

Globalization of Automobile Supply Chain: A Case Study Based on BYD's Globalization strategy

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Abstract:

With the development of global trade and the acceleration of economic globalization, it has become normal for automobile manufacturers to expand their production and sales to transnational markets. BYD is famous for its innovation in hybrid and pure electric vehicles. The company's example provides a useful reference for studying the application and landing of new energy vehicle technology on a global scale. Through the analysis of BYD case, we can understand the role and influence of new energy technology in the globalization of automobile supply chain, which is of positive significance to promoting sustainable transportation and reducing carbon emissions. The globalization of automobile supply chain not only involves market demand and technological innovation, but also is influenced by national and regional economic development and policy support. Through the case study of BYD, we can analyze the role of national policies and economic environment in the globalization of automobile supply chain, and provide reference for formulating relevant policies and strategies.

Keywords: New energy vehicles, BYD, Automobile supply chain

1 Introduction

Under the background of the increasingly serious pollution problem in the world today, electrification, internet, intelligence and sharing are gradually becoming the trend and trend of the development of China's automobile manufacturing industry. At present, a new round of high-tech revolution and the transformation and upgrading of emerging industries around the world are booming, and the accelerated integration of automobiles with renewable energy, transportation, information and communication will promote the great changes in the form of new energy automobile products, transportation modes, energy consumption structure and its economic and social operation mode in China, and the new energy automobile industry will continue to face unprecedented opportunities for market development, so it is particularly important to promote the sustained and healthy development of China's new energy automobile industry. New energy vehicles are sought after by people and regions all over the world because of their unique advantages of environmental protection and energy saving. New energy vehicles are also regarded as the vanguard of this industry, and new energy vehicles in various countries are also moving towards it, and their policies are also different. In 2020, China's new energy vehicle market has ranked first in the world for the fifth consecutive year. In recent years, with the continuous im-

provement and improvement of the production technology of new energy vehicles in China, the preferential policies, subsidies and support of national policies for new energy vehicles, and other related environmental protection concepts and advertisements have become more and more popular, China's new energy vehicle industry is showing a high-speed growth.

2 Related notion

2.1 New energy electric vehicles

Compared with some other traditional electric vehicles and self-propelled vehicles, new energy vehicles are more environmentally friendly than automobiles. The main fuels that new energy vehicles can use in automobiles should be non-fuel driving and heating devices, which need not only renewable energy such as gasoline and diesel, but also clean new energy such as clean electricity, solar energy and hydrogen. In this way, the atmospheric emissions of various inert greenhouse gases, such as oxygen and carbon dioxide, can be effectively reduced, thus achieving the important role of energy conservation and environmental protection. Moreover, new energy electric vehicles are more conducive to saving money. The average fuel cost of a vehicle with fuel consumption of one kilometer is about 0.6-0.8 yuan, but a vehicle with electricity consumption of one kilometer only needs about

0.2 yuan. In addition, the operation structure of the motor is very simple and not easy to be damaged, so it is not necessary to carry out daily maintenance frequently; For new energy electric vehicles, it is not appropriate to use restricted signals to drive, because its ecological environment is seriously polluted. In order to effectively alleviate the double pressure of ecological environment, some people in many first-tier cities have begun to try to adopt the management method of adding restricted signals to drive, which has restricted many private cars. However, almost all new energy electric vehicles are low-emission with zero pollution and zero waste, so it is more convenient for drivers to travel normally without a good car number limit interval. Using new energy electric vehicles to improve efficiency is higher.

2.2 BYD Company

BYD Company was established in 1995 and headquartered in Shenzhen. IT has three major businesses, namely batteries, IT and new energy vehicles. It was listed on the main board of Hong Kong in 2002. BYD Company attaches great importance to the research and development of product technology, has the ability to independently develop and produce power batteries, and has developed lithium iron phosphate batteries, making it the largest lithium iron phosphate battery manufacturer in the world. In 2021, BYD's cumulative sales volume reached 594,000 vehicles, and its operating income reached 216.1 billion. In the first half of 2022, BYD surpassed Tesla to become the world's first comprehensive sales volume of new energy vehicles. Automobile business is the core business of BYD, which mainly produces pure trams and plug-in hybrid cars. The brands are divided into Yuan Dynasty series and Ocean series, and now the company is in a leading position in the field of new energy vehicles. BYD's second main business is electronic business, involving smart phones and automotive intelligent systems. BYD's third main business is the production of batteries, with strong technical strength. Its battery business covers nickel-hydrogen batteries, iron phosphate file batteries, etc. These batteries are widely used in mobile phones, automobiles and other fields. In terms of organizational structure, BYD has 23 business departments and 5 large industrial clusters, which have accumulated rich technical reserves through "vertical integration".

