

Based on the Green Technology Changes on the Motor Market Environment Research: Take CRRC Zhuzhou Locomotive CO.,LTD as an Example

Yifan Sun

School of Marxism, Wuhan University of Technology, Wuhan, China

Email: 1294024130@qq.com

ABSTRACT

Since the Third Scientific and Technological Revolution, with the development of society and the continuous upgrading of information technology and the increasing awareness of environmental protection, people value the high efficiency of industrial products in terms of energy efficiency and environmental protection. In this paper, PEST analysis method is used to analyze the current motor market environment, including current policy support, current market size and characteristics, as well as future market data forecast, based on the current motor company development model analysis. In the future development, opportunities and challenges coexist. For the current energy-efficient development direction, CRRC Zhuzhou Locomotive CO.,LTD has a certain market competitiveness and more potential market space, if it can seize the opportunity to adopt the right strategy, will become an important part of the motor market.

Keywords: *PEST Analysis Data Model Political Environment Economic Environment Cultural Environment Technical Environment*

1. INTRODUCTION

CRRC Zhuzhou Locomotive CO.,LTD is a first-class subsidiary of China Central Automobile, mainly engaged in traction motors, traction transformers, wind turbines, new energy vehicle motors, high-efficiency motors and special transformers, is China's electric locomotives, high-speed locomotives, urban rail vehicle motors and transformers specialized scientific research, production base, wind power motors, one of the largest production enterprises, electricity, metallurgy, petroleum, paper, new energy vehicles and other high-efficiency motor products professional research base. Domestic oil-immersed and dry high-end transformers first-class enterprises.^[1] After more than ten years of development, the company has achieved rapid growth, the company's existing employees more than 5500 people, senior and middle-level titles 455 people, including 26 professor-level senior workers. The company has 3 first-class subsidiaries and Baotou, Hami 2 second-class subsidiaries in Jiangsu, Chengdu and Guangzhou, as well as 4 participating companies in China Auto Logistics, Shanghai Shentong, Anhui Ruida and Jiangxi Shengyilun. As a national technology innovation demonstration enterprise, the company established a national enterprise technology center, with state-level motor, transformer testing test station, electrical insulation power equipment national key laboratory, locomotive group and locomotive traction and control national key laboratory, high-power AC

transmission electric locomotive system integration national key laboratory, national wind power technology research center motor research room, set up a postdoctoral workstation. Zhuzhou as the center of the construction of a global service network, products with 11 railway bureaus, 23 locomotives, more than 40 wind farms, products exported to Europe, North America, Central Asia, West Asia and other places.

2. ANALYSIS OF THE POLITICAL ENVIRONMENT

Because of Sino-US trade friction, many enterprises in China are facing the development problem of "stuck neck" because of the lack of core technology and the blockade and repression of American science and technology. Therefore, China's enterprises urgently need to break through the existing technology bottlenecks and foreign technology blockade, adapt to the changes of the times, to achieve high-speed and high-quality development. On August 4, 2020, the General Office of the State Council issued the Notice of the State Council on the Issue of a Number of Policies for the Promotion of High-quality Development of the Integrated Circuit Industry and the Software Industry in the New Era, which clearly stated that the focus should be on the development of key core technologies such as high-end chips, integrated circuit equipment and process technology, key materials for integrated circuits, and integrated circuit design tools.^[2] This year, General Secretary Xi Jinping has repeatedly emphasized China's

leading role in energy conservation and emission reduction, carbon-rich neutrality, and high-speed rail, including the opening ceremony of the Second United Nations Conference on Sustainable Transportation, the 15th Conference of the Parties leaders' summit of the Convention on Biological Diversity, and the 16th summit of G20 leaders. Green transportation, including electric vehicles, plays an important role in China's energy conservation and emission reduction efforts. On October 24, 2021, the Central Office of the Communist Party of China and the State Office issued the Opinions of the State Council of the CPC Central Committee on complete, accurate and comprehensive implementation of the new development concept to do a good job in carbon-reaching carbon neutralization, which also emphasized the promotion of intelligent transportation and the electrification of railways.^[3] China built a large-scale railway during the 13th Five-Year Plan period, and the fixed investment of the railway exceeded 28 trillion yuan. In order to fully support and regular motor industry development, the government has also promulgated the Renewable Energy Law of the People's Republic of China and other laws and regulations, and in the "14th Five-Year Plan" stressed the promotion of green development and transformation and upgrading of the motor industry, for the development of the industry to create a good environment. Zhongzhou Electric Company has always strictly followed the national policy guidance, research and development and national industrial development requirements in line with the product, technology development direction and products to obtain social and government recognition and support.

3. ECONOMIC ENVIRONMENT ANALYSIS

At present, China's economy is in a high-speed development stage, the overall economic situation is good. In 2020, GDP will be RMB 1015986 billion, an increase of 2.3% over the previous year in constant prices, and the per capita disposable income of residents nationwide will be RMB3218.9 billion, an increase of 4.7% over the previous year. Since the high-speed rail began operating, the average daily passenger number has increased from 350,000 in 2008 to 6.459 million in 2019, an average annual increase of 30.3%. In 2020, high-speed rail passenger turnover will account for 25.2% of the total passenger traffic, an increase of 20.4 percentage points over 2012^[4]. After the out break of the new crown outbreak in 2020, although the global economy continued to be depressed, China's economy has maintained a strong resilience and maintained a steady and progressive development trend overall. The stability of economic operation provides a solid foundation for the investment and construction of high-speed rail and other infrastructure, while economic development also provides a good space for technological development and product promotion.

