

Analysis of the New Energy Vehicle Market in China and the United States

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Abstract: As a matter of fact, with the changing times, people have more time to travel and an increasing need for transportation that does not cause significant pollution, so new energy vehicles have emerged. In contemporary society, with the comprehensive development of AI and 5G technology, new energy vehicles are the best carrier of these future technologies and can also drive the development of related technologies, which prompts every country to compete in this market and occupy more market share. With this in mind, this article attempts to combine market information in recent years to explore in detail the future development of new energy vehicles. To be specific, this study will investigate the differences that may arise from the different approaches of China and the United States towards new energy vehicles. According to the analysis, the suggestions as well as implications for development of the new energy vehicle industry will be proposed. Overall, these results shed light on guiding further exploration of new energy vehicle development in global market.

1. Introduction

With the increasingly severe global environmental problems and the high dependence of traditional fuel vehicles on energy, the development of new energy vehicles has become an inevitable trend [1]. In this context, research on the development of new energy vehicles is extremely important. In recent years, new energy vehicle technology has continuously made breakthroughs and market share has gradually expanded. However, its development still faces many problems including range, charging facility construction, costs, etc. I through analysis of relevant data and case studies, analyse the characteristics and problems of new energy vehicles in terms of technological innovation, policy support, market promotion, etc. [2].

At this point, I further explore the competitive relationship between new energy vehicles and traditional fuel vehicles, as well as their role and impact in energy transformation. At the same time, attention will be paid to the sustainable development of the new energy vehicle industry [3], including comprehensive impacts on the environment, economy, and society. China's new energy vehicles have achieved excellent results internationally. Through the growth in sales and technological research and development of new energy vehicles in China in recent years, as well as the implementation of new energy subsidies by the government [4], and make the development of

China's new energy market on the rise. The sales and technology in the United States are stabilizing, with corresponding government subsidies. However, the charging stations required for new energy vehicles have not been widely adopted in various regions. Nevertheless, in recent years, the gradual change in consumer attitudes also indicates that the market is expected to continue to grow. Through these market analyses, it is available to predict the future market.

2. Development Analysis

The future development of new energy vehicles can be analysed in several sections. The original intention of the development of new energy vehicles is to achieve low-carbon and environmental protection. Unlike traditional fuel vehicles, it perfectly achieves the goal of reducing exhaust emissions, which is extremely important for environmental protection. Traditionally, the noise generated by the engine of traditional fuel powered vehicles has always been a major issue, while new energy vehicles have relatively less noise. Not long after the launch of new energy vehicles in the market, most people are still reluctant to use them, one of the reasons being that their prices are very expensive. From 23 to 24 years ago, the general selling price of new energy vehicles has become increasingly affordable. In terms of charging, the cost of new energy vehicles is much lower compared to traditional fuel vehicles. For traditional vehicles that cost a few hundred yuan to refuel, the charging of new energy vehicles is more cost-effective. Due to the rise of new energy vehicles worldwide, various countries have also adopted corresponding policies, such as car purchase subsidies and tax incentives. Nowadays, AI and other technologies are developing comprehensively, and correspondingly, new energy vehicles have also become a new carrier to carry these technologies, which indicates lighter travel and more convenient life. These phenomena all indicate that the future automotive market will definitely be dominated by new energy vehicles, and its future development is sustainable, which will affect various levels of society.

3. Analysis of Chinese Market

The report of the 20th National Congress of the Communist Party of China pointed out that accelerating the green transformation of development mode is a major measure to comprehensively build a socialist modernized country. As an important strategic emerging industry in China's 14th Five Year Plan, new energy vehicles can accelerate the optimization of industrial structure to the greatest extent. China has implemented corresponding policies to develop towards green and environmental protection, which has made China's new energy vehicles develop rapidly and gradually occupy a leading position in the market [5]. The top 10 NEV sales data in Q1 of 2023 is shown in Fig. 1. According to a report released by market research firm Counterpoint Research, China remained the world's largest electric vehicle market in the first quarter of 2023. Although overall passenger car sales decreased by 12%, electric vehicle sales increased by 29% year-on-year. With such rapid development and an increase in the number of users, China has also built enough charging stations to supply: the number of new charging stations added in 2023 accounts for 40% of the total number. From January to April 2024, China's charging infrastructure increased by 1.017 million units, with domestic sales of 2.52 million new energy vehicles. Charging infrastructure and new energy vehicles continued to grow rapidly. The increment ratio of pile cars is 1:2:5 [6].

