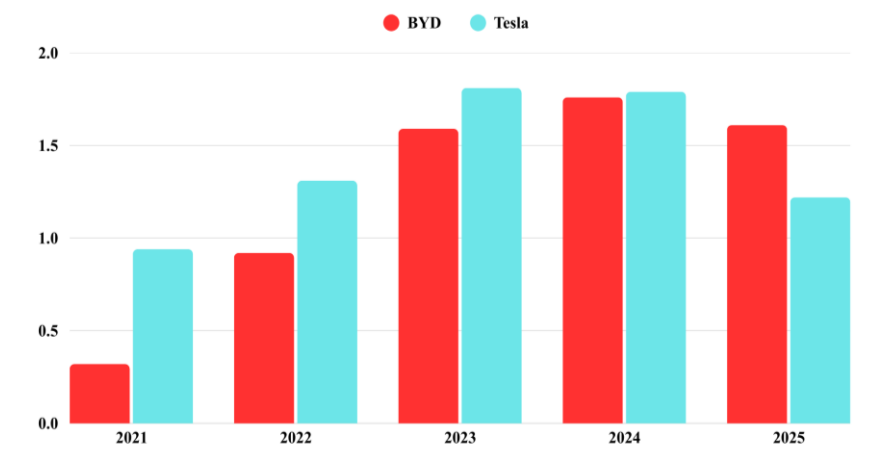
Graph 2. 2 Top 10 NEV-makers by sales volume (unit) in China 2014-2017



Source: Yeung (2018)

Graph 2.2 illustrates that demand for NEVs in the domestic market increased during this policy plan, with the outcome substantially exceeding the government's aim. Meanwhile, Graph 2.3, as put forward by Gaudiaut (2025), shows that BYD sales reached approximately 1.61 million units between January and September 2025.

Graph 2. 3 Annual Unit Sales of BEV by Tesla and BYD (in million)



Source: Compiled by the Author

During the Trump administration, Graham, Belton, and Xia (2021) stated that the subsidy program in China is an unfair trade practice owing to fraudulent activities, discovered during a government inquiry, which led to the growth of new small-scale NEV producers.

However, within the incentive measures applied by the government is resulted in a large increase in NEV demand in the coming year within the vast and rapidly developing market for locally produced lithium batteries. Cai (2022) stated that, in this scenario, attracting investment helps to establish an environment for lithium battery companies to compete fiercely in the sector. It also increases the demand for raw materials, causing their prices to climb dramatically. Fortunately, the Chinese government had already implemented a carbon budget system, developing an energy transition schedule, regulating traditional energy vehicles, and progressively transitioning to a new energy period.

Graham, Belton, and Xia (2021) noted that the 2016-2020 "The 13th Five-Year Plan" required industries to make rapid breakthroughs to implement further the prioritized policy and the relevant time-frame. During the implementation, the central government shifted the approach, requiring foreign automakers to work on joint ventures with Chinese automakers in April 2018. The subsidies became eligible only for companies that were assembling vehicles in China, and local automakers had to approve local suppliers of lithium battery to qualify for NEV subsidies. Finally, the Chinese banks began to help the local suppliers to gain access to raw materials for producing batteries and NEV. Zhao and Luethje (2024) stated four factors contributing to the rapid development of the NEV industry in China: national industrial policy, the Chinese market size, NEV laws, and the availability of abundant natural resources.

Table 2. 2 Chinese Government Policies for the Development of NEV Industry

Year	Government Policies
2016-2018	Whitelist Battery Producer Published to targeting the subsidy goes to the supply of raw materials by Chinese mining companies, the production of battery by Chinese battery makers and the local production of EVs using Chinese batteries.
2017	Published National Plan for battery industry with the goal to become “technologically independent storage superpower”
2019 - 2022	Zhejiang Automotive industry High-Quality Development Action Plan.
2018 - 2020	Modern Industrial System Construction and 100-Billion-Yuan-Level Industrial Clusters Promotion Plan (Fujian).
2020	Opinions on Accelerating the Innovation and Development of New Energy Automobile Industry (Guangdong)
2020-2024	Increasing Charging Station Infrastructure
2024-2025	Introduce the Trade-in Scheme of wider the economic stimulus package, apply to purchase of conventional and electric cars with different financial support

Source: Compiled by the Author

In 2021-2025, China has "The 14th Five-Year Plan" which included notes for adjusting supply chain design, precision policy execution, and developing an innovative industrial supply chain with better value. Andersen (2024) stated that China could maintain its position as a first mover with an advantage in consolidating and improving competitiveness, as well as maintain the future direction of industrial transformation through its successful policy of introducing NEVs to the global market. Following the introduction of the NEV, the Chinese government's priority shifted to fast charging infrastructure. Masiero et al. (2016) noted that, in terms of infrastructure support at the end of 2013, there were around 400,000 charging stations at that time. Despite reduced subsidies to support NEV development, the Chinese government had already prioritized core infrastructure, including the presence of charging stations, and had been able to establish BYD as a battery company with the potential to compete in international level. Miao (2025) stated China has 16.7 million charging points by the end of July 2025.

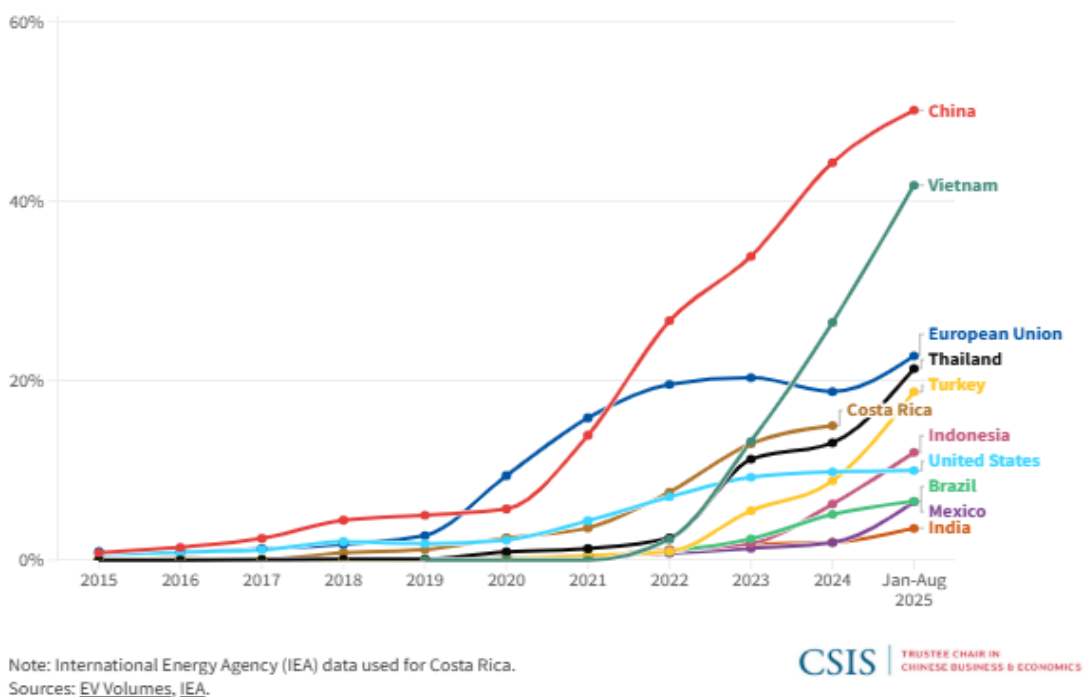
Other types of policy incentives provided by the Chinese government to assist the development of NEVs are non-financial initiatives in major cities (e.g., Shanghai, Beijing, Shenzhen). Residents have been unable to obtain new license plates for their cars in recent years due to the installation of a license plate limitation policy. According to Liao (2021), numerous policies have been implemented to encourage consumer acceptance of NEV, including the construction of charging infrastructure, NEV parking or lane access advantages, and technical assistance policies for NEV manufacturers. Within those policies, the lowering of subsidies in BEV is nevertheless aided by the non-financial initiatives to enhance NEV market demand among consumers. Zhao et al. (2024) have provided examples of Chinese government efforts in NEV development, such as parking incentive policies implemented in Qingdao with "NEV-only parking zones" offering partial fee exemptions. Likewise in Suzhou, Nantong, and Shenzhen, half-price or free roadside parking is available for NEV-specific plates. Additionally in Beijing, NEVs are exempt from traffic management regulations that limit their use during peak weekday hours. In Xi'an, Shaanxi Province, Gansu Province, NEVs can ride in bus lanes, further increasing driving convenience.

