

# Analysis of Problems and Countermeasures in the Promotion of New Energy Vehicles in China

Chunkai Bi<sup>1, \*</sup>, Guanru Li<sup>2</sup>

<sup>1</sup> Tianjin Nankai High School, Tianjin, China

<sup>2</sup> Linzi Middle School, Zibo, China

\* Corresponding Author Email: bichunkai2025@outlook.com

**Abstract.** At present, China's new energy vehicle industry is in the stage of rapid development, but it also faces a series of challenges. These include problems in the installation of community charging facilities and home charging stations, negative public opinion on new energy vehicles on the Internet, restrictions on the supply of key materials for new energy batteries, and a global shortage of chips. To overcome these constraints, society needs to adopt diversified strategic measures. Policy promotion is the key. Relevant policies can guide the property management of residential communities and improve the community power grid capacity, so as to promote the rapid construction of shared EV charging facilities. At the same time, society also needs to increase the publicity of the network platform and improve the public's cognition and understanding of new energy vehicles, so as to change the inherent concept of consumers. In addition, industry leaders should be actively encouraged to accelerate technology research and development in order to break through the existing technical bottlenecks. Through these comprehensive measures, people can effectively promote the sustainable and healthy development of the new energy vehicle industry.

**Keywords:** New energy vehicles; promotion; problems; countermeasure analysis.

## 1. Introduction

In the perspective of globalization, environmental pollution and climate change caused by greenhouse gas emissions have posed serious challenges to the sustainable development of the global economy and society. The concentration of carbon dioxide in the atmosphere has continued to rise since the Industrial Revolution and now stands at 419 ppm. The global average surface temperature has already increased by 1.1 degrees Celsius and, if left unchecked, could rise further to 2.5 degrees Celsius in the second half of this century. The rise of surface temperature will cause a series of climate and environmental problems, such as sea level rise, climate anomaly intensification, and land drought intensification. Global warming has become a central issue in many fields such as international politics, economy, and environmental protection, and has even become the center of gravity of international politics. 178 parties around the world signed the Paris Agreement, a unified arrangement for global actions against climate change after 2020, and the goal of achieving carbon neutrality in the middle of this century. The Chinese government fully considers the domestic and international environment and conditions, comprehensively weighs the advantages and disadvantages, and clearly puts forward the strategic development goals of "carbon peaking" by 2030 and "carbon neutrality" by 2060 in September 2020 [1]. In October 2021, The State Council issued the "Action Plan for Carbon Peak before 2030" and the Outline of the National Comprehensive Three-dimensional Transportation Network Planning, which clearly pointed out that by 2030, new energy and clean energy powered transportation vehicles will account for 40% [2].

Consequently, the new energy automobile industry has garnered significant attention due to its immense significance in attaining the 'dual carbon' goal. Not only does it have the potential to facilitate the transformation of China's energy landscape, but it also holds promise in advancing the country's environmental sustainability and economic development. Therefore, it is necessary to identify the problems of community charging in the promotion of new energy vehicles, the user cognitive bias caused by excessive network publicity, and the high cost of new energy vehicles

through the grasp of the status quo of China's new energy vehicle industry. Combined with the actual situation in China, the countermeasures are analyzed to promote the healthy development of the new energy automobile industry.

## **2. Industry Status Quo of New Energy Vehicles**

As the main pillar industry of the country, the automobile industry is an important strategic measure for China to save energy and reduce emissions, achieve the goal of "double carbon", and develop new energy vehicles. According to the statistics of the Passenger Association, the cumulative retail sales of passenger cars in China in 2023 were 21.699 million, an increase of 5.6%. The cumulative production of 8.920 million new energy passenger vehicles in 2023, an increase of 33.7%. In 2023, global new energy vehicle sales reached 14.653 million, an increase of 35.4%, of which China's new energy vehicle sales reached 9.495 million, accounting for 64.8% of global sales [3]. In the first half of April 2024, the penetration rate of new energy vehicles in the passenger car market in China exceeded that of fuel vehicles for the first time, reaching 50.4%, ushering in a milestone watershed. From the perspective of car companies, the main car companies have obtained a huge increase. Byd is the first car company in the world to announce the cessation of vehicle production of fuel vehicles from March 2022 and is also a leader in the development of new energy vehicles in China, achieving sales of 3.024 million new energy vehicles in 2023, and announcing the 2024 sales target of more than 20% on the basis of 23 years. China's new energy vehicle industry is an absolute leader in the world. Then, the healthy development of the industry is of great significance for the national strategy of new energy.

## **3. Problems Existing in the Promotion of New Energy Vehicles**

At present, there are still some shortcomings in the promotion of new energy vehicles, which can not support the development of the entire industry. In this paper, the problems existing in the promotion of new energy vehicles are mainly divided into three aspects, and the following three aspects are introduced in depth.