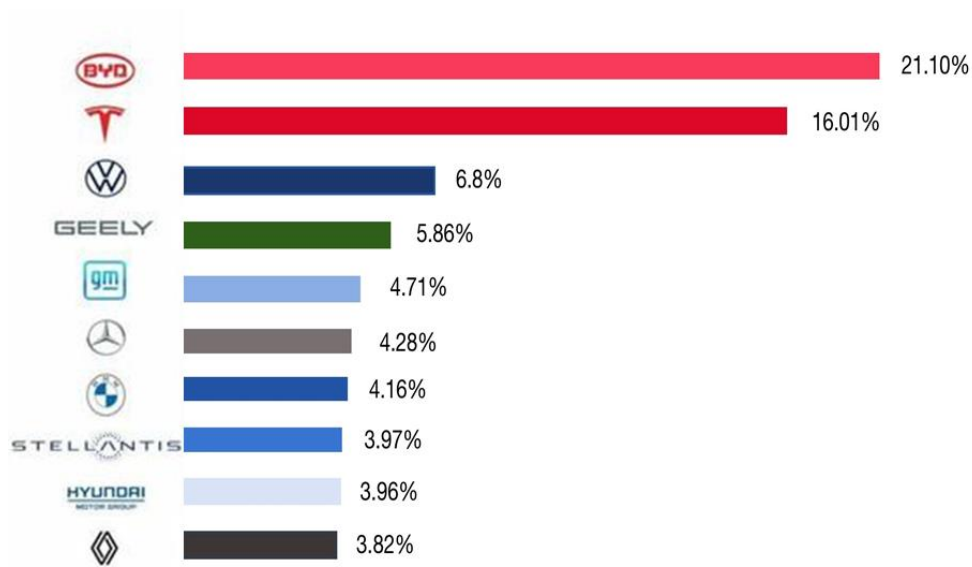


Figure 1: Collection of top 10 EV automobiles sales in Q1 of 2023.

In 2023, as depicted in Fig. 2, the production and sales of automobiles in China reached 30.161 million and 30.094 million respectively, with year-on-year growth of 11.6% and 12%, respectively. The production and sales have remained the world's top for 15 consecutive years. Among them, the production and sales of new energy vehicles reached 9.587 million and 9.495 million, respectively, with a year-on-year increase of 35.8% and 37.9%, and a market share of 31.6%.

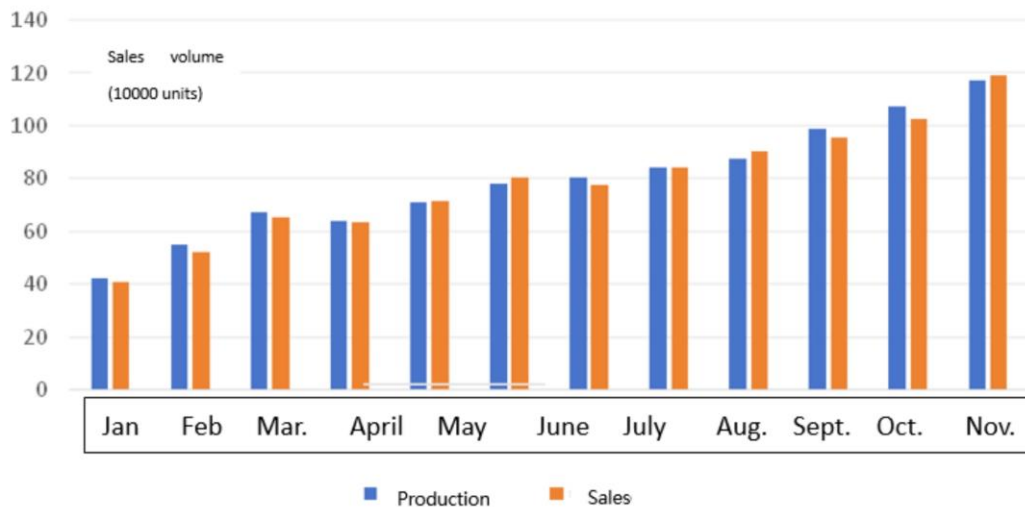


Figure 2: Monthly production and sales of new energy vehicles in 2023.