2.2 Global Expansion of China's New Energy Vehicle

Industrial policy from the government is have an effective impact towards the expansion of NEV. For instance in the developing country, the policy experimentation are seen as the direct response for Chinese export activities, investment, and raise the global demand. Therefore, with the proactive policy from the Chinese government to NEV industry lead to the key opportunity for achieve the economic and climate goals (Mazzocco 2025). China NEV expansion not only advance in its domestic market, but also in other regions as well such as in Southeast Asia. It is symbolize the good relations between China and Southeast Asian countries as the emerging market and become the strategic area of NEV expansion with the traditional

auto companies. China has reason for entering the Southeast Asia market, not only for fulfill the local demand, but it intends to stimulating the technological innovation and competitiveness between the local automakers, thus for the carbon reduction and energy transition (Global Times 2025). With the project of infrastructure to support the NEV, the region needs 2.8 trillion USD by 2030 where China seen it is a opportunity for put the invesment and lead the market.

Figure 2. 1 NEV Sales Share of Total Car Sales in Several Countries



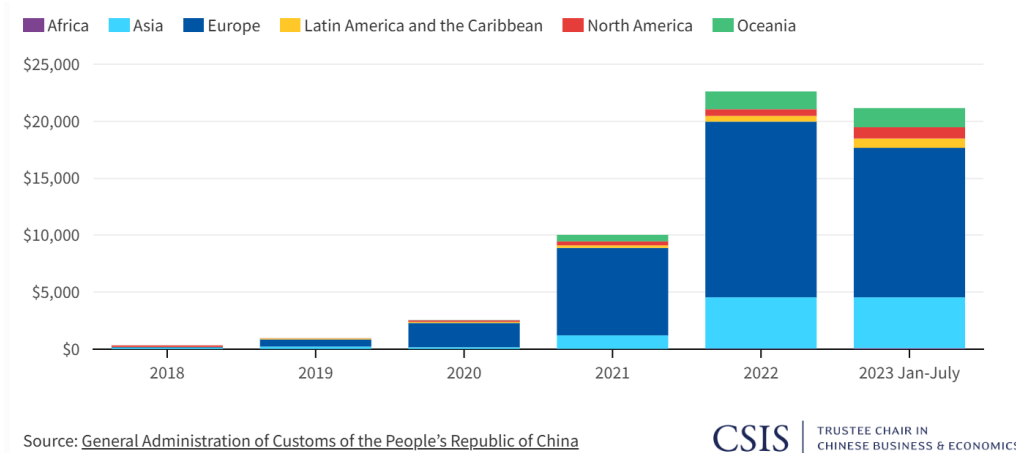
Source: Mazzocco (2025)

According to the Counterpoint Research, total sales of China NEV in Southeast Asia growth yearly which exceed 849% as the highest number globally in Figure 2.1. The consumer of China NEV is from Thailand, Vietnam, Indonesia and Malaysia (Wei 2024). China is competing with Japan in Southeast Asian market, while in Thailand, Chinese brand of BYD surpassing the Nissan and Mazda within controlled 80% NEV market share. Particularly as the subsidy program stated in 2009-2022, the power of purchase in Southeast Asia is success for China NEV development. Even it has the long-term program “Plan for the Development of the

New Energy Vehicle Industry (2021-2035)”, as the goal to secure the leadership position in the global NEV market. However, China faces several challenges such as the lower exposure of Chinese brand at Vietnamese market, also there are insufficient charging infrastructure which inhibit the NEV growth (Global Times 2025).

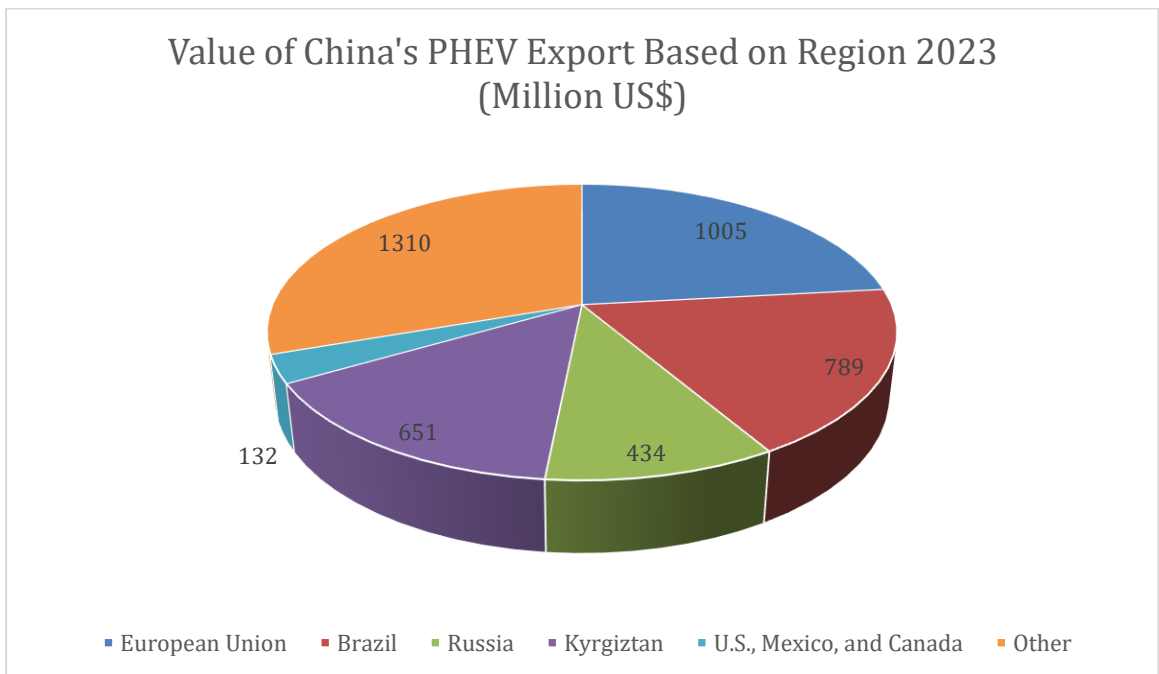
In Africa, the Chinese NEV makers investment entering the African market due to the natural choices because the close economic relations and collaboration between both countries in the Global South. Li (2024) explained the Chinese brand of Chery has goal to open an assembly line in Kenya. This case shows offering the promising prospect to be benefitted in economic development, sustainability and technological advancement. Also, BYD in Africa especially in Egypt market, included as the second most-sold vehicle with the number of NEV sold grew from July 2021-June 2024. Jianqiao (2025) reported that China carmaker collaborate with BasiGo, the provider of electric bus in sub-Saharan Africa based in Nairobi. This marking the deepening of China presence in the East Africa region, even the BAIC brand also partnering with Alkan Auto as the subsidiary of Egyptian International Motor Group with the aim to created new factory and expected to be operational in the end of 2025. Graph 2.4 illustrates the distribution of China BEV export in the various regions, where the data shows that Europe is the most high exporter compare with the other regions, and Asia is consider as the second position after Europe. However, the data in the next 2024-2025 still unclear to show the Chinese BEV export. Additionally Graph 2.5 illustrated the China’st PHEV export in several regions within the European as the second larger position compare to other regions.

Graph 2. 4 Chinese Battery EV Export to Region (2018-2023) in USD million



Source: Mazzocco and Sebastian (2023)

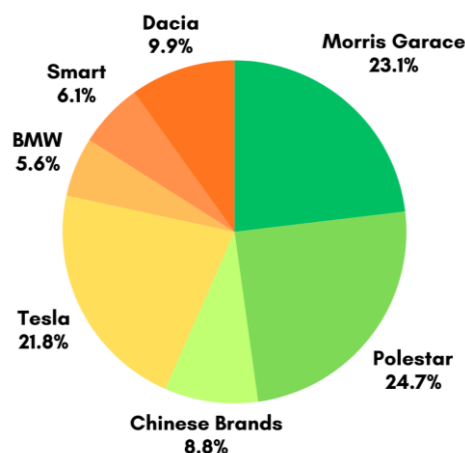
Graph 2. 5 Chinese PHEV Export Based on Region 2023



Meanwhile in European region, Wigender et al. (2024) have shown how China's NEV manufacturing and expanding market sales are currently succeeding in diminishing customer interest in purchasing Internal Combustion Engine vehicles. Yan and Liao (2025) have said that China sold more than 500,000 NEV to Europe in 2023, accounting for close to 40% of the total export which is considered the world's top auto export. In this situation, the EU is China's

greatest export market, as demonstrated in 2023, where 21.7% of BEV sales were vehicles made in China, with Chinese brands accounting for 7.6%. There are several reasons why China is essential in the European market. First, Salaberria and Xia (2023) have reported that NEVs built in China are less expensive than equivalent models made by European manufacturers. This is NEVident from the increase in average NEV sales in Europe, from 49,680 Euro in 2015 to 55,880 Euro in 2022. In addition, Bencivelli et al. (2024) have reported that battery prices in China are 17% lower than in the EU. According to Mazzocco and Sebastian's (2023), Chinese brands of Made-in-China Battery NEV registered in Germany accounted for 8.8% of the total seven brands between January and June 2023.

