

Characteristics and Trends of the development of China's New Energy Vehicle industry in the context of Carbon neutrality

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Abstract: Under the guidance of the concept of green energy, China's economy is transitioning to low-carbon energy. In February 2021, The State Council issued the Outline of the National Comprehensive Three-dimensional Transportation Network Planning, which clearly points out that carbon dioxide emissions in the transportation sector should peak as soon as possible. Along with the construction of carbon neutrality goal, the new energy vehicle industry has received wide attention, and the new energy vehicle industry is of great significance for realizing the "double carbon" goal. At present, the development of China's new energy automobile industry has shown some obvious characteristics, according to the development data of the new energy automobile industry, we can also analyze the development trend of the new energy automobile industry. This paper explores the development of China's new energy automobile industry under the background of carbon neutrality, analyzes the positive significance of carbon neutrality for the development of new energy industry, and analyzes the characteristics and trend of the development of China's new energy automobile industry under the background of carbon neutrality, hoping to provide some ideas for China's carbon neutral target construction and the development of new energy automobile industry.

Key words: carbon neutralization; New energy vehicle; Development characteristics; Development trend

1. The significance of carbon neutrality for the development of new energy enterprises

1.1 Deepening the transformation and upgrading of the new energy automobile industry

To promote green development and build an environmentally-friendly society, China has set a goal to reach its carbon peak by 2023 and achieve carbon neutrality by 2060. This goal is not only in line with the internal requirements of China's economic development, but also reflects the country's active response to climate change. Carbon neutral construction itself has the characteristics of green and low carbon, and the transport sector has an important responsibility in promoting green and low carbon work. In the context of carbon neutrality, China's new energy automobile industry is booming, reflecting the characteristics of electrification, networking and intelligence. Electric vehicles have been promoted more and more important in the market, and are widely promoted and applied in major cities in China. Along with the continuous improvement of the infrastructure construction of new energy vehicles, and the continuous improvement of the construction of intelligent road network facilities, and the improvement of big data platform, Promoting the upgrading of the new energy automobile industry, improving the utilization rate of resources, and promoting energy saving and emission reduction are of great significance for the development of China's automobile industry and the green development of the national economy.

1.2 Optimizing the circular mechanism of the new energy vehicle industry

Building an ecological civilization is an important task for economic development during the 14th Five-Year Plan period. To build an ecological civilization, we need to improve the utilization rate of resources and build a recycling system for materials. In the production process of new energy vehicles, the recycling mechanism of each production link and production materials is constantly improved, and the service quality is improved through the research and development of electronic control, motor and battery technology. Among them, the recycling system construction of new energy vehicle battery materials is the most advanced. The recycling of new energy vehicle battery materials has become a typical representative feature of the green development of new energy vehicles, providing an important boost for new energy vehicles to expand their market share. In the future, the new energy automobile industry will further deepen the construction of the cycle mechanism, constantly improve the recycling and reuse system of waste batteries, promote the sustainable development of new energy vehicles, and provide technical support for the realization of low-carbon development of the automobile industry.

2. The characteristics of the development of new energy automobile industry in the context of carbon neutrality

2.1 Standardization construction

In the process of the development and expansion of new energy vehicles, the construction of related infrastructure has become a hot issue of great concern to people. For pure electric vehicles and hybrid vehicles, ensuring the convenience of charging is an important factor affecting their market promotion. As of November 2022, China has set up millions of charging piles, covering various cities, becoming one of the countries with the broadest coverage and largest number of charging piles in the world. At present, China's new energy vehicle infrastructure construction is developing in the direction of upgrading the standardization, and it is further improving the layout of green technology and green service network. At present, according to the forecast data of the battery Alliance, it is expected that by 2025, the total battery scrap of China's new energy vehicles will reach 116GWh. In order to effectively deal with the problem of battery scrapping, China continues to strengthen the construction of battery recycling, and relevant normative documents are also constantly introduced, providing normative guidance to the new energy automobile industry from the institutional level.

2.2 Intelligent development

The level of intelligence of new energy vehicles is constantly improving. At present, the level of intelligence in the infrastructure

construction, core technology and information traceability of new energy vehicles has been very high. In terms of core technologies, the level of green governance of the new energy automobile industry has been continuously improved through intelligent development. Although there is further development in the chip research and development, risk detection, and automotive system optimization of new energy vehicles, these fields will also achieve rapid development with the continuous advancement of intelligent technology. Secondly, the intelligent development of information traceability work has promoted the construction of the recycling system of new energy vehicles. Through the implementation of the recycling responsibility of each subject, the recycling system of the new energy vehicle industry has been continuously improved. In the future, the realization of the recycling level prediction system of new energy vehicles based on intelligent technology will further promote the green development of new energy vehicles. Finally, the intelligent level of the industrial base has promoted the green governance and green development of the new energy automobile industry, so that the new energy automobile industry has shown great vitality for development.

2.3 Low-carbon transformation

Green development is the important guiding ideology of China's economic development, and the important sign of economic development transition, is the basic path to achieve carbon neutrality. The low-carbon development of the new energy automobile industry has led to the development of the field of transportation and energy, and the amortization of infrastructure, making the balance of the energy structure enhanced. New energy vehicles are becoming more and more powerful for renewable energy, so that the energy utilization rate of new energy vehicles has a very serious impact on clean production and energy conservation and emission reduction. Second, in new energy vehicles, the supply of hydrogen fuel and the support technology of clean energy have slowed down the speed of energy conservation, emission reduction and clean production transition.