3 Current situation of BYD enterprises

3.1 BYD's export scale of new energy vehicles

By 2020, a total of 222,900 electric passenger cars will be exported, down 12.5% year-on-year. Among them, pure electric passenger cars are the main export force, account-

ing for about 90%. BYD's export market for new energy vehicles is relatively strong. In 2018 and 2019, BYD's new energy vehicle exports achieved a positive growth of 6%. Under the influence of novel coronavirus, BYD's exports of new energy vehicles decreased by 63.3% in 2020. In 2023, BYD exported 242,000 new energy vehicles, which was in a leading position. As far as the overall export sales of new energy vehicles in China are concerned, BYD's new energy vehicles are impressive in export sales and have also made great contributions to the export of new energy vehicles in China.

3.2 BYD New Energy Vehicle Export Area

Due to the long-term advantages of well-known old brands of hybrid electric vehicles from developed countries such as Europe, America, Japan and the United States in the existing market, BYD, as an independent automobile brand, started late and has relatively low experience, with a promotion process, and its sales and profits are not high in developed countries and regions [1]. Since 2003, BYD has been constantly exploring the international market. Japan, Australia and other countries have not yet established production bases in the new energy vehicle market, mainly using export trade. For the United States, Brazil, Bulgaria, Hungary and other countries/regions, please choose to set up factories overseas to irradiate the surrounding areas, and adopt export trade mode plus overseas production and sales [2], as shown in Table 1.

Table 1 BYD's entry mode and time in some countries

country	Enter mode	Entry time
Singapore	export	2011
Thailand	export	2012
Bulgaria	Joint venture factory	2012
United States of America	Green land investment	2013
Britain	joint venture	2013
Japan	export	2015
France	Green land investment	2016
Hungary	Green land investment	2016
Brazil	Green land investment	2016
Australia	export	2016
Ecuador	Green land investment	2017

3.3 BYD New Energy Vehicle Export Types

According to BYD's "Strategy 542" plan, BYD successfully launched the "Qin" dual-mode electric vehicle in December 2013. Using long-distance fuel and short-distance

electric driving mode, “Qin” can not only meet the needs of cars, but also eliminate the cruising range, but also reduce the dependence on fuel. Since its launch at the end of 2013, it has sold more than 20,000 cars and maintained a steady growth. “Qin” is mainly concentrated in the private market, so the general enthusiasm of the market can be seen in the sales of this car. BYD launched the compact SUV “Song” in the second quarter of 2015 and the small SUV “Yuan” in the third quarter of 2015. BYD officially announced its first “Tang” plug-in SUV in mid-January 2015. New products are planned to be launched in 2015. The pure electric version of Song will be launched in the first or second quarter of 2016, and the medium and large SUV- Ming will be launched in 2017. These new products are all new energy vehicles under “Strategy 542”. At present, BYD has planned a series of models with the name “Dynasty”. All these products are new energy models for the civilian market. Most of them are “plug-in hybrid vehicles”, covering three types of cars: SUV and MPV. According to BYD’s product plan, Tang, Song, Yuan, Ming and other SUV products have more than half of the seats, and the follow-up company plans to launch two new energy SUVs.

4 Problems of BYD’s new energy vehicles under the globalization of automobile supply chain

4.1 brand value recognition is not high

Brand image is very important and belongs to the intangible assets of the company. A good brand image can help improve the company’s competitiveness, attract a large number of loyal customers, maintain market advantages and improve the company’s bargaining power. [3] In the international market, if we rely on our own brand advantages to establish our own brand image, we can help companies enter new markets faster and attract a large number of loyal customers. As we all know, BMW, Mercedes-Benz and other automobile brands. At this stage, if new energy vehicles belong to a monopolistic competition market, the key to competition in this type of market is not limited to products, and the role of brands can not be ignored. BYD’s new energy vehicles can reflect the value of new energy vehicles and consumers’ psychological positioning of the brand. High-value automobile brands, the higher the price of their products, the greater the added value of their products, and the stronger their competitiveness in the market [4].

4.2 Enterprise capital strength is relatively weak.

Automobile industry is a typical capital-intensive industry.

Whether developing new products or establishing a marketing network, upgrading production lines or building new factories, the company needs strong capital strength to support it. When implementing its internationalization strategy, BYD faces the shortcomings of insufficient production and operation funds in other countries. As far as capital strength is concerned, BYD still can’t compare with some large domestic automobile companies, not to mention the large international automobile companies with a history of 100 years.

By 2020, BYD’s market value will reach \$72.4 billion, which is still far from the capital strength of trillion-dollar automobile multinational companies such as Nissan, Volkswagen and Toyota.