Figure 2. 2 Battery NEVs Made-in-China Registered in Germany by Brand from January-June 2023



Source: Mazzocco and Sebastian (2023)

Second, BYD being China's largest company, has offices in Europe (the Netherlands and the United Kingdom), and it built its first bus manufacturing plant in Hungary in 2017, making China and European manufacturers remain competitive in the NEV field. Third, Yan and Liao (2025) have explained that there has been a favorable subsidy policy driving trade between China and Europe since 2020, with various levels of tax benefits and purchase incentives for BEVs in Table 2.1.

Because of the changing environment in NEV production, the Chinese NEV market is expanding globally. Yan and Liao (2025) describe Europe as the second largest NEV market, with total registrations increasing 20% from 2022 to 2023 to nearly 3.2 million. After this the EU Commission announced the launch of an EU anti-subsidy investigation into the Chinese NEV supply chain in October 2023. Accordingly, Wingender et al. (2024) highlighted that European officials were concerned that unfair competition from Chinese NEVs in the labor market would reduce automobile production in the region. As a result, the EU started an inquiry into Chinese BEV subsidies, which led to the imposition of further provisional tariffs on Chinese BEV imports in June 2024. Some EU leaders had already spoken publicly before voting to impose tariffs on Chinese BEV, for instance, the Spanish Prime Minister criticized mobilization at the time of visiting China and stated that the parties involved should cooperate instead of provoking a trade war. Meanwhile, the Germany's Chancellor has supported further negotiations addressing the skepticism surrounding potential tariffs due to the interlinked economy and Germany automakers having a significant investment with China. Lastly, the French President reaffirmed his statement by saying that the Chinese government's industrial policy support could risk the European efforts to produce and preserve the industrial footprint in the region (Featherston 2024).

Interestingly, China has responded to the tariffs by emphasizing the process in which China could become a global provider of green technology, while the EU would still be stuck on being the exporter of high-emission ICE vehicles (Featherston 2024). At the same time, Chinese automakers have found strategic ways to promote their PHEV models in EU. As the tariffs only apply for BEV, this gives more advantages for China to maintain its level in global market. Generally, by minimizing the EU tariffs on China's BEV, the automakers increase the export activity of PHEV to Europe with the plan to build a new model locally. Due to the combination of gasoline and electricity, PHEV is becoming more well-known and considered

alternative vehicles. Data shows the PHEV sales in Europe, which consist of 28 countries, reached 59% in August 2025 with 84,000 units, compared to July - October 2024 when exports reached 65,800 units. Meanwhile, as for the BEV sales, these rose 27% which is less significant than the promotion plan (Parodi and Potter 2025; Reuters 2024).

CHAPTER 3

CHINESE GOVERNMENT'S STRATEGIES FOR NEW ENERGY VEHICLE COMPETITIVENESS

In chapter 3, the focus is on utilizing the framework of Porter's Diamond Model to analyze the Chinese government's initiatives to increase the competitiveness of NEVs 2021-2025. Michael E. Porter's (1990) theory of the Competitive Advantage of Nations defines national competitiveness as a level of productivity that occurs within the nation. There are determinants of national competitive advantage that can give a solid foundation for understanding the nation's role. He contends that the nature of rivalry and the sources of competitive advantage change among industries, or even sectors of industries. Accordingly, global rivals may execute numerous tasks outside of their native country as part of the value chain. Home base is the location where strategy, core product, and process development take place, as well as vital and proprietary skills. Finally, in order to maintain its competitive advantage on a global scale, it underwent improvements, innovations, and upgrades.

Porter emphasizes that a suitable home base relates to well-organized plans, the process of developing and maintaining the core product and technology, and the placement of the most productive professions with advanced abilities. As a result, the industry will succeed in gaining a competitive advantage by acting early and aggressively to capitalize on the opportunity that foreshadows international needs. To gain a competitive advantage, the home base should allow and support the rapid accumulation of specialized skills and resources, have good information and insight for the production and process, and meet the interests of stakeholders who will support the intense commitment and sustain the investment. As a result, the most dynamic and challenging environment exists for a successful nation to achieve a competitive advantage.

The Diamond of National Advantage model divides the characteristics of a country's competitive advantages into four determinants; 1. factor conditions, 2. demand conditions, 3. related and supporting industries, and 4. firm strategy, structure, and rivalry. These determinants can create the national environment to which the firm was born in and learns how to survive in. These determinants, whether individually or as a system, refer to the availability of resources and skills required to achieve a competitive advantage in a specific industry. The factors of national advantage reinforce one another, and the cause and effect of each determinant can be obscured as a result of the 'diamond' serving as a symbol for these relationships. In most cases, these determinants will impact each other, even if one interaction is stronger than the others. Furthermore, the benefit of each factor may present chances to generate or improve advantages in others. Domestic rivalry and spatial industry concentration are two factors that will significantly alter the 'diamond' into an ecosystem. Domestic rivalry contributes to the overall improvement of the national 'diamond', whereas regional concentration intensifies and enhances interactions inside the 'diamond'.

Additional factors influencing the national system are required to complete the hypothesis. The first category is chance, which includes pure inventions, technological advances, wars, external political changes, and substantial shifts in the international markets. The second is the government which can assess by examining the impact of policy on each determinant. Furthermore, antitrust policy may have an impact on domestic rivalry, regulation may modify home base demand conditions, education investment may result in a shift in factor conditions, and government purchases may encourage the supporting and linked industries.

3.1 Chinese Government Strategies in Ensuring the Availability of Factor Condition

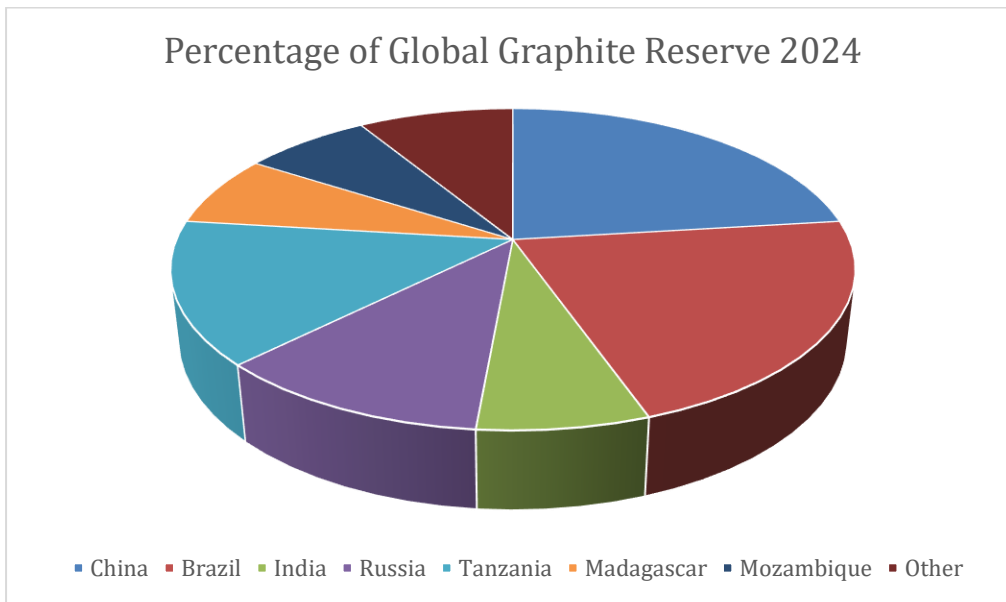
Factors conditions have a broad meaning, commonly referred to as land, labor, and capital, and are used to define competitive advantages in strategically distinct industries. In the

hierarchy, Porter explains that the factors are separated into two categories: basic and advanced. Natural resources, climate, location, unskilled and semiskilled labor, and debt capital are basic factor conditions. Meanwhile, advanced factor conditions include contemporary digital data communication infrastructure, highly educated professionals (e.g., graduate engineers and computer scientists), and university research institutes. In sophisticated economies, countries generate advanced factor production through trained human resources or a scientific foundation. Because a nation has the potential to access and circumvent natural resources through technology, they have to innovate. Thus, if suitable talents and a good environment for industry development exist, it will result in the activation of domestic rivalry.