### **3.1. Cell Capacity and Household Charging Pile Installation Problems**

At present, the main problem plaguing many prospective owners to choose new energy vehicles is the installation of charging piles. According to the requirements of the process of applying for the installation of charging piles, one is that it is necessary to have its own parking space (except for rural self-built houses), and the other is that it is necessary for the property company to agree to the application for installation.

For owners who do not have their own parking Spaces, there is no condition for installing home charging piles. If you already have a property right parking space, the property company may not necessarily allow the installation of charging piles. One is the new community with a new energy dedicated circuit, which can be applied from the dedicated circuit line. The second is that the property provides electricity service in public areas, and you can apply for electricity connection from public areas at a higher cost than household electricity, but the premise is that it does not exceed the existing capacity of the community. Third, there is no public area of the community, the property is only allowed to connect electricity from their own meters, but at the same time, it is necessary to arrange professional personnel to investigate the wiring problems and can be installed under the conditions that meet the safety norms [4]. In this context, there are several pivotal issues to be addressed. One significant concern is the limited power capacity of residential communities, which, if overwhelmed by the charging demands of numerous new energy vehicles, would inevitably lead to an overload of electrical consumption within the community. If the community wants to increase the electricity capacity, it needs to invest huge funds and large equipment, which cannot find the source of these costs, and involves the personal interests of all owners. Second, if you take electricity from your own meter, it involves the distance of the line. Generally, when new energy vehicles are sold, they will

send power piles and cable lines of about 30-40 meters. But in fact, from the high-rise to the underground garage almost will exceed the standard, and the excess part is charged according to the distance and the actual line specifications used. The longer the distance, the thicker the cable, the higher the cost. It is normal to pay thousands at one's own expense, and it will be 10,000 individually. More than 200 meters will have a large electrical loss, it is not recommended to install charging piles. Third, if the property creates several public charging piles in a unified way, it will crowd out the existing public parking Spaces, especially for the old residential areas where parking Spaces are already very tight, which is almost impossible.

### **3.2. Negative Publicity on Network Platforms**

At present, there are some voices against new energy vehicles on the network platform, some of which are people who do not understand new energy vehicles, and some are people who are closely related to the interests of traditional oil vehicles. There are five main misleading aspects:

First, trams save electricity but do not save money. As people all know, the cost of using trams is very low, and charging with peak and valley electricity prices can reduce the cost of electricity consumption per kilometer to a few cents. This is very cost-effective for individuals, and at the same time, it also makes reasonable use of power resources during peak and valley hours for the benefit of the country and the people. Some remarks on the network often say that "the battery decay in the use of new energy vehicles is fast, and the cost of replacing the battery is very high." The fact is that the state has mandatory provisions, that is, "three power" 8 years or 120,000 kilometers as the most basic requirements, this time and use of the distance most private cars are not up to. At the same time, the "three power" lifetime warranty is also almost all manufacturers of extended warranty strategy, consumers can choose.

Second, the network creates insufficient mileage, leading to excessive consumer anxiety. At present, the commercial charging piles in various cities are fully equipped, and the driving range anxiety does not exist for the owners of urban commuting. Due to the relatively long charging time, high-speed charging facilities are relatively insufficient, especially during the holiday peak period, which requires long-distance owners to travel at the wrong peak, or do line planning, and choose the combination of high-speed and non-high-speed charging piles. At the same time, for owners who often have long-distance needs, they can choose to mix or increase the program, which can reduce fuel consumption and solve the problem of high-speed charging.

Third, the safety of new energy vehicles has been amplified. The network broke out some battery spontaneous combustion, brake failure and other problems of new energy vehicles, including real cases, there is no shortage of hype to attract traffic reports, affecting the decision of consumers to choose new energy vehicles. In fact, the Ministry of Industry and Information Technology started the development of electric vehicle safety standards as early as 2016, including the "safety requirements for electric vehicles", "Safety requirements for electric buses" and "safety requirements for power batteries for electric vehicles" three mandatory national standards, and began to be implemented on January 1, 2021. It is fully integrated with the United Nations Global Technical Regulations on Electric Vehicle Safety (UN GTR 20), and further improves and optimizes the safety technical requirements for electric vehicles and power battery products [5]. Other authorities have done a comprehensive safety test on new energy vehicles, and on the whole, the ranking of new energy vehicles is higher than that of traditional fuel vehicles, but this data needs to be continuously improved with the popularity of new energy vehicles.

Fourth, the warranty rate of used cars is far lower than that of traditional fuel vehicles. But the fact is that the used car warranty rate is actually closely related to market demand and share. In the early stage of the development of new energy vehicles, its low value protection rate is an indisputable fact. However, with the rapid development in recent years, the value of its used cars has gradually increased, especially in the first half of 2022, the sale of used cars is higher than the price of new cars.