4.3 Product quality and after-sales service need to be improved.

Nowadays, BYD has developed rapidly in domestic and foreign markets, but there are too many problems in the process of development. The standardization of after-sales service, the uneven development of product quality and the progress of product technology will become the key factors restricting BYD’s active competition with foreign famous brands. According to the “2020 China Passenger Car Service Satisfaction Research Report” issued by Cary Sachs Consulting Co., Ltd., the customer satisfaction of independent automobile brands is lower than that of joint venture automobile brands, while that of BYD is 769, which is higher than the average level of independent automobile brands, as shown in Figure 3. The industry lags far behind potential competitors such as Nissan and Hyundai. BYD has provided consumers with new energy vehicles that adapt to the development of technology, but more and more consumers are beginning to realize BYD’s technology and cars. However, the quality and after-sales service of vehicles are still key issues. Just a few years ago, the more dominant middle class had not fully accepted the BYD brand. Many customers who pursue high-quality life do not need excessively advanced technology, but pay more attention to the quality and service level of their vehicles.

The battery power performance of new energy vehicles is usually not as efficient and sustainable as advertised by enterprises. As an important core component of new energy vehicles, batteries have the characteristics of high value, short life and dangerous storage. Websites are afraid to store them. Too many, resulting in a long after-sales processing cycle for customers to replace batteries. Because the scale and supply of some recent automobile manufacturers are insufficient, there may be problems in the supply of after-sales parts. Compared with other mature new energy automobile brands, BYD’s new energy

automobile products are short in export time, lack of good after-sales service system, and weak in foreign business experience. In the service competition in the international market. In the overseas marketing process of BYD's new energy vehicles, due to various factors such as differences in business environment, there is a problem of insufficient after-sales service, and a good corporate image cannot be established. BYD's investment in overseas after-sales service is relatively small, and the after-sales service can't keep up, which may damage the brand images of "Made in China" and "China Bus".

4.4 Non-tariff barriers restrict the export of BYD's new energy vehicles

In recent years, the export volume of China's automobile products has increased rapidly. At the same time, the global financial crisis has not improved. Trade protectionism has gradually increased in several countries. Many countries have implemented a series of foreign trade barrier policies, which set up many obstacles to protect their own new energy vehicle market and restricted the import of foreign cars [5]. China has not yet issued a truly comprehensive and unified technical standard system, which has caused confusion in the market to some extent, and the quality certification standards of some automobile enterprises are difficult to reach the international level, which has led to the development of the industry. Lagging behind new energy vehicles has helped China's new energy vehicles occupy the international market to some extent.

BYD lacks international operation experience. At the same time, trade barriers are hidden and highly complex, and they are easily hindered by technical trade barriers in other countries when exporting. First of all, due to the internal defects of WTO trade agreements, member countries seize the opportunity to formulate discriminatory trade policies and domestic standards on their own, especially as a means for developed countries to gain international market share. Secondly, BYD has no comprehensive understanding of the relevant technical standards and systems involved in technical barriers to foreign trade. As a high-consumption and fragile product, automobiles need compulsory certification before they can enter the market. Due to the differences between international standards and regulations, the use of unreasonable technology and the establishment of complex certification procedures restrict the export of products. BYD's own new energy vehicles still have some technical deficiencies.

5 Countermeasures for BYD's development of new energy vehicles under the globalization of automobile supply

chain

5.1 Strengthen independent innovation

BYD should focus on the independent innovation of new energy technology. When consumers are faced with a variety of products or services besides profitability, differentiation strategy can increase the potential value of products and drive consumers to buy. A successful differentiation strategy can improve the value of your products and services and turn them into products that consumers are willing to accept and pay a corresponding high price [6]. Unique and exclusive service will be an invisible land, because it can attract other demanders in the market, which can increase product sales and enhance consumers' confidence in BYD brand. These consumers will be highly attracted by BYD's iconic products and services and will continue to strengthen their relationship with BYD and other products. Lack of independent innovation ability has always been the main factor restricting economic development [7].

BYD Group needs to start producing new energy automobile products with excellent performance and novel styles. Integrate innovative design concepts into manufacturing, transform innovative concepts into efficient production, and improve overall business research and development. Only in this way can the company develop and occupy a favorable position in the world. Among them, "core technology" is very important for the company's sustainable development, and it is also an important prerequisite for putting forward the global market value proposition. Through quantitative accumulation, it is integrated with the future of the world and develops continuously with the development of the times [8]. The key technology of new energy vehicles is battery technology. Nowadays, the energy density of batteries is increasing year by year. How to improve the energy density and reduce the cost is a long-term problem in the development of new energy vehicles. The dominant height is also the dominant height of the development of new energy vehicles, so the research and development of battery technology can not be ignored.