Porter explains that advanced factor conditions are critical to achieving higher-order competitive advantages since they are limited for major improvement demands and continuous investment in people and physical resources. The integrated development and design in the process of increasing capacity to innovate would be beneficial for home base, because it has a direct link to the company's strategy. If the basic element existed without the advanced factor, innovation would not exist. The consideration of advanced factors in this example centered on China's highly skilled labor.

In the context of basic factor condition related to the development of NEV industry, China holds a dominant share of global graphite reserves. In 2024, graphite reserves in China was accounted 29% of global graphite reserve as shown in the Chart 3.1 Percentage of Global Graphite Reserve 2024.

Chart 3. 2 Percentage of Global Graphite Reserve 2024



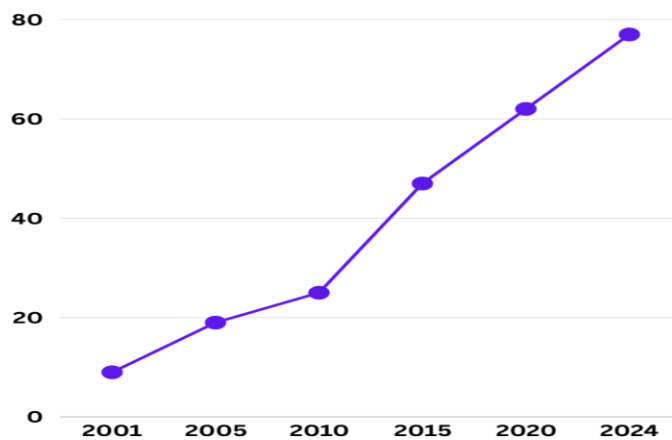
Source: Benson and Denamiel (2023)

China's pre-eminent position in graphite extraction and processing, coupled with escalating material needs from the electric-vehicle sector, led Beijing in 2023 to implement export licensing restrictions aimed at safeguarding national battery supply chains (Benson and Denamiel 2023). The other the key raw materials such as cobalt, lithium, and nickel used for China NEV production are also taken from overseas such as Democratic Republic of Congo and Indonesia, respectively. The Chinese government is using the strategy to occupy the cobalt mining industry for the NEV battery production. Even though China can produce the majority of the key minerals, but it still seeks opportunities to establish foreign production bases through dominating several mining companies. However, the Chinese government in the NEV industry prefer to focus on expanding its effort to increase the advanced factor through high-skilled labor since China is still incapable to fulfil it. Also, the government endeavors to develop critical infrastructure to increase the advancement of its NEV industry.

As for the advance factor condition, high-skilled labor in China has a foundation outlined in Figure 3.1 which depicts a considerable increase in student willingness to pursue higher education. The student focus is on Science, Technology, Engineering, and Mathematic,

and is beneficial to the development of the NEV industry. Today, China produces 3.57 million STEM graduates each year, with more than 40% holding university degrees. In 2025, Chinese universities created more than 77,000 STEM PhD graduates (Ogwo 2025). Undergraduate students rose 10% in 2022 to 4.7 million, while higher-level vocational schools increased 24% to 4.9 million graduates, as reported by the Ministry of Education (Cheng 2023). Shuo (2025) also stated that China is 2nd rank in STEM education, as reported by the Tongji University STEM education think-tank in Shanghai. This is critical to bolstering national innovation capability and promoting high-quality development.

Figure 3. 1 China’s Tertiary School Enrollment (% Gross) 2001-2024



Source: World Bank Group (2025)

China has strategic plan for 2025-2027 which outlines the government's efforts to improve skilled labor for industrial transformation. The program will integrate national strategic goals (MIC 2025, rural transformation, and digital economy employment). Supported by the Vocational Skills Training Initiative, it will improve labor force skills, achieve high-quality development, and increase worker productivity. The aim is to increase the availability of skilled workers in critical economic areas, facilitate industry-academia collaboration, and open up new prospects for investment in human capital (e.g., vocational education, training services, and human resource development). The NEV sector's concentration is on advanced

manufacturing within educational approaches such as enterprise-led training, institutional assistance, project-based training, standardization, and digitization (Interesse 2025).

Beside improving labor skills, the other strategic plan is to produce a document providing financial support to continue the education of over 3 million industrial workers in China by 2030. The various educational programs have been promoted to increase labor capabilities. Trade unions across China invested 1.12 billion yuan in June 2024 to assist more than 2.4 million migrant workers in improving their education quality and abilities (The State Council, People's Republic of China, 2025). Another supporting point from Morris (2025) is that CATL, a Chinese battery manufacturer, intends to relocate 2,000 trained workers to Spain's Zaragoza. This is the breaking point for transferring knowledge to local people in Europe so they are up-to-date on NEV technology. Furthermore, companies will educate approximately 4,000 personnel to work in Spain's largest battery facility, a 4.8 billion USD investment supported by EU funds totaling 300 million Euro, underscoring the reliance on Chinese technology. In addition to the possibility for Spain's university to train local workers, China will send its local employees to the manufacturing base for additional training (Waldersee 2025).

Table 3. 1 Total Charging Infrastructure in China 2020-2025

Year	Total in units
2025	19,32 million
2024	12.82 million
2023	8,6 million
2022	5,2 million
2021	2,617 million
2020	1,3 million

Source: Compiled by the Author

In terms of infrastructure, the Chinese government is already focused on the significant number of total fast charging networks. Table 3.1 illustrates the rising level of NEV Charging Infrastructure. Recently, IEA (2025) reported from 2020-2024 growth of about two-thirds within 65% of the charging. Miao (2025) reported that in first to the 7th month of 2025, the charging stations reached 3.878 million units, increasing tenfold compared to 2020, within the total up until the end of July 2025 at 16.696 million units. Several NEV companies have also helped to provide charging stations within the rank as illustrated in the Table 3.5.

To conclude the determinant factor condition based on the Porter's theory, Chinese government already fulfill through the effort with provide and support the high skilled labor and supply raw materials. As for basic factor, China has pre-eminent position in graphite processing and extraction while the other raw materials are obtained from several countries overseas. The advanced factor conditions are centered around two important policies. First, providing more STEM Education. China students in tertiary education keep increasing through the year, within the focus on the STEM Education. Second, the government support focuses on infrastructure such as fast charging and the total charging station increased in the past 5 years. Last, even though China lacks critical natural resources used to produce the new energy vehicle, yet the advance factors could sustain the strategies to be applicable in NEV industry development.

3.2 Chinese Government Strategies in Increasing Demand Conditions

Porter defines demand condition as consisting of three broad categories: the composition or nature of buyer needs, the size and the pattern of growth of home demand, and the mechanism in which the domestic nation preferences are transmitted to foreign markets. Through the mix and characteristics of home buyers, which specialize in each part of the influence factor of home demand, competitive advantage. Nations get competitive advantage if home demand gives the local industry a clear insight into the picture of buyer needs rather

than the competitors might have. The first indicator will discuss the composition or nature of buyer needs, the condition of home demand will shape how the firm perceive, interpret and respond to the customers.

For shaping the buyer needs, the Chinese government made several strategies to boost NEV sales domestically. Starting from the NEV manufacturers' effort to prioritize adjusting the infrastructure channel, intensifying marketing, and optimizing the promotion and sales of product. By using the 14th FYP as a framework to accelerate the promotion and application of new energy and clean energy transition, China has begun to shift the culture by providing electric taxis, electric bus, and urban logistics with green energy (Tian, Wang, and Zhu 2024, 2). For instance, 60% the electric buses are applicable in Beijing, Tianjin, Hebei and surrounding areas. Generally, China's marketing has been enhanced by the policy support from its government which has reduced or exempted the NEV purchase tax. NEVs purchased between 2024-2025 are exempted from the tax. Meanwhile, for the NEVs purchased from 2026-2027, there will be a 50% reduction of the tax. Correspondingly, IEA (2025) explains that although China's subsidy on NEV ended, it still became the largest public spending for the next 2 years. Interestingly in 2024, China introduced a trade-in subsidy for the premium purchase of NEVs within the total expenditure reaching 2.7 billion USD.