This also shows that consumers' recognition and demand for new energy vehicles are gradually changing, and the warranty rate of second-hand trams will continue to increase.

Fifth, new energy vehicles are not environmentally friendly. The fact is that new energy vehicle electricity mainly comes from water conservancy, thermal power, nuclear power, photovoltaic and other energy sources, at present, thermal power generation will indeed cause a certain amount of emissions pollution, but because its thermal conversion efficiency is much higher than the fuel vehicle, the centralized treatment of thermal power generation is better than the individual treatment of the vehicle, and domestic high-quality coal resources storage is rich and other reasons, relative to fuel energy is more environmentally friendly and economic. So electricity is a very viable energy solution. At the same time, the recycling and reuse of waste batteries are also gradually forming a mature industrial chain, and the reuse of precious metals in batteries is conducive to controlling environmental pollution to a minimum.

### **3.3. The Scarcity of New Energy Battery Materials**

As the special battery materials of new energy vehicles are as follows: the metal raw materials used in lithium batteries are lithium, cobalt, manganese, nickel, zinc, copper, iron, nickel, chromium; The fuel cell class (generally refers to hydrogen and oxygen fuel cells) uses metal raw materials such as platinum, ruthenium, iron, cobalt, gold, nickel, palladium, titanium, copper, tin, silver, tungsten, chromium and manganese. According to the market, the price of battery-grade lithium carbonate rose from 68,000 yuan/ton in early 2021 to about 500,000 yuan/ton in 2022, an increase of nearly 8 times, although the price fell in 2023, but the cost premium is still considerable, which led to the rise in the cost of new energy vehicles.

However, with the continuous improvement of technology, the source of the required metal materials will be more extensive, the extraction technology will be more advanced, and the solution is more economically feasible than the global oil crisis. The global chip shortage affects far more than new energy vehicles, and more than the traditional automobile industry, the root cause is the problem of supply and demand, which can be restored to normal in the long run, but fundamentally it is necessary to continuously improve the chip manufacturing capacity of independent enterprises.

## **4. Countermeasure Analysis**

### **4.1. Policy-oriented, Guide the Growth of Residential Property**

The government issued policy subsidies and assessment measures to guide the property to coordinate the power company to increase the distribution capacity of the community, and the power company to plan the centralized installation and management of transformers and other equipment in the residential area. Especially when the development of new energy vehicles has reached a considerable scale, only by fundamentally improving the distribution capacity can people ensure the charging needs of a large number of private cars and public parking Spaces and make good use of excess power resources in peaks and valleys to achieve the optimization of overall electricity consumption. When new energy vehicles occupy more than half of the share of family vehicles, the use of community maintenance funds to install public charging piles and related equipment will be supported by most owners, so as to promote the matching of community charging facilities and household new energy vehicles into a virtuous cycle [6].

### **4.2. Accelerate the Construction of New Energy Vehicle Charging Pile Sharing Platform**

From the frequency of family use of charging piles, the general city commuter-based week only 1-2 charging can meet the needs of use. At this stage, the private car of the owners of the community can fully realize the method of sharing 1 charging pile with 2 families, the specific approach is to coordinate the charging time, exchange parking Spaces to meet the charging needs, and there is no problem for 1 charging pile to alternately charge 2-3 cars. Only one of these parking Spaces is its

own parking space to install charging piles, and the others are rented parking Spaces or private car Spaces that do not have installation conditions. Even in order to save line costs, choose the closest connection point access can be, such as from the low-level A owner's meter access to the nearest B owner's own parking space, of course, the prerequisite is that the two sides negotiate well in advance.

The details of the problem is the electricity settlement, one is inevitable to take the third step of the settlement standard, the second is used for shared charging piles, in the meter billing also need to support the meter and other counting equipment, the third is based on the acquaintance mode of sharing is easy to achieve, based on the need to establish an information sharing platform to achieve based on the mode of strangers. Or the residential property can give optimal support in information sharing and co-construction and sharing of charging piles. In addition, some intelligent services are based on the premise of binding charging piles, such as booking charging time, and binding charging piles are exclusive, that is, other vehicles cannot be used. Therefore, it is necessary for manufacturers to enhance the sharing technical support ability of household charging piles in research and development.

For the construction of third-party charging piles, although the supporting facilities in big cities are very perfect, government subsidies should be further expanded for highways and counties, districts and townships, mobilizing private capital to participate in the investment and construction of commercial charging piles, and promoting the continuous improvement and optimization of charging infrastructure. Policy guidance continues to promote the construction project of supporting charging piles at gas stations to ensure that the layout of charging piles is more reasonable and perfect. At the same time, it constantly innovates the hardware and software technology of the charging pile to speed up the charging speed and shorten the charging waiting time.