The market share of new energy vehicles is increasing. Chen stated that "it is expected that the total sales of automobiles in China will exceed 31 million in 2024, with a year-on-year growth of more than 3% [7]; among them, the sales of passenger cars will be 26.8 million, with a year-on-year growth of 3%; and the sales of commercial vehicles will be 4.2 million, with a year-on-year growth of 4%. In addition, the sales of new energy vehicles will be 11.5 million. The rapid increase in the number of Chinese automobile exports indicates that China regards overseas production as its ultimate goal. Xu once said that human beings have not been very encouraging to be the "world's largest automobile exporting country" because trade exports are only a small part of automobile exports [8]. For example, Japan produced about 17 million cars overseas last year, and Germany and the United States also mostly produced overseas. In the future, more localized production in

overseas markets can be achieved to say the success of China's automobile industry. With goals and sales, BYD, as one of the leaders in China's new energy market, launched multiple intelligent technologies at the BYD Dream Day press conference on January 16, 2024. The long term prediction is shown in Fig. 3. It has been said that autonomous driving and intelligent driving are often confused, and currently, autonomous driving does not have the conditions to be implemented in terms of laws, regulations, and technological maturity [9]. Autonomous driving is too early, intelligent driving has arrived. New energy vehicles, as the best carrier of AI and other technologies, take BYD as an example. This intelligent configuration makes the general public more willing to pay for it.

In recent years, China's overall development has been extremely rapid, forming a trend of low opening and high moving. The influence of China's new energy vehicles in the international market has further increased, indicating the rise of China's new energy vehicles from all aspects [10].

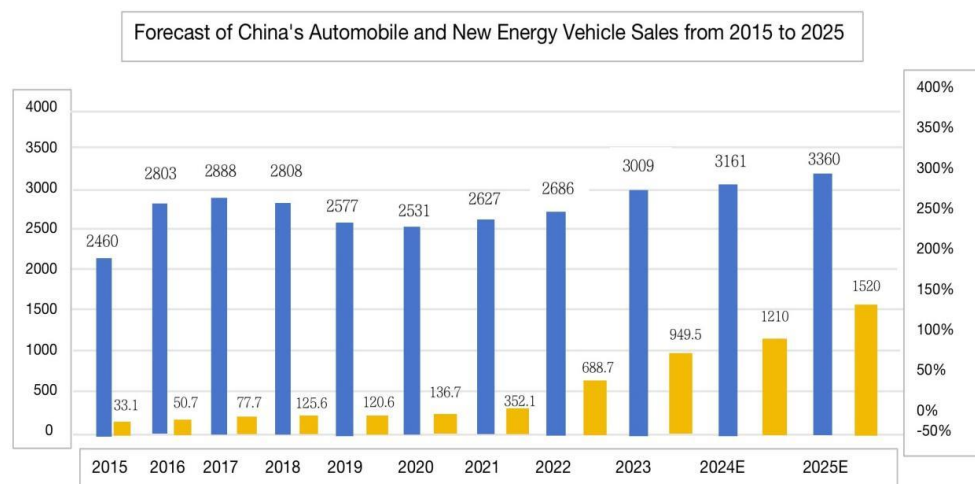


Figure 3: Forecasting of China's vehicle sales to 2025.

4. Analysis of the Unites States' Market

On March 5, 2024, NEW WORK POST published an article stating that electric vehicles actually produce more toxic gases than traditional gasoline vehicles, and their impact on the environment is more severe. According to this article by American media, fuel vehicles have been equipped with many efficient filtration systems, which have reduced the pollution of fuel to the minimum, so the pollution to the atmosphere is not as serious. On the contrary, most of the current car pollution comes from particulate matter released by brakes and tires. Research has shown that the amount of particulate matter released by brakes and tires is 850 times higher than that of gasoline powered vehicles. This is because electric vehicles are equipped with bulky batteries, which leads to heavier weight and higher friction with the road surface, resulting in more particulate matter released by tires. However, in reality, the overall weight of electric vehicles is similar to that of gasoline vehicles, and it is baseless to say that particulate matter leads to more pollution. Originally, new energy vehicles are a great product, the United States also wanted to have a certain advantage in the market. However, because traditional fuel vehicles will be more affordable, Volkswagen is unwilling to bear more costs, which means that new energy vehicles in the United States are still on the high end. In the European and American markets, rapid energy replenishment has always been an urgent need for tram owners. In addition to residential and work locations, scenes such as highways, shopping malls, and parking lots all require fast charging services. However, there is a significant difference in the number of AC/DC piles in the European and

American markets, with only about 10% of public charging piles being fast charging DC piles. This further leads to American citizens being unwilling to purchase trams for use [11]. Nevertheless, taking Tesla as an example, Tesla's brand influence still holds an advantage in the world (seen from Fig. 4). It has avant-garde design, excellent performance, and leading intelligent technology. From the current situation, Tesla's globalization strategy allows it to have a wide market coverage and occupy a considerable share in the international market [12].

Number of vehicles sold (in thousands), BEV and total market share (%)



Figure 4: Tesla sales in unit of thousands.

