

Evaluation of the Competitiveness of Wind Power Industry in China ——Based on SWOT Analysis

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Abstract

In the face of the globalization problems of energy security and environmental protection, the development of wind power industry has attracted great attention. According to the SWOT analysis, this paper evaluates the competitiveness of Chinese wind power industry and puts forward the future development strategies, which will improve Chinese wind power industry's competitive advantage in the market.

Key words: *wind power; competitive strength; SWOT analysis; development strategy; superiority*

1 Introduction

Since 21st Century, energy security and environmental protection have become a global issue. In the long term, fossil fuel-based energy structure not only directly led to the depletion of energy, but also caused serious environmental pollution and ecological deterioration. With the rapid development of society and economy, governments around the world are actively developing renewable energy, to reduce environmental pressures and promote the adjustment of energy structure by saving and replacing part of the fossil energy. Renewable energy mainly includes solar energy, wind energy, hydropower, biomass, geothermal energy and ocean energy, etc. Wind power, as a clean and sustainable energy, can reduce industrial society's consumption dependence on the traditional energy. And it takes neither rising fuel price risk nor environmental costs of carbon emissions. Wind energy has many excellent characteristics such as large reserves, wide distribution, mature technology, relatively low development cost, so wind power generation is the first choice for renewable energy power generation.

2 Development status of wind power industry in China

By now the global wind energy scale is about 130 billion kilowatts, Chinese wind energy reserves is 3.226 billion kilowatts, ranks first in the world, in which of the actual development and utilization reserves is 253 million kilowatts. The Liaodong Peninsula, Xinjiang, Inner Mongolia, the southeast coast and its nearby islands are rich regions in wind energy resources, with great development potential. By the end of 2015, the cumulative installed capacity of wind power in the world reached 432.4 gigawatts, while the annual growth rate reached 17%.¹ China's cumulative installed capacity of wind power reached 145.1 gigawatts, the proportion of the various countries' cumulative installed capacity of wind power in 2015 is shown in Fig. 1.

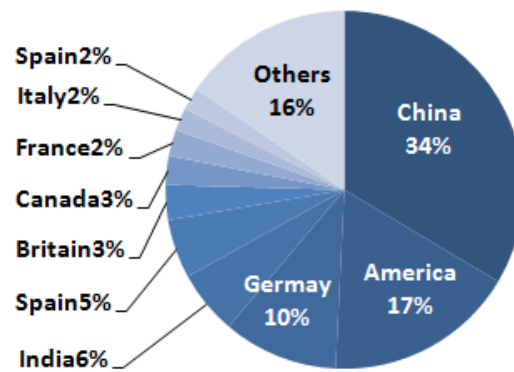


Fig. 1 – The proportion of various countries’ cumulative installed capacity of wind power in 2015

On the basis of resource superiority, the technology gradually sophisticated, the industrial chain constantly improved and the industrial capital investment increased. In addition, there are a number of laws and regulations on supporting the development of wind power industry, as shown in Table 1.

Table 1 – The relative supporting policies of wind power industry in China

Time	Policy and Main Contents
2005	Policy: <i>Notice on the Requirements of Wind Power Construction and Management</i> Main Contents: Requiring the rate of wind power equipment nationalization is more than 70%
2006	Policy: <i>Renewable Energy Law</i> Main Contents: Adjusting the price of electricity and establishing special fund of renewable energy development
2007	Policy: <i>Renewable Energy Long-Term Planning</i> Main Contents: Setting mandatory market share targets for non-hydro renewable energy power generation
2012	Policy: <i>The Twelfth Five-Year Plan of Wind Power</i> Main Contents: Making development plans for wind power industry in the next five years.
2014	Policy: <i>Strategic Action Plan for Energy Development (2014-2020)</i> Main Contents: By 2020, China's cumulative installed capacity of wind power reached 200 gigawatts, the feed-in tariffs in wind power and thermal power are equivalent
2015	Policy: <i>Policy on Developing Benchmark Feed-in Tariffs of Wind Power, Photovoltaic Power Generation</i> Main Contents: Readjusting the benchmark feed-in tariffs of wind power

Chinese wind power industry has gradually being mature, but there are still many gaps and deficiencies compared with developed countries. In this context, the development of Chinese wind power industry is also facing huge risks and challenges. A clear understanding of the

current development situation of Chinese wind power industry and enhancing the competitiveness have guiding significance to its future development.

3 SWOT Analysis and Development Suggestions of Chinese Wind Power Industry

SWOT analysis refers to the analysis of the company's four aspects situations, which are Strengths, Weaknesses, Opportunities and Threats.² This paper formulates the corresponding competitive strategy according to these aspects. Now through in-depth understanding of the current situation of Chinese wind power industry, this paper analyzes Chinese wind power industry by SWOT.

3.1 Strengths of wind power industry in China

3.1.1 Strengths of unique resources

China has vast grasslands and a long coastline, it is one of the most suitable areas for the development of wind power generation in the world. The total reserves of wind energy resources in 10m height level is 3226 gigawatts, which is 10 times more than exploitable hydropower resources. It has great development potential in the future.