The second indicator focuses on the demand size and pattern of growth. Porter explains that if the nation has big home market then the strength exists due to the economic scale, while its weakness is due to the local company exporting their product and its essential for gaining the competitive advantage globally. Thus, the other strategy is through the weakness of high demand, which will force the company to export products overseas to reach global markets. The Chinese government uses this mechanism by providing subsidy programs and strengthening the Intellectual Property Rights. Salaberria and Xia (2023) reported that NEV sales increased significantly in 2020, with a total of 1.3 million units (Tang 2020). In 2022,

China sold 6.9 million NEVs, representing a substantial increase from the previous year. China has a high position when it comes to registering NEVs in 2021, which exceeded 3.33 million NEVs, compared to Europe with only 2.28 million and the US with 0.63 million. In comparison to the market position in 2025, BYD had already surpassed Tesla's market in China illustrated in Graph 2.3. This reflects the home based natural comparative advantage through massive support from industrial policy and improving the quality in order to attract domestic and global consumers for its products (Kennedy and Mazzocco 2024).

As for the third indicator, China is using the mechanism of FDI out-bond in other regions to transmit the foreign market. The initiatives of significant investment, it drives the sustainable development of regional economies and its included as one of the strategies of “win-win model” as the tool of shared interest between Chinese automakers and Southeast Asian society. Indonesia has pulled investment from China 22 billion USD (Bhattacharya et al. 2025), while two-thirds of the investment are in the manufacturing components (e.g., battery materials) are located in Asia. Thus, in Cambodia, BYD invest on the construction of charging infrastructure and promoting the global charging network. There are 70,000 NEVs are registered in Thailand, which this moment showed the momentum of total BYD sales growth 91.7% in 2024 and success entering the top 10 market globally (Global Times 2025). While in Europe, Hungary recorded as the highest received investment from China firms, Hungary has attracted 18 billion USD. Moreover, for the battery investment in Europe there are some cases like CATL has project with total 7.3 billion Euro for battery gigafactory in Debrecen, followed by Envision AESC invest 2 billion Euro for the plant in Douai. Other European countries also received FDI from China according to Tagliapietra, Trasi, and Sebastian (2025), including Belgium, Germany, the Netherlands, Poland, Slovakia and Sweden. Additionally, in other region like Latin America, China invests on vehicle assembly, also CATL take part in expand the market overseas through investing at four manufacturer plants outside home country.

Meanwhile in Africa, Morocco and Nigeria also has investment especially for its critical minerals to support the China NEV expansion globally (Bhattacharya et al. 2025).

The Chinese government has been offering an affordable price for its NEV products worldwide and especially in the Europe, it is around half of the European car prices. Within the massive state subsidies, and strategic export orientation, China enables their manufacturers to produce high-quality vehicles at cheaper prices. It gives the chance for BYD, NIO, and Cherry to scale-up production in the global market rapidly. In the same way, the Germany automotive sector enhances cooperation not only as a sales market, but also as a center for research and innovation. Thus, the EU has become China's largest export market for NEVs with around 40% of Chinese export headed for Europe (Osthoff and Goodman 2025).

Table 3. 2 Three Indicator of Demand Conditions Based on The Category

No	Indicator	Strategy
1	The composition or nature of buyer needs in home demand	<ol style="list-style-type: none"> 1. Chinese government shift the culture by provide electric bus, electric taxi, and urban logistics that using renewable energy. 2. In marketing, Chinese government provide policy support to reduced or exempted the NEV purchase tax. 3. Chinese government introduce the trade-in subsidy for the premium purchase of NEV.
2	The size and pattern of growth of home demand	<ol style="list-style-type: none"> 1. Providing subsidy program which resulted in the affordable prices offered by Chinese automakers for its NEV products that cheaper than Europeans'. 2. Strategic export orientation by strengthening the Intellectual Property Rights by build the Global IP center.
3	The mechanism by which nation's domestic preferences are transmitted to foreign markets	<ol style="list-style-type: none"> 1. Foreign Direct Investment Outbound with the other countries (e.g. Hungary, Indonesia, Nigeria) to sustain the upstream to the downstream manufacture of NEV industry development.

Source: Compiled by the Author

3.3 Chinese China's Government Policies for Related and Supporting Industries

Porter believes that the presence of supplier industry or related industry is internationally competitive. This is important because nations can produce the inputs that are necessary for innovation or even internationalization. In many ways, the presence of a global competitive supplier will create advantages in the early stages of manufacturing. Porter

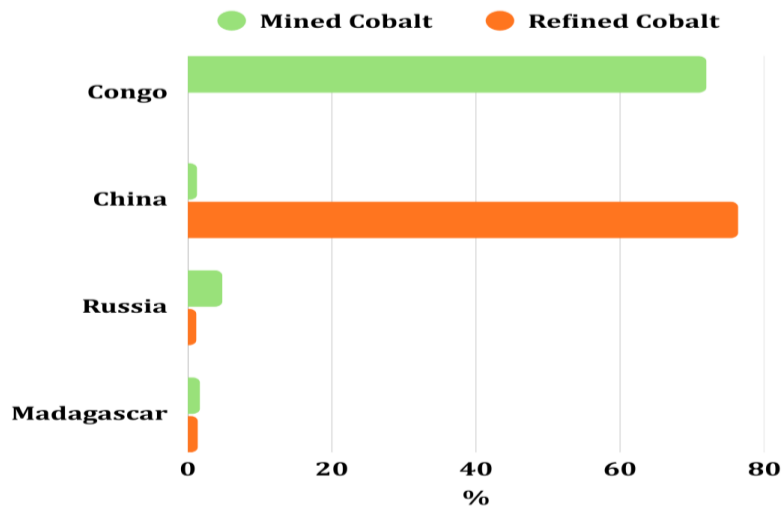
emphasizes that the most important advantage of home-based suppliers is in the process of innovation and upgrading. New methods to apply the technology innovation will emerge if the nation has close relationship with world-class suppliers because the nation's firm has access to information, novelty ideas and insight. The exchange of RnD and joint problem solving lead to the faster and quick solutions. By this mechanism, the pace of innovation inside of the home-base is accelerated. Therefore, local firms can get the maximum advantages rather than their suppliers which included as global competitors.

Definition of related industry is firms that can share activities or are integrated in the value chain while also competing, or even with those are involved as a complementary products. Thus, sharing activities can happen in technology development, manufacturing, marketing, distribution or service. The presence of global related industry will bring new approaches to compete for the new entrants. If the new entrants are domestic companies in related industries, they will share activities frequently and forge new alliances. Therefore, successful companies at global level also can pull through demand for complementary products. This discussion focuses on the China's industrial chains which divided into three sectors: upstream, midstream and downstream or known as three tier of NEV supply chain (Yong, Wan, and Qiyuan 2024). The production of NEV in China is highly related to how the government effort to sustain the NEV supply chain. Therefore, in the upstream supply of raw materials and components is not far from the mining manufacturer as a first component of production and midstream focus on battery and semiconductor. While the downstream are related to NEV Company (e.g., BYD, CATL).

As for the upstream sector, production of NEV needs some specific raw materials such as lithium, cobalt, nickel, and graphite. The lithium is concentrated in several countries, such as Chile and Zimbabwe while DRC has cobalt's reserve globally. Considering raw materials as an input, China has already secured its position in cobalt mining sector as critical element

for the battery technology, and most of the world’s refined cobalt is made in China (Ritchie and Rosado 2024).

Figure 3. 2 Refined Cobalt Production in 2021



Source: Ritchie and Rosado (2024)

Figure 3.2 illustrates that even though China only has 1.3% of the mined cobalt, its percentage of refined cobalt exceeds 76.4%. Meanwhile, Congo, which mines 72.1% of its cobalt, does not produce refined cobalt because this is already dominated by Chinese companies. In September 2007, China and Congo signed a MoU to represent the first stage of negotiation to deal with the joint venture under the name *Sino-Congolais des Mines* or known as Sicomones (Landry 2018), in which the agreement still effective for these years. Followed in 2024, that the DRC government successfully increased the infrastructure up until 7 billion (Rakotoseheno 2024). China relation with Congo is consider as the most important partners, due to the rising of bilateral trade which driven China continuously demanding the Congo’s natural resources.