At present, there is no problem with fuel costs in the United States. In the United States, oil prices are generally low, so electric cars are unnecessary for many consumers. Boston Consulting analysed that American consumers who are willing to purchase electric cars require that the vehicle must be quickly charged in 20 minutes, with a range of about 560 kilometres and a price not exceeding \$50000. But this is a goal that the United States is basically unwilling to achieve at present. Even if there are very close fast charging stations, they are not spread throughout the country, only a few regions have fast charging stations.

As early as 2022, the US government and states have introduced varying degrees of preferential policies for purchasing domestic new energy vehicles. The US government first provided a subsidy of \$7500, followed by state governments offering subsidies ranging from \$2000 to \$10000. California's subsidy even reached \$18000. These policies are aimed at boycotting Chinese products, and any parts and cars made in China do not receive these subsidies. This indicates that the United States has resorted to all means to develop its own new energy vehicles [13]. Combined with the policies recently released by the United States this year, many new energy vehicle plans in the United States have changed, funding for development has been revoked, and the Inflation Reduction Act has been enacted [14]. The proposal of tax credits for electric vehicles to boycott Chinese products, as well as the gradual fading of enthusiasm among American consumers towards electric vehicles in 2023, indicate that new energy vehicles in the United States will be delayed or even stagnant in the future. However, similar policies will be issued to prevent the development of new energy vehicles in other countries.

5. Conclusions

To sum up, this study summarizes the future trends of NEV for the global market. At the same time, by comparison of two major markets, i.e., the Chinese market as well as the United States's market, the current statues and projections for future developments are clarified and demonstrated.

In the meantime, according to the presented data, the limitations as well as prospects for the NEV field are also evaluated. According to the analysis, the overall market of NEV shows a general growth trend while the development speed might meet some challenges in recent years. For further study, one needs to focus on the development of policy as well as the whole economy in order to make a more precise prediction for the market.

References

- [1] Bai, F., Zhao, F., Liu, X. and Liu, Z. (2022) *The Role and Implementation Path of the Automotive Industry in Carbon Neutrality*. Society of Automotive Engineers (SAE)-China Congres, 100-112.
- [2] Li, J., Jiao, J. and Tang, Y. (2019) *An evolutionary analysis on the effect of government policies on electric vehicle diffusion in complex network*. Energy policy, 129, 1-12.
- [3] Yu, J.S. (2022) *Exploring the Future Development Trends of the New Energy Vehicle Industry*. Automotive knowledge, 22(4), 53-55.
- [4] Liu, W.T. (2024) *Incentive policies and prospects for new energy vehicles based on SWOT analysis*. Management Science and Engineering, 13(1), 246-256.
- [5] Wang, Z. (2024) *Annual report on the big data of new energy vehicle in China (2022)*, Springer Nature.
- [6] China Charging Alliance: Public charging stations increased by 47% year-on-year in April Retrieved from: <https://baijiahao.baidu.com/s?id=1798744500674060896&wfr=spider&for=pc>
- [7] Zhang, L. (2015) *Inside China's automobile factories*. Cambridge University Press.
- [8] Xu, H.D. (2023) *Current Deputy Chief Engineer and Minister of Industrial Research Department of China Association of Automobile Manufacturers, concurrently serving as Secretary General of the International Trade Coordination Committee, Secretary General of the Market and Trade Committee, and Automotive Industry Secretary General of the Post Market Committee*, 11, 7
- [9] Wang, C.F. (2023) *The current Chairman, Executive Director and President of BYD Co., Ltd., and Honorary President. WeChat Business Association*, 17.
- [10] Wang, Z. (2024) *Taking BYD as an Example to Analyze the Key Technologies and Development Trends of New Energy Vehicles in China*. Auto Maintenance, 6, 111.
- [11] Knez, M., Zevnik, G.K. and Obrecht, M. (2019) *A review of available chargers for electric vehicles: United States of America, European Union, and Asia*. Renewable and Sustainable Energy Reviews, 109, 284-293.
- [12] Zheng, J. (2024) *Yinji Technology: Unlocking the new era of intelligence*. Car observation, 1, 56-58.
- [13] Shi, M. J. and Hu, X. *Research on the Impact of Differentiated Subsidies on the New Energy Vehicle Supply Chain under Asymmetric Information*. Journal of Chongqing Gongshang University (Natural Science Edition), 41(2), 96-106.
- [14] Bown, C.P. (2023) *Industrial policy for electric vehicle supply chains and the US-EU fight over the Inflation Reduction Act*. Peterson Institute for International Economics Working Paper, 23, 1