

# New Energy Vehicles, as Represented by BYD. What is the Way Forward?

Mengwei Liu

Business school, university of adelaide  
Adelaide, Australia  
a1696252@adelaide.edu.au

## ABSTRACT

This article examines the global market for new energy vehicles represented by BYD in a global context of green energy, focusing on competitive advantages and global positioning strategies as the main focus for overview and analysis. Literature analysis, statistical data analysis and market research are used in the research methodology. The paper is dedicated to exploring the future and contribution of new energy vehicles and the arguments that they can become the mainstream trend of the future.

**Keywords:** *BYD, New energy vehicle marketing, marketing-wide strategy*

## 1. INTRODUCTION - GLOBAL MARKET BACKGROUND

The new energy car, which had been on the global scene since the nineteenth century, have achieved great success, but it is only a short time. By the 1820s, the discovery of significant oil reserves had brought down the price of gasoline. The technological progress of internal combustion engine made gasoline vehicles the preferred mode of transportation. Electric vehicles have been eliminated because of their slow speed, short range and high price. Although some electric vehicles were introduced in the decades after that, they never became commercially viable due to their high cost and short range.

Until the end of the twentieth century, oil resources became limited and the threat of global warming became more serious, people once again focused on energy-saving and environmental-friendly electric vehicles. Many countries and major automobile manufacturers across the world have taken the development of electric vehicles as the strategic focus to solve energy and environmental concerns in the twenty-first century, and the global new energy vehicle sector has entered a phase of thorough upgrading [6].

With the increasingly serious oil crisis and environmental pollution, people began to pay more attention to the development of new energy vehicles. In order to stimulate demand, well-known automobile enterprises have also started the research and development of new energy

vehicles. As the largest electric vehicle and solar panel company in the United States, Tesla ranked first among the top ten new energy passenger vehicles in the world in 2020. With strong momentum, Chinese carmaker BYD currently ranks third.

## 2. INTRODUCTION OF BYD

BYD has developed at a rapid pace in the past 25 years and mastered the core technologies of the new energy vehicle industry chain. After 25 years of rapid growth, BYD has grown from 20 employees to 230,000, and has established more than 30 industrial parks throughout the world and strategic layout on six continents. BYD's business model covers electronics, automobiles, new energy and rail transportation, with the goal of creating a zero-emission new energy solution that includes energy collection, storage, and application. BYD is a global leader in the field of new energy vehicles, which has established a complete power product system of traditional gasoline, hybrid, and pure electric vehicles in the field of new energy vehicles, and mastered the basic technologies.

## 3. COMPREHENSIVE ANALYSIS

### 3.1 Technology of the new energy vehicle industry chain

The company's primary businesses include automotive, mobile phone components and assembly, secondary

rechargeable batteries, and photovoltaics power generation, and actively enter the urban rail transit market through its cloud rail technology. Due to its leading technology, economic advantages and the quality of international standards, the company has rapidly evolved into a prominent manufacturer of China's own branded automobiles since its inception in 2003 [1]. In the field of new energy vehicles, the company continues to develop its technology and market share, making itself a global leader. BYD is one of the world's leading rechargeable battery manufacturers. Its main customers include leading mobile phone manufacturers such as Samsung and Huawei, as well as global manufacturers of power tools and other portable electronic devices such as Bosch and Cooper.

**GYD's Brand Strategy:** The company's core philosophy is "walk towards newness", which is embedded in its values. BYD Auto always adheres to the brand value of "technological innovation, trustworthy, leading green mobility", insists on the vigorous development of scientific and technological energy-saving and new energy vehicles, and is committed to bringing a more energy-saving, environmental-friendly, safe, convenient and pleasant automobile life to the whole society. Its technological innovation is embodied in "new energy, new technology and new design", trustworthiness is embodied in "new quality, new safety and new service", and leading green mobility is embodied in "new platform, new product and new life".

