Chinese New Energy Vehicle Industry Competitiveness Evaluation

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Abstract. This paper uses the comprehensive index method and the analytic hierarchy process to evaluate the competitiveness index of Chinese new energy vehicle (NEV) industry based on the data of NEV industry and experts in 2018. The results show that the international competitiveness of Chinese NEV industry in 2018 is basically the same as last year, and the competitiveness index ranks the third. The new support policies for NEVs are continuously introduced and the effectiveness of the policies has been promulgated to make the NEV industry develop at a high speed.

The Construction of an International Competitiveness Evaluation System for an Industry

(1) Definition of the concept of Chinese NEV industry competitiveness

According to the industry background of the NEV industry and the research purpose of this paper, combined with the relevant theories of international competitiveness, the competitiveness of the NEV industry is defined as follows:

The competitiveness of the NEV industry is from the perspective of the industrial chain. In the existing macro environment and industrial development level, in the NEV market at home and abroad, the future production cost can be lower and the market is different. Product (service) characteristics is to achieve the best potential market share and profitability.

(2) Evaluation of the research subject

According to the needs of this research, the products evaluated by the competitiveness of the NEV industry include battery electric vehicles, plug-in hybrid vehicles, and fuel cell vehicles. The evaluation subject is a vehicle manufacturer (including a joint venture) that manufactures NEVs in China.

(3) Definition of research scope

The scope of this chapter includes the comprehensive evaluation of Chinese NEV industry competitiveness and the benchmark analysis of the competitiveness of Chinese and foreign NEV industry.

(4) Selection of evaluation reference objects

The NEV Industry Competitiveness Evaluation Index adopts the international comparative law and mainly benchmarks the competitiveness of NEV industries between China, the United States, Germany, Japan and South Korea.

(5) Basic ideas for the construction of the indicator system

The index evaluation system includes six levels of indicators: policy environmental competitiveness, basic competitiveness, industrial support, display competitiveness, enterprise competitiveness and product competitiveness, and 14 secondary indicators, mainly economic policies and industry management policies, technical policy, scientific research competitiveness, manufacturing competitiveness, environmental support, basic support, industrial support, relative display, research and development capabilities, industrialization capabilities, vehicle competitiveness, parts competitiveness.
Evaluation of the Competitiveness of NEV Industry

(1) The competitiveness of NEV industry has been steadily increasing year by year. Compared with the United States, Japan, Germany, and South Korea, China's new energy auto industry ranked third in international competitiveness in 2018, which was the same as 2017 and one place higher than the 2016. The composite index is 97.7, which is 97.7% in the US, 98.6% in Japan, 100.8% in Germany, and 108.4% in South Korea. From 2016 to 2018, the US NEV industry's international competitiveness ranking has remained the first, and it is still the leader in the development of the global NEV industry.

From the ranking of the international competitiveness of the NEV industry, China can be seen as the fifth place in 2013, and it has steadily increased to the third place in 2018 year by year. The absolute value of competitiveness has also increased from 70.7 in 2013 to 97.7 in 2017. The gap in competitiveness with NEV industries in developed countries such as the United States and Japan is gradually narrowing.

![Figure 1. International comparison of NEV industry competitiveness index.](image)

(2) Environmental competitiveness
Chinese NEV industry environmental competitiveness index ranked the fourth, the comprehensive index was 92, which is 91.1% in Germany, 91.2% in the United States, 93.6% in Japan, and 103.1% in South Korea.

(3) Basic competitiveness
Chinese NEV industry basic competitiveness index ranked fifth, the comprehensive index was 81.1, which was 81.1% in Japan, 81.8% in the United States, 85.4% in Germany, and 97.9% in South Korea. The competitiveness of China's new energy auto industry's basic competitiveness is still relatively weak, and it still needs the joint efforts of the whole industry.

(4) Industry support power
Chinese NEV industry's support power ranks the fourth among the above five countries, with a composite index of 89.9, which is 89.9% in the US, 92.6% in Germany, 92.7% in Japan, and 101.0% in South Korea.

(5) Showing competitiveness
China's new energy auto industry shows that its competitiveness includes two major aspects: absolute display of competitiveness and relative display of competitiveness, and is reflected by the two tri-level indicators of NEV sales and NEV penetration. Chinese NEV industry shows its
competitiveness in the first place in five countries for many years, and its advantages are obvious compared with other countries.

(6) Enterprise competitiveness

The competitiveness of Chinese NEV companies ranks the last among the five countries, with a composite index of 83.3, which is 83.3% in Germany, 83.6% in Japan, 83.6% in the US, and 95.3% in South Korea.

(7) Product competitiveness

Chinese NEV product competitiveness ranks the fourth in those five countries, with a composite index of 90.0, which is 90.0% in Japan, 90.1% in the US, 95.3% in Germany, and 100.1% in South Korea.

Suggestions on Improving the Competitiveness of NEV Industry

(1) China's next step to continue to maintain and enhance the international competitiveness of Chinese NEV industry requires the construction of a package of non-subsidized policy tools covering production, research and development, acquisition, use, infrastructure, business models, etc., through different types of support policies. Combine, effectively balance the comprehensive cost gap between NEVs and traditional vehicles, solve the problems of institutional mechanisms that hinder industrial development, improve the development environment of NEV industry, and promote the development of high-quality and high-competitive industries.

(2) Relative to developed countries, we should strengthen the management of R&D, especially the key technologies and products such as relatively obsolete batteries and chips, and accelerate the establishment of a technological innovation system with enterprises as the mainstay, market-oriented, and deep integration of production, education and research. To promote the accelerated transformation of effective scientific and technological achievements. At the same time, we will increase investment in patented products and original core technologies, continuously increase the market share of NEVs in the future, expand the proportion of private purchases, and enhance the competitiveness of industrial bases.

(3) In order to improve industrial support, China must continue to strengthen its infrastructure supporting capacity and common platform service capabilities, increase investment in equipment development and manufacturing capabilities, and strengthen the development of power systems and key components while improving the proficiency of industrial skilled workers.

(4) In the next step, Chinese NEV companies should continue to increase product research and development, design, produce and sell new energy auto products from the long-term perspective of product development, thereby improving product competitiveness.

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