TABLE 1 NEW MAJOR PRODUCTION AND OPERATIONAL CAPABILITIES FOR FIXED ASSET INVESTMENT IN 2020

index	unit	Absolute
Added 20 kV and above substation equipment	thousands of volts	22288
New railway production mileage	kilometer	4933
Among them, high-speed rail	kilometer	2521
Increase and build new railway re-line production mileage	kilometer	3380
Electrified railway production mileage	kilometer	5480
Newly remodeled highway mileage	kilometer	12713
Port tons of terminal berths to add through capacity	tons/year piece	30562 3
New civil transport airports	10,000	
Added fiber optic cable length	kilometers	428

In recent years, China's national economy level has developed steadily, from high-speed to high-quality, economic development presents a unique toughness, potential and leeway. During the "13th Five-Year Plan" period, China was the world's largest trading and manufacturing country, with per capita GDP in the ranks of middle-income countries, the second largest investment in scientific and technological research and development, and the first in the world in the number of high-speed rail mileage. The rapid development of China's macroeconomic environment determines the development of China's railway industry and also affects the development trend of the motor industry. In 2020, China's railway start-up projects 20, fixed asset investment scale of 781.9 billion yuan, of which the new line production mileage of 4933 kilometers, high-speed rail new line production mileage of 2521 kilometers, accounting for 51%, the national railway projects started 22, the completion of railway construction investment is expected to exceed 500 billion yuan, railway construction tasks successfully completed. In 2020, the national railway business mileage reached 150,000 kilometers, of which the high-speed railway business mileage of 30,000 kilometers, the complex rate and electrification rate reached about 60% and 70%, respectively, basically forming a reasonable layout, extensive coverage, clear hierarchy, safe and efficient railway network.^[5]

Table2 National railway cargo traffic

index	unit	2020	±% over the previous year
The total amount of goods sent	tons	455236	3.2

National Railway	tons	358102	4.1
Total turnover of goods	tons of kilometers	30514.46	1.0
National Railway	tons of kilometers	27397.83	1.4

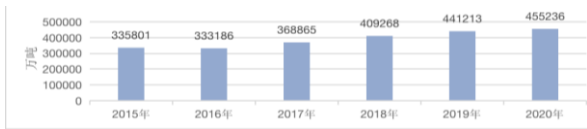


Figure 1 Total national rail cargo shipments

4. CULTURAL ENVIRONMENT ANALYSIS

In energy conservation and emission reduction, low-carbon environmental protection concept is increasingly popular today, the choice of more efficient, green clean energy and lifestyle has become the consensus. At the same time, China's resource constraints are increasing, ecological environment problems are prominent, the pressure to adjust the structure, improve energy efficiency and ensure energy security has increased, the development of the energy industry is facing a series of new problems and new challenges. According to the Action Plan of the Energy Development Strategy (2014-2020), in order to adjust the national energy structure and effectively reduce carbon emissions, China's non-fossil energy will account for 15% of energy consumption by 2020 and increase to about 20% by 2030.^[6] The development of new energy will become the trend of the general trend and the direction of the people's hearts.

In the economic and social development of railway transport also has a special and important position and role, it not only has convenient, affordable, strong safety, can be all-weather transport and so on, but also with China is constantly promoting the electrification of railways, the current electrification rate of China's railways has reached more than 70%, but also to meet the needs of energy conservation and emission reduction. China's geographical area is wide, geographical form is diverse, the demand for railway is higher, and due to natural factors brought about by certain socio-economic development imbalance, but also through the completion of the railway network to change the status quo. China's vast land area also determines the large scale of our road network, but also on the functional needs of the railway has a diversified impact, in order to meet the needs of different regions of travel and transportation, the need for different operating models and train equipment support.

5. TECHNICAL ENVIRONMENT ANALYSIS

In recent years, the rapid development of China's railways has become a hot spot at home and abroad, one is to promote the construction of comprehensive projects, and the other is to go to the world with technical equipment. Science and technology first, innovation-led, the current overall level of China's railway technology, including IGBT and other key technologies to achieve breakthroughs, high-speed rail locomotives to achieve localization, more and more involved in the formulation of railway-related standards, become the industry leader. At present, the country more encourage the combination of industry, education and research, the improvement of domestic overall technology and other conditions for China's high-tech enterprises to provide a good environment for development. Technology continues to benefit from dependence on imports to more in our own hands, from a single technology to the entire rail industry chain. As more and more enterprises in China continue to deepen in scientific and technological innovation, master more new high-quality technical resources, provide favorable conditions for independent innovation, and constantly break the foreign technology monopoly, but also for the technical development of China Motor Zhuzhou provides a strong technical support.

6. CONCLUSIONS

At present, enterprise development will be energy-efficient and environmental protection technology as the development trend, but at the same time the current economic growth rate slows down, the number of new projects decreased, human resources costs rise, the company's advantages are mainly reflected in a strong financial strength but also has high-tech experienced scientific research team, in rail transportation and efficient motors have a certain degree of authority and visibility, disadvantage In the field of high-efficiency motor market influence is low, at present, China has mastered the high-efficiency and ultra-efficient energy-saving motor production technology to become a large motor country, but from the overall view of the industry competitiveness is weak, low energy efficiency level, with the motor manufacturing industry competition is increasing, the company needs to change customer demand and enterprise development environment research continue to explore. In the global environment of promoting energy conservation and efficient use of clean energy, the development of energy-efficient motors will have good market expectations, will also receive strong support from national policies. Therefore, the external environment of China Car Zhuzhou Electric Co., Ltd., the current macro environment is suitable for the rapid development of

enterprises, so enterprises should adopt a development strategy.

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