5.2 Improve the quality level of the whole vehicle

The core technology of new energy vehicles is not yet mature, which affects the reliability, safety and cost of new energy vehicles. The key technologies of new energy vehicles are new energy and energy storage systems, including batteries, engines, gearboxes and energy storage battery systems [9]. For energy storage batteries, problems such as increasing the energy density of lithium batteries, balancing the voltage of individual batteries, ensuring the stability of charging and discharging States and prolong-

ing the battery life must be solved. Moreover, the technology of engine system and transmission system is still inexperienced. All these mean that we can't guarantee the resistance and stability of new energy vehicles in use [10]. At this stage, the bottleneck of new energy vehicle battery technology is high cost. Ferrous lithium phosphate lithium battery independently developed by BYD has the advantages of long service life, wide working temperature range, stable discharge performance and strong durability. Compared with other new energy automobile manufacturers, BYD's lithium iron phosphate battery has good performance. However, the product quality of BYD is relatively poor, so it is necessary to pay close attention to these aspects and improve the product quality, which is the basis of enterprise survival. In the international market, quality is the primary factor of automobiles. When the car failure rate rises, foreign governments will take action to boycott car brands. Consumers will also be disappointed with the products and the brand image will be damaged. In the international market, all products are worthy of word of mouth. China's new energy vehicles have advantages in cost, but the product quality can not be ignored. There should be no quality problem. When something goes wrong, the image of the whole company will be damaged and the whole company will be lost. It is particularly important to improve the quality of today's cars, because it is difficult to gain market share in the global market.

5.3 Actively carry out strategic cooperation

Due to fierce market competition, companies usually actively participate in strategic cooperation and strategic alliances to improve their competitiveness in the market. Strategic cooperation can well integrate the resources of various enterprises, thus improving the market competitiveness of enterprises. Cooperation between enterprises can form an internal market, control information barriers and transaction frictions, and effectively reduce transaction costs. Improve production efficiency and make reasonable decisions.

In 2018, Chaowei Group and China Trade and Barter Trade Association of Thailand formally signed a cooperation agreement, and the two sides will jointly develop the new energy vehicle market in Thailand and Southeast Asia. Among them, Thailand, the Philippines and Malaysia have introduced policies to promote the development in this field. Other large automobile manufacturers have also made development plans in this field. For example, Mercedes-Benz and BMW plan to set up factories in Thailand. BYD has also entered the electric taxi market in this region. The contract was signed this time. The two sides will cooperate in the sales of finished cars and spare parts,

as well as the investment and operation of rechargeable batteries, so as to promote the sustainable development of Xinyuan automobile industry in this region. The company plans to establish perfect after-sales service and charging facilities overseas, so that China's new energy vehicles can enter foreign markets on a large scale. Cooperation with foreign companies can make full use of local resources and reduce the number of new energy vehicles in China. Investment and maintenance costs will further expand the export scale.

5.4 Improve the overseas marketing network and after-sales service plan.

The establishment of BYD's marketing network in the most important local market is still not perfect, and the establishment of marketing network in foreign markets will inevitably form a bigger gap with competitors. Establishing a strong overseas marketing network is a key part of the company's international business strategy to enter foreign markets. It can form a large amount of long-term investment and strict management. BYD must be aware of the importance of online marketing to improve its reputation and increase its market share. Although the financial strength is not strong, after the network has laid a solid foundation for the international business strategy, you need to increase investment to improve the marketing in each market. BYD can increase the professional training for service personnel and improve their technical level and service awareness. Through training, service personnel can better understand product features, troubleshooting and maintenance methods, and provide consumers with more professional and efficient services. BYD can also cooperate with large professional service companies at home and abroad to improve the existing after-sales service system. Cooperation with international service organizations can gain their experience and expertise in after-sales service and provide comprehensive and effective after-sales support for BYD consumers. Through communication and cooperation with other companies, BYD can learn their best practices in after-sales service and constantly improve and optimize its own after-sales service processes and strategies. This will help to improve consumer satisfaction, enhance users' loyalty to BYD brand, and further promote the development and growth of enterprises. Sales through leasing cooperation channels, direct offline sales showrooms and authorized maintenance after-sales agents.

6 Conclusion

This paper takes BYD Company's going out to sea as a case, analyzes the influence and problems of the globalization of automobile supply chain on the development of BYD's new energy vehicles, and puts forward relevant

countermeasures. The global new energy automobile industry is in the stage of rapid growth, and BYD, as a leading new energy automobile manufacturer in China, is facing some problems, such as low brand recognition, relatively weak capital strength, product quality and after-sales service to be improved. In order to gain an advantage in the global competition of supply chain, BYD should strengthen independent innovation, improve the quality level of the whole vehicle, actively carry out strategic cooperation, and improve the overseas marketing network and after-sales service plan. Through the above countermeasures, BYD can enhance its competitiveness in the global market and achieve sustained and healthy development. The globalization of automobile supply chain is an irreversible trend, and any automobile manufacturer needs to adapt to this trend and formulate corresponding strategies to maintain its competitiveness.

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