3. The development trend of new energy vehicles

3.1 The overall trend of the electric vehicle industry

Since 2010, electric vehicles have begun to develop rapidly, and a large number of new power enterprises have emerged, such as Xiaopeng, NiO and so on. After more than ten years of development, the electric vehicle industry chain has become more and more mature, and many general technologies and design schemes of electric vehicles have been developed, and the reliability and safety of electric vehicle products have also been gradually improved.

China has played an active role in the promotion of new energy vehicles, infrastructure construction and government subsidies, and by 2022, China's electric vehicle sales will reach 5.34 million units, accounting for 41.3 percent of the world's electric vehicle sales. Compared with other countries, China has a huge car ownership. Due to the large market base, the overall growth rate of China's comprehensive electrification penetration rate is very slow. In 2019, the penetration rate of pure electric vehicles in China was around 4 percent, and by the second half of 2022, the penetration rate of pure electric vehicles in China will be around 9.5 percent, but the overall penetration rate is less than 19 percent. Judging from the development trend, China's electric vehicle market will show a rapid development trend in the future. From the current policy environment, in China, the electric vehicle market still has a lot of room for growth, is the world's electric vehicle development center.

3.2 Reducing carbon emissions during the life cycle

China is highly dependent on fossil fuels, with energy and electricity activities accounting for about 50 percent of the country's carbon emissions. China's transportation industry shoulders the arduous mission of reducing carbon and achieving carbon neutrality, and in recent years, China and the main motor vehicle ownership areas are sparing no effort to promote the cleanliness of motor vehicles and reduce carbonization work. Among them, accelerating the penetration rate of electric vehicles is an important measure to reduce carbon emissions. However, not every type of electric vehicle can achieve carbon emission reduction, and its emission reduction effect and emission reduction effect are closely related to the regional electricity structure, vehicle operating parameters and vehicle maintenance, and the comprehensive utilization of scrapped resources. Based on the comprehensive carbon emission calculation method, at present, carbon emissions from human activities are mainly concentrated in the fields of energy and electricity, transportation, industrial manufacturing, construction steel, agriculture and daily life. Due to the different energy composition of each country, there are obvious differences in the carbon emission structure of each industry.

In China, due to the reason of energy structure, the energy consumption of electric vehicles is higher than that of other countries, resulting in the carbon emission of the same model when driving in China is higher than that of other countries and regions. According to a detailed analysis, the carbon emissions of electric vehicles in the north of our country are larger than those in the south. The average annual carbon emission equivalent of diesel vehicles in China is 331.3 g/km, and the average annual carbon emission equivalent of gasoline vehicles is 241.9 g/km; The fuel consumption of pure electric vehicles is 146.5 g/km, which is much lower than other fuel vehicles; In the case of city buses, the carbon emission of electric vehicles is 14g/person. Km or so; Diesel car 18g/person. Km or so.

3.3 The development trend of hydrogen energy transportation

Hydrogen is a secondary energy, for solar and wind energy such as unstable clean energy, about 85% of the electric energy can not be directly transported to the grid, only these electric energy can be converted into hydrogen energy, and then by hydrogen fuel cells to provide energy. The development of hydrogen energy and hydrogen fuel cells will be an important supplement for China to reduce carbon emissions of new energy vehicles and achieve carbon neutrality.

4. Suggestions on the development of new energy automobile industry in the context of carbon neutrality

4.1 Increase the recovery rate of new energy vehicle batteries

At present, China is starting to revise the Circular Economy Promotion Law, which will provide a clearer standard for reducing carbon emissions and reducing the environment. The law clearly stipulates low-carbon emissions, which has positive significance for the standardized development of new energy vehicle battery recycling. In the relevant laws and regulations, specific operational targets should also be proposed from the aspects of recycling responsibility, ecological design, incentive measures, etc., and the low-carbon development of new energy vehicles should be promoted through the mandatory law.

4.2 New demand for energy conservation and emission reduction

At present, the main components of China's new energy vehicles are batteries, hydrogen energy and electric vehicles. China has certain technical advantages in wind power and photovoltaic power producers, and also has the corresponding basic conditions, but it still needs hydrogen energy and batteries to store energy. Therefore, China also needs to further develop new energy power generation technology, in order to promote the revolution of new energy vehicles, and then achieve the goal of carbon neutrality. The cost of light and wind power generation is relatively low, the use of silicon-based photovoltaic and perovskite, can improve the efficiency of light energy use, in the production and storage of electric energy by leaps and bounds. In addition, hydrogen-powered vehicles can not only drive the transformation and upgrading of the automobile industry, but also help promote the low-carbon development of other related industries. At present, hydrogen energy is mainly obtained by electrolysis of water. In the development process, solid oxide electrolysis technology can effectively improve efficiency. Therefore, in the process of development of new energy automobile industry, for these low-carbon energy, put forward new technical requirements, if improve technology, reduce costs, become the fundamental development of new energy automobile industry.

Concluding Remarks

All in all, the new energy automobile industry is an important help in building a resource-saving and economically friendly society, in line with the green development strategy advocated by our country, and will provide important help for the realization of the carbon neutrality goal. In the process of development of the new energy automobile industry, we must first do a good job in the production and recycling of batteries, but also do a good job in infrastructure construction such as charging piles, and escort the development of the new energy automobile industry. By the way, China also needs to further create conditions for the development of the new energy automobile industry from the aspects of laws and policies, and provide development standards for the design, production and recycling of new energy automobiles. In order to promote the development of the new energy automobile industry and achieve the goal of carbon neutrality, it is necessary to continuously strengthen technical research, do a good job of policy and legal protection, to what extent deal with the various problems encountered in the development process of the new energy automobile industry, and promote the healthy development of the new energy automobile industry.

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