Besides, China also gaining the supply chain of natural resources from several areas such as in Indonesia, after the ban of export of nickel ore effectively in 2020. China started to invest on the facilitation of nickel processing such as in nickel refineries and smelters, also High-Pressure Acid Leaching plants as a facility to support the process of nickel ore transform into higher-grade product that suitable for EVB. Meanwhile in Zimbabwe, similar on

Indonesian case to ban of export the raw lithium ore which then China provides investment 300 USD for concentrate processing of lithium by Zhejiang Huayou and Bikita mine owned by Chinese Sinomine already invested 480 USD for concentrate production of lithium (Zhou 2026, 282). Thus, Mazzocco, Berg, and Bledsoe (2024) explained in Latin America (e.g., Argentina, Bolivia, and Chile) are the major exporter of lithium mineral to China. While copper as essential for components of NEW from battery to wires are collected from Peru, within the sales of copper ore and copper concentrate to China raise 76% in 2022. The effort of Chinese government is driven by several strategies such as through Belt Road Initiative approach, policy support and diplomatic ties with the mentioned countries.

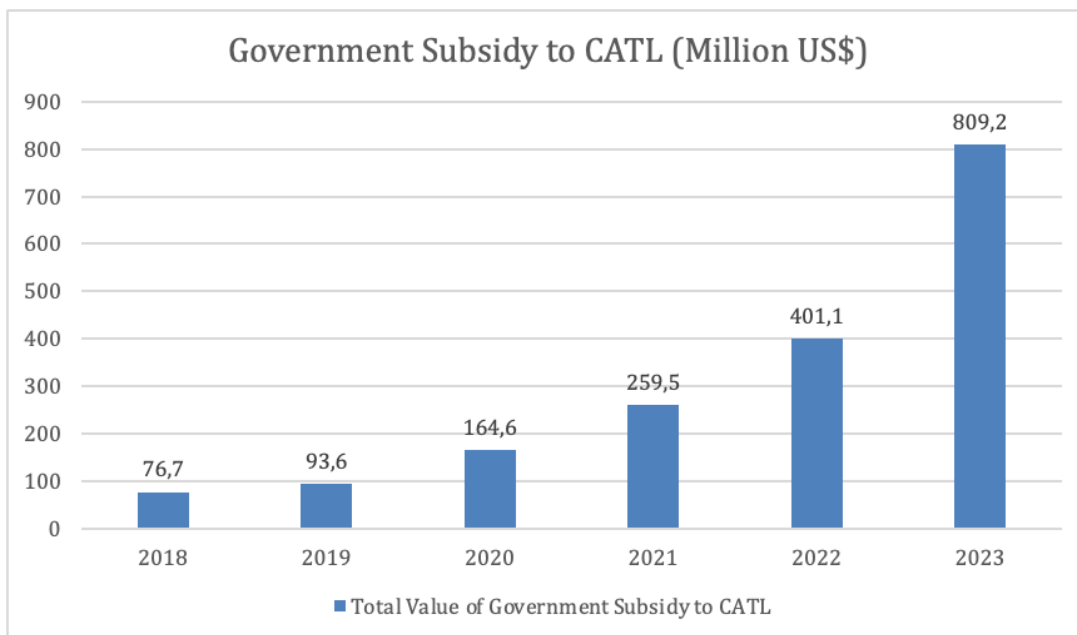
As for midstream sector, China dominates the downstream battery production cycle, the country produces three-quarters of lithium battery, 70% of cathodes, and 85% of anodes. This is the effect of Chinese government policy that prioritizes integrated domestic supply chains (Zhou, Gosens, and Jotzo 2023). Table 3.3 shows the policy which has impacted on the battery cluster development to help the Chinese automakers reducing the cost of production. Even within the impact from the applicable policy in Guangdong, Zhejiang, and Fujian, the effectiveness of NEV industry growth are supported by the supporting industry in battery manufacturer. The government has also reportedly provided subsidies to the major battery company, CATL, as illustrated in Graph 3.1.

Table 3. 3 Battery Cluster Policy by Chinese Government

No	Year	Name of Policy	Aim
1.	2020	Opinions on Accelerating the Innovation and Development of New Energy Automobile Industry (Guangdong)	To promote the development of industrial agglomeration of NEV industrial clusters, to guide large-scale clustering of key parts and component productions.
2.	2018 - 2020	Modern Industrial System Construction and 100-Billion-Yuan-Level Industrial Clusters Promotion Plan (Fujian)	Identified 27 industrial clusters such as EVB and new materials industry of rare earth and graphene, high-end equipment industry clusters, automobile industry clusters, and new chemical material industry clusters as development priorities.
3.	2019 - 2022	Zhejiang Automotive industry High-Quality Development Action Plan	Industrial cluster policy has aim make Zhejiang a world-class automotive industry clusters by 2022. which will focus on the construction of 4 major automobile industry cluster, relying on development zones (parks), high-tech parks, and promote the transformation of ICE, and key components of smart vehicles and EVs.

Source: Zhao and Luethje (2024)

Graph 3. 1 Government Subsidy to CATL 2018-2023



Source: (Kennedy and Mazzocco 2024)

Semiconductor is included in the midstream sector which the existence is essential for China’s national security and high-tech growth industry. Xi Jinping, President of China in his speech ever mention about semicondustor as a core technology in which China should produce domestically. Later, the government provide National Integrated Circuit Promotion Guidelines

in order to support the domestic chip industry correlated with the MIC 2025. According to Janjeva, Baek, and Sellars (2024), there are The Big Fund (I,II,III) having role in China's most centralised instrument to directing the fund into the domestic semiconductor industry. There are two compounds of semiconductor which are Gallium Nitride and Silicon Carbide. Previously in 14th FYP, China already listed compound semiconductor as priority sector due to the transition over global NEV. Then, the 15th FYP of Chinese government will provide the semiconductor and AI chips roadmap to fulfill its ambitions (Duchâtel 2025).

The Ministry of Science and Technology in 2015 established the National Third-Generation Semiconductor Technology Innovation Centre. It has aim to coordinate the natural resources. Focus on key technologies and applications, also fostering the collaboration between partners. The innovation center and CASA focus only on the development of technology and commercialization in several areas like in equipment, micro-LED. Power-supply technology and materials. In terms of design and IP, Janjeva, Baek, and Sellars (2024) mentioned that China already scaled up its industry with significant support from government and private investors within 95% investor are spread to local startups.

As for the downstream supply chain, the analysis will emphasize on the Chinese government efforts in helping the NEV industry survived through its proactive policy. For instance, the Dual-Credit Policy which still applicable nowadays is a China's significant effort in shaping the NEV policy framework from the direct subsidies into the market-oriented approach. Gary, Zhao, and Bao (2024) explained this policy sets the NEV and CAFC credit that require the manufacturer to meet the target by either producing enough fuel-efficient vehicles and NEVs or purchasing the credits from another manufacturer who have excess credits. Table 6 emphasize on the detail of the Chinese government effort in support the policy which aim to give the opportunity for open the equal level player and boost innovation between the automakers.

Table 3. 4 Features of Dual-Credit Policy in 2018

No	Features	Goals
1.	Covering both traditional and new energy vehicles	<u>In order to</u> create equal level of competition for car manufacturers.
2.	Establishing credit trading mechanism	<u>In order to</u> allow manufacturers to buy and sell credit based on their production and compliance status, also provide flexibility and market incentives for NEV.
3.	It establishes increasingly strict credit targets over time	<u>In order to</u> give pressure for manufacturers to continuously improve their production of vehicles.

Source: Gary, Zhao, and Bao (2024)

Recently in 2023, Zhang (2023) reported that there is an annual credit report media conference where China's industry regulators announce the new credit trading system for the dual-credit mechanism in the NEV business. This aims to facilitate credit trading among automakers, implement through a credit pool management system, and investigate mechanisms for interacting with the carbon trading market. Consequently, under the credit pool arrangement, automakers could voluntarily request the storage of positive credits for NEVs when supply exceeds demand. It is valid for five years, and if the supply credit falls short of the demand, automakers can release the stored positive credits to balance supply and demand in the credit markets.