### 3.2 Market-wide electrification strategy

BYD's "7+4" market-wide strategy will achieve a comprehensive electrification layout. In April 2015, BYD officially launched its "7+4" whole market strategy of new energy vehicles with the theme of "New Energy - New Future" at the Shanghai Auto Show. "7" in "7 + 4" represents seven major conventional areas, namely private cars, urban public transport, taxis, road passenger transport, urban merchandise logistics, urban building traffic and sanitation vehicles. "4" in "7 + 4" refers to four special areas, namely warehousing, mines, airports and ports, so as to realise the comprehensive coverage of new energy vehicles for road transportation. Through this strategy, the company will promote new energy vehicles nationwide, increase investment and efforts in brand upgrading, strengthen R&D, launch more cost-effective and competitive products, and comprehensively promote its three strategies of technology, products and brands. The company's rich product lines, core technologies and clear strategic layout are its core advantages in the field of new energy vehicles.

Adopting a highly vertically integrated business model helps to reduce costs and improve product quality. In terms of automotive business, BYD has adopted a highly vertically integrated business model, with independent R&D, design and manufacturing capabilities for

complete vehicles and components, as well as comprehensive testing capabilities of complete vehicles and components. Through economies of scale and synergy, this model effectively saves logistics costs and significantly reduces vehicle production costs. In addition, the company's high in-house productivity of automotive components and comprehensive vehicles. The component testing capabilities ensure the quality of its products [5]. The vertically integrated model has the overall competitiveness and can consistently produce high-quality and low-cost auto products, providing consumers with cost-effective automotive products. At the same time, vertical integration enables BYD to master its core technologies, which are constantly developed and innovated through integration to create leading new technologies.

BYD has 15 major production bases in China. It has a strong production capacity covering many provinces and regions, which is conducive to penetrate the sales layout of all first-tier cities and enhance confidence in brands in the region. The company is actively promoting the expansion of new energy vehicles from first-tier and restricted cities to second- and third-tier cities, and finally realise the national sales of new energy vehicles. According to Gaixia Auto, after the consolidation of fuel vehicle production capacity, BYD plans to produce more than 1.4 million vehicles, of which at least 700,000 are pure electric vehicles.

### 3.3 The BNA architecture

The BNA (BYD New Architecture) architecture = model platform + power system + electronic system + ecosystem. It is an open platform integrating advanced technology, covering the whole value chain and significantly improving production efficiency. In September 2018, based on the changes of automobile consumption market and insights into the new pattern in the future, BYD creatively proposed the BNA architecture with comprehensive openness as the core, so as to realise the two legs of fuel vehicles and new energy vehicles. In addition, BYD responds to the needs of the times with highly intelligent vehicles. The BNA architecture, dubbed the "incubator for high-grade intelligent cars and cost-effective cars", is the top-level configuration of the new generation of automobile manufacturing industry. It will optimise the whole value chain of BYD Auto, including the Smart Manufacturing Platform, Smart Link Platform, Autonomous Driving Platform, and New Energy Platform, and will continue to penetrate into the future product matrix to reduce costs. This will reduce expenses while also improving production efficiency and product quality. Model platforms: BSP, BMP, and BLP, corresponding to small, medium and large vehicles; Electronic systems: Dilink system, various electronic devices, and so on; Ecosystem: applications, intelligent driving module, and so on.

The BNA platform architecture improved the efficiency and stability of vehicles, shortened the development cycle of new vehicles and speeded up the release of new models. Specifically, component compatibility and commonality can reduce the overall complexity of products, shorten the development cycle of models, allow the rapid release of new models, improve vehicle performance and quality, improve the stability and durability of products, and ensure the consistency of vehicle quality. The time, effort and costs saved by increasing the speed of model iteration and the efficiency of technical development are also used to further increase the investment in technology development and product quality.

To cut down R&D and production expenses, the system has high compatibility and adaptability [2]. Due to its modular vehicle concept and the development and design of standardised integrated components, BNA is very flexible and widely used. For example, the body modules from the new generation Tang family may be immediately shared with the new generation Tang EV and other vehicle series.