3.1.2 Strengths of industrial clusters

Wind power equipment manufacturing enterprise, such as Sinovel, Goldwind, DTC and United Power, has formed a certain scale. Vestas, Gamesa, Suzlon and many other famous enterprises gathered in China. The industrial cluster has been initially formed.

3.1.3 Strengths of scientific research institutions and talent resources

Many universities and scientific research institutes in China have trained a large number of talents for the development of wind power industry, which promotes the research ability of the wind power industry.

3.2 Weakness of wind power industry in China

3.2.1 Lack of industry standard system

Production technology standard system, product examination system and quality standard certification system in wind power industry is not perfect. Market competition is out of order. Most of the products are concentrated in the middle and low level.

3.2.2 Lack of professional core technology

Because of the complex climate environment, high-standard equipment and technology are required in wind power industry. But at present China has not transformed from the situation of lacking core technology, many professional equipments are still dependent on imports.³

3.2.3 Higher cost of power generation

Wind power industry is a high-tech industry, the construction of the wind farm, transportation, construction and maintenance of wind power equipment need the strong financial support.

3.3 Opportunities of wind power industry in China

3.3.1 Support from national and local policy

The development of wind power industry is a major planning to achieve sustainable development strategy. Since 1990s, in order to support the development of wind power industry, Chinese government has put forward specific requirements for its development and utilization, the overall layout, system standards and so on.⁴

3.3.2 Shortages and price changes of traditional fossil energy

A great deal of exploitation of oil and coal makes the sharp decline in energy reserves, Chinese oil price in recent years has also been showing a rising trend.⁵ Since not affected by price fluctuation, it has brought a good opportunity to the development and utilization of wind power.⁶

3.3.3 Global climate change and pressure of environmental protection

Environmental pollution in China is very serious, SO₂ and CO₂ emissions ranks first in the world. As a new form of clean power, wind power plays an important role in the realization of a friendly environment, sustainable development and CO₂ emission reduction.⁷

3.4 Threats of wind power industry in China

3.4.1 Extension of other new energy power generation technology

In addition to wind power generation, new energy power generation also includes solar photovoltaic, concentrating solar power, biomass power generation, geothermal power generation, tidal power generation and fuel cell power generation, etc. The rapid development of these power generation technologies formed a certain influence on wind power market share.

3.4.2 The sustained increase of the proportion of curtailed wind power

By 2015, the situation of wind power curtailment and power rationing exacerbated, annual wind power curtailment is 33.9 billion kw·h, the average rate of wind power curtailment is 15% with an increase of 7 percentage points. The rate of wind power curtailment in Gansu, Xinjiang and Jilin has reached up to 30%, which seriously affects people's preference for wind power.¹

3.4.3 Lack of domestic market exploitation

Due to the higher wind power price and smaller domestic demand, the current wind power generation capacity only accounts for 3.3% of the country's electricity generation, much lower than the thermal power and hydropower generation.

Through the analysis of the strengths, weakness, opportunities and threats of Chinese wind power industry, it puts forward some corresponding suggestions for the future development of the wind power industry in China, as shown in table 2.

4 Conclusion

The development of Chinese wind power industry has both strengths and weakness, as well as opportunities and threats. Therefore, the strength of resources reserves, industrial clusters and

scientific research talents should be full used in the development of Chinese wind power industry. There are many weaknesses in wind power industry such as the lack of core technology, the disordered development of wind power equipment manufacturing industry and the relatively lagging power grid. To improve these shortcomings, then transform inferiority into superiority. At the same time, the opportunities in the development of wind power industry should be seized, taking a clear understanding of the threat in the wind power's development, and promoting the rapid and steady development of Chinese wind power industry.

Tab.2 SWOT analysis of wind power industry in China

Strategy Interior Exterior	Strengths: 1. Strengths of unique resources 2. Strengths of industrial clusters 3. Strengths of scientific research institutions and talent resources	Weaknesses: 1. Lack of industry standard system 2. Lack of professional core technology 3. Higher cost of power generation
Opportunities: 1. Support from national and local policy 2. Shortages and price changes of traditional fossil energy 3. Global climate change and pressure of environmental protection	Actively responding to the national strategy of sustainable development, taking advantages of resources superiority, and expanding the scale of industrial construction; Strengthening the training and introduction of talents by using policy support; Strengthening international exchange and cooperation.	Improving fiscal and taxation policies, establishing special funds; Establishing and completing a sound production technology standard system and a quality standard certification system.
Threats: 1. Extension of other new energy power generation technology 2. The sustained increase of the proportion of curtailed wind power 3. Lack of domestic market exploitation	Utilizing the strengths of resources and industry scale, improving the competitiveness and ameliorating the market environment of wind power; Preferentially developing wind farms with the resource and grid-connected power generation conditions.	Implementing the differentiation strategy and training the core competitiveness of industry; Strengthening the core technology research and independent production.

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