Table 3. 5 Self-Built Charging Stations by Chinese NEV Companies

Brand	Charging Stations	Charging Piles
NIO	5,137	28,681
Li Auto	2,851	15,655
Tesla	2,800 +	14,100 +
XPeng	2,348 +	12,300 +

Source: Miao (2025)

Lastly, the supporting industry related to the charging and battery swapping facilities inline with the Chinese government strategic program started 2020-2024 in focusing on adjust

the charging stations. Additionally, the domestic company of China NEV also doing some effort by provided the charging stations, where in Table 3.5 the NIO has provided 5,137 charging stations and followed by the other local companies. Nowadays, China NEVs industry already fulfilled integrated local industrial and supply chains, which has efficient and low-cost production, and the industries are integrated from upstream to downstream that built specialized division of work.

Table 3. 6 Summarize Indicator of Supply Chain Sectors of China NEV Industry

No	Indicator	Strategy
1	Upstream	<ul style="list-style-type: none"> • Raw material in several areas such as in DRC, Indonesia, Zimbabwe, Argentina, Bolivia, Chile, and Peru. • Government of China using different approach to secure the mining industry in those areas.
2	Midstream	<ul style="list-style-type: none"> • Battery Clusters as the strategic policy from Chinese government to reduce the cost production of NEV. • Semiconductor industry and its National Third Generation Semiconductor Technology Innovation Centre.
3	Downstream	<ul style="list-style-type: none"> • Dual-Credit Policy Features and Revision which still applicable nowadays. • Charging infrastructure supported by Chinese NEV companies to provide the charging stations, helps the local government to accelerate the facilities.

Source: Compiled by the Author

3.4 Chinese Government Policies to Regulate Firm, Structure, and Rivalry of NEV Company

According to Porter, a good match between the option and the sources of competitive advantage in a certain industry will result in a national advantage. The pattern of rivalry in one's home base plays a role and has the potential for international success in the innovation process. National factors influence how a company is managed and choses to compete. For example, in Italy, enterprises that are relatively small-medium and privately owned are successful on a global scale. Thus, the nation will be successful if industry, practices, and organizations are managed in a way that allows them to thrive in a favorable climate as sources of competitive advantage. Firms' ability to compete abroad is influenced by a variety of factors,

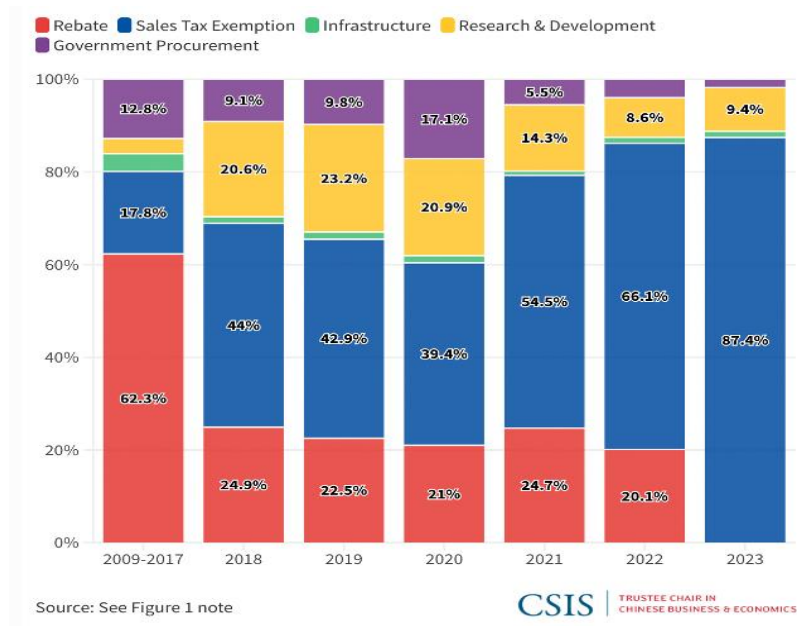
including domestic market pressure and global demand. Sometimes government policy has a considerable impact on the ease or difficulty of internationalization of domestic companies or the types of industries in which they are passionate.

In terms of goals, Porter defines national success as the alignment of industry goals and motivations with the source of competitive advantage. If national priorities have an impact on attaining goals, the quality of human resources will attract and drive the specific industry to be affected, resulting in a competitive advantage. For example, teaching young people in science and engineering is extremely advantageous to the economy since it offers the biggest stimulation to innovation. When the industry is prioritized as a prestigious place to work at the national level, brilliant people head there and display extraordinary dedication and effort. Furthermore, any specific issue that will have an impact on many industries can then be assigned national importance.

Porter argues that if strong corporations compete vigorously at home, it will put pressure on other companies to improve and innovate. In fact, the durable national advantage may exist in the form of technological rivalry rather than price competition. Domestic rivalry inside a home base is advantageous for a variety of reasons, including creating specific visible pressure if there are strong competitors, forcing others to develop, and even attracting new rivals to the business. Furthermore, the presence of geographic concentration in a specific area within a country will magnify the benefits. Because of the process of domestic competition, the entire national industry that is not related to any individual enterprise will gain advantages as it explores several methods to strategy and creates products or services that cover a variety of segments. As a consequence, a group of strong domestic competitors creates a fertile atmosphere for maintaining the competitive edge, which is difficult to recreate through foreign competition.

The policies taken by Chinese government to boost its NEV industry as explored in previous determinants have resulted in the boom of NEV company in China as well as tightening the competition among the companies. However, it should be noted that recently there is a shift in the government’s approach to support the NEV company from state-led expansion toward a more market-oriented and quality-focused. Figure 3.3 depicts the gradual reduction of government rebate to increase NEV demand while the other policy types such as sales tax exemption and RnD financial support were increased.

Figure 3. 3 Composition of Chinese Industrial Policy Support (%)



Source: Kennedy and Mazzocco (2024)

In total, the industrial policy spending for China NEV sector in the years of 2020-2023 was 16.8 billion USD, 30.1 billion USD, 45.8 billion USD, and 45.3 billion USD, respectively (Kennedy and Mazzocco 2024). As per Table 2.1 shows BEV subsidies have the limitation from the government. Additionally, to support the market demand, the Chinese government has implemented policies that relate to the market of NEV, as follows in Table 3.7.

Table 3. 7 Chinese Government Policy Relate to the Market Promotion and NEV Subsidy

Year	Policy	Aim
2018-2023	- Notice on Adjusting and Improving the Financial Subsidy Policy for the Promotion and Application of the NEV - Notice on Further Improving the Financial Reform Subsidy Policy for the Promotion and Application of NEV	
2020	Ministry of Finance PRC: Announcement on Extending the Policy of Exempting NEV from Vehicle Purchase Tax	Exemption from vehicle purchase tax
2021	State Council: Notice on the Comprehensive Work Plan for Energy Conservation and Emission Reduction for the 14th FYP Period	Increase the proportion of NEV used by public transport and Implement national emission standard for automobiles
2022	Ministry of Finance PRC: Announcement on Extending the Policy of Exempting NEV from Vehicle Purchase Tax	NEVs purchased from 1st January - 31st December 2023, are exempt from the vehicle purchase tax
2024-2025	Trade in Subsidies Scheme by apply the financial support for different cars	

Source: Compiled by the Author

In geographical concentration, Zhao and Luetje (2024) emphasize that the Chinese government has already secured numerous locations to construct an NEV battery cluster of industry. There are three important locations: Fujian, Zhejiang, and Guangdong as shown in Table 3.3. In Fujian, there are 27 industrial clusters of BEV and new material to support the NEV development and automobile industry clusters identified. Second, in Zhejiang, there is the aim to make it a world-class automotive industry cluster by 2022, which will focus on the construction of four major automobile industries based on infrastructure support for the smart vehicles and NEVs component ecosystems. The third is Guangdong Province, which aims to promote the NEV industry cluster development, and take the Pearl River Delta as part of the leading base for completing NEV and large-scale clustering of NEV components production.

Because of the Chinese government's significant role in boosting the global NEV industry, the Made in China 2025 strategy plan includes domestic measures which already explained in the previous sub section in factor condition, demand condition, also related and

supported industry. Mainly in terms of the important policies over charging infrastructure, promoting the NEV demand, and also incentives for tax reductions for NEV. Such as, with NEVs that have already been purchased having zero tax in the purchase transaction. This is only effective until the end of 2025; however, for the next term beginning January 1, 2026, there will be a 50% decrease on NEV purchases, with a maximum tax of 15,000 Yuan (Tang 2025). As a result, the Chinese government's involvement in NEV sector growth, such as its proactive policy in the NEV industry, has the potential to foster local rivalry and competition with other companies. The implementation of NEV demand in the worldwide market, as well as the Dual-Credit Policy which revised in 2021, influences the progress and innovation process through the financial assistance. China is embracing a state-led approach to NEV development as part of its strategy to achieve the MIC 2025 goal of shifting industrial focus to high-value manufacturing, innovation, and advanced technology, including the automobile sector. Consequently, a result of the fierce rivalry in the home market, new entrants or new brands in the NEV business have an opportunity to emerge on a domestic scale.