#### **4.3. Strengthen the Publicity of the Network Platform, Change the Consumption Concept of Consumers, and Improve the Cognition Level**

First, the relevant government departments and car companies provide positive clarifications to the false information and remarks on the Internet through the official media to solve the doubts of consumers. Especially for the "three power" lifetime warranty, the first owner restrictions, maintenance binding and other sensitive issues need to be given a convincing official policy explanation, do not be vague. If necessary, it should comply with the market demand, revise the manufacturer's policy, and obtain higher market recognition. The second is to establish a network interaction mechanism for car owners, and use self-media (such as Tiktok, today's headlines, etc.) to objectively feedback the advantages and shortcomings of the use of new energy vehicles, so that the information is more transparent, and help consumers to fully grasp and make choices. In this regard, car companies can take part of their profits to encourage owners to participate in interactive activities, establish online communities, mobilize the enthusiasm of owners to participate in activities by reducing and reducing maintenance costs, giving car parts, extending warranty and other forms, form a good network publicity atmosphere, promote consumers to change their ideas and improve their awareness.

#### **4.4. Guide the Head Enterprise to Speed Up Technology Research and Development, Break through the Industry Bottleneck, and Achieve Curve Overtaking**

The core of technology research and development in the field of new energy is three electric technologies, that is, battery, motor and electronic control technology, but also includes related chip technology, as well as chassis, suspension and vehicle assembly technology that can not be ignored. The government will strengthen the guidance of 3 to 5 large enterprises, including state-owned enterprises, to increase relevant research and development efforts, obtain more high-end patents, accelerate the technological iteration of core materials, improve battery safety and service life, innovate and develop new battery materials that can replace rare metals, and constantly reduce the cost of vehicle production. Ensure the level of localization and international competitiveness in the field of new energy vehicles [7].

## 5. Conclusion

This paper analyzes the community charging problems encountered in the promotion of new energy vehicles, the user cognitive bias caused by excessive network publicity, and the high cost of new energy vehicles. Combined with the current situation of the rapid development of China's new energy automobile industry and the complete industrial supply chain foundation, in terms of consumer charging problems, some suggestions are put forward for the government to guide the upgrading of power grid and the construction of private charging pile sharing platform. In terms of the problem of misleading consumers by negative publicity on online platforms, it is suggested to increase the intensity of official publicity and information transparency, and gradually guide consumers to return to rationality. On the problem that the cost of new energy battery materials accounts for the high proportion of vehicle costs, it is suggested that through government policy guidance in the industrial layout, traditional car-making enterprises should transform their core business, guide relevant technicians to transform into new energy research and development, production, maintenance and other fields, form a perfect new energy vehicle and battery industry chain, and constantly reduce the production cost and use cost of new energy vehicles.

Due to the limitations of investigation methods and the author's knowledge level, this paper certainly cannot cover all the problems encountered in the promotion of new energy vehicles in China. This paper believed that with the joint efforts of the Chinese government, dedicated research institutions, vehicle enterprises and many automobile practitioners, and with the support of the world's largest automobile consumer market in China. This paper believed that it will be the general trend to realize the corner overtaking of China's automobile industry.

## Authors Contribution

All the authors contributed equally and their names were listed in alphabetical order.

## References

- [1] Wang Yongzhong. Carbon peaking carbon neutrality and china's new energy revolution. *People's Forum Academic Frontier*, 2021, (14).
- [2] The State Council. Notice of The State Council on issuing an action plan on carbon peak before 2030. *Guofa*, 2021, 23.
- [3] National New energy passenger vehicle retail sales in 2023 increased by 36.2% year-on-year. 2024, Retrieved from [www.xinhuanet.com/auto/20240110/2773f1f7182b4c4fb380a584f2e77660/c.html](http://www.xinhuanet.com/auto/20240110/2773f1f7182b4c4fb380a584f2e77660/c.html).
- [4] Liang Bo, Wang Jilong. Investigation and research on micro-experience of new energy vehicle use in Beijing. *Energy Conservation and Environmental Protection*, 2024, (01): 22-29.
- [5] Ministry of Industry and Information Technology. Three mandatory national standards for electric vehicles officially released China Government Net, 2020, Retrieved from [www.gov.cn/fuwu/2020-05/14/content\\_5511415.htm](http://www.gov.cn/fuwu/2020-05/14/content_5511415.htm).
- [6] Li Dongdong, Zhou Guanting, Zou Siyuan. Research on the selection and price mechanism of charging piles based on sharing model. *Distribution & Utilization*, 2020, 37 (7): 37-43.
- [7] Wang Xiyuan, Fu Wenjing, Ke Wei. Analysis of the Development Trend of New Energy Vehicle Intelligence. *New Energy Automobile*, 2023, (07): 126-128.