Flexible response to the needs of different markets and consumer groups - BNA architecture provides great flexibility to share technology across various BYD brands, allowing faster establishment of market-specific shape changes and reflecting regional configuration needs, so as to meet the diverse needs of the market, while reducing the complexity of the overall product, so as to improve the stability and durability of the product.

Consumers will be able to experience products with more cost-effective and technical quality. All three powertrain models (fuel, DM and EV) can be produced on the same platform, resulting in increased production efficiency and reduced costs of new vehicle development, manufacturing, and so on, so as to achieve more effective quality control. For consumers, higher quality products are more cost-effective.

### 3.4 Blade battery technology leadership

Blade batteries significantly reduce the costs by about 30%, and the advantages of long service life, long range, safety and cost performance will enhance the competitiveness of the company's lithium iron phosphate batteries. According to BYD's patent, the length of LFP blade battery can reach up to 2500mm, which is more than 10 times that of traditional ordinary lithium iron phosphate battery, which can significantly improve the efficiency of the battery. The blade battery will be used in BYD Han pure electric vehicle for the first time, with zero-hundred acceleration of 3.9 seconds and a range of 600 kilometres. The cost advantage of the blade battery is obvious, which is expected to bring a cost reduction of 30%, Saving \$2,500 per vehicle on batteries alone while CTP saves costs on modules, structural parts and covers. The energy density of the cells will increase by 50% in volume and

150 Wh/kg in weight, which may reach 160 Wh/kg in the future and will not only save the outsourcing cost of Han components, but also help to highlight Han's advantages [3]. Compared with ternary lithium battery, the blade battery uses lithium iron phosphate as its raw material, which has the advantages of low cost, long cycle life, high temperature resistance, high-cost effectiveness and good safety.

The blade battery has an innovative structural design, which significantly increases the space utilisation rate of the battery by 50%. BYD's blade batteries adopt innovative structural design, which significantly improves the system quality and volume energy density. At the same time, the "module" layer of the intermediate structure is eliminated when forming the battery pack, which significantly reduces the complexity of the battery system and significantly improves the volume utilisation rate. The result is a more stable product with a lower failure rate. Through structural design, cell size optimisation, cell and internal design, production processes and material formulations, the space utilisation of power cells is increased by 50% to 60% from 40% compared with conventional batteries, which means that the battery lifetime is significantly increased and the service life is more than 1 million kilometres [4]. The debut of blade battery will further reduce the battery costs, increase the volume energy density and range, and bring consumers a new energy vehicle with high safety and quality.

## 4. CONCLUSION

In 2021, the car market suffered a "cold winter", but the new energy vehicle market has become a gratifying "touch of spring". The penetration rate is rising rapidly, the voice of the industrial chain is rising, the high, medium and low ends are blooming, and the brand premium is rising. China's sales of new energy vehicle have topped the world for six consecutive years, realising the new energy track that cannot be achieved in the era of internal combustion engine, completely rewriting the pattern of the global automobile industry, and becoming one of the important grasps for China to achieve the goal of "double carbon". Under the background of "carbon peaking and carbon neutral", the development of new energy vehicles is getting better and better. Besides, on the new energy track, Chinese brands are developing better and better. While increasing the domestic market share, they are actively distributing the overseas passenger car market.

In this year's report, the brand value of the automotive industry increased by 480% year-on-year. Azera and BYD ranked 35th and 43rd with US \$8.604 billion and US \$6.711 billion respectively. In the next few years, the new energy vehicle market is expected to grow rapidly at an annual rate of 40%. In the future, China's new energy vehicle start-ups may soon be among the most valuable and fastest-growing brands in the world. Currently,

BYD's technology-driven innovation features are expected to break the traditional model of how consumers choosing automobile brands. Cato's research on luxury electric vehicles shows that in the eyes of consumers, the traditional BYD brand is synonymous with cost-effective vehicles. However, compared with new energy models, traditional brands also lack the capability and experience in software development, autonomous driving technology innovation and advanced connectivity solutions. Only by solving these problems can we see the future of domestic new energy vehicles.

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