In this section, the discussion are focus on the current situation of Chinese government strategies are becoming less supportive, especially after the phased out of subsidy in 2022. As result, the company have faces several obstacle in sustaining their NEV domestically due to the focus shifted into regulating rather than assisting. However, in the recent case of irrational competition in China, the government has made a deliberate effort to implement regulations to avoid irrational competition by committing to boosting costs and investigations, as well as price monitoring, as reported by the state broadcaster CCTV. Furthermore, the government will focus on promoting high-quality growth of the NEV industry by implementing comprehensive short and long-term measures to address the unreasonable issue of competition (Reuters 2025). China's automakers must fulfill their commitments to suppliers on payment conditions and keep promises to increase competitiveness through technological innovation

and quality development. Previously, regulators and executives have cautioned about excessive competition, which will have an impact on health and sustainability. As a result of the cabinet meeting, Reuters (2025) reported that there was a discussion about increasing domestic consumption, and policymakers must commit to systematically reducing unreasonable restrictions to prevent household spending, rather than optimising the consumer goods trade-in program.

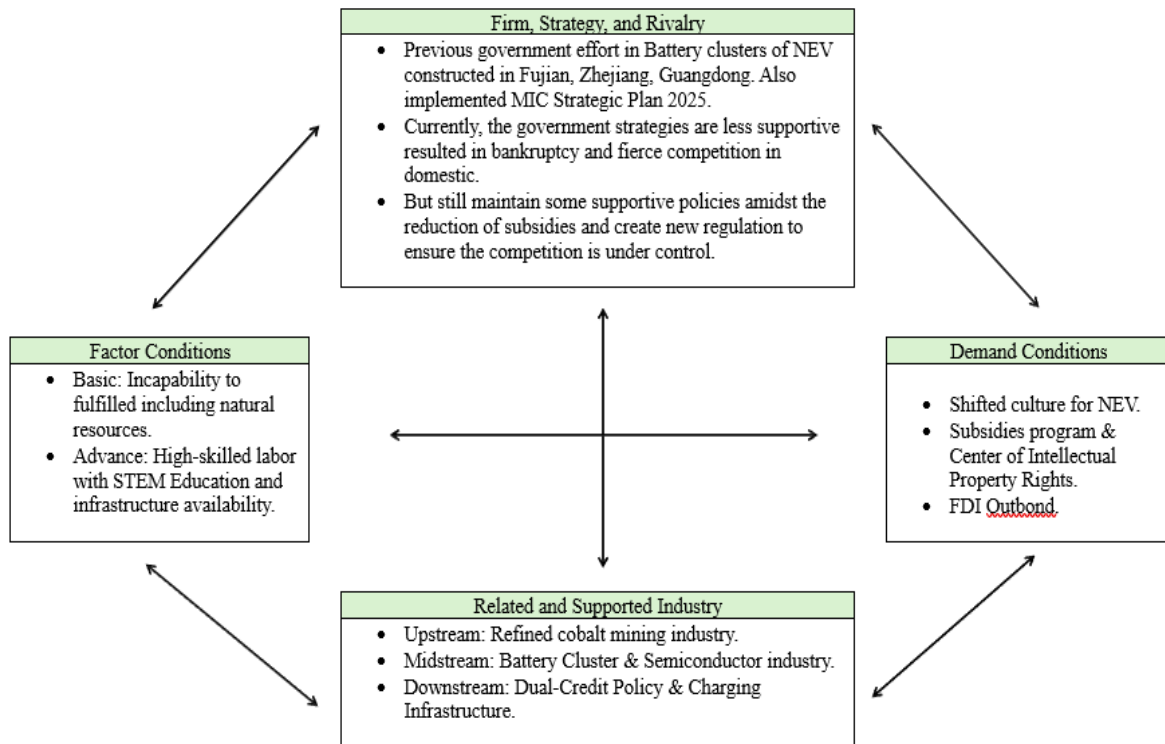
Taking into account that the competition of domestic NEV company in home demand are aggressively, another possibility of negative impact of strong competition is bankruptcy due to obstacle in financial problems. For instance, Zhejiang Hozon New Energy Automobile as the owner of Neta brand from China NEV entered bankruptcy officially announced on June 2025. Which several Neta stores in Shanghai already closed, this happened because it faces several problems in finance (Li et al. 2025). After the subsidy phased out, and China NEV sector expand in overseas within the significant sales demand, the Chinese government started to less support the domestic company. In other cases, Reuters (2025) claimed that 15 of 129 NEV brands will be commercially viable by 2030. It represents severe competition in the domestic market, which eliminates weak companies. It is also encouraged by the decline in local government assistance because it takes into account regional economies, employment, and supply chains. Overcapacity manufacturing of NEVs in the domestic market may have an impact on price wars between enterprises in order to secure long-term profitability. The regulators are attempting to end the pricing war, but it is difficult due to decreasing insurance subsidies and zero-interest financing, rather than directly price reductions.

Nonetheless, the government maintains several supportive policies amidst the reduction of subsidy and new regulations to ensure the competition is in control. The prominent example is Dual-Credit System which was issued in 2017 and remained in force in 2025. China's Dual Credit scheme, combining fuel-consumption standards with mandatory NEV production

quotas, has functioned as a regulatory market mechanism that structurally supports domestic NEV manufacturers. By requiring conventional automakers to generate or purchase NEV credits under increasingly stringent Corporate Average Fuel Consumption (CAFC) targets, the policy ensures demand for new energy vehicle and creates tradable credit revenue for specialized NEV producers. This mechanism has enabled Chinese NEV firms to sustain production and scale competitiveness even as direct purchase subsidies declined (Chen, Zhan, and Liu 2023; Gary, Zhao, and Bao 2024; Peng and Li 2022).

The Chinese government's efforts to enhance the global competitiveness of its NEV industry extend beyond domestic industrial policy to encompass active economic and trade diplomacy. A prominent case is Beijing's response to the European Union's tariffs on Chinese BEV, where China initiated dispute consultations at the World Trade Organization in 2024, arguing that the EU measures contravened WTO rules (World Trade Organization 2024). In parallel, China adopted retaliatory trade measures, including tariffs on selected agricultural imports from the EU and Canada, as leverage in ongoing negotiations (Bhattacharya 2025). These actions form part of a broader strategy to safeguard and sustain China's NEV export performance.

Diagram 3. 1 The Diamond of Chinese Government Strategies in National Competitive Advantages



Source: Compiled by the Author

BAB 4

CONCLUSION

4.1 Conclusion

There are various strategies from Chinese government in raising the competitive advantage within the Diamond Model of competitiveness advantage by Porter. Chinese government start to ensure the availability of factor condition through the basic and advance factors. The basic factor focusses on graphite processing and extracting as China's position is outstanding, while for other natural resources are taken from other countries such as DR Congo, Indonesia, Brazil, Peru, and Zimbabwe. Additionally, for the advanced factor, there are high skilled labor which roots from the focus education on STEM which is related to the NEV industry and increases the infrastructure availability.

In the strategies for increase the demand condition, China shifted the culture of vehicles in home country, then it provides subsidies program, as well as build the center of Intellectual Property Rights and strengthening the FDI outbound in several regions. As for the government policies for related and supporting industries, China focuses on raw material (refined cobalt sector), battery cluster and semiconductor industry to secure the supply chain as well as the dual-credit policy features and charging infrastructure policy. Last, in the strategies of regulate firm, structure and rivalry, the government success in raising the fierce competition on home base, however the less supportive mechanism for the industry resulted in various challenges (e.g., bankruptcy, irrational competition) for company to sustain their NEV market industry.

4.2 Recommendation

This study of the Chinese government's strategies for growing competitive advantage, which was conducted using Porter's Diamond Theory Model, reveals how one factor influences the others to gain a competitive advantage in a favorable home base. The study's findings already demonstrate how the Chinese government's efforts resulted in these determinants, but the author acknowledges that future research could more thoroughly explain NEV expansion in other locations or countries. Further research will be better if broaden the time horizon for NEV development in light of the present global trend toward green energy technology.

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